

ELECTRONIC COMPONENTS

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2013 / 2014E HIGH QUALITY CAPACITORS



 <p>CAUTION Observe the following to ensure safe operation.</p>	<p>1. The models and specification values contained in this catalog are for reference purposes only. During actual use or when placing an order, please request "drawings" and make your purchase or use the purchased product based on those drawings.</p> <p>2. In order to ensure that products are used correctly and safely, always make sure to read the cautions for using prior to using the product.</p>
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<p>NOTE</p>	<p>1. Since the contents contained are subject to changes in specifications, dimensions and so forth without notice due to modification, please confirm the contents when placing an order. If any of the matters described here are unclear, please inquire at one of our nearby sales offices.</p> <p>2. The contents of this catalog are valid as of December 2012.</p>
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Electronic Components
 High Quality
CAPACITORS

ALUMINUM ELECTROLYTIC CAPACITORS WITH CONDUCTIVE POLYMER
 SOLID ELECTROLYTE
 ALUMINUM ELECTROLYTIC CAPACITORS
 ELECTRIC DOUBLE LAYER CAPACITORS "DYNACAP"
 PLASTIC FILM CAPACITORS

ELNA CO.,LTD.
 CAT.No.2013/2014E

ELNA CO.,LTD.

Certifications of Quality Management System (as of Sep. 2012)

Factory	Applicable Standard	Certification Number	Item	Applicable Organization
ELNA CO., LTD. SHIRAKAWA Tech. (Japan)	ISO 9001	JP05/060268	Aluminum electrolytic capacitors Electric double layer capacitors	SGS
ELNA TOHOKU CO., LTD. AOMORI Factory (Japan)				
TANIN ELNA CO., LTD. (Thailand)	ISO/TS 16949	IATF0089622 44 111 060686	Aluminum electrolytic capacitors Electric double layer capacitors	TÜV
	ISO 9001	04100 1999 0506	Aluminum electrolytic capacitors Electric double layer capacitors	TÜV
ELNA-SONIC SDN. BHD. (Malaysia)	ISO/TS 16949	IATF0110000 SGS MY04/0675	Aluminum electrolytic capacitors	SGS
	ISO 9001	SG02/20012	Aluminum electrolytic capacitors	SGS

Certifications of Environmental Management System (as of Sep. 2012)

Factory	Applicable Standard	Certification Number	Applicable Organization
ELNA TOHOKU CO., LTD. AOMORI Factory (Japan)	ISO 14001	JQA-EM2918	Japan Quality Assurance (JQA)
TANIN ELNA CO., LTD. (Thailand)	ISO 14001	04104 1999 0506E5	TÜV
ELNA-SONIC SDN. BHD. (Malaysia)	ISO 14001	SG03/60718	SGS

Standard Ratings

Rated voltage (V)	Rated capacitance (μF)	Case (mm)		Casing symbol	Maximum current (Arms)	Thermal resistance (K/W)	Maximum peak current (A)	Series resistance (mΩ)	Self-inductance (nH)	ELNA Parts No.
		φD	L							
880	220	85	70	F70	50	5.6	2640	1.9	60	NYD-880V221KF706BB
	260	75	95	E95	45	5.6	2600	2.8	80	NYD-880V261KE956BB
	350	85	95	F95	50	5.1	3500	2.4	60	NYD-880V351KF956BB
	440	116	70	H70	65	5.8	5280	1.5	60	NYD-880V441KH706BB
	480	85	120	FC0	55	4.7	3840	2.8	60	NYD-880V481KFC06BB
	550	85	136	FD6	50	4.6	3850	3.0	60	NYD-880V551KFD66BB
	700	116	95	H95	70	5.4	7000	1.7	60	NYD-880V701KH956BB
	750	85	173	FH3	55	4.3	6750	3.7	60	NYD-880V751KFH36BB
	970	116	120	HC0	75	5.0	5820	1.9	60	NYD-880V971KHC06BB
	1100	116	132	HD2	75	4.9	6600	2.0	60	NYD-880V112KHD26BB
	1500	116	173	HH3	80	3.4	13500	2.4	60	NYD-880V152KHH36BB
	1100	100	75	70	E70	35	6.0	1200	2.5	80
140		85	70	F70	45	5.6	1680	2.1	60	NYD-1100V141KF706BB
170		75	95	E95	40	5.6	1700	3.2	80	NYD-1100V171KE956BB
230		75	120	EC0	40	4.7	1840	4.1	80	NYD-1100V231KEC06BB
260		75	136	ED6	40	4.6	2080	4.4	80	NYD-1100V261KED66BB
280		116	70	H70	60	5.8	2800	1.6	60	NYD-1100V281KH706BB
350		75	173	EH3	40	4.2	3500	5.6	80	NYD-1100V351KEH36BB
420		85	136	FD6	55	4.6	3200	2.2	60	NYD-1100V421KFD66BB
450		116	95	H95	65	5.4	4500	1.9	60	NYD-1100V451KH956BB
480		85	173	FH3	50	4.3	4800	4.3	60	NYD-1100V481KFH36BB
610		116	120	HC0	70	5.0	5490	2.2	60	NYD-1100V611KHC06BB
700		116	132	HD2	70	4.9	6300	2.3	60	NYD-1100V701KHD26BB
940		116	173	HH3	70	3.4	9400	1.6	60	NYD-1100V941KHH36BB
1100		116	230	HNO	80	2.7	11000	1.5	100	NYD-1100V112KHN06BB
1320	70	75	70	E70	35	6.0	1050	2.8	80	NYD-1320V700KE706BB
	110	75	95	E95	35	5.6	1540	3.8	80	NYD-1320V111KE956BB
	160	75	120	EC0	40	4.7	1600	4.6	80	NYD-1320V161KEC06BB
	180	75	136	ED6	40	4.6	1800	5.1	80	NYD-1320V181KED66BB
	220	85	120	FC0	45	4.7	2200	3.6	60	NYD-1320V221KFC06BB
	260	85	136	FD6	45	4.6	2600	3.9	60	NYD-1320V261KFD66BB
	310	116	95	H95	65	5.4	3720	2.0	60	NYD-1320V311KH956BB
	340	85	173	FH3	50	4.3	4080	4.9	60	NYD-1320V341KFH36BB
	420	116	120	HC0	65	5.0	4200	2.4	60	NYD-1320V421KHC06BB
	480	116	132	HD2	70	4.9	4800	2.6	60	NYD-1320V481KHD26BB
	660	116	173	HH3	70	3.4	7920	3.1	60	NYD-1320V661KHH36BB

Please read the following warning and cautions !!

The Electronic components shown in this catalog are designed and produced mainly for such general purpose electronic equipment as audio and visual equipment, home appliances, office equipment and information processing and communication equipment.

If you wish to use these components in medical equipment, transportation equipment, (automotive, train, ships, etc), aircraft, spacecraft, security systems or other equipment that requires high security application, you are required to confirm application through your own testing and own judgment.

Regardless of a component intended use, if high safety application is required, it is recommended that you shall establish a protective or redundant circuit and shall conduct own evaluation test.

It is highly recommended that you shall follow our "Cautions for using"

Also it is recommended that you shall obtain technical specifications from Elna Co., Ltd to ensure that the component is suitable for your intended use.

It is not our responsibility for any kind of problems without technical specifications.

Specifications and dimensions shown in this catalog are subject to change without prior notice.

Be sure to read “Cautions for Using Electrolytic Capacitors”, before using those products.

1

Aluminum Electrolytic Capacitors

— 5

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

— 21

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

Chip Type Aluminum Electrolytic Capacitors

— 49

Aluminum Electrolytic Capacitors
Chip Type

Miniature Aluminum Electrolytic Capacitors

— 83

Aluminum Electrolytic Capacitors
Miniature

Large Capacitance Aluminum Electrolytic Capacitors

— 127

Aluminum Electrolytic Capacitors
Large Capacitance

Aluminum Electrolytic Capacitors for Audio

— 151

Aluminum Electrolytic Capacitors
for Audio

2

Electric Double Layer Capacitors “DYNACAP” , “POWERCAP”

— 177

Electric Double Layer Capacitors

■ “GREEN CAP”

“GREEN CAP”, ELNA considers the global environment and it is a product that doesn't use the hazardous substance and “Lead Free” in the plating of terminals and outer Sleeves.

The product in this catalog is ‘GREEN CAP’ if there is no description in the text.

The hazardous substance is

Pb : lead, Cr⁶⁺ : hexavalent chromium, Hg : mercury and Cd : cadmium,
PBB : the polybrominated biphenyl, PBDE : the polybromo-diphenyl ether,

■ Regarding to various environmental Regulations

- It suits “EU RoHS Directives”.
- According to the content of RIP3.8TGD(Technical Guidance Document which is published on 26 May 2008), our electronic components are “articles without any intended release”.
Therefore they are not applicable for “Registration” for EU REACH Regulation Article 7 (1).
ELNA develops the products without substance of very high concern(SVHC). DEHP(CASNo.117-81-7) was contained as some covering material.
- If you need “Halogen-Free” products, please consult with us.

Terminal area plating material and sleeve material

● Aluminum electrolytic capacitors

Category		Terminal area plating	Plating thickness	Sleeve
SMD (Chip type)	φ3 to 6.3	Sn-Bi	12μm	Sleeve less
	φ8,10	Sn-Bi	12μm	PET or sleeve less
	φ12.5	Sn 100%	12μm	PET or sleeve less
	φ16 to 18	Sn 100%	12μm	Sleeve less
	A supplementary terminal	Sn 100%	12μm	PET or sleeve less
Sn 100%		12μm	Sleeve less	
Lead terminal		Sn 100%	12μm	PET or sleeve less
Snap-in		Sn 100%	12μm	PET
Screw terminal		—		PVC *

* Pb less PVC

● Electric double layer capacitors

Category		Terminal area plating	Plating thickness	Sleeve	
Cion cell	SMD	Single cell	Sn 100% or Sn + Cu	5μm	Sleeve less
		Piled cell	Sn 100%	5μm	PET
	Lead type	Sn 100% or Sn + Cu	5μm	PET	
Large capacitance	Lead terminal		Sn 100%	12μm	PET
	Snap-in terminal		Sn 100%	12μm	PET
	Screw terminal		—		PET

Note : Sn : Tin Bi : Bismuth Cu : Copper

Please inquire when hoping excluding the above-mentioned terminal plating and sleeve.

■ About the Sn whisker

1. Sn whisker-generating mechanism on the lead wire

On the surface of the lead wire, Sn and aluminum will get mixed instead of getting dissolved. The surface condition is complex, aluminum will expand due to the heat and humid causing the oxidation and hydration. This reaction will cause the inner stress and influence the development of the whisker.

2. Generation control of the Sn whisker

In the past, Sn whisker was reduced by adding a lead(Pb). Aluminum electrolytic capacitor was also using the Sn-plate with Pb on the lead wire. But due to environmental regulation such as the “ELV” and “RoHS”, Pb was strictly prohibited since 2000. Lead wire not containing the Pb was used, which caused the Sn whisker problem to happen again. Since Sn whisker is influenced by the mixture of aluminum, method of reducing the aluminum on the welding surface was to clean the lead terminal using the alkali. However since the welding area of the large case size is larger compared to the small ones, whisker will generate even if it is cleaned by alkali. This whisker will scatter outside of the capacitor and potentially cause the short-circuit. Countermeasure of keeping the whisker inside the capacitor is being discussed.

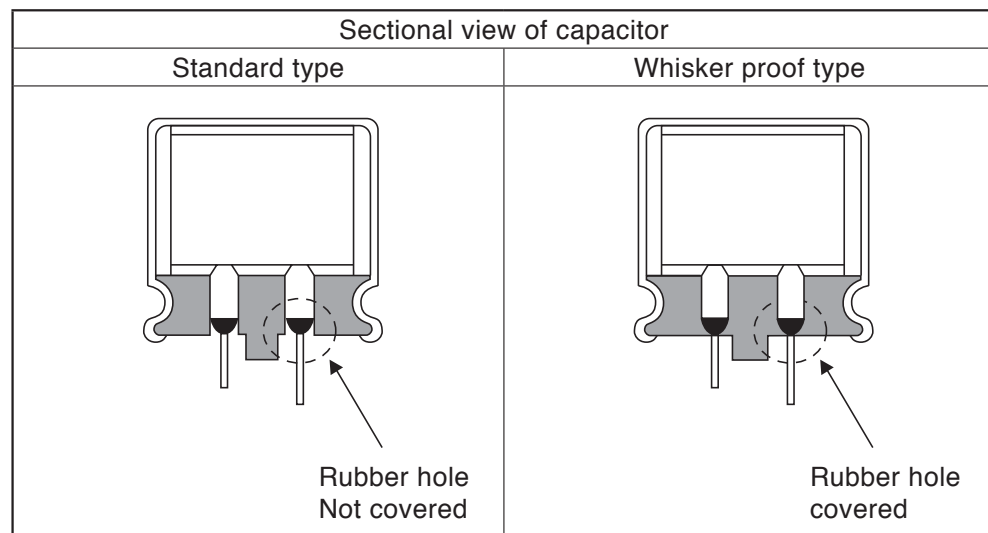
3. Prevention of scattering of Sn whisker

In the past Sn-plate with Pb was used and recently plate with Bi is being introduced to prevent the whisker from generating. However the whisker will still generate under the temperature and moisture condition. Therefore, the current method of preventing the whisker will not completely prevent the whisker from generating.

In our company, we are developing and supplying products with design of preventing the whisker from scattering outside the capacitor.

This design corresponds to series such as the RJD and RJE for 105°C use, RKD and RPK for 125°C use.

If it is required for the other series, please feel free to make an inquiry.



■ Ordering Information

Please designate the number of capacitors you order in integral multiples of the minimum packing number of units.

Aluminum Electrolytic Capacitors

Classification	Size φD×L (mm)	Quantity (PCS.)								
		Long lead		Forming lead		Taping (flat box)		Taping (reel)		
		Vinyl bag	Packaging box	Vinyl bag	Packaging box	Box	Packaging quantity	One reel	Packaging quantity	
Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte	Chip Type	φ5 to φ6.3×4.5 to 7.7	—	—	—	—	—	—	1,000	5,000
		φ8×6.7 to 7.7	—	—	—	—	—	—	1,000	4,000
		φ10×7.7	—	—	—	—	—	—	500	2,000
	O4 Type	φ6.3×8	200	2,000	200	2,000	2,000	20,000	—	—
φ8×8		200	2,000	200	2,000	1,000	10,000	—	—	
φ10×12.5		200	1,000	200	1,000	500	5,000	—	—	
Chip Type	φ3, φ4	—	—	—	—	—	—	2,000	10,000	
	φ5 to φ8×6.7, φ6.3×7.7	—	—	—	—	—	—	1,000	5,000	
	φ8×10, φ10×10 to 10.5	—	—	—	—	—	—	500	2,000	
	φ12.5×13.5	—	—	—	—	—	—	200	1,000	
	φ9.5×19 to 24	—	—	—	—	—	—	400	(2,000)	
	φ3 to φ5×5, φ4×7	200	2,000	200	5,000	2,000	20,000	—	—	
O4 Type	φ5×7	200	2,000	200	4,000	2,000	20,000	—	—	
	φ6.3×5, φ6.3×7	200	2,000	200	2,000	2,000	20,000	—	—	
	φ8×5 to 7	200	2,000	200	2,000	1,000	10,000	—	—	
	φ5 to 6.3×11, 11.5, 15	200	2,000	200	2,000	2,000	20,000	—	—	
	φ8×11.5, 12	200	2,000	200	2,000	1,000	10,000	—	—	
	φ8×15	200	1,000	200	2,000	1,000	8,000	—	—	
	φ8×20	200	1,000	200	1,000	1,000	8,000	—	—	
	φ10×12.5	200	1,000	200	4,000	500	5,000	—	—	
	φ10×16	200	1,000	200	1,000	500	5,000	—	—	
	φ10×20	200	1,000	100	500	500	4,000	—	—	
	φ10×25 to 30	200	1,000	100	500	500	3,000	—	—	
	φ12.5×15	100	1,000	100	500	500	4,000	—	—	
	φ12.5×20 to 25	100	500	100	1,000	500	4,000	—	—	
	φ12.5×30 to 35	100	500	200	2,000	500	3,000	—	—	
	φ12.5×40	100	500	200	2,000	—	—	—	—	
	φ16×16 to 20	100	500	100	1,000	250	2,000	—	—	
	φ16×25	100	500	100	1,000	250	1,500	—	—	
	φ16×31.5 to 35.5	50	200	100	1,000	250	1,500	—	—	
	φ16×40	50	100	100	800	—	—	—	—	
	φ18×16 to 31.5	50	100	100	1,000	250	1,500	—	—	
φ18×35.5	50	100	100	1,000	—	—	—	—		
φ18×40	50	250	100	800	—	—	—	—		
69□Type	φ22 to φ25	—	100	—	—	—	—	—	—	
331Type or Others	φ30 to φ35	—	50	—	—	—	—	—	—	
	φ36 to φ101	—	*	—	—	—	—	—	—	

* Please inquire.

Electric Double Layer Capacitors

Series	Case size (mm)	Quantity (PCS.)							
		Long lead		Standard lead		Taping (flat box)		Taping (reel)	
		Vinyl bag	Packaging box	Vinyl bag	Packaging box	Box	Packaging quantity	One reel	Packaging quantity
DX, DXJ, DXN, DXS(H or V Terminal)	φ11.5	—	—	200	8,000	—	—	—	—
	φ19	—	—	100	2,000	—	—	—	—
DH, DHL, DHC, DBJ	φ13.5	—	—	200	4,000	—	—	—	—
	φ21.5	—	—	100	2,000	—	—	—	—
DK, DB, DBN, DBS	φ6.8	—	—	200	6,000	—	—	—	—
	φ4.8	—	—	—	—	—	—	2,000	10,000
DS, DSK	φ6.8	—	—	—	—	—	—	1,500 to 2,000*	6,000 to 10,000*
	φ12.5×8.5	—	—	—	—	—	—	300	1,500
DVN	φ12.5×8.5	—	—	—	—	—	—	250	1,250
DVL	φ12.5×10.5	—	—	—	—	—	—	—	—
Series	Case size (mm)	Quantity (PCS.)							
		Long lead		Forming lead		Taping (flat box)		Taping (reel)	
		Vinyl bag	Packaging box	Vinyl bag	Packaging box	Box	Packaging quantity	One reel	Packaging quantity
DY	φ6.3	200	1,000	200	2,000	2,000	20,000	—	—
	φ8	200	1,000	200	1,000	1,000	8,000	—	—
DZ	φ10	200	1,000	100	500	500	3,000	—	—
	φ12.5×23	100	500	100	1,000	500	4,000	—	—
DZN	φ12.5×31.5	100	500	200	2,000	500	3,000	—	—
	φ16×20	100	500	100	1,000	250	2,000	—	—
DZH	φ16×25	100	500	100	1,000	250	1,500	—	—
	φ16×31.5 to 35.5	50	200	100	1,000	250	1,500	—	—
DP	φ18	50	250	100	800	—	—	—	—
	φ25	—	50 or 100*	—	—	—	—	—	—
	φ35	—	50 or 100*	—	—	—	—	—	—
	φ51	—	32	—	—	—	—	—	—
DZP	8.5×17×16 8.5×17×24 10.5×21×34 10.5×21×39	—	*	—	—	—	—	—	—

* Please inquire.



Aluminum Electrolytic Capacitors

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Type List for Miniature and Large type Aluminum Electrolytic Capacitors

★ : New series
☆ : Upgrade

Category	Series	Page	Applications	Feature							Category Temp. Range °C		Rated Voltage Range V.DC		Rated capacitance Range µF	Color of sleeve	JIS Configuration	Note		
				Thin and small Size	Reliability at 105°C					For Audio	Anti-clearing solvent	Reflow Solder Resistance	Max.	Min.					Max.	Min.
				1000hrs	2000hrs	3000hrs	5000hrs	10000hrs	Low Impedance											
High Reliability Type	RJB	100	105°C , Low Impedance, Miniaturized				•	•	•	•	+	105	-55	100	6.3	3.3 to 10000	Black	04		
	RJH	102	105°C , Extra Low Impedance				•	•	•	•	+	105	-55	100	6.3	1 to 15000	Black	04		
	RJF	105	105°C , Extra Low Impedance, Miniaturized				•	•	•	•	+	105	-40	100	6.3	5.6 to 6800	Black	04		
	RJL	108	105°C , Long life, Low Impedance	•				•	•	•	•	+	105	-40	100	6.3	6.8 to 6800	Black	04	
	RJD	110	105°C , Low Impedance, High Ripple, Miniaturized	•				•	•	•	•	+	105	-55	35	6.3	10 to 18000	Black	04	☆
	RJE	113	105°C , Low Impedance, High Ripple, For Airbag	•				•	•	•	•	+	105	-55	35	25	830 to 11000	Black	04	☆
	RHS	114	105°C , Long Life, High Ripple, For Ballast	•				•				+	105	-40	250	160	4.7 to 220	Black	04	☆
	RHC	116	105°C , Long Life, High Ripple, For Ballast	•				•				+	105	-25	450	350	1 to 120	Black	04	☆
	RHD	118	105°C , Long Life, High Ripple, For Ballast	•				•				+	105	-25	450	160	3.3 to 330	Black	04	☆
	RKD	120	125°C , Low Impedance, Miniaturized	•				•	•	•	•	+	125	-40	100	10	100 to 6800	Black	04	☆
	RPK	122	125°C , Low Impedance, Vibration resistance	•				•	•	•	•	+	125	-40	100	10	220 to 6800	Black	04	★
	RQA	124	150°C , Low Impedance, Miniaturized	•				•	•	•	•	+	150	-40	35	10	220 to 10000	Silver	04	★
RKB	125	135°C , Low Impedance, Miniaturized	•				•	•	•	•	+	135	-40	35	10	220 to 6800	Silver	04	★	
Snap-in Type	LA5	128	Miniaturized	•							+	85	-40	400	10	56 to 82000	Black	692	☆	
	LAT	130	105°C , Miniaturized	•	•						+	105	-25	450	160	22 to 2700	Black	692	☆	
	LAH	132	105°C , Standard	•	•						+	105	-40	100	16	560 to 47000	Black	692	☆	
	LAZ	134	High-Reliability, High Ripple, Long Life	•		•					+	105	-25	100	16	560 to 47000	Black	692	☆	
	LAX	136	105°C , Ultra Long Life				•				+	105	-25	400	160	56 to 1800	Black	692	☆	
	LJ6	138	105°C , Higher Capacitance, Ultra Long Life				•				+	105	-25	500	200	390 to 3900	Black	-	★	
	LJ2	138	105°C , Higher Capacitance, Ultra Long Life				•				+	105	-25	500	200	560 to 3900	Black	-	★	
Special Type	LPM	140	High ripple current								+	85	-25	400	250	45 to 220	Black	692	★	
	LM	140	High ripple current, Higher Capacitance								+	85	-25	400	250	90 to 440	Black	622	★	
Screw terminal Type	LYX	142	105°C , Ultra Long Life				•				+	105	-25	450	350	1000 to 15000	Black	331	★	
	LYL	144	Ultra Long Life								+	85	-40	450	350	1000 to 15000	Black	331	★	
	LY6	146	High Ripple, Miniaturized	•							+	85	-25	550	400	1000 to 22000	Black	331	★	
	LY5	148	Standard								+	85	-25	250	10	1500 to 820000	Black	331	★	
For Audio	RVO	152	Chip Type (PURECAP)	•							+	85	-40	50	6.3	0.22 to 1000	Silver Brown	32		
	RVF	153	Chip Type (SILMIC)	•							+	85	-40	50	10	0.33 to 100	Silver	32		
	RVM	154	Chip Type 105°C , 2000h	•	•						+	105	-55	50	6.3	1 to 470	Silver	32		
	RVW	155	Chip Type 105°C (PURECAP)	•	•						+	105	-55	50	6.3	0.22 to 1000	Silver Brown	32		
	RVG	156	Chip Type	•							+	85	-40	35	6.3	3.3 to 470	Silver	32		
	RFS	157	High Grade (SILMIC II)								•	+	85	-55	100	6.3	2.2 to 3300	Brown	04	
	ROS	158	High Grade (SILMIC)								•	+	85	-40	100	16	1 to 2200	Brown	04	
	ROB	159	Miniaturized Standard (TONEREX)								•	+	85	-40	100	6.3	1 to 10000	Black	04	
	R2A	160	7mmL	•							•	+	85	-40	50	6.3	0.33 to 330	Black	04	
	R3A	161	5mmL	•							•	+	85	-40	50	4	0.22 to 220	Raddish purple	04	
	RFO	162	Standard (PURECAP)	•							•	+	85	-40	100	6.3	1 to 15000	Black	04	
	RA3	163	Miniaturized Standard	•							•	+	85	-40	100	6.3	1 to 22000	Brown	04	
	RW5	164	105°C , Miniaturized	•	•						•	+	105	-55	25	16	100 to 15000	Black	04	☆
	RBD	165	Miniaturized Bipolar	•							•	+	85	-40	100	6.3	0.47 to 4700	Black	04	
LAO	166	For Audio, Higher Capacitance								•	+	85	-40	100	16	680 to 10000	Black	692	☆	

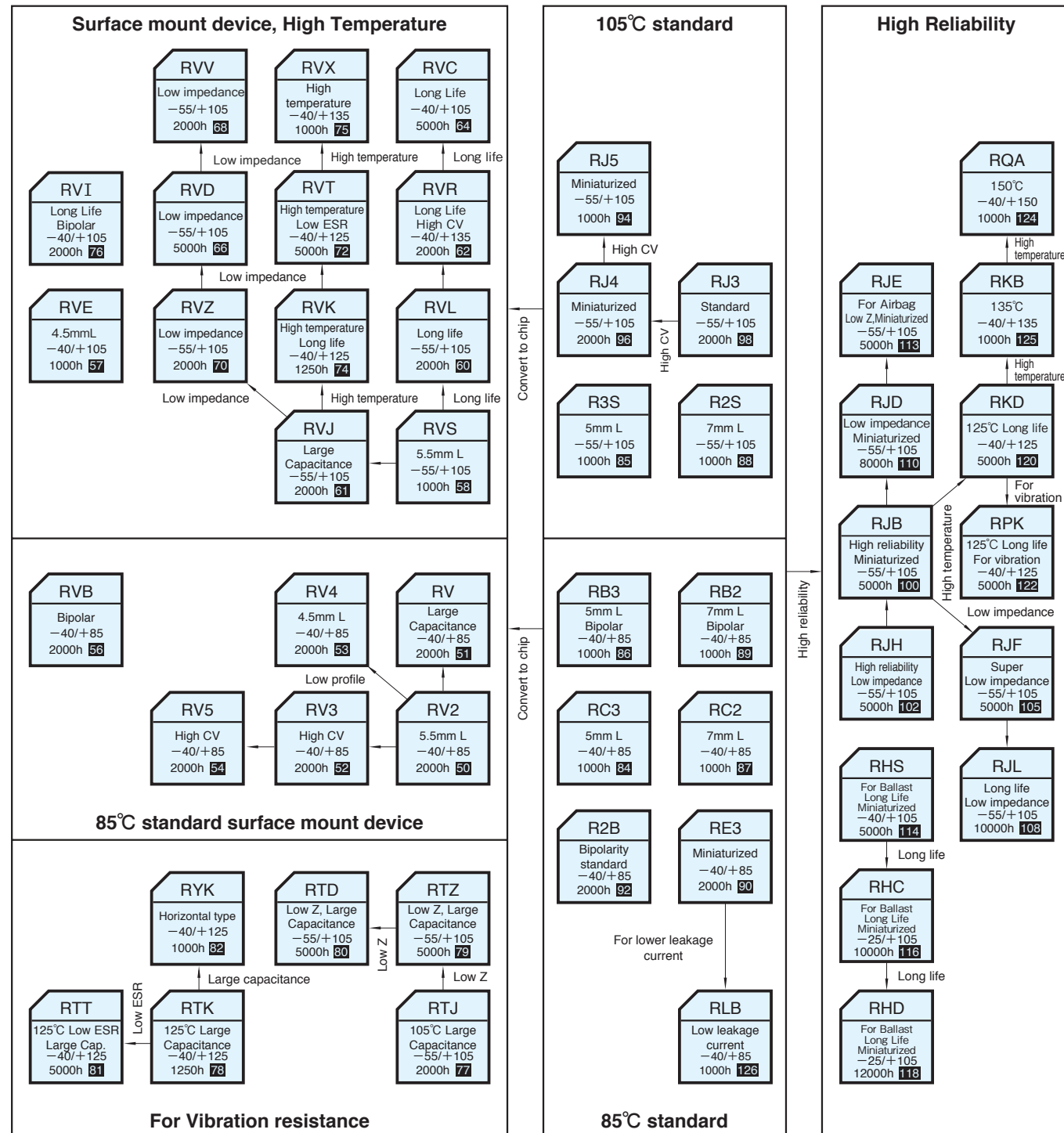
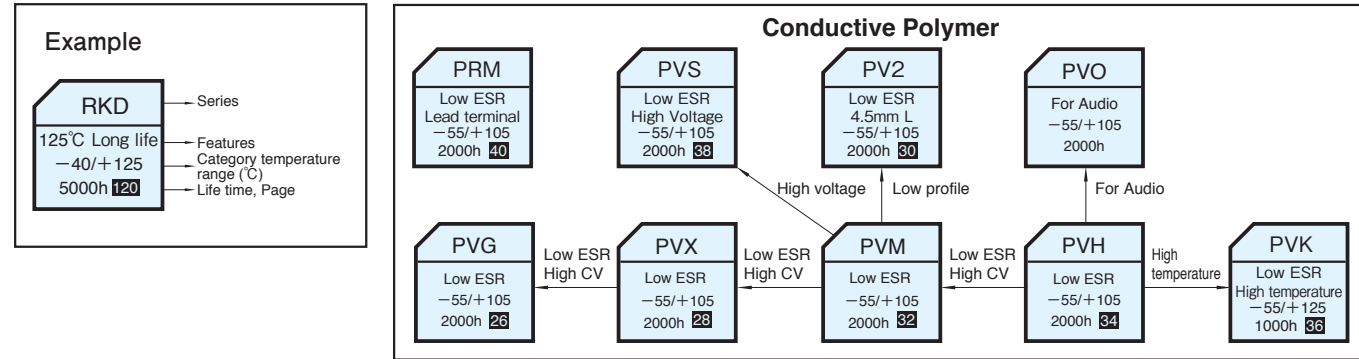
* Be sure to "Cautions for Using Aluminum Electrolytic Capacitors", before using these products.

Some series of the following table was omitted from this catalog. Please consult, when you inquire newly.

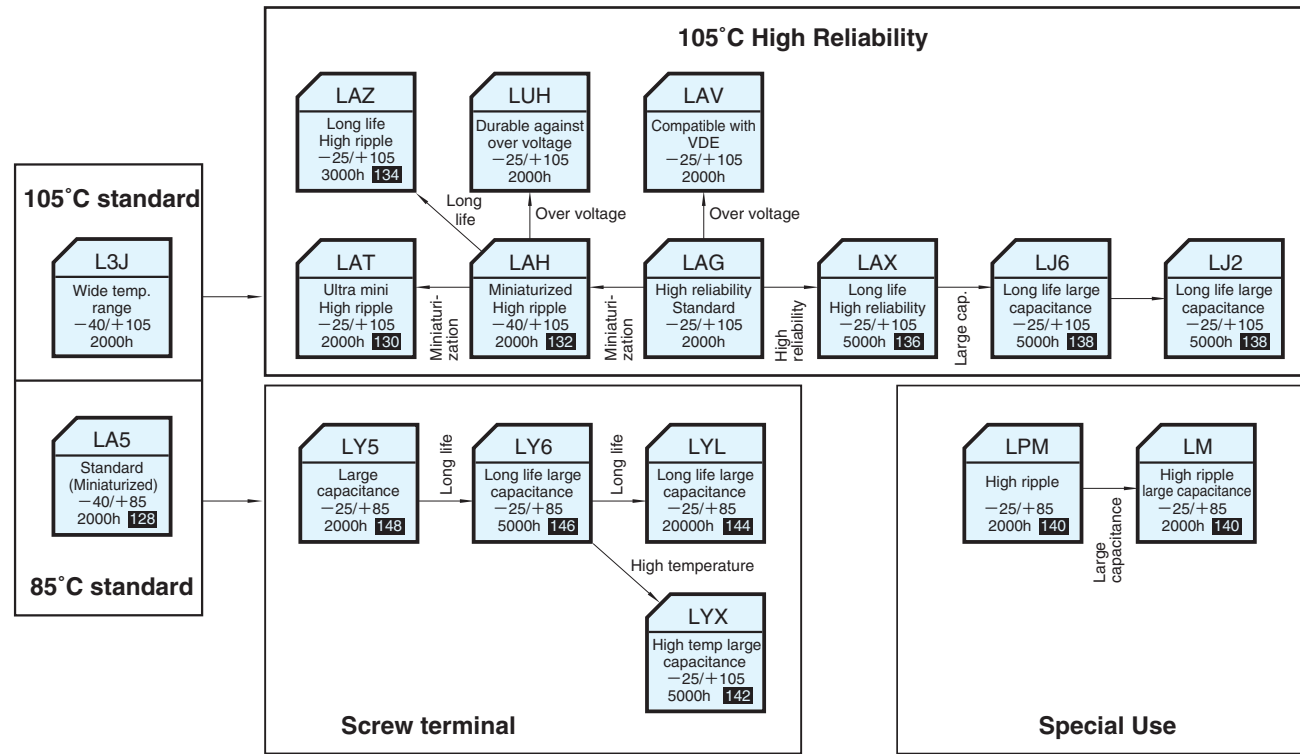
Category	Series	JIS Configuration	Applications
High Reliability Type	RJJ	04	105°C , Low Impedance
	RK	04	125°C , Longevity
Snap-in Type	LH7	692	Higher Capacitance
	LAV	692	105°C , Compatible with VDE
	LUH	-	105°C , Durable against Over Voltage
For Audio	PVO	32	For Audio, Conductive Polymer Chip
	ROA	04	High Grade (Cerafine)

NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

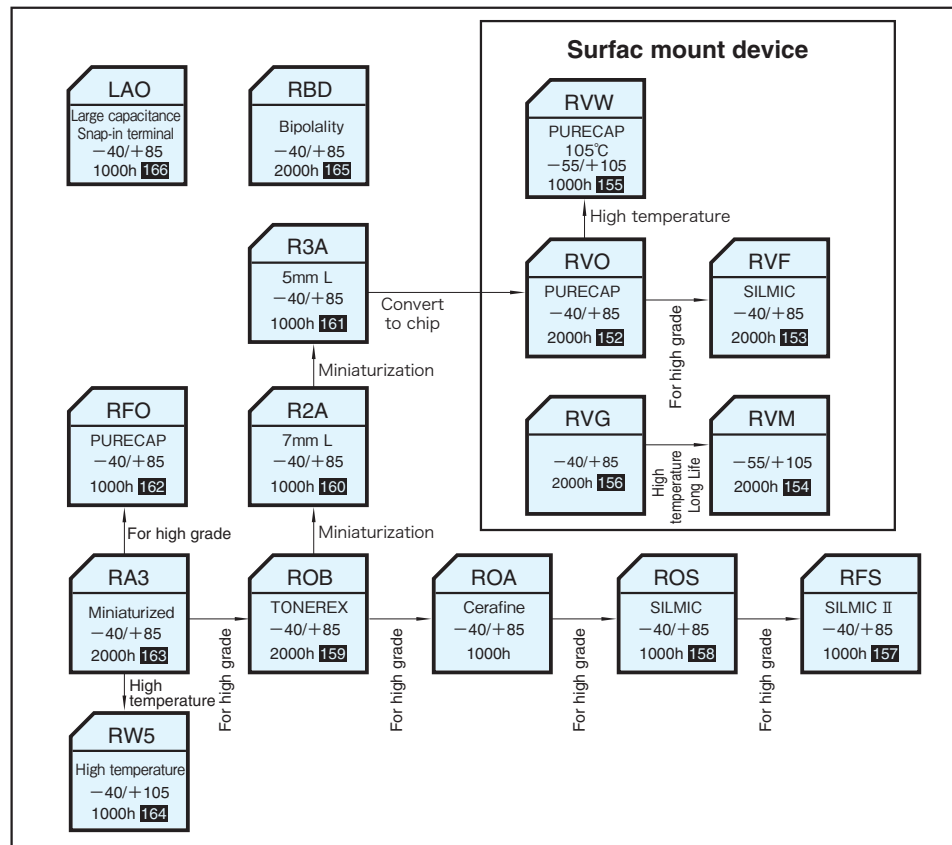
Systematized Classification of Miniature and Chip Type Aluminum Electrolytic Capacitors



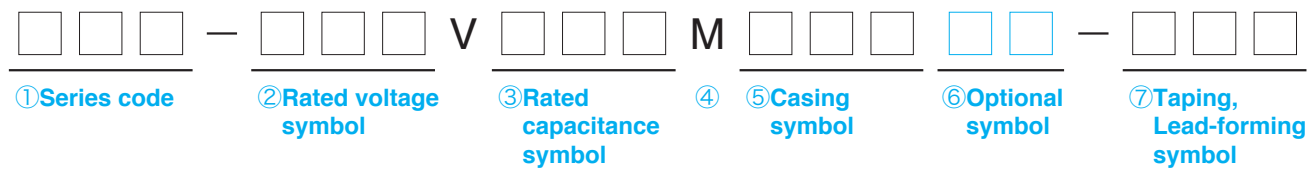
■ Systematized Classification of Large Aluminum Electrolytic Capacitors



■ Systematized Classification of Aluminum Electrolytic Capacitors For Audio



■ Product Symbol System for Aluminum Electrolytic Capacitors



① Series code

Please refer to the page of each series.

② Rated voltage symbol

Write down the rated voltage itself ; however, write 2R5 for 2.5V, 6 for 6.3V.

③ Rated capacitance symbol

The symbol denoting nominal capacitance shall consist of three numerals.
The first and second numerals shall represent the significant figures of nominal capacitance in the unit of microfarad (μF).
And the third numeral shall represent the number of zeros following the significant figures.
A decimal point is expressed with "R."

Example

Rated capacitance (μF)	Symbol
0.1	R10
1	010
2.2	2R2
33	330
100	101
2200	222
33000	333
470000	474

④ Capacitance tolerance symbol

Example

Capacitance tolerance	Symbol
$\pm 10\%$	K
$\pm 20\%$	M
-10 to +30%	Q
-10 to +50%	T

⑤ Casing symbol

Please refer to the page of each series.

⑥ Optional symbol

Plating or others are expressed.

Example

Symbol	Contents
#	Sn 100% plating +PET sleeve (lead terminal type)
U	Sn-Bi plating (chip type)
T	Sn 100% plating (chip type)
Q	Based on AEC-Q200

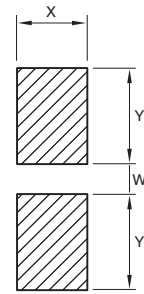
⑦ Taping, Lead-forming symbol

Write down one of the forming symbols given on page 14 to 17 for taping and lead-forming capacitors.
When taping or lead-forming is not necessary, leave the boxes blank.

Recommended land pattern and size

(Vertical chip type)

● Standard type



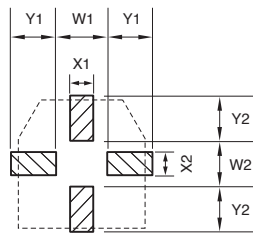
(Unit : mm)

Case Size φD×L	Land Size			Thickness of Solder paste
	X	Y	W	
3×5.3	1.6	2.2	0.8	0.15
4×4.5, 5.3, 5.7, 5.8	1.6	2.6	1.0	0.15
5×4.5, 5.3, 5.7, 5.8	1.6	3.0	1.4	0.15
6.3×4.5, 5.3, 5.7, 5.8	1.6	3.6	1.9	0.15
6.3×7.7	1.6	3.6	1.9	0.15
8×6.5, 6.7	1.6	4.0	2.1	0.15
8×10, 10.5	2.5	*3.5	*3.0	0.15
10×7.7, 10, 10.5	2.5	*4.0	*4.0	0.15
12.5×13.5	3.2	6.0	4.0	0.15

*For Vibration resistance use
 φ8×6.5 Y=4.5 W=1.0
 φ8×10, φ8×10.5 Y=4.0 W=2.5
 φ10×10, φ10×10.5 Y=4.5 W=3.0

● For vibration resistance type

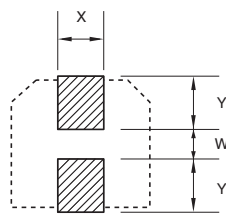
RTJ, RTK series



(Unit : mm)

Case Size φD×L	Land Size						Thickness of Solder paste
	X1	X2	Y1	Y2	W1	W2	
8×10	2.5	2.5	3.0	3.5	4.0	3.0	0.20
10×10.5	2.5	2.5	4.0	4.5	4.0	3.0	0.20

RTZ, RTD, RTT series

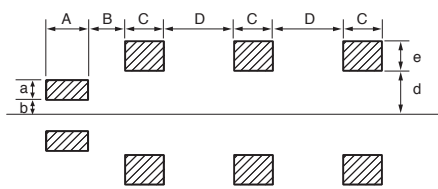


(Unit : mm)

Case Size φD	Land Size			Thickness of Solder paste
	Y	W	X	
8	4.0	2.5	5.0	0.2
10	4.8	3.6	5.0	0.2
12.5	6.6	3.2	7.0	0.2
16	7.8	5.0	10.5	0.2
18	8.8	5.0	10.5	0.2

(Horizontal chip type)

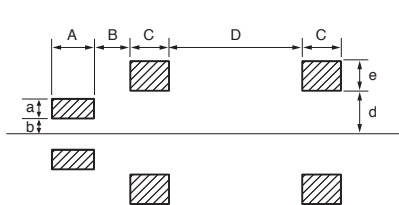
● □9.5×24.0 (8 pin type)



(Unit : mm)

8 pin	
A	4.0
B	1.0
C	3.0
D	5.5
a	1.5
b	1.0
d	3.0
e	2.0
Thickness of Solder paste	0.15

● □9.5×19.0 (6 pin type)



(Unit : mm)

6 pin	
A	4.0
B	1.0
C	3.0
D	9.0
a	1.5
b	1.0
d	3.0
e	2.0
Thickness of Solder paste	0.15

Recommended soldering conditions

Aluminum electrolytic capacitors (Lead free)

(1) Methods

See the following

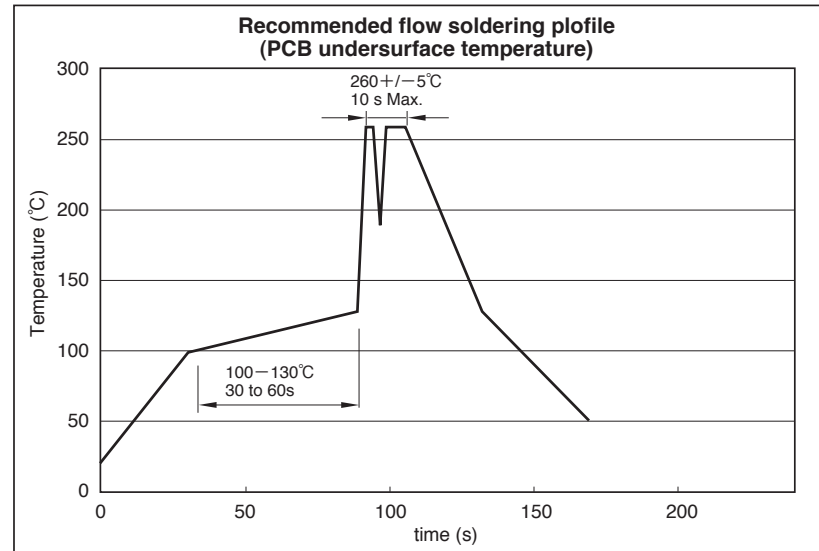
Methods	Reflow soldering	Soldering iron	Flow soldering
Advisability	×	○	○

(2) Soldering iron conditions

Iron tip temperature shall be $400^{\circ}\text{C} \pm 5^{\circ}\text{C}$ within the duration of $3\frac{1}{2}$ seconds.

(3) Flow soldering conditions

The recommendation soldering conditions of the product in which flow soldering is possible are as graph.



Caution for Using aluminum Electrolytic Capacitors

- (1) Do not dip the capacitor into melted solder.
- (2) Do not flux other part than the terminals.
- (3) If there is a direct contact between the sleeve of the capacitor and the printed circuit pattern or a metal part of another component such as a lead wire, it may cause shrinkage or crack.
- (4) If the application is for extended use, understand and manage the soldering characteristics to avoid abnormal current caused by a contact failure between the capacitor and the PCB.
- (5) Please refer to cautions for using on page 44 to 47 and product specifications about other notes.

■ Recommended soldering conditions

● Chip type aluminum electrolytic capacitors (Lead free)

(1) Methods

See the following

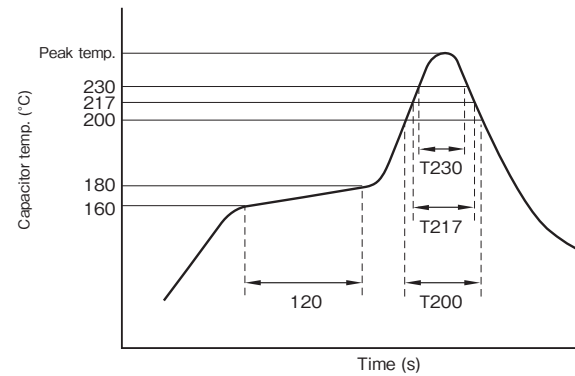
Methods	Reflow soldering	Soldering iron	Flow soldering
Advisability	○	○	×

(2) Soldering iron conditions

Iron tip temperature shall be 400°C±5°C within the duration of 3¹/₂seconds.

(3) Reflow soldering conditions

Profile



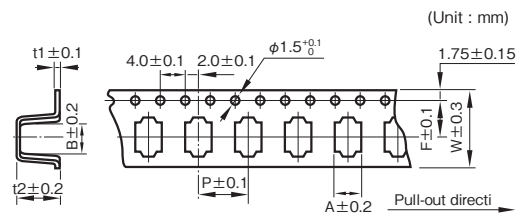
1. Preheating shall be under 180°C within 120 seconds.
2. Peak temperature shall be within the peak temperature matrix.
3. For conditions exceeding the tolerances, consult with us.

T200 : Duration while capacitor head temperature exceeds 200°C (s)
 T217 : Duration while capacitor head temperature exceeds 217°C (s)
 T230 : Duration while capacitor head temperature exceeds 230°C (s)
 The measurement temperature point is the case top.

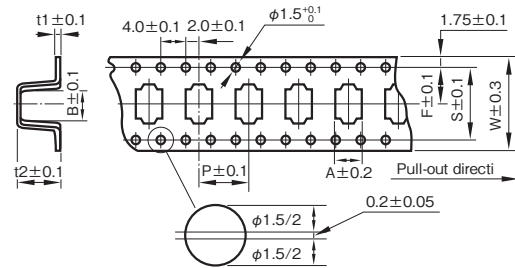
	Peak temp. matrix	Series
condition (1)		RV2, RV3, RV4 (φ4, 5), RV5 (φ4 to 6.3), RVB, RVE, RVS (φ4 to 6.3), RVL, RVR (φ4 to 6.3), RVC (φ4 to 6.3), RVD (φ4 to 6.3), RVV (φ4 to 6.3), RVZ (φ4 to 6.3), RVT (φ4 to 6.3), RVI, PVG (φ5, 6.3), PVX (φ5, 6.3) PV2, PVM (φ5, 6.3), PVH (φ6.3), PVK (φ6.3), PVS (φ6.3)
		RV, RV4 (φ6.3), RV5 (φ8, 10), RVS (φ8, 10), RVR (φ8, 10), RVJ (φ8, 10), RVC (φ8, 10), RVD (φ8, 10), RVV (φ8, 10), RVZ (φ8, 10), RVT (φ8, 10), RVK (φ8, 10), RVX, RTJ, RTK, PVG (φ8, 10), PVX (φ8, 10) PVM (φ8, 10), PVH (φ8, 10), PVK (φ8, 10), PVS (φ8, 10)
		RVJ (φ12.5), RVZ (φ12.5), RVK (φ12.5), RYK
condition (2)		RTZ (φ8, 10), RTD (φ8, 10), RTT (φ8, 10)
		RTZ (φ12.5 to 18), RTD (φ12.5 to 18), RTT (φ12.5 to 18)
condition (3)	Peak temp.: 260°C T217 : 90s max. T230 : 40s max.	RZA (φ4 to 6.3), RZB (φ4 to 6.3), RZC (φ4 to 6.3)
	Peak temp.: 250°C T217 : 90s max. T230 : 40s max.	RZA (φ8, 10), RZB (φ8, 10), RZC (φ8, 10)

■ Taping

■ Carrier tape dimension (taping polarity R)

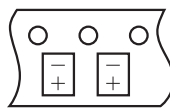


● Series RYK, RV, RVJ, RVZ, RVK (φ12.5), RTZ, RTD, RTT (φ12.5 to 18)

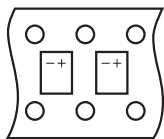


■ Taping polarity

(The all series except RVB and RYK)



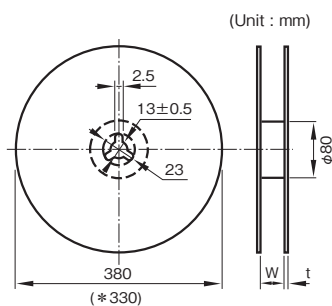
(Series RYK)



(Unit : mm)

Outside size φD×L	W	A	B	P	t2	F	t1	S
3×5.3	12	3.4	3.4	8.0	5.9	5.5	0.4	—
4×4.5	12	4.7	4.7	8.0	4.8	5.5	0.4	—
4×5.3	12	4.7	4.7	8.0	5.8	5.5	0.4	—
4×5.7, 5.8	12	4.7	4.7	8.0	6.2	5.5	0.4	—
5×4.5	12	5.7	5.7	12	4.8	5.5	0.4	—
5×5.3	12	5.7	5.7	12	5.8	5.5	0.4	—
5×5.7, 5.8	12	5.7	5.7	12	6.2	5.5	0.4	—
6.3×4.5	16	7.0	7.0	12	4.8	7.5	0.4	—
6.3×5.3	16	7.0	7.0	12	5.8	7.5	0.4	—
6.3×5.7, 5.8	16	7.0	7.0	12	6.2	7.5	0.4	—
6.3×7.7	16	7.0	7.0	12	8.3	7.5	0.4	—
8×6.5	16	8.7	8.7	12	6.8	7.5	0.4	—
8×6.7	24	8.7	8.7	12	7.2	11.5	0.4	—
8×10	24	8.7	8.7	16	11	11.5	0.4	—
8×10.5	24	8.7	8.7	16	11.5	11.5	0.4	—
10×7.7	24	10.7	10.7	16	8.2	11.5	0.4	—
10×10	24	10.7	10.7	16	11	11.5	0.4	—
10×10.5	24	10.7	10.7	16	11.5	11.5	0.4	—
* 12.5×13.5	32	13.4	13.4	24	14.5	14.2	0.5	28.4
* 12.5×16	32	13.4	13.4	24	17	14.2	0.5	28.4
* 16×16.5	44	17	17	28	17.5	20.2	0.5	40.4
* 16×21.5	44	17	17	28	22.5	20.2	0.5	40.4
* 18×16.5	44	19	19	32	17.5	20.2	0.5	40.4
* 18×21.5	44	19	19	32	22.5	20.2	0.5	40.4
* 9.5×19.0	44	9.9	22.9	16	9.5	20.2	0.4	40.4
* 9.5×24.0	44	9.9	27.9	16	9.5	20.2	0.4	40.4

■ Reel dimension



(Unit : mm)

Outside size φD×L	Reel dimension	
	W	t
3, 4	14	3
5	14	3
6.3	18	3
8×6.5	18	3
8×6.7	26	3
8, 10	26	3
* 12.5	34	3
* 16	46	3
* 18	46	3
* 9.5×19.0	45	3
* 9.5×24.0	45	3

■ Packing quantity (Reel)

Outside size φD×L	Quantity (PCS.)
3, 4	2000
5, 6.3	1000
8×6.5	1000
8×6.7	1000
* 8, 10	500
* 12.5×13.5	200
* 12.5×16	150
* 16×16.5	125
* 16×21.5	75
* 18×16.5	125
* 18×21.5	75
* 9.5×19.0	400
* 9.5×24.0	400

■ Reel material

Card board : symbol R
Polystyrene : symbol R2

Lead Forming

• In order to facilitate insertion into printed circuit board, lead wires are cut or formed.

Product Size Table

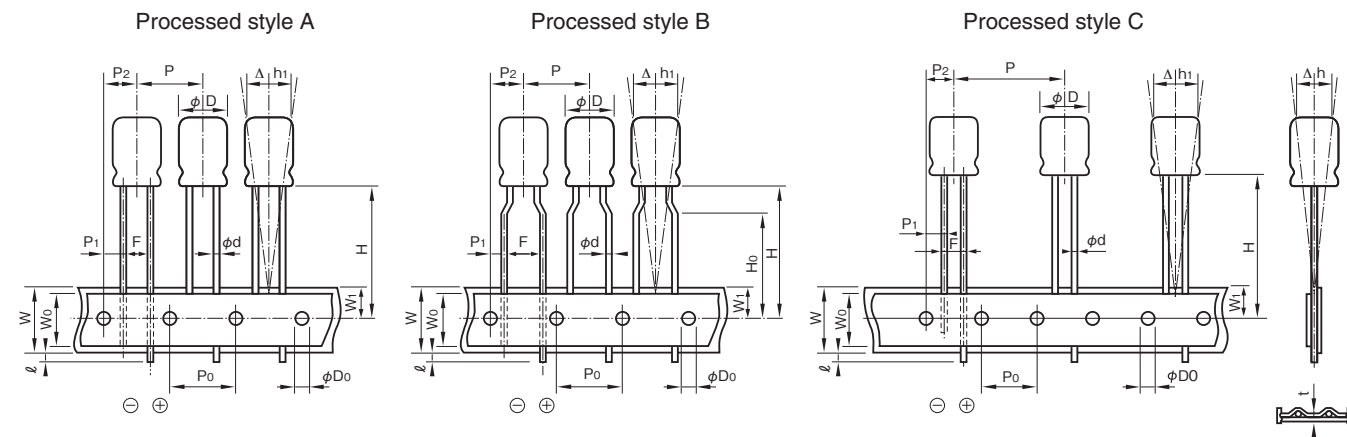
Unit: mm

Forming name	Lead forming symbol	Dimension		Style	Outline drawing
		F (Lead pitch)	φD (Case diameter)		
Forming cut	F10	2.0	4	B	
	F1		5	A	
	F12	2.5	4 to 5	B	
	F1		6.3	B	
	F1	3.5	8	A	
	F4		4 to 8	B	
	F	5.0	4 to 8	B	
	F		10 to 12.5	A	
	F		16 to 18	A	
Snap-in	S1	5.0	4 to 8	B	
	S1		10 to 12.5	A	
	S1	7.5	16 to 18	A	
Forming cut (restrict series)	F49	5.0	10 to 12.5		
	F51		10 to 12.5		
	F58		10		
	F49	7.5	16 to 18		
	F51		16 to 18		

Forming name	Lead forming symbol	Dimension				Outline drawing
		F (Lead pitch)	φD (Case diameter)	ℓ ₀	ℓ ₁	
For 90°C side mount of case	G9, G10	3.5	8	5.5	1.0	
	G59, G60		8	3.6	1.0	
	G9, G10	5.0	10 to 12.5	5.5	1.0	
	G55, G56		12.5	7.5	2.5	
	G59, G60		10 to 12.5	3.6	1.0	
	G95, G96		12.5	0.95	4.9	
	G99, GA0		10	1.0	1.9	
	GAS, GAT		10 to 12.5	4.5	1.0	
	G9, G10	7.5	16 to 18	5.5	1.0	
	GAS, GAT		16 to 18	4.5	1.0	

Taping

•For automatic insertion (radial lead type)



*The shape of a lead wire sandwiched by the mounting strips may differ from the ones shown in the figures.

Product Size Table

Unit: mm

Item	Symbol	Tolerance	5L to 7L	
			φ3 to φ8(except φ8×7L)	φ4 to φ8
Lead forming symbol	—	—	T36	T2
Style	—	—	A or B	
Lead-wire diameter	φd	±0.05	0.4 or 0.45	
Lead to lead distance	F	+0.8 -0.2	2.5	5.0
Height of component from tape center	H	+0.75 -0.5	18.5	17.5
Lead-wire clinch height	H0	±0.5	—	16.0
Pitch of componet	P	±1.0	12.7	
Feed hole pitch	P0	±0.3	12.7	
Hole center to lead	P1	±0.5	5.1	3.85
Hole center to component	P2	±1.0	6.35	
Tape width	W	±0.5	18.0	
Hold down tape width	W0	Min.	6.0	
Feed hole position	W1	±0.5	9.0	
Max. lead protrusion	ℓ	Max.	1.0	
Feed hole diameter	φD0	±0.2	4.0	
Alignment of component to center	Δh	±1.0	0	
Alignment of component to center	Δh1	±1.0	0	
Total tape thickness	t	±0.2	0.7	

■ Taping

• For automatic insertion (radial lead type)

Product Size Table

Unit: mm

Item	Symbol	Tolerance	11L to 25L					
			φ5, φ6.3		φ8	φ10	φ12.5	
Lead forming symbol	—	—	T36	T58	T2	T2	T2	T4
Style	—	—	A or B		B		A	
Lead-wire diameter	φd	±0.05	0.5 or 0.6			0.6		
Lead to lead distance	F	+0.8 -0.2	2.5		5.0			
Height of component from tape center	H	+0.75 -0.5	18.5	17.5	18.5	20.0	18.5	
Lead-wire clinch height	H ₀	±0.5	—		16.0		—	
Pitch of componet	P	±1.0	12.7				15.0	
Feed hole pitch	P ₀	±0.3	12.7				15.0	
Hole center to lead	P ₁	+0.5 (10 to φ18 ±0.7)	5.1		3.85		5.0	
Hole center to component	P ₂	±1.0	6.35				7.5	
Tape width	W	±0.5	18.0					
Hold down tape width	W ₀	Min.	6.0					
Feed hole position	W ₁	±0.5	9.0					
Max. lead protrusion	ℓ	Max.	1.0					
Feed hole diameter	φD ₀	±0.2	4.0					
Alignment of component to center	Δh	±1.0	0					
Alignment of component to center	Δh ₁	±1.0	0					
Total tape thickness	t	±0.2	0.7					

Part numbering system (example: Series RJB, 10V470μF, 5mm pitch taping)

RJB	—	10	V	471	M	G3	#	—	T2
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping symbol

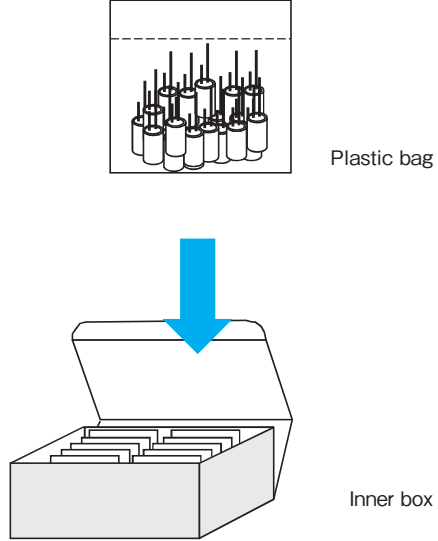
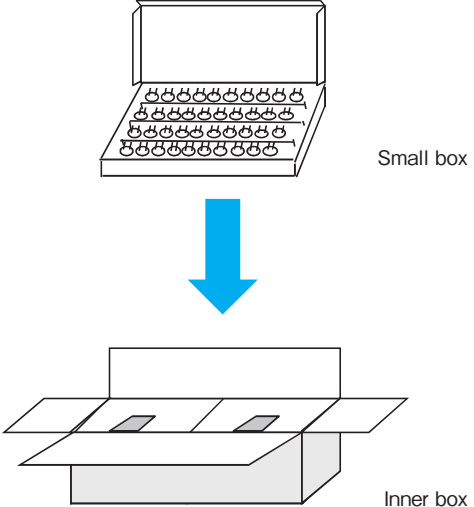
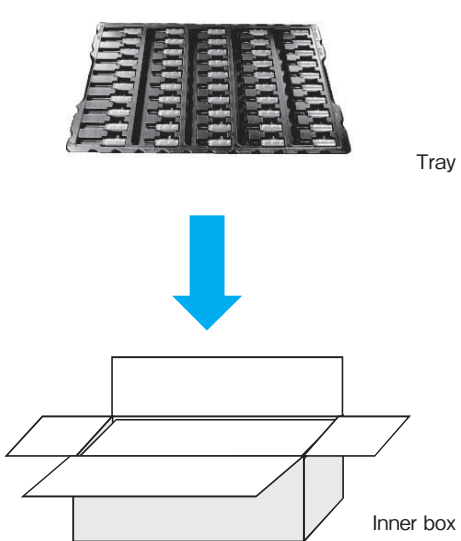
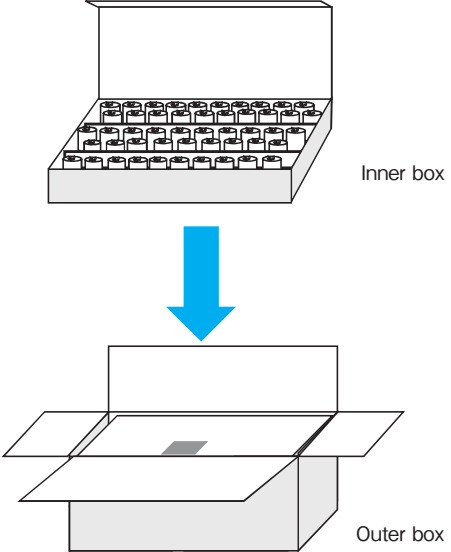
Standard packing specification of aluminium electrolytic capacitors (taping article)

Classification	Chip type	
	Aluminium electrolytic capacitors	Aluminium electrolytic capacitors with conductive polymer solid electrolyte
Packing style	<p>Reel</p> <p>Inner box</p>	<p>Reel</p> <p>Dampproof bag</p> <p>Inner box</p>

Classification	Lead terminal type
Packing style	<p>Flat box</p> <p>Inner box</p>

Please inquire for details.

■ Standard packing specification of aluminium electrolytic capacitors
(long lead, lead forming)

Size	$\phi 3$ to $\phi 10$	$\phi 12.5$ to $\phi 18$
Packing style	 <p>Plastic bag</p> <p>Inner box</p>	 <p>Small box</p> <p>Inner box</p>
Size	$\phi 10$ to $\phi 18$	$\phi 22$ or more
Packing style	 <p>Tray</p> <p>Inner box</p>	 <p>Inner box</p> <p>Outer box</p>

Please inquire for details.

MEMO

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

■ Cautions for Using Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

Please be sure to read this specification before using this product.

Before placing an order, please inquire about the Product Specification to check details.

■ Cautions for Usage

1. Solid conductive polymer aluminum electrolytic capacitors are polarized.

- Using a capacitor with reversed polarity causes abnormal current flow, resulting in a short circuit.
- Cannot use for the circuit to which the polarity reverses by ripple voltage.

2. Prohibited Circuits

- Since leakage current problem may arise, capacitors cannot be used in the following circuits.
 - ① Coupling circuits
 - ② Circuits greatly affected by leakage current

3. Use capacitors within the rated voltage.

- The application of voltages exceeding the rated voltage can significantly increase leakage current, resulting in a short failure. Please do not apply a voltage exceeding the rated voltage.

4. Be careful of excessive rush current.

- Using capacitors in the circuit where excessive rush current passes may cause characteristic deterioration or a short. When the rush current exceeds 10 A, we recommend use of protection circuits to ensure high reliability.

5. Use the allowable ripple voltage and the rated ripple current below the specified values.

- When superimposing a ripple voltage on a DC bias voltage, exercise care that the peak voltage value does not exceed the rated voltage and does not reverse the polarity.
- The rated ripple current shall be below the specified value.

6. Changes in characteristics due to operating temperature

- The characteristics of solid conductive polymer aluminum electrolytic capacitors vary by temperature as follows. These variations are temporary and recover when the temperature goes back (except for the case of characteristic deterioration because of high temperatures over a long time).

Note that using capacitors over the upper category temperature increases leakage current, resulting in a short and destruction.

Be careful of the capacitor temperature considering not only the ambient temperature where the equipment is placed and the temperature inside the equipment but also radiation heat from the heating element inside the equipment, and self-heat

generation by ripple current.

- ① Capacitance expressed in the value at 20°C, 120 Hz increases with increased temperature and decreases with decreasing temperature.
- ② Tangent of loss angle ($\tan\delta$) expressed in the value at 20°C, 120 Hz is temperature-independent.
- ③ Equivalent series resistance (ESR) expressed in the value at 20°C, 100 kHz is temperature independent.
- ④ Leakage current increases with increased temperature and decreases with decreasing temperature.

7. Changes in characteristics due to frequency

- The characteristics of solid conductive polymer aluminum electrolytic capacitors vary by operating frequency as follows.
 - ① Capacitance expressed in the value at 20°C, 120 Hz decreases with increased frequency.
 - ② Tangent of loss angle ($\tan\delta$) expressed in the value at 20°C, 120 Hz increases with increased frequency.
 - ③ Equivalent series resistance (ESR) expressed in the value at 20°C, 100 kHz increases with decreasing frequency.

8. Failure modes of solid conductive polymer aluminum electrolytic capacitors

- The failure modes of solid conductive polymer aluminum electrolytic capacitors are a wear-out failure by deterioration of electrical performance and a random failure by a short. The failure rate level is 0.5%/1,000h at the reliability level of 60% with the specified voltage applied at 105°C.
- If a short occurs and continues with the application of a voltage exceeding the rated voltage, increasing the internal temperature, the internal pressure increases by vaporization of the cathode material, which may cause the aluminum case to come off.

9. Operating environments

- Do not use capacitors in an environment directly exposed to water, saltwater spray, oil spill or condensation.
- Do not use capacitors in an environment filled with toxic gas such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, etc.
- Do not use capacitors in a place exposed to ozone, ultraviolet rays, or radiation.

10. Fumigation Process

- Before transportation of electronic equipment to overseas, fumigation process may be subjected to wooden packing material with a halogen (compound) gas such as methyl bromide. Exercise care that this halogen gas may corrode capacitors. Also, be careful of epidemic preventive agent as corrosive component such as halogen may be contained.

11. The case of solid conductive polymer aluminum electrolytic capacitors and the cathode terminal are not insulated.

- The case and the cathode terminal are not insulated as being connected through inconstant resistance.

12. Double-sided PCB's

- When using capacitors on a double-sided PCB, exercise care that the wiring pattern does not touch the area where the capacitors are mounted. Failure to do so may cause a short to occur to the PCB depending on the mounting conditions.

13. Regarding Connection of Solid Conductive Polymer Aluminum Electrolytic Capacitors

- When connecting more than one capacitor in parallel, consider the current balance.

14. Use at a high altitude

- The use of capacitors at high altitudes such as on an airplane causes a large difference between the internal pressure of the capacitors and the atmospheric pressure. However, there is no problem in use under atmospheric pressure up to about an altitude of 10,000 meters.
If the condition is severe like space, please contact us.

15. Other Notes

- Do not use capacitors on a circuit where rapid charge and discharge are repeated.
- Electrical characteristics of capacitors vary by variations in temperature and frequency. Please consider these variations when designing a circuit.

■Cautions for Mounting

1. Cautions for Mounting

- Do not reuse capacitors that have been assembled in a set and energized. Capacitors cannot be reused except for those which have been measured on electrical performance during periodic inspection.
- Before mounting, confirm the capacitor ratings (rated capacitance and rated voltage).
- Capacitors may generate transient recovery voltage. In this case, discharge through a resistor of about 1 k Ω .
- Before mounting, confirm the polarity of capacitor.

- Do not drop capacitors onto a floor nor use them.
- Do not mount deformed capacitors.
- Do not mount heating parts around capacitors and on the back of the PCB under or back of capacitors).

2. Do not apply excessive pressure to the capacitor or its terminals

- Be careful of the shock force that can be produced by absorbers, product checkers, and centering on automatic inserters and installers.

3. Soldering

- Do not solder capacitor body by dipping into melted solder.
- Soldering conditions (preheating, soldering temperature, terminal dipping time) should be within the ranges specified in the catalog or the delivery specification.
- Flux should not adhere to the parts other than the terminals.
- When using a soldering iron, avoid excessive stress to capacitor body.
- In reflow soldering, the reflow should be conducted once. Please be sure to consult with us if reflow must be conducted twice.
- Although leakage current may increase (from a few μ A to hundreds of μ A) after soldering, it can be reduced through self-repair by applying voltage. It is advised to operate the set properly after treating with the recommended voltage.
- In case of a long-term use of equipment, control the soldering characteristics so that capacitors and PCB do not fail to connect to avoid abnormal current passage by a failure of soldering to mount.

4. Handling after Soldering

- Do not tilt, fall, raise or twist capacitor body.
- Do not pick up or move PCB by holding a capacitor.
- Do not bump capacitors against objects. When stacking PCB's, make sure that capacitors do not touch the PCB's or other components.
- Do not subject capacitors to excessive stress.

5. Cleaning after Soldering

- Recommended cleaning method
 - ①Cleaning solutions:
 - (a) CLEANTHROUGH 710M, 750H, 750L
 - (b) PINEALPHA ST-100S
 - (c) Techno Care FRW-4~17
 - (d) Isopropyl alcohol (2-propanol)
 - ②Cleaning conditions:
 - (a) The temperature of cleaning solution shall be less than 60°C.
 - (b) Use immersion or ultrasonic waves within two minutes.

- (c) After cleaning, capacitors and PCB's shall thoroughly be rinsed and dried with hot blast for more than 10 minutes. The temperature of such breeze should be less than the upper category temperature.
- (d) After cleaning, do not keep capacitors in cleaning solution atmosphere or airtight containers.
- During cleaning, control the cleaning solution against contamination.

6. Fixing adhesives and coating materials.

- Do not use halogenated fixatives and coatings.
- Before using a fixative or coating, remove flux residues and contaminants from between the PCB and the sealing section of capacitors.
- Dry the cleaning solution before using the adhesive or coating.
- Do not cover up all the sealing sections (terminal side) of capacitors with the adhesive or coating.
- Heat curing conditions of fixative and coating.

■ Other Cautions

1. Do not directly touch the terminals of solid conductive polymer aluminum electrolytic capacitors.

Failure to do so can cause electric shock or burns. Before use, allow capacitors to discharge through a 1kΩ resistor (with a sufficient margin to the heat generation capacity) as needed.

2. Do not short-circuit between the terminals of the solid conductive polymer aluminum electrolytic capacitors with electric conductor. Do not subject capacitors to conductive solutions such as acid and alkaline water solutions.

3. Periodic inspection should be performed on the capacitors for the industrial equipment application.

Check the following checkpoints.

- Visual inspection to check for significant defects.
- Electrical performance: leakage current, rated capacitance, tangent of loss angle, ESR, and items specified in the catalog or delivery specification.

4. Be careful of the following cases of emergency.

- In case of a short during use of capacitors in sets, producing gas, turn off the main power of the set or unplug the power cord from the outlet.
- In case of a short, producing gas, it may take a few seconds to a few minutes depending on the conditions. Therefore, ensure that the protective circuit of the power supply works during this time.
- If the gas gets in your eyes, rinse them immediately. Gargle if the gas is inhaled.
- Do not lick the electrolyte of capacitors. When the

electrolyte gets on your skin, wash it off with soap immediately.

5. Storage Conditions.

- Do not store at high temperature and high humidity. Store at a temperature of 5 to 35°C and a relative humidity of less than 75%, keeping free from direct sunlight.
- During delivery, capacitors are stored in airtight moistureproof bags to ensure satisfactory soldering. Once the bag is opened right before mounting, it is better to use up the capacitors. If some are unavoidably left over, return them to the moistureproof bag, and seal the opening hermetically.
- Solid conductive polymer aluminum electrolytic capacitors may have increased leakage current when unused or stored for a long time after mounted on equipment. This phenomenon often occurs at high ambient temperatures; however, leakage current will decrease through voltage treatment. If leakage current still increases after a lapse of more than one year at ambient temperature (shorter time at high temperatures), treat with voltage as needed. In design of equipment, consider the effect of increase in initial current, and install protective circuits as needed.

Please check that recommended voltage treatment conditions are provided for each series.

- Do not store capacitors in an environment directly exposed to water, saltwater spray, oil spill or condensation.
- Do not store capacitors in an environment filled with toxic gas such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, etc.
- Do not store capacitors in a place exposed to ozone, ultraviolet rays, or radiation.

6. Please take the following actions when disposing of solid conductive polymer aluminum electrolytic capacitors.

- Entrust to specialists of industrial waste treatment for incineration.

7. Others

- Before using capacitors, check the details of this delivery specification and catalog as well as the following.

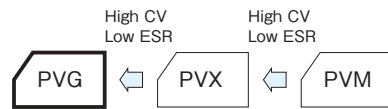
Technical Report of Japan Electronics and Information Technology Industries Association
EIAJ RCR-2367B
Guideline of notabilia for fixed aluminum electrolytic capacitors for use in electronic equipment

MEMO

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent

- Super low E.S.R. and high ripple current are realized.
- Guaranteed 105°C, 2000 hours.



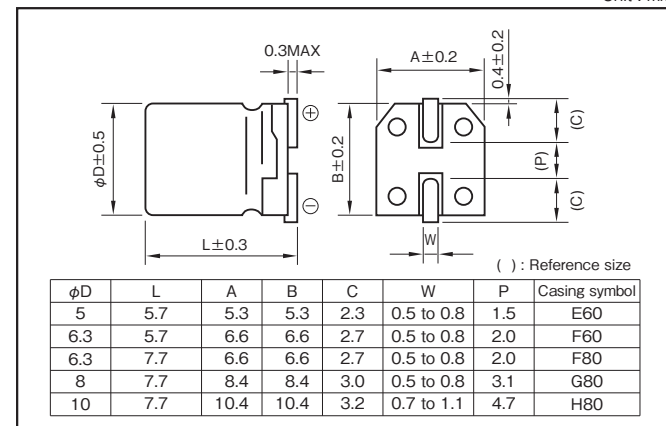
Specifications

Item	Performance										
Category temperature range (°C)	-55 to +105										
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)										
Leakage current (μA) *Note	Less than 0.2CV C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)										
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C,120Hz)										
Characteristics at high and low temperature	Impedance ratio (max.) Z-25°C / Z+20°C : 1.15 Z-55°C / Z+20°C : 1.25 (100kHz)										
Endurance (105°C) (Applied ripple current)	<table border="1"> <tr><td>Test time</td><td>2000 hours</td></tr> <tr><td>Leakage current</td><td>The initial specified value or less</td></tr> <tr><td>Percentage of capacitance change</td><td>Within ±20% of initial value</td></tr> <tr><td>Tangent of the loss angle</td><td>150% or less of the initial specified value</td></tr> <tr><td>E.S.R. change</td><td>150% or less of the initial specified value</td></tr> </table>	Test time	2000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	150% or less of the initial specified value	E.S.R. change	150% or less of the initial specified value
Test time	2000 hours										
Leakage current	The initial specified value or less										
Percentage of capacitance change	Within ±20% of initial value										
Tangent of the loss angle	150% or less of the initial specified value										
E.S.R. change	150% or less of the initial specified value										
Bias Humidity 60°C, 90 to 95%RH	<table border="1"> <tr><td>Test time</td><td>500 hours</td></tr> <tr><td>Leakage current</td><td>The initial specified value or less</td></tr> <tr><td>Percentage of capacitance change</td><td>Within ±20% of initial value</td></tr> <tr><td>Tangent of the loss angle</td><td>150% or less of the initial specified value</td></tr> <tr><td>E.S.R. change</td><td>150% or less of the initial specified value</td></tr> </table>	Test time	500 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	150% or less of the initial specified value	E.S.R. change	150% or less of the initial specified value
Test time	500 hours										
Leakage current	The initial specified value or less										
Percentage of capacitance change	Within ±20% of initial value										
Tangent of the loss angle	150% or less of the initial specified value										
E.S.R. change	150% or less of the initial specified value										
Characteristics of applied surge voltage	<p>The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage</p> <table border="1"> <tr><td>Leakage current</td><td>The initial specified value or less</td></tr> <tr><td>Percentage of capacitance change</td><td>Within ±20% of initial value</td></tr> <tr><td>Tangent of the loss angle</td><td>150% or less of the initial specified value</td></tr> <tr><td>E.S.R. change</td><td>150% or less of the initial specified value</td></tr> </table>	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	150% or less of the initial specified value	E.S.R. change	150% or less of the initial specified value		
Leakage current	The initial specified value or less										
Percentage of capacitance change	Within ±20% of initial value										
Tangent of the loss angle	150% or less of the initial specified value										
E.S.R. change	150% or less of the initial specified value										
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)										

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Part numbering system (example : 4V150μF)

PVG	—	4	V	151	M	E60	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

Standard Ratings

Rated voltage (V)	Item	2.5			4			6.3		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
		φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)
120	—	—	—	—	—	—	5×5.7	8	4000	
150	—	—	—	5×5.7	8	4000	—	—	—	
220	5×5.7	8	4000	6.3×5.7	6	4500	6.3×5.7	7	4300	
270	—	—	—	6.3×5.7	6	4500	6.3×7.7	7	4600	
330	6.3×5.7	6	4500	6.3×7.7	6	4800	8×7.7	7	4700	
390	6.3×5.7	6	4500	6.3×7.7	6	4800	—	—	—	
470	6.3×7.7	6	4800	8×7.7	6	5000	8×7.7	7	4700	
560	6.3×7.7	6	4800	—	—	—	8×7.7	7	4700	
680	—	—	—	8×7.7	6	5000	—	—	—	
820	—	—	—	—	—	—	10×7.7	7	4900	
1000	8×7.7	6	5000	10×7.7	6	5200	—	—	—	
1200	10×7.7	6	5200	—	—	—	—	—	—	

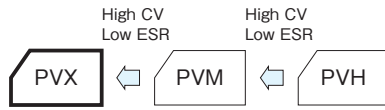
(Note) Rated ripple current : 105°C, 100kHz ; E.S.R. : 20°C, 100kHz

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent

- Super low E.S.R. and high ripple current are realized.
- Guaranteed 105°C, 2000 hours.



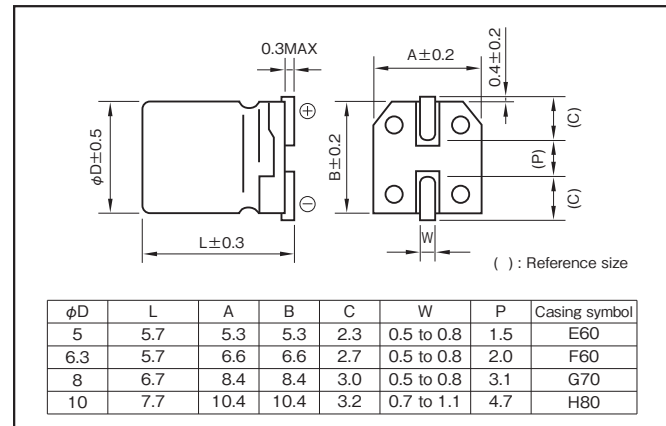
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (μA) *Note	Less than 0.2CV C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)	
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C,120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.) Z-25°C / Z+20°C : 1.15 Z-55°C / Z+20°C : 1.25 (100kHz)	
Endurance (105°C) (Applied ripple current)	Test time	2000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Bias Humidity 60°C, 90 to 95%RH	Test time	500 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Part numbering system (example : 4V150μF)

PVX	—	4	V	151	M	E60	E	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping symbol

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

Standard Ratings

Rated voltage (V)	Item	2.5			4			6.3			10		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
		φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)
100	—	—	—	—	—	—	5×5.7	15	3100	5×5.7	15	3100	
120	—	—	—	—	—	—	—	—	—	6.3×5.7	13	3300	
150	5×5.7	10	3800	5×5.7	10	3800	5×5.7	15	3100	—	—	—	
220	5×5.7	10	3800	5×5.7	10	3800	6.3×5.7	9	4000	8×6.7	10	3800	
270	5×5.7	10	3800	—	—	—	—	—	—	—	—	—	
330	6.3×5.7	9	4000	6.3×5.7	9	4000	8×6.7	8	4300	8×6.7	10	3800	
390	6.3×5.7	9	4000	—	—	—	8×6.7	8	4300	—	—	—	
470	8×6.7	8	4300	8×6.7	8	4300	8×6.7	8	4300	10×7.7	10	4000	
560	8×6.7	8	4300	8×6.7	8	4300	—	—	—	—	—	—	
680	8×6.7	8	4300	10×7.7	8	4600	—	—	—	—	—	—	
820	—	—	—	—	—	—	10×7.7	8	4600	—	—	—	
1000	10×7.7	8	4600	10×7.7	8	4600	—	—	—	—	—	—	
1200	10×7.7	8	4600	—	—	—	—	—	—	—	—	—	

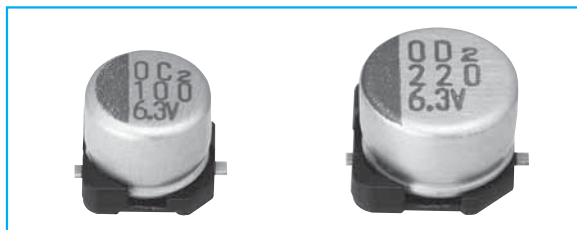
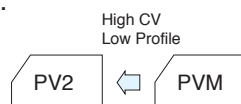
(Note) Rated ripple current : 105°C, 100kHz ; E.S.R. : 20°C, 100kHz

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent

- 4.5mm high
- Super low E.S.R. and high ripple current are realized.
- Guaranteed 105°C, 2000 hours.



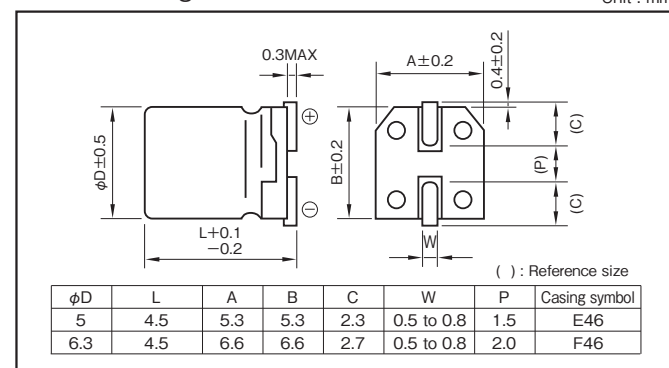
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA) *Note	Rated voltage (V) 2.5 to 20 25, 35	
	Leakage current (μA) Less than 0.2 CV Less than 0.5 CV	
C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C, 120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.)	
	Z-25°C/Z+20°C : 1.15 Z-55°C/Z+20°C : 1.25 (100kHz)	
Endurance (105°C) (Applied ripple current)	Test time 2000 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Bias Humidity 60°C, 90 to 95%RH	Test time 500 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Part numbering system (example : 4V120μF)							
PV2	—	4	V	121	M E46	—	
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol

Standard Ratings

Rated voltage (V)	Item	2.5			4			6.3			10			16		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
Rated capacitance (μF)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	
39	—	—	—	—	—	—	—	—	—	—	—	—	6.3×4.5	40	1450	
100	—	—	—	—	—	—	5×4.5	20	1300	—	—	—	—	—	—	
120	—	—	—	5×4.5	20	1400	—	—	—	6.3×4.5	30	1750	—	—	—	
150	—	—	—	—	—	—	6.3×4.5	16	1950	—	—	—	—	—	—	
180	5×4.5	20	1400	—	—	—	—	—	—	—	—	—	—	—	—	
220	—	—	—	6.3×4.5	16	2400	6.3×4.5	16	1950	—	—	—	—	—	—	
270	6.3×4.5	16	2400	—	—	—	—	—	—	—	—	—	—	—	—	
330	6.3×4.5	13	2400	—	—	—	—	—	—	—	—	—	—	—	—	
390	6.3×4.5	16	2400	—	—	—	—	—	—	—	—	—	—	—	—	

Rated voltage (V)	Item	20			25		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
Rated capacitance (μF)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	
15	—	—	—	6.3×4.5	45	1150	
22	6.3×4.5	45	1250	—	—	—	

(Note) Rated ripple current : 105°C, 100kHz ; E.S.R. : 20°C, 100kHz

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent

- Super low E.S.R. and high ripple current are realized.
- Guaranteed 105°C, 2000 hours.



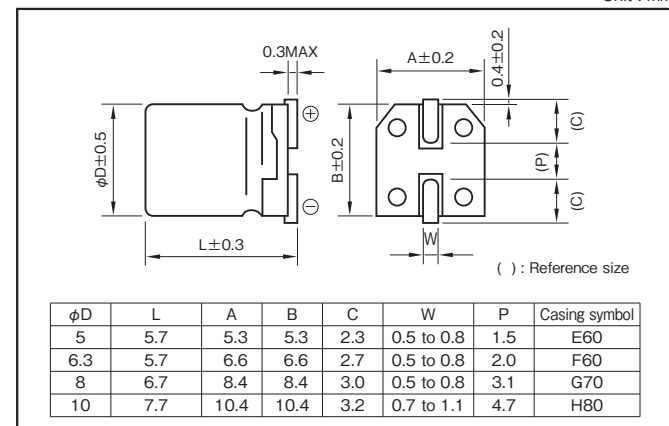
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (μA) *Note	Rated voltage (V) 2.5 to 20 25,35	
	Leakage current (μA) Less than 0.2 CV Less than 0.5 CV	
C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C,120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.)	
	Z-25°C/Z+20°C : 1.15 Z-55°C/Z+20°C : 1.25 (100kHz)	
Endurance (105°C) (Applied ripple current)	Test time 2000 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Bias Humidity 60°C, 90 to 95%RH	Test time 500 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



Part numbering system (example : 4V150μF)

PVM	—	4	V	151	M	E60	E	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping symbol

- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated voltage (V)	Item	2.5			4			6.3			10			16		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
Rated capacitance (μF)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	
33	—	—	—	—	—	—	—	—	—	—	—	—	5×5.7	35	2070	
39	—	—	—	—	—	—	—	—	—	—	—	—	5×5.7	35	2070	
47	—	—	—	—	—	—	—	—	—	—	—	—	5×5.7	28	2310	
56	—	—	—	—	—	—	—	—	—	—	—	—	5×5.7	28	2310	
68	—	—	—	—	—	—	—	—	—	—	—	—	5×5.7	28	2310	
100	—	—	—	5×5.7	22	2610	5×5.7	24	2500	6.3×5.7	25	2530	8×6.7	24	3010	
120	—	—	—	—	—	—	5×5.7	24	2500	6.3×5.7	25	2530	8×6.7	24	3010	
150	—	—	—	5×5.7	22	2610	—	—	—	—	—	—	—	—	—	
180	5×5.7	21	2670	—	—	—	—	—	—	—	—	—	—	—	—	
220	5×5.7	21	2670	5×5.7	22	2610	6.3×5.7	15	3160	8×6.7	21	3220	10×7.7	22	3450	
270	—	—	—	6.3×5.7	15	3160	—	—	—	8×6.7	21	3220	—	—	—	
330	6.3×5.7	15	3160	6.3×5.7	15	3160	8×6.7	14	3950	10×7.7	19	3800	—	—	—	
390	6.3×5.7	15	3160	—	—	—	8×6.7	14	3950	—	—	—	—	—	—	
470	8×6.7	13	3600	8×6.7	14	3950	8×6.7	14	3950	10×7.7	19	3800	—	—	—	
560	8×6.7	13	3600	8×6.7	14	3950	—	—	—	—	—	—	—	—	—	
680	8×6.7	13	3600	—	—	—	—	—	—	—	—	—	—	—	—	
820	—	—	—	—	—	—	10×7.7	14	4300	—	—	—	—	—	—	
1000	10×7.7	13	4450	10×7.7	14	4300	—	—	—	—	—	—	—	—	—	
1200	10×7.7	13	4450	—	—	—	—	—	—	—	—	—	—	—	—	

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

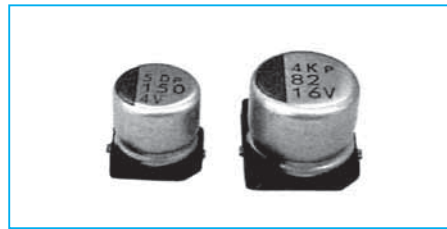
Rated voltage (V)	Item	20			25			35		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
Rated capacitance (μF)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	
10	—	—	—	6.3×5.7	60	1500	—	—	—	
15	—	—	—	—	—	—	8×6.7	150	1000	
22	6.3×5.7	50	1650	8×6.7	50	1800	—	—	—	
33	—	—	—	—	—	—	10×7.7	100	1800	
39	—	—	—	10×7.7	45	2100	—	—	—	
47	8×6.7	45	2000	—	—	—	—	—	—	
82	10×7.7	40	2500	—	—	—	—	—	—	

(Note) Rated ripple current : 105°C, 100kHz ; E.S.R. : 20°C, 100kHz

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent

- Super low E.S.R. and high ripple current are realized.
- Guaranteed 105°C, 2000 hours.



PVH

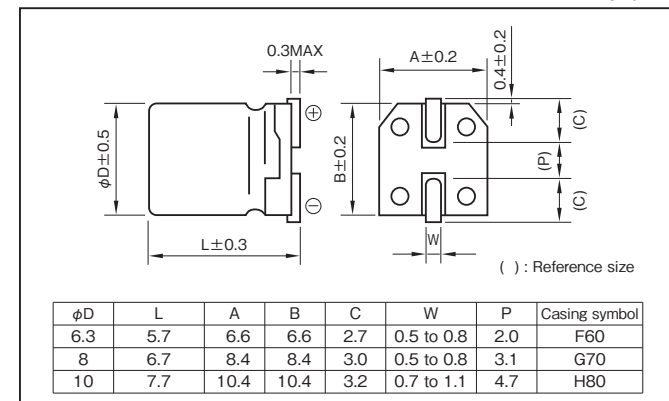
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (μA) *Note	Rated voltage (V) 2.5 to 20 25,35	
	Leakage current (μA) Less than 0.2 CV Less than 0.5 CV	
C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of loss angle (tanδ)	Less than 0.12 (20°C,120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.) Z-55°C/Z+20°C : 1.50 (100kHz)	
Endurance (105°C) (Applied ripple current)	Test time 2000 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 200% or less of the initial specified value	
Damp heat, steady state (humidity) 60°C, 90 to 95%RH	Test time 500 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 200% or less of the initial specified value	
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 15 to 35°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 200% or less of the initial specified value	
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



Part numbering system (example : 4V150μF)

PVH	—	4	V	151	M	F60	E	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping symbol

- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated voltage (V)	Item	2.5			4			6.3			10			16		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
Rated capacitance (μF)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	
33	—	—	—	—	—	—	—	—	—	—	—	—	6.3×5.7	37	2050	
39	—	—	—	—	—	—	—	—	—	—	—	—	6.3×5.7	37	2050	
47	—	—	—	—	—	—	—	—	—	6.3×5.7	31	2250	6.3×5.7	37	2050	
56	—	—	—	—	—	—	—	—	—	6.3×5.7	31	2250	—	—	—	
68	—	—	—	—	—	—	—	6.3×5.7	27	2400	—	—	—	—	—	
82	—	—	—	—	—	—	—	6.3×5.7	27	2400	—	—	—	8×6.7	30	2700
100	—	—	—	6.3×5.7	26	2450	6.3×5.7	27	2400	8×6.7	27	2800	8×6.7	30	2700	
120	—	—	—	—	—	—	—	6.3×5.7	27	2400	8×6.7	27	2800	—	—	—
150	—	—	—	6.3×5.7	26	2450	8×6.7	25	3020	8×6.7	27	2800	10×7.7	26	3430	
180	—	—	—	—	—	—	—	—	—	—	—	—	10×7.7	26	3430	
220	6.3×5.7	25	2500	8×6.7	25	3020	8×6.7	25	3020	10×7.7	24	3770	—	—	—	
270	—	—	—	—	—	—	—	—	—	10×7.7	24	3770	—	—	—	
330	8×6.7	23	3100	8×6.7	25	3020	10×7.7	20	4130	10×7.7	24	3770	—	—	—	
470	8×6.7	23	3100	10×7.7	20	4130	10×7.7	20	4130	—	—	—	—	—	—	
560	8×6.7	23	3100	—	—	—	—	—	—	—	—	—	—	—	—	
680	—	—	—	10×7.7	20	4130	—	—	—	—	—	—	—	—	—	
1000	10×7.7	19	4240	—	—	—	—	—	—	—	—	—	—	—	—	

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

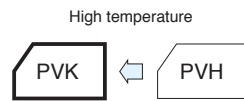
Rated voltage (V)	Item	20			25			35		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
Rated capacitance (μF)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	φD×L (mm)	(mΩ max.)	(mAmps)	
10	—	—	—	6.3×5.7	65	1500	8×6.7	200	750	
22	6.3×5.7	50	1650	8×6.7	50	1800	10×7.7	150	1000	
33	8×6.7	45	2000	10×7.7	45	2100	—	—	—	
39	8×6.7	45	2000	10×7.7	45	2100	—	—	—	
47	8×6.7	45	2000	—	—	—	—	—	—	
82	10×7.7	40	2500	—	—	—	—	—	—	

(Note) Rated ripple current : 105°C, 100kHz ; E.S.R. : 20°C, 100kHz

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 125°C 1000hours
- Anti-cleaning solvent

- Super low E.S.R. and high ripple current are realized.
- Guaranteed 125°C, 1000 hours.



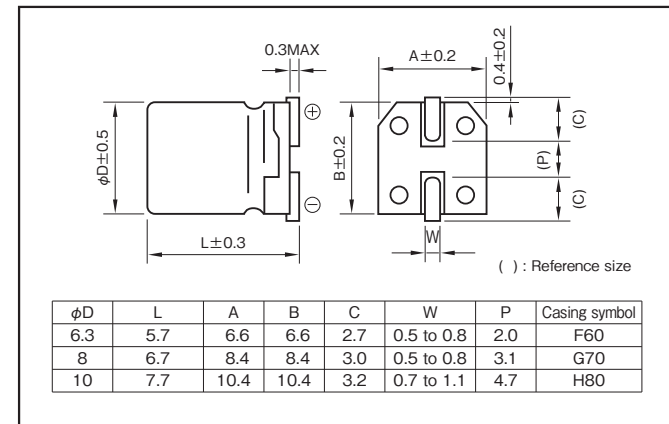
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +125	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA) *Note	Rated voltage (V) 2.5 to 20 25,35	
	Leakage current (μA) Less than 0.2 CV Less than 0.5 CV	
*Note C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C, 120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.)	
	Z-25°C/Z+20°C : 1.15 Z-55°C/Z+20°C : 1.25 (100kHz)	
Endurance (125°C) (Applied ripple current)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Bias Humidity 60°C, 90 to 95%RH	Test time	500 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 125°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 125°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 125°C.

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Part numbering system (example : 4V150μF)

PVK	—	4	V	151	M	E60	E	—	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol				

Standard Ratings

Rated voltage (V)	Item	2.5			4			6.3			10			16		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
		φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)
33	—	—	—	—	—	—	—	—	—	—	—	—	6.3×5.7	37	590	
39	—	—	—	—	—	—	—	—	—	—	—	—	6.3×5.7	37	590	
47	—	—	—	—	—	—	—	—	—	6.3×5.7	31	680	6.3×5.7	37	590	
56	—	—	—	—	—	—	—	—	—	6.3×5.7	31	680	—	—	—	
68	—	—	—	—	—	—	6.3×5.7	27	720	—	—	—	—	—	—	
82	—	—	—	—	—	—	6.3×5.7	27	720	—	—	—	8×6.7	30	830	
100	—	—	—	6.3×5.7	26	770	6.3×5.7	27	720	8×6.7	27	880	8×6.7	30	830	
120	—	—	—	—	—	—	6.3×5.7	27	720	8×6.7	27	880	—	—	—	
150	—	—	—	6.3×5.7	26	770	8×6.7	25	960	8×6.7	27	880	10×7.7	26	930	
180	—	—	—	—	—	—	—	—	—	—	—	—	10×7.7	26	930	
220	6.3×5.7	25	770	8×6.7	25	960	8×6.7	25	960	10×7.7	24	1010	—	—	—	
270	—	—	—	—	—	—	—	—	—	10×7.7	24	1010	—	—	—	
330	8×6.7	23	960	8×6.7	25	960	10×7.7	20	1100	10×7.7	24	1010	—	—	—	
470	8×6.7	23	960	10×7.7	20	1100	10×7.7	20	1100	—	—	—	—	—	—	
560	8×6.7	23	960	—	—	—	—	—	—	—	—	—	—	—	—	
680	—	—	—	10×7.7	20	1100	—	—	—	—	—	—	—	—	—	
1000	10×7.7	19	1100	—	—	—	—	—	—	—	—	—	—	—	—	

Aluminum Electrolytic Capacitors With Conductive Polymer Solid Electrolyte

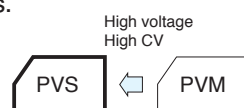
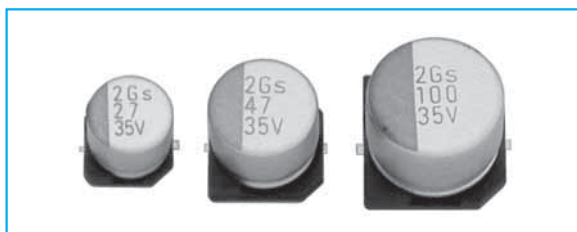
Rated voltage (V)	Item	20			25		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
		φD×L (mm)	(mΩ max.)	(mA rms)	φD×L (mm)	(mΩ max.)	(mA rms)
10	—	—	—	6.3×5.7	65	500	
22	6.3×5.7	50	590	8×6.7	50	600	
39	8×6.7	45	780	10×7.7	45	700	
47	8×6.7	45	780	—	—	—	
82	10×7.7	40	820	—	—	—	

(Note) Rated ripple current : 125°C, 100kHz ; ESR : 20°C, 100kHz

Chip Type

- GREEN CAP
- SMD
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent

- High voltage (to 63V)
- High CV and low E.S.R and High ripple Current are realized
- Guaranteed 105°C, 2000 hours.



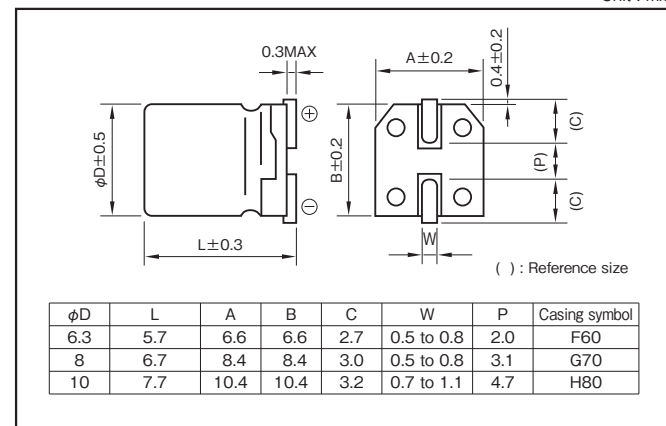
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (μA) *Note	Rated voltage (V) 35 to 63	
	Leakage current (μA) Less than 0.5 CV	
*Note C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C,120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.)	
	Z-25°C/Z+20°C : 1.15 Z-55°C/Z+20°C : 1.25 (100kHz)	
Endurance (105°C) (Applied ripple current)	Test time 2000 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Bias Humidity 60°C, 90 to 95%RH	Test time 500 hours	
	Leakage current The initial specified value or less	
	Percentage of capacitance change Within ±20% of initial value	
	Tangent of the loss angle 150% or less of the initial specified value	
	E.S.R. change 150% or less of the initial specified value	
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	150% or less of the initial specified value
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Part numbering system (example : 35V100μF)

PVS	—	35	V	101	M	H80	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

Standard Ratings

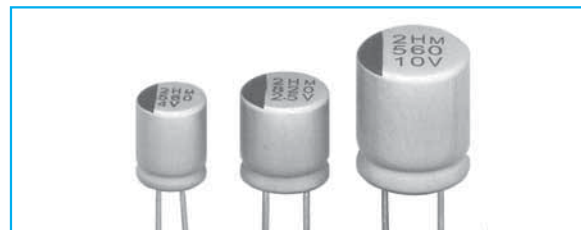
Rated voltage (V)	Item	35			50			63		
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current
		φD×L (mm)	(mΩ max.)	(mA _{rms})	φD×L (mm)	(mΩ max.)	(mA _{rms})	φD×L (mm)	(mΩ max.)	(mA _{rms})
18	—	—	—	—	—	—	8×6.7	55	2300	
22	—	—	—	—	—	—	—	—	—	
27	6.3×5.7	40	2600	8×6.7	45	2600	—	—	—	
33	—	—	—	—	—	—	—	—	—	
39	—	—	—	—	—	—	10×7.7	50	3000	
47	8×6.7	35	2800	—	—	—	—	—	—	
56	—	—	—	10×7.7	40	3200	—	—	—	
68	—	—	—	—	—	—	—	—	—	
82	—	—	—	—	—	—	—	—	—	
100	10×7.7	30	3500	—	—	—	—	—	—	

(Note) Rated ripple current : 105°C, 100kHz ; ESR. : 20°C, 100kHz

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

Radial lead Type

- GREEN CAP
- Low ESR
- 105°C 2000hours
- Anti-cleaning solvent



- Low E.S.R. and high ripple current are realized.
- Guaranteed 105°C, 2000 hours.



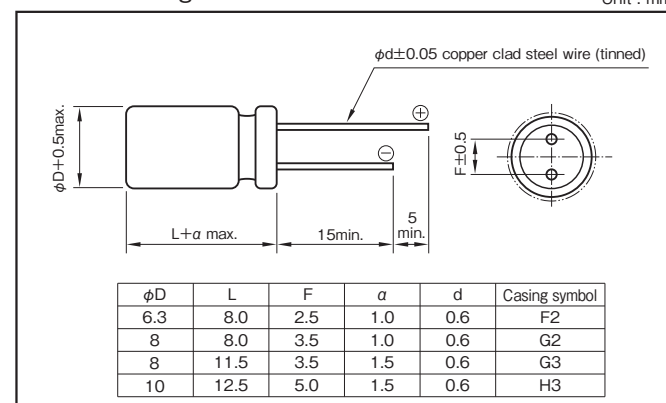
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (μA) *Note	Less than 0.2CV or 500 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)	
Tangent of the loss angle (tanδ)	Less than 0.12 (20°C,120Hz)	
Characteristics at high and low temperature	Impedance ratio (max.) Z-55°C / Z+20°C : 1.50 (100kHz)	
Endurance (105°C) (Applied ripple current)	Test time	2000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	200% or less of the initial specified value
Damp heat, steady state (humidity) 60°C, 90 to 95%RH	Test time	500 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	200% or less of the initial specified value
Characteristics of applied surge voltage	The capacitors shall be subject to 1000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (Rc=1kΩ) in 6 minutes per cycle. Surge voltage : 1.15 times of rated voltage	
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
	E.S.R. change	200% or less of the initial specified value
Failure rate	0.5% per 1000 hours maximum (Confidence level 60% at 105°C)	

*Note : If any doubt arises, measure the leakage current after following voltage application treatment.
Voltage application treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

Outline Drawing

Unit : mm



- Soldering conditions are described on page 12.
- The taping specifications are described on page 17.

Part numbering system (example : 4V560μF)

PRM	—	4	V	561	M	F2	□	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol		Taping symbol

Standard Ratings

Rated capacitance (µF)	Rated voltage (V)																
	2.5				4				6.3				10				
	Item	Case	tan δ	ESR	Rated ripple current	Case	tan δ	ESR	Rated ripple current	Case	tan δ	ESR	Rated ripple current	Case	tan δ	ESR	Rated ripple current
	φD×L (mm)		(mΩ max.)	(mA _{rms})	φD×L (mm)		(mΩ max.)	(mA _{rms})	φD×L (mm)		(mΩ max.)	(mA _{rms})	φD×L (mm)		(mΩ max.)	(mA _{rms})	
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
180	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
220	—	—	—	—	—	—	—	—	—	—	—	—	6.3×8.0	0.10	10	4680	—
270	—	—	—	—	—	—	—	—	—	—	—	—	6.3×8.0	0.10	10	4680	—
330	6.3×8.0	0.10	7	5600	—	—	—	—	6.3×8.0	0.10	10	4680	8×8.0	0.08	10	5000	—
390	—	—	—	—	—	—	—	—	—	—	—	—	8×8.0	0.08	10	5000	—
470	6.3×8.0	0.10	7	5600	—	—	—	—	6.3×8.0	0.10	7	5600	8×8.0	0.08	8	5700	—
560	6.3×8.0	0.10	7	5600	6.3×8.0	0.10	7	5600	8×8.0	0.08	7	6100	10×12.5	0.12	12	5300	—
680	—	—	—	—	8×8.0	0.08	6	6100	8×8.0	0.08	8	5700	—	—	—	—	—
820	8×8.0	0.08	6	6100	8×8.0	0.08	6	6100	10×12.5	0.12	10	5500	—	—	—	—	—
1000	8×8.0	0.08	6	6100	10×12.5	0.12	8	5500	10×12.5	0.12	10	5500	—	—	—	—	—
1200	10×12.5	0.12	8	5500	10×12.5	0.12	8	5500	—	—	—	—	—	—	—	—	—
1500	10×12.5	0.12	8	5500	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C , 100kHz ; ESR : 20°C , 100kHz

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

MEMO

Aluminum Electrolytic Capacitors

■ Cautions for Using Aluminum Electrolytic Capacitors

Please read product specifications before using ELNA products.

The following cautions should be observed when using our aluminum electrolytic capacitors to assure their maximum stability and performance. When your application design conditions or operating conditions exceed the limit of the product specification, please contact us. If used under conditions beyond the limit of our specifications, it may cause defects such as short circuit, open circuit, leakage, explosion or combustion.

■ Cautions for usage

1. DC electrolytic capacitors are polarized.

- If used with a wrong polarity, it creates an abnormal current resulting in a short circuit or damage to itself. Use DC bipolar electrolytic capacitors for use with uncertain or unknown polarity. DC capacitors cannot be used in AC circuits.

2. Use within the rated voltage.

- If a voltage exceeding the rated voltage is applied, it may cause characteristic deterioration or damage due to the increased leakage current.
- When ripple current is loaded, make sure that the peak value of the ripple voltage does not exceed the rated voltage.

3. Using for power supply circuit.

- While aluminum electrolytic capacitors are operated electrolyte liquid inside dries up and E.S.R. (Equivalent Series Resistance) of the capacitor increases. In case operated longer than rated life time, the capacitance much decreases, tangent of loss angle and E.S.R. much increases. Therefore for some case the sum of bias direct voltage and the peak of ripple voltage is over the rated voltage of the capacitor.
- For any type of circuit, in case the sum of bias direct voltage and the peak of ripple voltage is over the rated voltage of the capacitors or in case the minimum voltage is lower than 0 (zero) volt, the voltage control for the capacitors shall be provided.

4. Do not use in a circuit which requires rapid charging or discharging.

- If used in a circuit requiring rapid charging or discharging, it may cause characteristic deterioration or damage to itself due to the heat generated inside the capacitor. In such cases, contact us for our rapid charging/discharging capacitors.

5. Use within the rated ripple current.

- If applied ripple current exceeds rated ripple current, the life of the capacitor may be shortened, or in an extreme case it gets destroyed due to its internal heat. Use high-ripple type capacitors for such circuits.

6. Changes in characteristics due to operating temperature.

- The characteristics of an electrolytic capacitor will change with a change in the temperature. Such changes are temporary and the original characteristics will be restored at the original temperature (if

the characteristics are not deteriorated by remaining at a high temperature for a long time). If used at a temperature exceeding the guaranteed temperature range, the capacitor may be damaged due to the increased leakage current. Pay attention to the capacitor temperature being affected by the ambient temperature of the unit, the temperature inside the appliance, the heat radiated by another hot component in the unit and the heat inside the capacitor itself due to the ripple current.

- (1)The electrostatic capacitance is normally shown as the value at 20°C-120Hz. It increases as the temperature raises and decreases as it lowers.
- (2)The tangent of loss angle ($\tan\delta$) is normally shown as the value at 20°C-120Hz. It decreases as the ambient temperature gets high and increases as it gets low.
- (3)The leakage current increases as the temperature gets high and decreases as it gets low.

7. Changes in the characteristics due to frequency.

- The characteristics of an electrolytic capacitor will change according to the change in the operating frequency.
 - (1)The electrostatic capacity is normally shown as the value at 20°C-120Hz. It decreases as the frequency increases.
 - (2)The tangent of loss angle ($\tan\delta$) is normally shown as the value at 20°C-120Hz. It increases as the frequency gets high.
 - (3)The impedance is normally shown as the value at 100kHz 20°C. It increases as the frequency lowers.

8. Aluminum electrolytic capacitor life.

- The life of an aluminum electrolytic capacitor terminates when it fails due to the deterioration in its electronic characteristics. Temperature and the ripple current since they especially affect the life. See chart on page.

9. Changes in aluminum electrolytic capacitors during storage.

- After storage for a long period, whether unused of mounted on the appliance, the leakage current of an aluminum electrolytic capacitor will increase. This tendency is more prominent when the ambient temperature is high. If a capacitor has been stored for more than 2 years under normal temperature (shorter if high temperature) and it shows increased leakage current, a treatment by voltage application is recommended. Addition of a protective circuit in

the design of the appliance is also recommended, considering the effect of the initial increased current.

10. Insulation between the capacitor case and the cathode terminal.

- The capacitor case and the cathode terminal are connected through the electrolyte which has uncertain resistance. If a complete insulation of the case is necessary, add an insulator at assembly.

11. External sleeve.

- During a preheating or a hardening of mounting adhesive may cause a sleeve cracked. The capacitors are usually sleeved with poly vinyl chloride or poly ethylene terephthalate for the indication purpose only. Please do not consider it as an insulation.

12. Fumigation Process

- When exporting electronic equipment abroad, fumigation process may be performed on wooden packaging material with a halogen (compound) gas such as methyl bromide. Exercise care as this halogen gas may corrode capacitors. Also, use caution to epidemic preventive agent as corrosive component such as halogen may be contained.

13. Specific Operating Environments

- Capacitors may corrode when stored or used in a place filled with acidic toxic gases (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, etc.) If capacitors are used or stored in such environments, please let us know.

14. Use at a high altitude

- The use of capacitors at high altitudes such as on an airplane causes a large difference between the internal pressure of the capacitors and the atmospheric pressure. However, there is no problem in use under atmospheric pressure up to about an altitude of 10,000 meters. Please check the operation of electronic equipment at the operating environmental temperature because the temperature lowers with increased altitude. If the condition is severe like space, please contact us.

15. Hole pitch adjustment of the PCB to the capacitors.

- Set the hole pitch of the PCB to the lead pitch (the "F" distance in the catalog) of the capacitor. Be careful since a short circuit, a cut or an increase in the leakage current etc. may be caused by the stress given to the lead wire terminals due to the difference between the hole pitch and the lead pitch.

16. Capacitors with pressure valves.

- A part of the capacitor case is made thin to have

the function as the pressure valve in order to prevent explosion due to the rise of inside pressure when a reverse or excessive voltage is applied to the capacitor. Once it has worked as a valve, the whole capacitor needs to be replaced since the valve will not restore.

- When you use a capacitor with pressure valve, provide certain space above the pressure valve as below to prevent an interference when it works as a valve.

Diameter of the capacitor (mm)	18 to less	20 to 40
Required space above the valve (mm)	2.0	3.0

17. Double-sided PCB's

- When you use electrolytic capacitors on a double sided PCB, be careful not to have the circuit pattern run under where the capacitor is mounted. Otherwise it may cause a short circuit on the PCB depending on the condition of mounting.

18. Regarding to connection of capacitors

- Aluminum electrolytic capacitor has electrolyte liquid so that the most portion of electric loss characteristics came from E.S.R(Equivalent Series Resistance) of electrolyte liquid. Therefore the capacitor is an electronic devise which can flow high ripple current in case the temperature increases and it decreases E.S.R.

In case connecting two capacitors or more, E.S.R. of the capacitors is close to the resistance of the circuit. Therefore in case current is unbalanced and some capacitors has high ripple current, temperature increase, it makes more high current and finally it is over the rated ripple current.

For parallel connection of capacitors the proper design of electric circuit such as balancing of each capacitors resistance or control of total ripple current shall be provided to avoid excess ripple current and voltage.

- When two or more capacitors are arranged in series, the voltage given to each capacitors shall be kept below the rated voltage level, by also giving consideration to the balance of the voltage impressed on the capacitors. Further, partial pressure resistor which considers leakage current shall be provided parallel to each condenser not to have over-voltage impressed on. Balance resistance are explained on p.106 of our Catalog.

■Cautions for Mounting

1. Cautions for mounting.

- Check the ratings (electrostatic capacitance and rated voltage) of the capacitor before mounting.
- Check the polarity of the capacitor to the chassis.
- Do not drop the capacitor to the floor. Do not use

the dropped capacitor.

- Do not deform the capacitor for mounting.

2. Do not apply excessive pressure to the capacitor, its terminals or lead wires.

- Make sure that the contact path of the capacitor meets the hole pitch of the PCB before mounting.
- Transient recovery voltage may be generated in the capacitor due to dielectric absorption. If required, this voltage can be discharged with a resistor with a value of about 1 kΩ.
- A PCB self-standing (snap-in) type capacitor should be pushed to the end (till there is no space) to the PCB for mounting.
- Do not set the automatic insertion machine to clinch the capacitor lead wires too strong.
- Pay attention to the impact given by the component receptacles of the automatic insertion/mounting machines and the product checker, and from the centering operation.

3. Soldering.

- Do not dip the capacitor into melted solder.
- The soldering conditions
 - Chip type : Please refer to 11 page.
 - small and large type : 260°C, 10 s (max.)
 The preliminary heating and other conditions described in the catalog or product specifications.
- Do not flux other part than the terminals.
- If there is a direct contact between the sleeve of the capacitor and the printed circuit pattern or a metal part of another component such as a lead wire, it may cause shrinkage or crack.
- When you use the capacitor with its sleeve touching directly to the PCB, excessive solder temperature or excessive soldering time may cause the sleeve to shrink or crack during the heat.
- If the application is for extended use, understand and manage the soldering characteristics to avoid abnormal current caused by a contact failure between the capacitor and the PCB.

4. Handling after soldering.

- After soldering, do not tilt, push down or twist the capacitor.
- After soldering, do not hold the capacitor as a handle to carry the PCB.
- After soldering, do not hit the capacitor with any obstacle. If PCB's are piled up for storage, the capacitor should not touch another PCB or component.

5. Cleaning after Soldering

- Recommended cleaning method
 - (1)cleaning solutions:
 - (a) CLEANTHROUGH 710M, 750H, 750L
 - (b) PINEALPHA ST-100S
 - (c) Techno Care FRW-4~17
 - (d) Isopropyl alcohol (2-propanol)

(2)Cleaning conditions:

- (a) The temperature of cleaning solution shall be less than 60°C.
 - (b) Use immersion or ultrasonic waves within two minutes.
 - (c) After cleaning, capacitors and PCB's shall thoroughly be rinsed and dried with hot blast for more than 10 minutes. The temperature of such breeze should be less than the upper category temperature.
 - (d) After cleaning, do not keep capacitors in cleaning solution atmosphere or airtight containers.
- During cleaning, control the cleaning solution against contamination.

6. Fixing adhesives and coating materials.

- Do not use fixing adhesive or coating material containing halogen-based solvent.
- Before applying the fixing adhesive or the coating material, make sure that there is no remaining flux or stains between the PCB and the sealed part of the capacitor.
- Before applying the fixing adhesive or the coating material, make sure that the detergent etc. has dried up.
- Do not cover the whole surface of the sealed part (terminal side) of the capacitor with the fixing adhesive or the coating material.
- Observe the description in the catalog or the product specifications concerning the thermal stiffening conditions of the fixing adhesive or the coating material. (If there is no such description, contact us.) When both discrete and SMT components are on the same PCB, the fixing material for the SMT components may cause crack, tear or shrinkage on the external sleeve depending on the thermal stiffening condition.
- Recommended fixing adhesives and coating materials
 - Fixing adhesives : Cemedine 1500, Diabond DN83K, Bond G103
 - Coating materials : Taffy TF1159, HumiSeal 1B66NS, 1A27NS

■ Other Cautions

1. Do not touch capacitor terminals with bare hands.

You may get electric shock or your hand may be burnt. Discharge it with a 1 KΩ resistance before use if necessary.

2. Do not short the capacitor terminals with a conductor.

Do not spill conductive solution including acid or alkaline solution on the capacitor.

3. Periodical inspections should be established for the capacitors used in industrial appliances.

- The following items should be checked:

(1) Appearance : Check if there is any open valve or leakage.

(2) Electronic performance : Check the leakage current, the electrostatic capacitance, the tangent of loss angle and other items described in the catalog or the product specifications.

4. Take the following measures in case of emergency.

- If you see gas coming out of the capacitor valve when the set is in operation, turn off the power switch of the unit or unplug the power cord from the outlet.
- Keep your face away from the capacitor pressure valve, since the high temperature gas at over 100°C bursts out when the valve works. If the gas gets into your eyes or your mouth, wash your eyes or your mouth. Do not ingest the capacitor electrolyte. If the electrolyte gets on your skin, wash it out with soap.

5. Storing conditions.

- Avoid high temperature or high humidity when storing capacitors. Keep the storing temperature at 5°C to 35°C and the relative humidity not more than 75%.
- The leakage current of an aluminum electrolytic capacitor tends to increase when stored for a long time. This tendency becomes more prominent if the ambient temperature is high. The leakage current will be decreased by voltage application. If necessary, treatment by voltage application should

be made on the capacitors which have been stored for a long period (more than 2 years after production).

- Do not store capacitors at a place where there is a possibility that they may get water, salt or oil spill.
- Do not store capacitors at a place where the air contains dense hazardous gas (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, ammonia, etc.).
- Fumigation treatment with toxic gas covering the whole wooden container frames as moth proofing during shipment may leave residual toxic gas.
- Do not store capacitors at a place where it gets ultraviolet or radioactive rays.

6. Disposing of capacitors.

- Punch a hole or crush the capacitors (to prevent explosion) before incineration at approved facility.
- If they are not to be incinerated, bring them to a professional industrial waste disposal company.

7. Other notes.

- Please refer to the following literature for anything not described in the product specifications or the catalog.

(Technical report of Japan Electronics and Information Technology Industries Association, EIAJ RCR-2367C "Guideline of notabilia for fixed aluminum electrolytic capacitors for use in electronic equipment")

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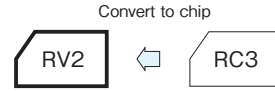
Chip Type Aluminum Electrolytic Capacitors

Chip Type
Aluminum Electrolytic Capacitors

ChipType Standard Capacitors (height:5.5mm)

GREEN CAP SMD Anti-cleaning solvent

- Compatible with surface mounting for 5.5mm high capacitors.
- Supplied with carrier taping.
- Guarantees 2000 hours at 85°C.

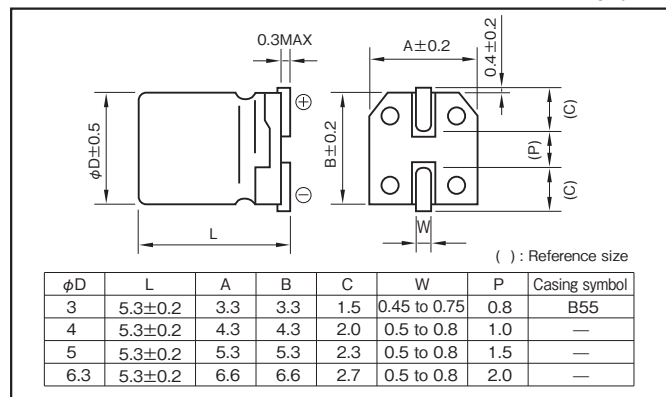


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Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	Rated voltage (V)	
	tanδ (max.)	
Characteristics at high and low temperature	Rated voltage(V)	
	Impedance ratio (max.)	φ3
		φ4 to φ6.3
	φ3	Z-25°C/Z+20°C
Z-40°C/Z+20°C		
φ4 to φ6.3	Z-25°C/Z+20°C	
	Z-40°C/Z+20°C	
Endurance (85°C) (Applied ripple current)	Test time: 2000 hours (φ3 : 1000 hours) Leakage current: The initial specified value or less Percentage of capacitance change: Within ±20% of initial value (4WV : ±30%) Tangent of the loss angle: 200% or less of the initial specified value (4WV : 300%)	
Shelf life (85°C)	Test time : 1000hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1	
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)	

Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	50 · 60	120	1k	10k · 100k
4 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.80	1	1.35	1.50

Part numbering system

• φ3 (example : 16V10μF)

RV2 — 16 V 100 M B55 U — □

Series code Rated voltage symbol Rated capacitance symbol Capacitance tolerance symbol Casing symbol Taping symbol

• φ4 to φ6.3 (example : 16V47μF)

RV2 — 16 V 470 M □ U — □

Series code Rated voltage symbol Rated capacitance symbol Capacitance tolerance symbol Additional symbol Taping symbol

*Should add "S", when there is a black point in standard ratings.

- Soldering conditions are described on page 13. • Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

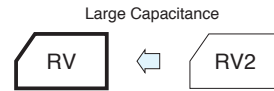
Rated capacitance (μF)	4				6.3				10				16				25				35				50			
	Case φD (mm)	Casing symbol	ESR (Ω)	Rated ripple current (mA)	Case φD (mm)	Casing symbol	ESR (Ω)	Rated ripple current (mA)	Case φD (mm)	Casing symbol	ESR (Ω)	Rated ripple current (mA)	Case φD (mm)	Casing symbol	ESR (Ω)	Rated ripple current (mA)	Case φD (mm)	Casing symbol	ESR (Ω)	Rated ripple current (mA)	Case φD (mm)	Casing symbol	ESR (Ω)	Rated ripple current (mA)				
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	1990	1				
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	905	2				
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	754	5				
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	603	3				
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	503	6				
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	424	4				
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	353	7				
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	199	6				
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	166	10				
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	106	8	4	—	75	15				
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	70	9				
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	42	20				
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	B55	57	11	5	—	35	26				
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	49	19	4	—	20	5				
22	3	B55	32	14	4	—	21	31	5	—	18	39	5	—	15	44	6.3	—	11	55	6.3	—	9.1	59	—			
33	4	—	21	31	5	—	14	44	5	—	12	48	6.3	—	10	63	6.3	—	7.0	67	—	—	—	—	—			
47	4	—	15	37	5	—	10	52	6.3	—	8.5	67	6.3	—	7.1	75	—	—	—	—	—	—	—	—	—			
100	5	—	7.0	63	6.3	—	5.0	89	6.3	—	4.0	98	6.3	—	3.3	103	—	—	—	—	—	—	—	—	—			
220	6.3	—	3.2	110	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			

(Note) Rated ripple current : 85°C, 120Hz ; ESR : 20°C, 120Hz

Chip Type Large Capacitance Capacitors

GREEN CAP SMD Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 85°C.



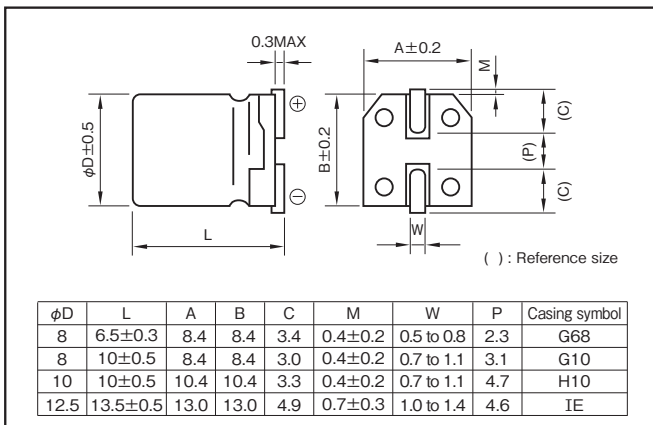
Marking color : Black print (φ8×6.5L)
White print on a brown sleeve (φ8×10L - φ12.5×13.5L)

Specifications

Item	Performance		
Category temperature range (°C)	-40 to +85		
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)		
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3 10 16 25 35 50 63 100	
	tanδ (max.)	0.28 0.24 0.20 0.14 0.12 0.10 0.10 0.10	
Characteristics at high and low temperature	Rated voltage (V)	6.3 10 16 25 35 50 63 100	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4 3 2 2 2 2 2 2
		Z-40°C/Z+20°C	8 5 4 3 3 3 3 3
Endurance (85°C) (Applied ripple current)	Test time	2000 hours	
	Leakage current	The initial specified value or less	
	Percentage of capacitance change	Within ±20% of initial value	
	Tangent of the loss angle	200% or less of the initial specified value	
Shelf life (85°C)	Test time : 1000hours; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1		
Applicable standards	JIS C 5101-1 1998,-18 1999 (IEC 60384-1 1992, -18 1993)		

Outline Drawing

Unit: mm



Coefficient of Frequency for Rated Ripple Current

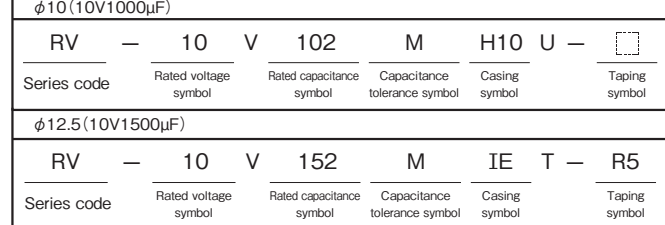
φ8, φ10

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50 to 63	0.80	1	1.35	1.50
100	0.70	1	1.35	1.50

φ12.5

Frequency (Hz)	120	1k	10k	100k
Rated capacitance (μF)				
100 to 220	1	1.21	1.29	1.43
330 to 1000	1	1.16	1.23	1.25
1500 to 2200	1	1.06	1.11	1.11

Part numbering system



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (μF)	6.3			10			16			25			35			50			63			100			
	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	Case	Casing symbol	Rated ripple current (mA)	
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	8×6.5	G68	155	8×6.5	G68	155	8×6.5	G68	155	8×10	G10	252	10×10	H10	458	10×10	H10	226	12.5×13.5	IE	242	—
220	8×6.5	G68	155	8×6.5	G68	155	8×10	G10	252	8×10	G10	252	10×10	H10	458	—	—	—	—	—	—	—	—	—	—
330	8×6.5	G68	155	8×10	G10	252	8×10	G10	252	10×10	H10	458	—	—	—	12.5×13.5	IE	451	—	—	—	—	—	—	—
470	8×10	G10	252	10×10	H10	458	8×10	G10	252	10×10	H10	458	12.5×13.5	IE	460	—	—	—	—	—	—	—	—	—	—
820	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	10×10	H10	458	10×10	H10	458	12.5×13.5	IE	521	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	12.5×13.5	IE	580	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	12.5×13.5	IE	651	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz

NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

Chip Type Aluminum Electrolytic Capacitors

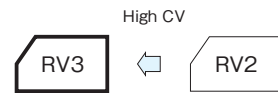
Chip Type 85°C Capacitors (height:5.5mm,8.0mm)

GREEN CAP

SMD

Anti-cleaning solvent

- Compatible with surface mounting for 5.5mm, 8.0mm high capacitors.
- Supplied with carrier taping.
- Guarantees 2000 hours at 85°C.



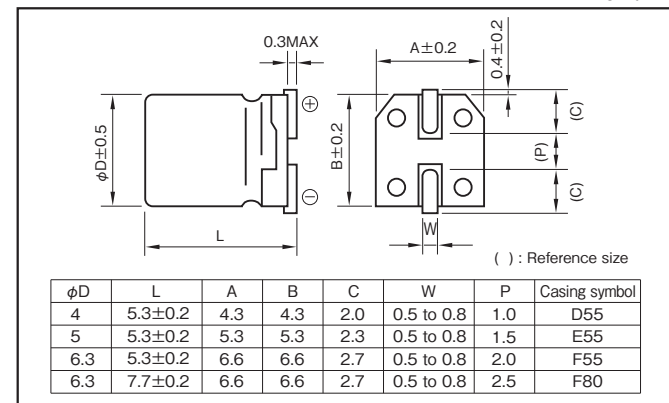
Marking color : Black print

Specifications

Item	Performance							
Category temperature range (°C)	-40 to +85							
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)							
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)							
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50	
	tanδ (max.)	0.42	0.32	0.26	0.18	0.14	0.12	
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	2
		Z-40°C/Z+20°C	8	8	5	5	4	4
Endurance (85°C) (Applied ripple current)	Test time	2000 hours						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±30% of initial value						
	Tangent of the loss angle	300% or less of the initial specified value						
Shelf life (85°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1							
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)							

Outline Drawing

Unit: mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated voltage (V)	Item	6.3			10			16			25			35			50				
		Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current		
Rated capacitance (μF)	φD (mm)	(Ω)	(mArms)	φD (mm)	(Ω)	(mArms)	φD (mm)	(Ω)	(mArms)	φD (mm)	(Ω)	(mArms)	φD (mm)	(Ω)	(mArms)	φD (mm)	(Ω)	(mArms)	φD (mm)	(Ω)	(mArms)
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	42	20	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	—	—	—	4×5.3	24	26	4×5.3	20	30	5×5.3	14	43	5×5.3	11	47	6.3×5.3	9.0	59	—	—	—
33	4×5.3	21	28	4×5.3	16	33	5×5.3	13	44	5×5.3	9.0	54	6.3×5.3	7.0	67	6.3×7.7	6.0	82	—	—	—
47	4×5.3	15	34	5×5.3	11	45	5×5.3	9.2	50	6.3×5.3	6.4	75	6.3×7.7	4.9	90	6.3×7.7	4.2	98	—	—	—
68	5×5.3	10	47	5×5.3	7.8	54	6.3×5.3	6.3	74	6.3×5.3	4.4	90	6.3×7.7	3.4	109	—	—	—	—	—	—
100	5×5.3	7.0	58	—	—	—	6.3×5.3	4.3	103	6.3×7.7	3.0	124	—	—	—	—	—	—	—	—	—
150	6.3×5.3	4.6	83	6.3×7.7	3.5	98	6.3×7.7	2.9	109	—	—	—	—	—	—	—	—	—	—	—	—
220	6.3×7.7	3.2	113	6.3×7.7	2.4	130	6.3×7.7	2.0	144	—	—	—	—	—	—	—	—	—	—	—	—
330	6.3×7.7	2.1	139	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz ; ESR : 20°C, 120Hz

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k·100k
Rated voltage (V)				
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.70	1	1.35	1.50

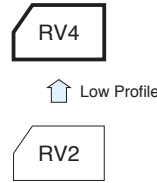
Part numbering system (example : 16V220μF)

RV3	—	16	V	221	M	F80	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

Chip Type 85°C Capacitors (height:4.5mm)

GREEN CAP SMD Anti-cleaning solvent

- Compatible with surface mounting for 4.5mm high capacitors.
- Supplied with carrier taping.
- Guarantees 2000 hours at 85°C.



Marking color : Black print

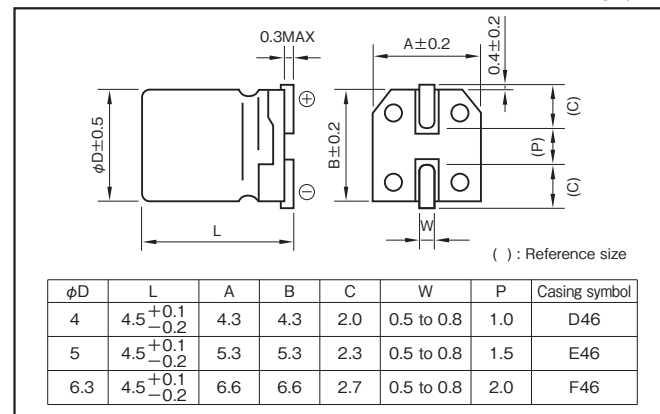
Specifications

Item	Performance																				
Category temperature range (°C)	-40 to +85																				
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																				
Leakage current (µA)	Less than 0.01 CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)																				
Tangent of loss angle (tanδ)	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>tanδ (max.)</td> <td>0.30</td> <td>0.24</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table> (20°C, 120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	tanδ (max.)	0.30	0.24	0.19	0.16	0.14	0.12						
Rated voltage (V)	6.3	10	16	25	35	50															
tanδ (max.)	0.30	0.24	0.19	0.16	0.14	0.12															
Characteristics at high and low temperature	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td rowspan="2">Impedance ratio (max.)</td> <td>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>8</td> <td>4</td> <td>4</td> <td>3</td> </tr> </table> (120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	Z-40°C/Z+20°C	8	8	4	4	3
Rated voltage (V)	6.3	10	16	25	35	50															
Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2															
	Z-40°C/Z+20°C	8	8	4	4	3															
Endurance (85°C) (Applied ripple current)	<table border="1"> <tr> <td>Test time</td> <td>2000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>300% or less of the initial specified value</td> </tr> </table>	Test time	2000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	300% or less of the initial specified value												
Test time	2000 hours																				
Leakage current	The initial specified value or less																				
Percentage of capacitance change	Within ±20% of initial value																				
Tangent of the loss angle	300% or less of the initial specified value																				
Shelf life (85°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1																				
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)																				

Aluminum Electrolytic Capacitors

Outline Drawing

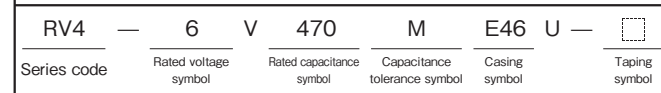
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50 · 60	120	1k	10k · 100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.70	1	1.25	1.40
50	0.1 to 3.3µF	0.50	1	1.35
	4.7 to 10µF	0.70	1	1.35

Part numbering system (example : 6.3V47µF)



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

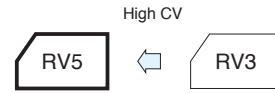
Rated capacitance (µF)	6.3			10			16			25			35			50		
	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	905	4
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	603	5
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	423	6
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	199	8
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	90	12
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	60	15
4.7	—	—	—	—	—	—	—	—	—	4	56	17	4	49	18	5	42	21
10	—	—	—	—	—	—	4	32	22	5	27	28	5	23	30	6.3	20	35
22	4	23	26	5	18	34	5	14	38	6.3	12	49	6.3	11	52	—	—	—
33	5	15	37	5	12	42	6.3	10	55	6.3	8	60	—	—	—	—	—	—
47	5	11	45	6.3	8	59	6.3	7	76	—	—	—	—	—	—	—	—	—
100	6.3	5	76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz ; ESR : 20°C, 120Hz

Chip Type Large Capacitance Capacitors

GREEN CAP SMD Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 85°C.



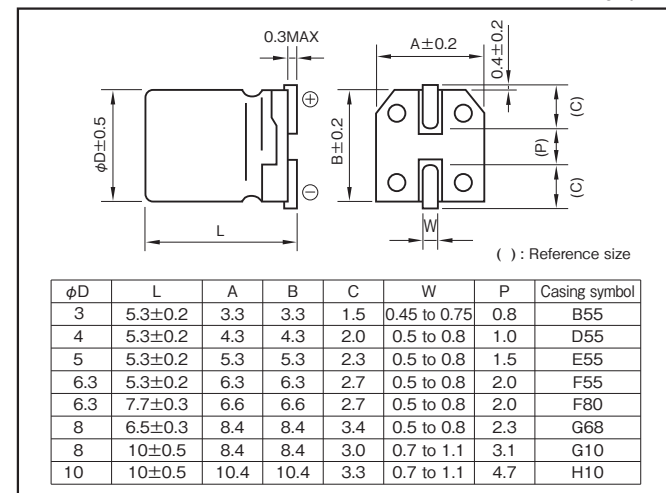
Marking color : Black print (φ3×5.3L-φ8×10L)
White print on a brown sleeve (φ10×10L)

Specifications

Item	Performance		
Category temperature range (°C)	-40 to +85		
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)		
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3 10 16 25 35 50 63 100	
	tanδ (max.)	0.35 0.32 0.28 0.18 0.14 0.12 0.12 0.12	
Characteristics at high and low temperature	Rated voltage (V)	6.3 10 16 25 35 50 63 100	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4 3 2 2 2 2 2 2
		Z-40°C/Z+20°C	10 8 6 4 3 3 3 3
Endurance (85°C) (Applied ripple current)	Test time	2000 hours (φ3 : 1000 hours)	
	Leakage current	The initial specified value or less	
	Percentage of capacitance change	Within ±30% of initial value	
	Tangent of the loss angle	200% or less of the initial specified value	
Shelf life (85°C)	Test time : 1000 hours; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1		
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)		

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50-60	120	1k	10k-100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50 to 63	0.80	1	1.35	1.50
100	0.70	1	1.35	1.50

Part numbering system (example : 16V470μF)

RV5	—	16	V	471	M	G10	U	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping symbol

Standard Ratings

Rated voltage (V)	Rated capacitance (µF)	6.3			10			16			25			35			50			63			100		
		Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)	Case	Casing symbol	Rated ripple current (mA rms)
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3×5.3	B55	7	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3×5.3	B55	10	4×5.3	D55	12
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3×5.3	B55	13	4×5.3	D55	18
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3×5.3	B55	18	3×5.3	B55	16
22	3×5.3	B55	21	3×5.3	B55	20	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	D55	24	5×5.3	E55	41
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.3×5.3	F55	30	6.3×5.3	F55	32
47	4×5.3	D55	34	4×5.3	D55	33	5×5.3	E55	52	—	—	—	—	—	—	—	—	—	—	6.3×7.7	F80	60	8×6.5	G68	62
100	5×5.3	E55	55	5×5.3	E55	54	6.3×5.3	F55	70	6.3×7.7	F80	120	6.3×7.7	F80	120	8×10	G10	252	10×10	H10	226	—	—	—	
150	—	—	—	6.3×5.3	F55	79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
220	6.3×5.3	F55	88	6.3×7.7	F80	173	6.3×7.7	F80	162	—	—	—	8×10	G10	260	—	—	—	—	—	—	—	—	—	
330	6.3×7.7	F80	188	8×6.5	G68	175	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
470	—	—	—	8×10	G10	310	8×10	G10	307	10×10	H10	400	—	—	—	—	—	—	—	—	—	—	—	—	
680	—	—	—	—	—	—	10×10	H10	380	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
820	8×10	G10	320	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
1000	—	—	—	10×10	H10	454	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
1500	10×10	H10	489	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

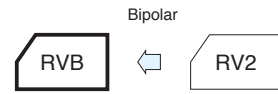
(Note) Rated ripple current : 85°C, 120Hz

Chip Type
Aluminum Electrolytic Capacitors

Chip Type Bipolar Capacitors (height:5.5mm)

GREEN CAP SMD Anti-cleaning solvent

- Compatible with surface mounting for 5.5mm high capacitors.
- Supplied with carrier taping.
- Guarantees 2000 hours at 85°C.

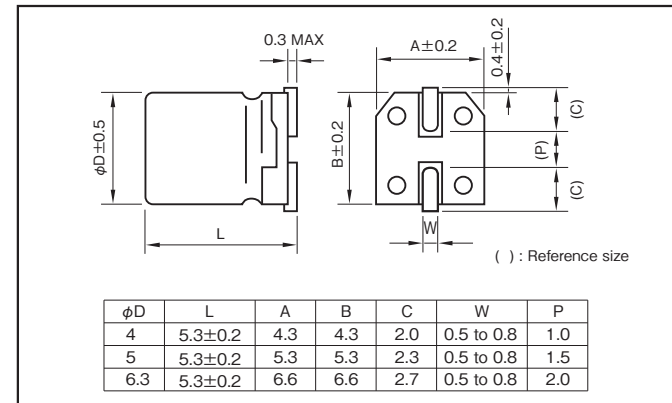


Marking color : Black print

Specifications

Item	Performance
Category temperature range (°C)	-40 to +85
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (85°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (85°C)	Test time : 1000hours; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)

Outline Drawing



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

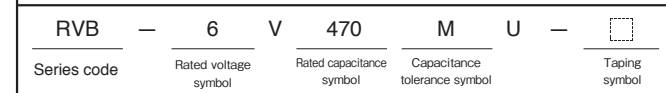
Rated capacitance (µF)	6.3			10			16			25			35			50		
	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})	Case	ESR (Ω)	Rated ripple current (mA _{rms})
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1510	3.3
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1010	4.1
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	706	4.9
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	332	7.2
2.2	—	—	—	—	—	—	—	—	—	—	—	—	4	151	10	5	113	14
3.3	—	—	—	—	—	—	—	—	—	—	—	—	4	101	13	5	75	17
4.7	—	—	—	—	—	—	4	88	14	5	53	20	5	53	21	6.3	53	24
10	—	—	—	4	50	18	5	33	26	6.3	25	35	6.3	25	35	—	—	—
22	5	23	27	6.3	19	40	6.3	15	45	—	—	—	—	—	—	—	—	—
33	6.3	15	45	6.3	13	50	6.3	10	55	—	—	—	—	—	—	—	—	—
47	6.3	11	54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz ; ESR : 20°C, 120Hz

Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	50	120	1k	10k·100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.80	1	1.35	1.50

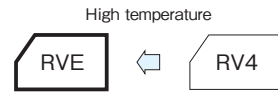
Part numbering system (example : 6.3V47µF)



Chip type 105°C Capacitors(height:4.5mm)

GREEN CAP SMD Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 1000 hours 105°C.



Marking color : Black print

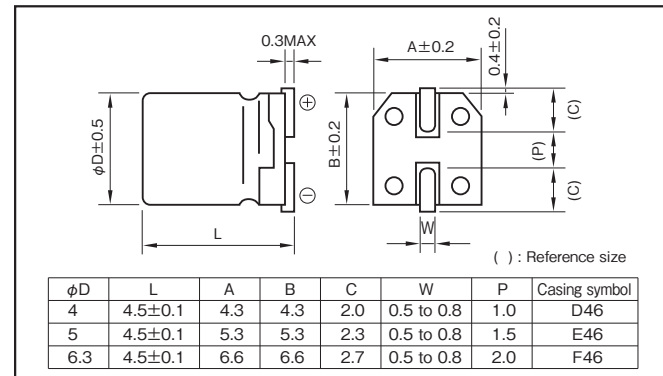
Specifications

Item	Performance																				
Category temperature range (°C)	-40 to +105																				
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																				
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)																				
Tangent of loss angle (tanδ)	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>tanδ (max.)</td> <td>0.38</td> <td>0.32</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.14</td> </tr> </table> (20°C, 120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	tanδ (max.)	0.38	0.32	0.20	0.16	0.14	0.14						
Rated voltage (V)	6.3	10	16	25	35	50															
tanδ (max.)	0.38	0.32	0.20	0.16	0.14	0.14															
Characteristics at high and low temperature	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td rowspan="2">Impedance ratio (max.)</td> <td>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> </tr> </table> (120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	Z-40°C/Z+20°C	10	8	6	4	3
Rated voltage (V)	6.3	10	16	25	35	50															
Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2															
	Z-40°C/Z+20°C	10	8	6	4	3															
Endurance (105°C)	<table border="1"> <tr> <td>Test time</td> <td>1000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within ±20% of initial value (16WV or less:±25%)</td> </tr> <tr> <td>Tangent of loss angle</td> <td>300% or less of the initial specified value</td> </tr> </table>	Test time	1000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value (16WV or less:±25%)	Tangent of loss angle	300% or less of the initial specified value												
Test time	1000 hours																				
Leakage current	The initial specified value or less																				
Percentage of capacitance change	Within ±20% of initial value (16WV or less:±25%)																				
Tangent of loss angle	300% or less of the initial specified value																				
Shelf life (105°C)	Test time : 500 hours ; other items are the same as those for the endurance. Voltage application treatment																				
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)																				

Aluminum Electrolytic Capacitors Chip Type

Outline Drawing

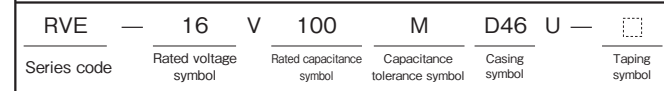
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50 · 60	120	1k	10k · 100k
6.3 to 16	0.80	1.00	1.15	1.25
25 to 35	0.80	1.00	1.25	1.40
50	0.1 to 3.3μF	0.50	1.00	1.35
	4.7μF to	0.70	1.00	1.35

Part numbering system (example : 16V10μF)



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (μF)	6.3		10		16		25		35		50	
	Case φD(mm)	Rated ripple current (mA _{RMS})	Case φD(mm)	Rated ripple current (mA _{RMS})	Case φD(mm)	Rated ripple current (mA _{RMS})	Case φD(mm)	Rated ripple current (mA _{RMS})	Case φD(mm)	Rated ripple current (mA _{RMS})	Case φD(mm)	Rated ripple current (mA _{RMS})
0.22	-	-	-	-	-	-	-	-	-	-	4	2.2
0.33	-	-	-	-	-	-	-	-	-	-	4	2.8
0.47	-	-	-	-	-	-	-	-	-	-	4	3.3
1	-	-	-	-	-	-	-	-	-	-	4	5.4
2.2	-	-	-	-	-	-	-	-	-	-	4	9.6
3.3	-	-	-	-	-	-	-	-	-	-	4	12
4.7	-	-	-	-	-	-	4	11	4	13	5	16
10	-	-	-	-	4	16	5	20	5	22	6.3	26
22	4	19	5	24	5	26	6.3	33	6.3	36	-	-
33	5	26	5	30	6.3	35	6.3	42	-	-	-	-
47	5	32	6.3	40	6.3	44	-	-	-	-	-	-
100	6.3	52	-	-	-	-	-	-	-	-	-	-

(Note) Rated ripple current : 105°C, 120Hz

Chip Type 105°C Standard Capacitors

GREEN CAP SMD 105°C 1000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 1000 hours at 105°C.

RVS

High temperature

RV2



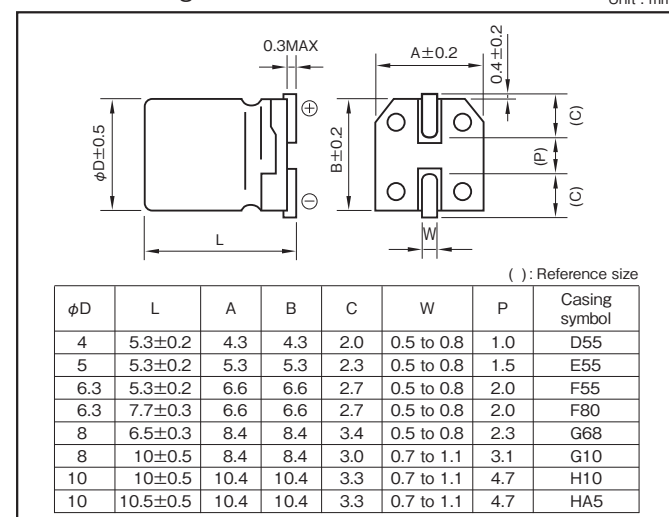
Marking color : Black print

Specifications

Item	Performance						
Category temperature range (°C)	-55 to +105						
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)						
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50
	tanδ (max.)	0.30	0.26	0.22	0.16	0.13	0.12
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2
Endurance (105°C) (Applied ripple current)	Test time	1000 hours					
	Leakage current	The initial specified value or less					
	Percentage of capacitance change	Within ±20% of initial value					
	Tangent of the loss angle	200% or less of the initial specified value					
Shelf life (105°C)	Test time : 1000 hours; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1						
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 - 60	120	1k	10k - 100k
Rated voltage (V)				
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.80	1	1.35	1.50

Part numbering system (example : 16V47M F55 U)

RVS	16	V	470	M	F55	U	
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol		

Standard Ratings

Rated voltage (V)	6.3			10			16			25			35			50					
	Item	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current	Case	ESR	Rated ripple current		
Rated capacitance (μF)	φD×L(mm)	(Ω)	(mAmps)	φD×L(mm)	(Ω)	(mAmps)	φD×L(mm)	(Ω)	(mAmps)	φD×L(mm)	(Ω)	(mAmps)	φD×L(mm)	(Ω)	(mAmps)	φD×L(mm)	(Ω)	(mAmps)	φD×L(mm)	(Ω)	(mAmps)
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	905	3	—	—	—
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	603	4	—	—	—
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	424	5	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	199	7	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	91	10	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4×5.3	60	12	—	—	—
4.7	—	—	—	—	—	—	—	—	—	4×5.3	57	12	4×5.3	46	14	5×5.3	42	17	—	—	—
10	—	—	—	4×5.3	43	15	4×5.3	36	16	5×5.3	27	21	5×5.3	22	23	6.3×5.3	20	26	—	—	—
22	4×5.3	23	21	5×5.3	20	25	5×5.3	17	28	6.3×5.3	12	36	6.3×5.3	10	50	8×6.5	9.0	51	—	—	—
33	5×5.3	15	30	5×5.3	13	31	6.3×5.3	11	40	6.3×5.3	8.0	44	8×6.5	6.5	59	6.3×7.7	6.0	60	—	—	—
47	5×5.3	11	36	6.3×5.3	9.2	43	6.3×5.3	7.8	47	8×6.5	5.6	66	—	—	—	6.3×7.7	4.2	63	—	—	—
100	6.3×5.3	5.0	61	6.3×5.3	4.3	60	6.3×5.3	3.6	60	6.3×7.7	2.7	91	6.3×7.7	2.2	84	8×10	2.0	140	—	—	—
150	—	—	—	—	—	—	6.3×7.7	2.4	105	8×10	1.8	140	8×10	1.4	155	10×10	1.3	180	—	—	—
220	8×6.5	2.3	102	6.3×7.7	2.0	105	6.3×7.7	1.7	105	8×10	1.2	155	8×10	0.98	190	10×10.5	0.91	220	—	—	—
330	6.3×7.7	1.5	105	8×10	1.3	195	8×10	1.1	195	8×10	0.80	190	10×10.5	0.65	300	—	—	—	—	—	—
470	8×10	1.1	210	8×10	0.92	210	8×10	0.78	230	10×10	0.57	300	—	—	—	—	—	—	—	—	—
680	8×10	0.73	210	10×10	0.63	310	10×10	0.54	310	—	—	—	—	—	—	—	—	—	—	—	—
1000	8×10	0.50	210	10×10	0.43	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1500	10×10	0.33	310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

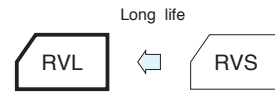
(Note) Rated ripple current : 105°C , 120Hz ; ESR : 20°C , 120Hz

Chip Type
Aluminum Electrolytic Capacitors

Chip Type 105°C Capacitors (height:6.0mm)

GREEN CAP SMD 105°C 2000hours Anti-cleaning solvent

- Compatible with surface mounting for 6.0mm high capacitors.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C.



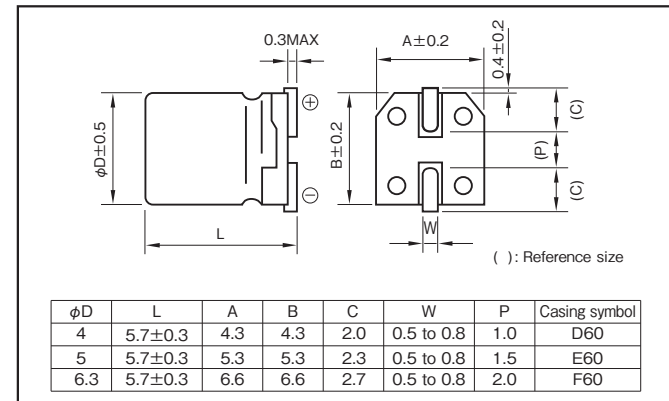
Marking color : Black print

Specifications

Item	Performance						
Category temperature range (°C)	-55 to +105						
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)						
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50
	tanδ (max.)	0.32	0.28	0.24	0.18	0.15	0.14
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2
Endurance (105°C) (Applied ripple current)	Test time	2000 hours					
	Leakage current	The initial specified value or less					
	Percentage of capacitance change	Within ±30% of initial value					
	Tangent of the loss angle	300% or less of the initial specified value					
Shelf life (105°C)	Test time : 1000hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1						
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50 · 60	120	1k	10k · 100k
6.3 to 16	0.8	1	1.15	1.25
25 · 35	0.8	1	1.25	1.40
50	0.1 to 3.3μF	0.5	1	1.35
	4.7 to 10μF	0.7	1	1.35

Part numbering system (example : 16V470 M F60 U)

RVL	—	16	V	470	M	F60	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

Standard Ratings

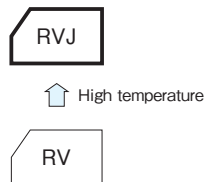
Rated capacitance (μF)	Item	6.3			10			16			25			35			50			
		Case	ESR (Ω)	Rated ripple current (mA _{RMS})	Case	ESR (Ω)	Rated ripple current (mA _{RMS})	Case	ESR (Ω)	Rated ripple current (mA _{RMS})	Case	ESR (Ω)	Rated ripple current (mA _{RMS})	Case	ESR (Ω)	Rated ripple current (mA _{RMS})	Case	ESR (Ω)	Rated ripple current (mA _{RMS})	
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 120Hz ; ESR : 20°C, 120Hz

Chip Type, 105°C Use, Large Capacitance Capacitors

GREEN CAP SMD 105°C 2000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C.
($\phi 12.5 \times 13.5L$: 5000 hours at 105°C)



Marking color : Black print ($\phi 8 \times 6.5L$)
White print on a brown sleeve ($\phi 8 \times 10L - \phi 12.5 \times 13.5L$)

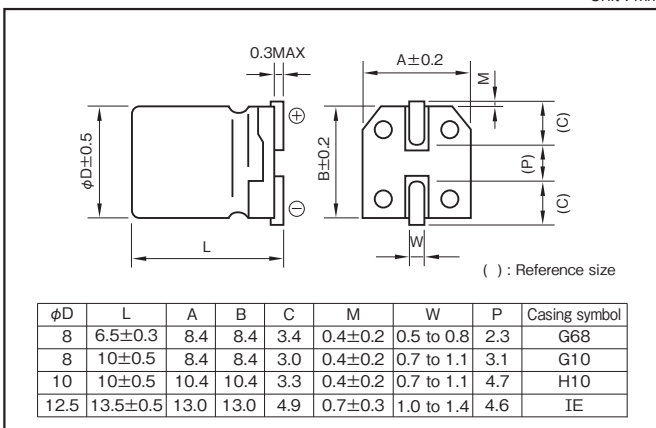
Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle ($\tan \delta$)	Rated voltage (V)	6.3 10 16 25 35 50 63 100
	$\tan \delta$ (max.)	0.30 0.24 0.22 0.16 0.13 0.12 0.11 0.10
Characteristics at high and low temperature	Rated voltage (V)	6.3 10 16 25 35 50 63 100
	Impedance ratio (max.)	Z-25°C/Z+20°C 4 3 2 2 2 2 2 2 Z-40°C/Z+20°C 8 5 4 3 3 3 3 3
Endurance (105°C) (Applied ripple current)	Test time	2000 hours ($\phi 12.5 \times 13.5L$: 5000 hours)
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within $\pm 20\%$ of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1	
Applicable standards	JIS C 5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)	

Chip Type Aluminum Electrolytic Capacitors

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

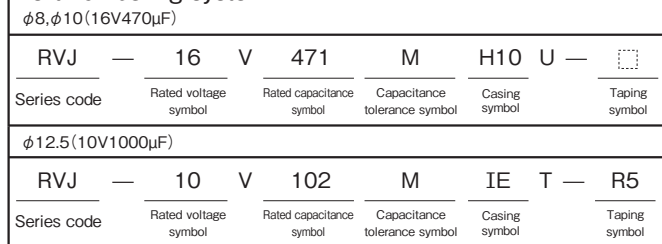
$\phi 8, \phi 10$

Rated voltage (V)	50 · 60	120	1k	10k · 100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50 to 63	0.80	1	1.35	1.50
100	0.70	1	1.35	1.50

$\phi 12.5$

Rated capacitance (μF)	120	1k	10k	100k
47	0.50	0.76	0.87	1
100 to 220	0.70	0.85	0.90	1
330 to 1000	0.80	0.93	0.98	1

Part numbering system



Standard Ratings

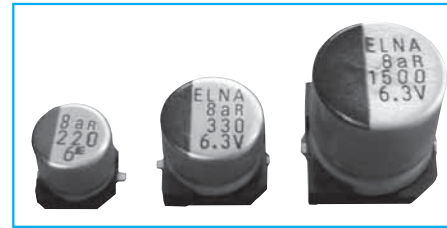
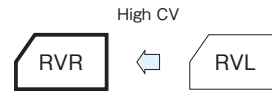
Rated capacitance (μF)	6.3		10		16		25		35		50		63		100			
	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol	Case ϕD (mm)	Casing symbol		
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
100	—	—	8×6.5	G68	110	—	8×6.5	G68	110	—	8×6.5	G68	110	—	8×10	G10	67	
220	8×10	G10	178	8×10	G10	178	10×10	H10	324	10×10	H10	324	10×10	H10	324	10×10	H10	133
330	8×10	G10	178	10×10	H10	324	10×10	H10	324	10×10	H10	324	12.5×13.5	IE	747*	—	—	
470	10×10	H10	324	10×10	H10	324	10×10	H10	324	12.5×13.5	IE	747*	—	—	—	—	—	
1000	10×10	H10	324	10×10	H10	324	12.5×13.5	IE	747*	—	—	—	—	—	—	—	—	

NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

Chip type, 105°C Use, Long Life, High CV Capacitors

- GREEN CAP
- SMD
- 105°C 2000hours
- Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours 105°C.



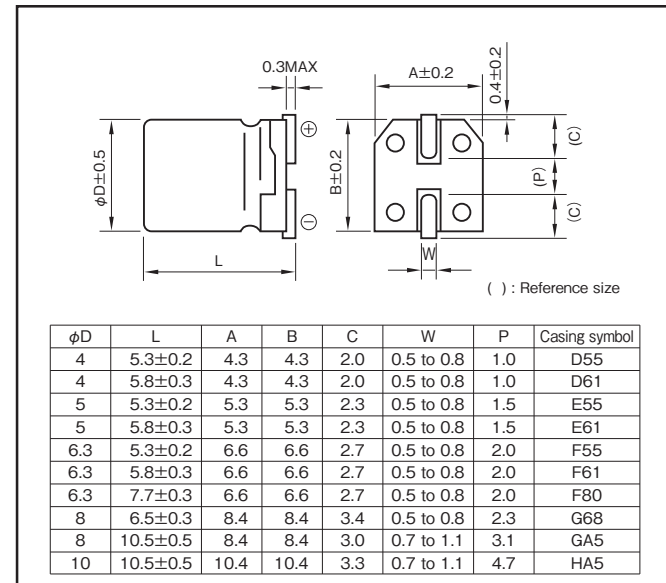
Marking color : Black print

Specifications

Item	Performance
Category temperature range (°C)	-40 to +105
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (105°C)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of loss angle
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment
Applicable standards	JIS C5101-1 1998, -18 1999(IEC 60384-1 1992, -18 1993)

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.80	1.00	1.15	1.25
25 to 35	0.80	1.00	1.25	1.40
50	0.50	1.00	1.35	1.50

Part numbering system (example : 16V100μF)

RVR	—	16	V	101	M	F61	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

Standard Ratings

Rated voltage(V) Rated capacitance(μF) Item	4			6.3			10			16			25		
	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)
4.7	--	--	--	--	--	--	--	--	--	--	--	--	4×5.3	D55	22
6.8	--	--	--	--	--	--	--	--	--	--	--	--	4×5.3	D55	25
10	--	--	--	--	--	--	--	--	--	4×5.3	D55	28	4×5.8	D61	36
22	--	--	--	4×5.3	D55	26	4×5.8	D61	33	4×5.8	D61	39	5×5.3	E55	39
				4×5.8	D61	28				5×5.8	E61	46			
33	--	--	--	5×5.8	E61	40	4×5.8	D61	41	5×5.8	E61	55	5×5.8	E61	59
							5×5.3	E55	43				6.3×5.3	F55	65
							5×5.8	E61	47	6.3×5.8	F61	66	6.3×5.8	F61	69
47	4×5.8	D61	42	4×5.8	D61	42	6.3×5.8	F61	74	5×5.8	E61	66	6.3×5.8	F61	82
				5×5.3	E55	46				6.3×5.3	F55	70			
				5×5.8	E61	48				6.3×5.8	F61	78			
				5×5.8	E61	70							6.3×7.7	F80	132
100	5×5.8	E61	70	6.3×5.3	F55	71	6.3×5.8	F61	95	6.3×5.8	F61	112	8×6.5	G68	146
				6.3×5.8	F61	99									
150	--	--	--	--	--	--	6.3×5.8	F61	117	8×6.5	G68	151	--	--	--
220	6.3×5.8	F61	121	6.3×5.8	F61	121	6.3×7.7	F80	156	6.3×7.7	F80	183	8×10	G10	320
							8×6.5	G68	173	8×6.5	G68	157	8×10.5	GA5	320
330	6.3×7.7	F80	163	6.3×7.7	F80	163	8×10	G10	296				8×10.5	GA5	340
	8×6.5	G68	181	8×6.5	G68	181	8×10.5	GA5	296	8×10.5	GA5	291	8×10.5	GA5	340
470	--	--	--	8×10	G10	320	8×10	G10	326	8×10	G10	348	10×10.5	HA5	490
				8×10.5	GA5	320	8×10.5	GA5	326	8×10.5	GA5	348			
680	--	--	--	8×10.5	GA5	340	10×10	H10	440	10×10	H10	484	--	--	--
							10×10.5	HA5	440	10×10.5	HA5	484			
820	--	--	--	--	--	--	--	--	--	10×10.5	HA5	484	--	--	--
1000	--	--	--	8×10.5	GA5	370	10×10.5	HA5	500	--	--	--	--	--	--
				10×10	H10	495									
				10×10.5	HA5	495									
1200	--	--	--	--	--	--	10×10.5	HA5	500	--	--	--	--	--	--
1500	--	--	--	10×10.5	HA5	550	--	--	--	--	--	--	--	--	--

Aluminum Electrolytic Capacitors

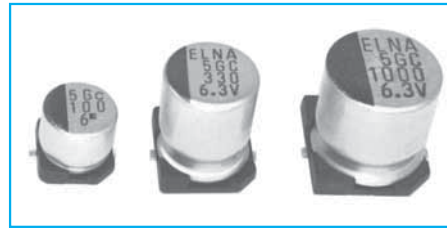
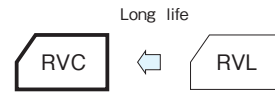
Rated voltage(V) Rated capacitance(μF) Item	35			50		
	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)	Case φ D×L (mm)	Casing symbol	Rated ripple current (mArms)
0.22	--	--	--	4×5.3	D55	2
0.33	--	--	--	4×5.3	D55	3
0.47	--	--	--	4×5.3	D55	5
1	--	--	--	4×5.3	D55	10
				4×5.8	D61	12
2.2	--	--	--	4×5.3	D55	16
				4×5.8	D61	19
3.3	--	--	--	4×5.3	D55	16
				4×5.8	D61	22
4.7	4×5.8	D61	23	4×5.8	D61	26
				5×5.3	E55	23
				5×5.8	E61	29
6.8	--	--	--	5×5.3	E55	23
10	4×5.8	D61	30	5×5.8	E61	35
	5×5.3	E55	28	6.3×5.3	F55	35
	5×5.8	E61	39	6.3×5.8	F61	47
22	5×5.8	E61	52	6.3×5.8	F61	61
	6.3×5.3	F55	55			
33	6.3×5.8	F61	74	6.3×7.7	F80	82
				8×6.5	G68	91
47	6.3×5.8	F61	89	6.3×7.7	F80	97
				8×6.5	G68	108
68	6.3×7.7	F80	117	--	--	--
	8×6.5	G68	130			
100	6.3×7.7	F80	142	8×10.5	GA5	230
	8×6.5	G68	158			
	8×10	G10	283	10×10.5	HA5	262
	8×10.5	GA5	283			
150	8×10	G10	293	10×10.5	HA5	300
	8×10.5	GA5	293			
220	8×10.5	GA5	302	10×10.5	HA5	375
	10×10	H10	450			
330	10×10.5	HA5	450	--	--	--

(Note) Rated ripple current : 105° C, 120Hz

Chip Type, 105°C Use, Long Life Capacitors

GREEN CAP SMD 105°C 3000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 3000 hours at 105°C. (10L:5000 hours).



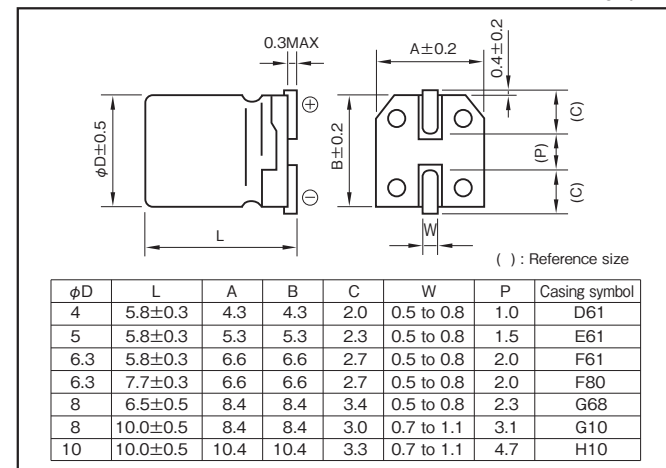
Marking color : Black print

Specifications

Item	Performance
Category temperature range (°C)	-40 to +105
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (105°C)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.8	1	1.15	1.25
25 to 35	0.8	1	1.25	1.40
50				
0.1 to 3.3μF	0.5	1	1.35	1.50
4.7μF to	0.7	1	1.35	1.50

Part numbering system (example : 16V470 M F61 U)

RVC	—	16	V	470	M	F61	U	—	
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping symbol

Standard Ratings

Rated voltage (V)	Item	6.3			10			16			25			35			50		
		Case φD(mm)	Casing symbol	Rated ripple current mAmps	Case φD(mm)	Casing symbol	Rated ripple current mAmps	Case φD(mm)	Casing symbol	Rated ripple current mAmps	Case φD(mm)	Casing symbol	Rated ripple current mAmps	Case φD(mm)	Casing symbol	Rated ripple current mAmps	Case φD(mm)	Casing symbol	Rated ripple current mAmps
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	4×5.8	D61	26	—	—	—	4×5.8	D61	28	—	—	—	5×5.8	E61	28	6.3×5.8	F61	35	—
33	—	—	—	5×5.8	E61	43	—	—	—	—	—	—	—	—	—	—	—	—	—
47	5×5.8	E61	46	—	—	—	6.3×5.8	F61	70	6.3×7.7	F80	65	—	—	—	—	—	—	—
100	6.3×5.8	F61	71	—	—	—	6.3×7.7	F80	81	8×10	G10	130	—	—	—	—	—	—	—
220	6.3×7.7	F80	101	8×10	G10	160	—	—	—	—	—	—	10×10	H10	220	—	—	—	—
330	8×10	G10	230	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
470	—	—	—	—	—	—	10×10	H10	340	—	—	—	—	—	—	—	—	—	—
1000	10×10	H10	313	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

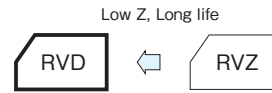
(Note) Rated ripple current : 105°C, 120Hz

Chip Type
Aluminum Electrolytic Capacitors

Chip Type, 105°C Use, Long Life Capacitors

GREEN CAP SMD Low Z 105°C 2000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C. (6.3 to 50V 10.5L:5000 hours)



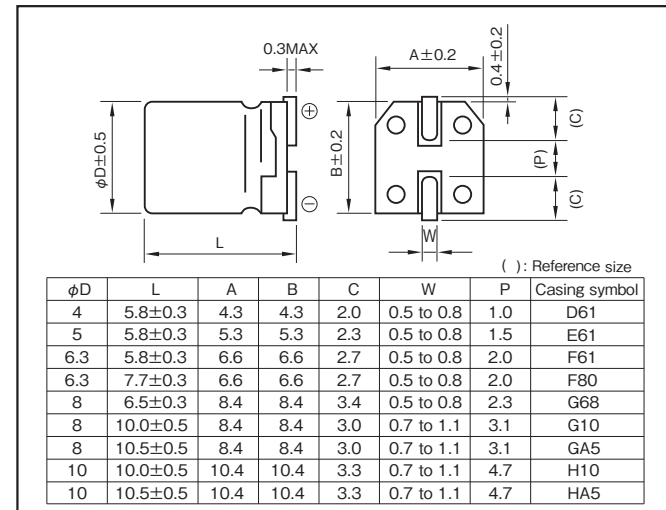
Marking color : Black print

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) , V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Z-25°C/Z+20°C
	Z-40°C/Z+20°C
	Z-55°C/Z+20°C
Endurance (105°C)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C 5101-1 1998, -18 1999(IEC 60384-1 1992, -18 1993)

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k·100k
Rated voltage (V)				
6.3 to 100	0.5	0.5	0.75	1

Part numbering system (example : 16V100µF)

RVD	16	V	101	M	F61	U	
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol		

In the case of "for High Temperature Reflow" type, a series name is "RZB".

Standard Ratings

Rated capacitance (μF)	Rated voltage (V)													
	6.3				10				16					
	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol
	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)	
10	-	-	-	-	-	-	-	-	4 X 5.8	D61	1.35	90	4 X 5.8	D61
22	4 X 5.8	D61	1.35	90	4 X 5.8	D61	1.35	90	5 X 5.8	E61	0.70	170	4 X 5.8	D61
33	-	-	-	-	4 X 5.8	D61	1.35	90	-	-	-	-	5 X 5.8	E61
47	4 X 5.8	D61	1.35	90	-	-	-	-	5 X 5.8	E61	0.70	170	6.3 X 5.8	F61
100	5 X 5.8	E61	0.70	170	-	-	-	-	6.3 X 5.8	F61	0.36	250	5 X 5.8	E61
220	6.3 X 5.8	F61	0.36	250	-	-	-	-	6.3 X 5.8	F61	0.36	250	6.3 X 5.8	F61
330	6.3 X 7.7	F80	0.30	300	6.3 X 7.7	F80	0.30	300	6.3 X 7.7	F80	0.30	300	8 X 6.5	G68
470	8 X 10	G10	0.16	600	8 X 10	G10	0.16	600	8 X 10	G10	0.16	600	8 X 10	G10
680	-	-	-	-	8 X 10.5	GA5	0.16	600	8 X 10.5	GA5	0.16	600	8 X 10.5	GA5
1000	8 X 10	G10	0.16	600	10 X 10	H10	0.09	850	10 X 10	H10	0.09	850	10 X 10	H10
1500	10 X 10	H10	0.09	850	10 X 10.5	HA5	0.08	850	10 X 10.5	HA5	0.08	850	10 X 10.5	HA5

Rated capacitance (μF)	Rated voltage (V)													
	25				35				50					
	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol
	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)	
4.7	-	-	-	-	4 X 5.8	D61	1.35	90	4 X 5.8	D61	2.7	60	4 X 5.8	D61
10	4 X 5.8	D61	1.35	90	4 X 5.8	D61	1.35	90	5 X 5.8	E61	1.5	90	5 X 5.8	E61
22	5 X 5.8	E61	0.70	170	5 X 5.8	E61	0.70	170	6.3 X 5.8	F61	0.86	170	6.3 X 5.8	F61
33	5 X 5.8	E61	0.70	170	6.3 X 5.8	F61	0.36	250	6.3 X 5.8	F61	0.86	170	6.3 X 7.7	F80
47	6.3 X 5.8	F61	0.36	250	6.3 X 5.8	F61	0.36	250	8 X 6.5	G68	0.63	200	8 X 6.5	G68
100	6.3 X 7.7	F80	0.30	300	6.3 X 7.7	F80	0.30	300	6.3 X 7.7	F80	0.66	195	6.3 X 7.7	F80
220	8 X 10	G10	0.16	600	8 X 10	G10	0.16	600	8 X 10	G10	0.34	350	8 X 6.5	G68
330	8 X 10	G10	0.16	600	8 X 10.5	GA5	0.16	600	8 X 10.5	GA5	0.32	350	8 X 10	G10
470	10 X 10	H10	0.09	850	10 X 10	H10	0.09	850	10 X 10	H10	0.20	700	10 X 10	H10
	10 X 10.5	HA5	0.08	850	10 X 10.5	HA5	0.08	850	10 X 10.5	HA5	0.18	700	10 X 10.5	HA5

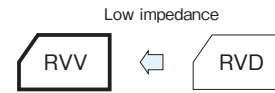
Rated capacitance (μF)	Rated voltage (V)													
	63				80				100					
	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol
	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)		(Ω max.)	(mAmps)	ϕDxL (mm)	
4.7	5 X 5.8	E61	3.0	50	-	-	-	-	-	-	-	-	-	-
10	6.3 X 5.8	F61	1.5	80	6.3 X 7.7	F80	2.4	60	-	-	-	-	-	-
22	6.3 X 7.7	F80	1.2	120	8 X 10	G10	0.90	130	8 X 10	G10	1.3	130	8 X 10	G10
33	8 X 10	G10	0.65	250	8 X 10.5	GA5	0.90	130	8 X 10.5	GA5	1.3	130	8 X 10.5	GA5
47	8 X 10	G10	0.65	250	8 X 10	G10	0.90	130	10 X 10	H10	0.70	200	10 X 10	H10
68	8 X 10.5	GA5	0.65	250	10 X 10	H10	0.50	200	10 X 10.5	HA5	0.70	200	10 X 10.5	HA5
100	10 X 10	H10	0.35	400	10 X 10.5	HA5	0.50	200	-	-	-	-	-	-
	10 X 10.5	HA5	0.35	400	-	-	-	-	-	-	-	-	-	-

(Note) Impedance : 20°C, 100kHz
 Rated ripple current : 105°C, 100kHz

Chip Type, 105°C Use, Low Impedance Capacitors

- GREEN CAP
- SMD
- Low Z
- 105°C 2000hours
- Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C.



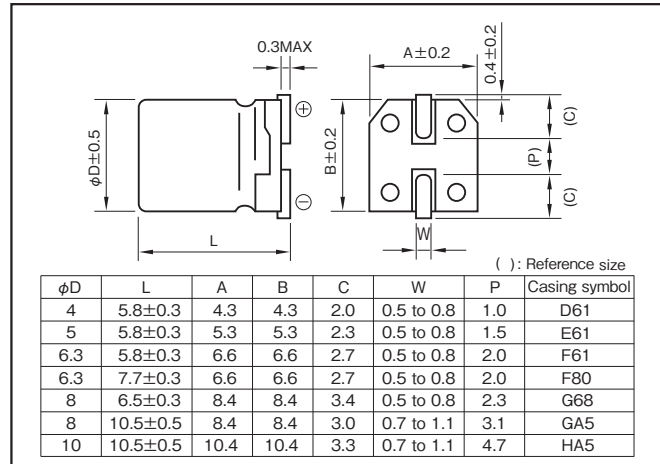
Marking color : Black print

Specifications

Item	Performance						
Category temperature range (°C)	-55 to +105						
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)						
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	
	tanδ (max.)	0.26	0.19	0.16	0.14	0.12	
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	
	Impedance ratio (max.)	Z-25°C/Z+20°C	2	2	2	2	2
		Z-40°C/Z+20°C	3	3	3	3	3
		Z-55°C/Z+20°C	8	4	4	3	3
Endurance (105°C)	Test time	2000 hours					
	Leakage current	The initial specified value or less					
	Percentage of capacitance change	Within ±30% of initial value					
	Tangent of the loss angle	200% or less of initial specified value					
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1						
Applicable standards	JIS C 5101-1 1998, -18 1999(IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k·100k
Rated voltage (V)	0.5	0.5	0.75	1
6.3 to 35				

Part numbering system (example : 16V100μF)

RVV	16	V	101	M	F61	U	
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol		

- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated voltage (V)	Item	6.3				10				16			
		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)
10	—	—	—	—	—	—	—	—	4×5.8	D61	0.85	160	
22	4×5.8	D61	0.85	160	4×5.8	D61	0.85	160	4×5.8	D61	0.85	160	
									5×5.8	E61	0.36	240	
33	—	—	—	—	4×5.8	D61	0.85	160	—	—	—	—	
					5×5.8	E61	0.36	240					
47	4×5.8	D61	0.85	160	—	—	—	—	5×5.8	E61	0.36	240	
	5×5.8	E61	0.36	240					6.3×5.8	F61	0.26	300	
100	5×5.8	E61	0.36	240	—	—	—	—	6.3×5.8	F61	0.26	300	
	6.3×5.8	F61	0.26	300					6.3×7.7	F80	0.16	600	
220	6.3×5.8	F61	0.26	300	6.3×7.7	F80	0.16	600	6.3×7.7	F80	0.16	600	
					8×6.5	G68	0.18	500	8×6.5	G68	0.18	500	
330	6.3×7.7	F80	0.16	600	8×10.5	GA5	0.08	850	8×10.5	GA5	0.08	850	
	8×6.5	G68	0.18	500									
470	8×10.5	GA5	0.08	850	8×10.5	GA5	0.08	850	8×10.5	GA5	0.08	850	
680	—	—	—	—	8×10.5	GA5	0.08	850	10×10.5	HA5	0.06	1190	
1000	8×10.5	GA5	0.08	850	10×10.5	HA5	0.06	1190	—	—	—	—	
1500	10×10.5	HA5	0.06	1190	—	—	—	—	—	—	—	—	

Rated voltage (V)	Item	25				35			
		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)
4.7	—	—	—	—	4×5.8	D61	0.85	160	
10	4×5.8	D61	0.85	160	4×5.8	D61	0.85	160	
					5×5.8	E61	0.36	240	
22	5×5.8	E61	0.36	240	5×5.8	E61	0.36	240	
33	5×5.8	E61	0.36	240	6.3×5.8	F61	0.26	300	
	6.3×5.8	F61	0.26	300					
47	6.3×5.8	F61	0.26	300	6.3×5.8	F61	0.26	300	
100	6.3×7.7	F80	0.16	600	6.3×7.7	F80	0.16	600	
	8×6.5	G68	0.18	500	8×10.5	GA5	0.08	850	
220	8×10.5	GA5	0.08	850	8×10.5	GA5	0.08	850	
330	8×10.5	GA5	0.08	850	10×10.5	HA5	0.06	1190	
470	10×10.5	HA5	0.06	1190	—	—	—	—	

(Note) Impedance : 20°C , 100kHz
 Rated ripple current : 105°C , 100kHz

Chip Type
Aluminum Electrolytic Capacitors

Chip Type, 105°C Use, Low Impedance Capacitors

GREEN CAP

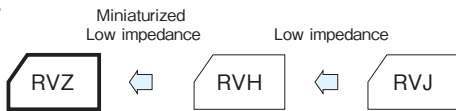
SMD

Low Impedance

105°C 2000hours

Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C.
($\phi 8 \times 6.5L$ or less : 1000hours)
($\phi 12.5 \times 13.5L$: 5000hours)



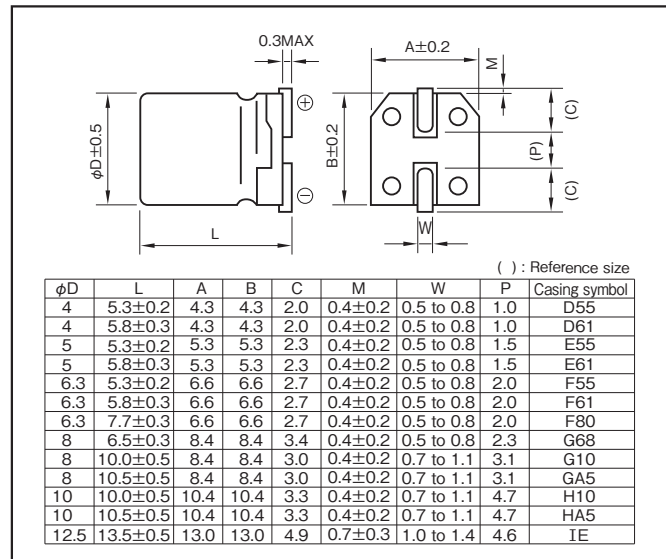
Marking color : Black print ($\phi 4 \times 5.3L$ — $\phi 8 \times 6.5L$, $\phi 12.5 \times 13.5L$)
: White print on brown sleeve ($\phi 8 \times 10L$ — $\phi 10 \times 10.5L$)

Specifications

Item	Performance					
Category temperature range (°C)	-55 to +105					
Tolerance at rated capacitance (%)	± 20 (20°C, 120Hz)					
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)					
Tangent of loss angle (tan δ)	Rated voltage (V)	6.3	10	16	25	35
	tan δ (max.)	0.28	0.24	0.20	0.16	0.14
Characteristics at high and low temperature	Impedance ratio (max.)	Rated voltage (V)				
		6.3	10	16	25	35
		Z-25°C/Z+20°C	4	3	2	2
		Z-55°C/Z+20°C	8	5	4	3
Endurance (105°C) (Applied ripple current)	Test time	1000 hours ($\phi 8 \times 6.5L$ or less) 2000 hours ($\phi 8 \times 10L$ to $\phi 10 \times 10.5L$) 5000 hours ($\phi 12.5 \times 13.5L$)				
	Leakage current	The initial specified value or less				
	Percentage of capacitance change	Within $\pm 25\%$ of initial value				
	Tangent of the loss angle	200% or less of initial specified value				
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1					
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)					

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage (V)	120	1k	10k	100k
6.3 to 35	0.5	0.75	0.9	1.0

Part numbering system

$\phi 10 \times 10.5L$ or less 6.3V1500 μF

RVZ	6	V	152	M	HA5	U	
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol		

In the case of "for High Temperature Reflow" type, a series name is "RZA".

$\phi 12.5 \times 13.5L$ 6.3V2700 μF

RVZ	6	V	272	M	IE	T	R5
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol		

Standard Ratings

Rated voltage (V)	Item	6.3				10				16				25				35						
		Case φD (mm)	Casing symbol	Impedance (Ω)	Rated ripple current (mAmps)	Case φD (mm)	Casing symbol	Impedance (Ω)	Rated ripple current (mAmps)	Case φD (mm)	Casing symbol	Impedance (Ω)	Rated ripple current (mAmps)	Case φD (mm)	Casing symbol	Impedance (Ω)	Rated ripple current (mAmps)	Case φD (mm)	Casing symbol	Impedance (Ω)	Rated ripple current (mAmps)			
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
10	—	—	—	—	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
15	—	—	—	—	—	—	—	—	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
22	4×5.3	D55	3.20	65	4×5.8	D61	1.80	80	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65	4×5.3	D55	3.20	65
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
33	5×5.3	E55	1.50	110	5×5.3	E55	1.50	110	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
47	5×5.3	E55	1.50	110	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×5.8	F61	0.44	230
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
68	6.3×5.8	F61	0.44	230	6.3×5.8	F61	0.44	230	6.3×5.8	F61	0.44	230	6.3×5.8	F61	0.44	230	6.3×5.8	F61	0.44	230	6.3×7.7	F80	0.34	280
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
100	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×5.3	F55	0.85	170	6.3×7.7	F80	0.34	280	6.3×7.7	F80	0.34	280	8×10	G10	0.20	450
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
150	6.3×5.8	F61	0.44	230	6.3×5.8	F61	0.44	230	6.3×7.7	F80	0.34	280	8×10	G10	0.20	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
220	6.3×5.8	F61	0.44	230	6.3×7.7	F80	0.34	280	6.3×7.7	F80	0.34	280	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
330	6.3×7.7	F80	0.34	280	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	10×10.5	HA5	0.09	670
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
470	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	10×10.5	HA5	0.09	670	10×10.5	HA5	0.09	670
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
680	8×10.5	GA5	0.17	450	10×10.5	HA5	0.09	670	10×10.5	HA5	0.09	670	12.5×13.5	IE	0.06	1100	12.5×13.5	IE	0.06	1100	12.5×13.5	IE	0.06	1100
1000	8×10.5	GA5	0.17	450	10×10.5	HA5	0.09	670	12.5×13.5	IE	0.06	1100	12.5×13.5	IE	0.06	1100	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
1500	10×10.5	HA5	0.09	670	12.5×13.5	IE	0.06	1100	12.5×13.5	IE	0.06	1100	—	—	—	—	—	—	—	—	—	—	—	
2200	12.5×13.5	IE	0.06	1100	12.5×13.5	IE	0.06	1100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2700	12.5×13.5	IE	0.06	1100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

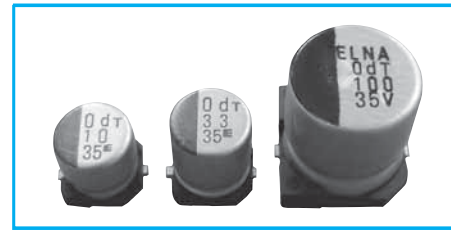
Chip Type
Aluminum Electrolytic Capacitors

(Note) Rated ripple current : 105°C, 100kHz ; Impedance : 20°C, 100kHz

Chip Type, 125°C Use, Low ESR, Long Life Capacitors

GREEN CAP SMD 125°C 2000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours at 125°C.
($\phi 4$ to $\phi 8 \times 6.5L$: 1000h)



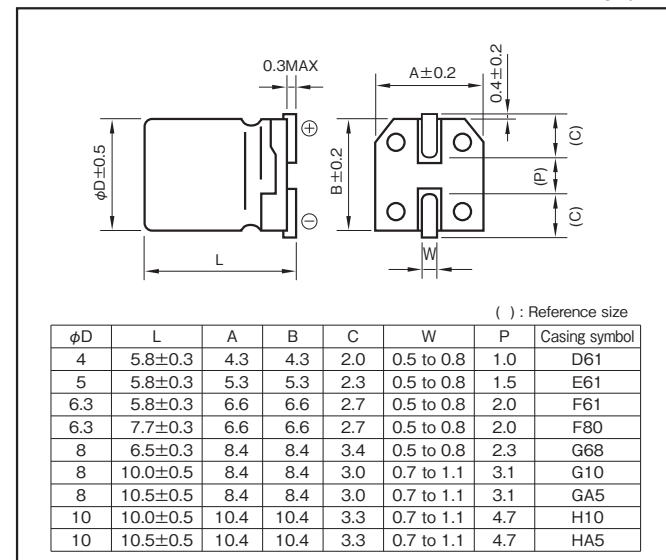
Marking color : Black print

Specifications

Item	Performance
Category temperature range (°C)	-40 to +125
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)
Tangent of loss angle	Rated voltage (V)
	Tangent of loss angle
Characteristics at high and low temperature	Rated voltage (V)
	Impedance Ratio (max.)
Endurance (125°C)	Test time
	Leakage current
	Capacitance change
	Tangent of loss angle
Shelf life (125°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage(V)				
10 to 100	0.77	0.88	0.96	1.00

Part numbering system (example : 35V220µF)

RVT	—	35	V	221	M	HA5	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

In the case of "for High Temperature Reflow" type, a series name is "RZC".

Standard Ratings

Rated voltage (V)	10				16				25			
	Item	Case		Rated ripple current	Item	Case		Rated ripple current	Item	Case		Rated ripple current
		φDxL (mm)	ESR (Ω max.)			(mArms)	φDxL (mm)	ESR (Ω max.)		(mArms)	φDxL (mm)	ESR (Ω max.)
			20°C	- 40°C			20°C	- 40°C			20°C	- 40°C
10	-	-	-	-	4 x 5.8	3.0	45	50	5 x 5.8	1.5	23	81
22	4 x 5.8	3.0	45	50	5 x 5.8	1.5	23	81	6.3 x 5.8	1.0	15	114
33	5 x 5.8	1.5	23	81	6.3 x 5.8	1.0	15	114	6.3 x 5.8	1.0	15	114
47	-	-	-	-	6.3 x 5.8	1.0	15	114	6.3 x 7.7	0.60	9.0	165
100	-	-	-	-	-	-	-	-	8 x 6.5	0.60	9.0	180
	-	-	-	-	-	-	-	-	6.3 x 7.7	0.60	9.0	165
	-	-	-	-	-	-	-	-	8 x 6.5	0.60	9.0	180
	-	-	-	-	-	-	-	-	8 x 10	0.20	2.0	340
220	6.3 x 7.7	0.60	9.0	165	8 x 10	0.20	2.0	340	8 x 10	0.20	2.0	340
	-	-	-	-	8 x 10.5	0.20	2.0	340	8 x 10.5	0.20	2.0	340
	8 x 6.5	0.60	9.0	180	10 x 10	0.15	1.5	500	10 x 10	0.15	1.5	500
	-	-	-	-	10 x 10.5	0.15	1.5	500	10 x 10.5	0.15	1.5	500
330	8 x 10	0.20	2.0	340	10 x 10	0.15	1.5	500	10 x 10	0.15	1.5	500
	8 x 10.5	0.20	2.0	340	-	-	-	-	-	-	-	-
	10 x 10	0.15	1.5	500	-	-	-	-	-	-	-	-
	10 x 10.5	0.15	1.5	500	-	-	-	-	-	-	-	-
470	10 x 10	0.15	1.5	500	-	-	-	-	-	-	-	-
	10 x 10.5	0.15	1.5	500	-	-	-	-	-	-	-	-

Rated voltage (V)	35				50				63			
	Item	Case		Rated ripple current	Item	Case		Rated ripple current	Item	Case		Rated ripple current
		φDxL (mm)	ESR (Ω max.)			(mArms)	φDxL (mm)	ESR (Ω max.)		(mArms)	φDxL (mm)	ESR (Ω max.)
			20°C	- 40°C			20°C	- 40°C			20°C	- 40°C
4.7	4 x 5.8	3.0	45	50	-	-	-	-	-	-	-	-
10	5 x 5.8	1.5	23	81	6.3 x 5.8	3.2	48	58	6.3 x 7.7	1.8	36	95
	6.3 x 5.8	1.0	15	114	-	-	-	-	-	-	-	-
22	6.3 x 5.8	1.0	15	114	6.3 x 7.7	1.2	18	95	8 x 10	0.70	14	140
33	6.3 x 7.7	0.60	9.0	165	6.3 x 7.7	1.2	18	95	8 x 10.5	0.70	14	140
	-	-	-	-	8 x 10	0.50	7.5	180	8 x 10	0.70	14	140
	8 x 6.5	0.60	9.0	180	8 x 10.5	0.50	7.5	180	8 x 10.5	0.70	14	140
	-	-	-	-	10 x 10	0.50	10	200	10 x 10	0.50	10	200
47	6.3 x 7.7	0.60	9.0	165	8 x 10	0.50	7.5	180	10 x 10.5	0.50	10	200
	8 x 6.5	0.60	9.0	180	8 x 10.5	0.50	7.5	180	8 x 10	0.70	14	140
	8 x 10	0.20	2.0	340	10 x 10	0.30	4.5	280	10 x 10	0.50	10	200
	8 x 10.5	0.20	2.0	340	10 x 10.5	0.30	4.5	280	10 x 10.5	0.50	10	200
100	8 x 10	0.20	2.0	340	10 x 10	0.30	4.5	280	-	-	-	-
	8 x 10.5	0.20	2.0	340	-	-	-	-	-	-	-	-
	10 x 10	0.15	1.5	500	10 x 10.5	0.30	4.5	280	-	-	-	-
	10 x 10.5	0.15	1.5	500	-	-	-	-	-	-	-	-
220	10 x 10	0.15	1.5	500	-	-	-	-	-	-	-	-
	10 x 10.5	0.15	1.5	500	-	-	-	-	-	-	-	-

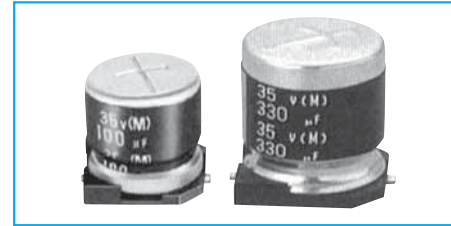
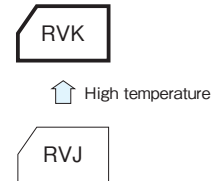
Rated voltage (V)	80				100			
	Item	Case		Rated ripple current	Item	Case		Rated ripple current
		φDxL (mm)	ESR (Ω max.)			(mArms)	φDxL (mm)	ESR (Ω max.)
			20°C	- 40°C			20°C	- 40°C
10	8 x 10	0.75	15	110	8 x 10	0.75	15	110
	8 x 10.5	0.75	15	110	8 x 10.5	0.75	15	110
22	8 x 10	0.75	15	110	8 x 10	0.75	15	110
	8 x 10.5	0.75	15	110	8 x 10.5	0.75	15	110
	10 x 10	0.55	11	150	10 x 10	0.55	11	150
33	10 x 10.5	0.55	11	150	10 x 10.5	0.55	11	150
	8 x 10	0.75	15	110	10 x 10	0.55	11	150
	8 x 10.5	0.75	15	110	-	-	-	-
	10 x 10	0.55	11	150	-	-	-	-

(Note) ESR : 20°C, 100kHz
Rated ripple current : 125°C, 100kHz

Chip Type 125°C Capacitors

GREEN CAP SMD 125°C (1250hours) 105°C (5000hours) Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 1250 hours at 125°C.
 - (ϕ 8 : 1000 hours)
 - (ϕ 12.5 : 5000 hours)
- Guarantees 5000 hours at 105°C.
 - (ϕ 8 : 4000 hours)

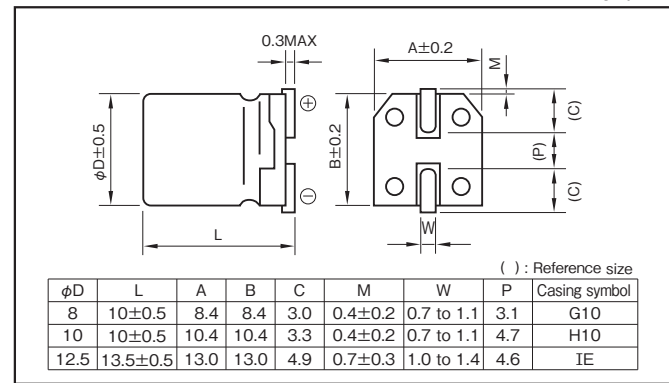


Marking color ϕ 8, ϕ 10 : Gold print on brown sleeve
 ϕ 12.5 : White print on brown sleeve

Specifications

Item	Performance							
Category temperature range (°C)	-40 to +125							
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)							
Leakage current (μ A)	Less than 0.02CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μ F) ; V : Rated voltage (V) (20°C)							
Tangent of loss angle (tan δ)	Rated voltage (V)	10	16	25	35	50	63	
	tan δ (max.)	0.28	0.26	0.24	0.20	0.19	0.18	
(20°C,120Hz)								
Characteristics at high and low temperature	Rated voltage (V)	10	16	25	35	50	63	
	Impedance ratio (max.)	Z-25°C/Z+20°C	3	3	3	3	3	3
		Z-40°C/Z+20°C	5	5	5	5	5	5
(120Hz)								
Endurance (Applied ripple current)	Test temp.	125°C			105°C			
	Test time	ϕ 8 : 1000h, ϕ 10 : 1250h, ϕ 12.5 : 5000h			ϕ 8 : 4000h, ϕ 10 : 5000h			
	Percentage of capacitance change	Within ±30% of initial value						
	Tangent of the loss angle	300% or less of the initial specified value						
	Leakage current	The initial specified value or less						
Shelf life	Test temp.	125°C			105°C			
	Test time	500 h			1000h			
	Percentage of capacitance change	Within ±20% of initial value						
	Tangent of the loss angle	200% or less of the initial specified value						
	Leakage current	The initial specified value or less						
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)							

Outline Drawing



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated voltage (V)	Item	10				16				25				35				50				63			
		Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA Arms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA Arms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA Arms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA Arms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA Arms)				
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	G10	0.80	38	—	—	—	—
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10×10	H10	0.65	45	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	G10	0.80	38	8×10	G10	1.00	33
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10×10	H10	0.65	48	10×10	H10	0.67	48
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	G10	0.80	40	10×10	H10	0.60	58
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10×10	H10	0.60	58	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	G10	0.68	55	8×10	G10	0.80	40
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10×10	H10	0.55	70	10×10	H10	0.60	58
100	—	—	—	—	—	8×10	G10	0.68	60	8×10	G10	0.68	60	8×10	G10	0.68	60	10×10	H10	0.55	102	10×10	H10	0.55	102
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10×10	H10	0.55	102	125×135	IE	0.136	509
220	—	8×10	G10	0.68	60	10×10	H10	0.55	107	10×10	H10	0.55	107	10×10	H10	0.55	102	125×135	IE	0.105	579	125×135	IE	0.136	509
		10×10	H10	0.55	111	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
330	—	10×10	H10	0.55	111	10×10	H10	0.55	111	125×135	IE	0.105	579	125×135	IE	0.105	579	—	—	—	—	—	—	—	
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
470	—	125×135	IE	0.105	579	125×135	IE	0.105	579	125×135	IE	0.105	579	125×135	IE	0.105	579	—	—	—	—	—	—	—	
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
680	—	125×135	IE	0.105	579	125×135	IE	0.105	579	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
1000	—	125×135	IE	0.105	579	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

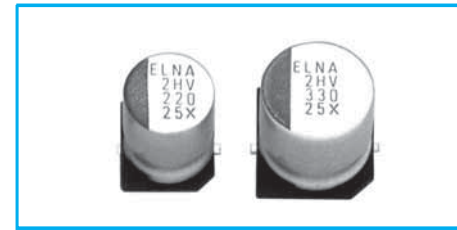
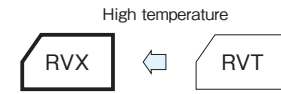
(Note) Impedance : 20°C, 100kHz : Rated ripple current : 125°C, 100kHz

NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

Chip Type, 135°C Capacitors

GREEN CAP SMD 135°C 1000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 1000 hours 135°C.



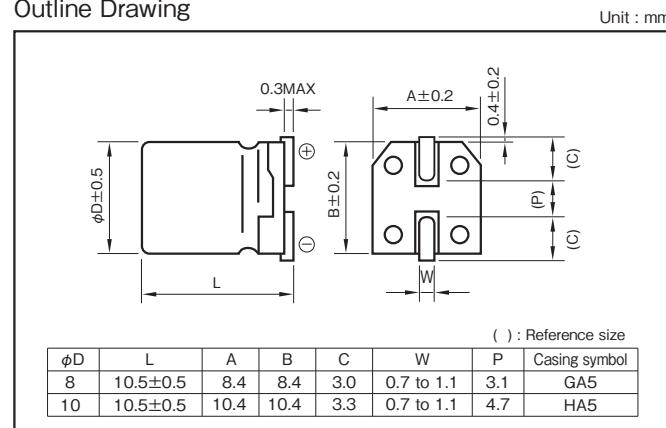
Marking color : Black print

Specifications

Item	Performance			
Category temperature range (°C)	-40 to +135			
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)			
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)			
Tangent of loss angle (tanδ)	Rated voltage (V)	25	35	
	tanδ (max.)	0.24	0.20	
Characteristics at high and low temperature	Rated voltage (V)	25	35	
	Impedance Ratio (max.)	Z-25°C/Z+20°C	2	2
		Z-40°C/Z+20°C	3	3
Endurance (135°C)	Test time	1000 hours		
	Leakage current	The initial specified value or less		
	Percentage of Capacitance change	Within ±20% of initial value		
	Tangent of loss angle	300% or less of the initial specified value		
Shelf life (135°C)	Test time : 500 hours ; other items are the same as those for the endurance. Voltage application treatment			
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)			

Aluminum Electrolytic Capacitors

Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage(V) 25 to 35	0.77	0.88	0.96	1.00

Part numbering system (example : 35V220µF)

RVX	—	25	V	331	M	HA5	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping symbol

- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

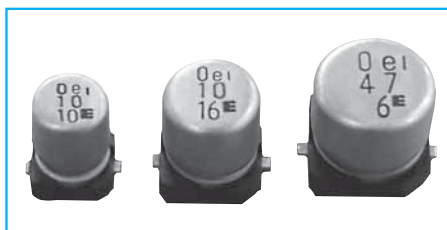
Rated voltage (V)	Item	25				35			
		Case	Casing symbol	ESR (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	ESR (Ω max.)	Rated ripple current (mA rms)
22	—	—	—	—	—	—	—	—	—
	8×10.5	GA5	0.70	115	8×10.5	GA5	0.70	115	
33	8×10.5	GA5	0.70	115	8×10.5	GA5	0.70	115	
	10×10.5	HA5	0.50	155	10×10.5	HA5	0.50	155	
47	8×10.5	GA5	0.70	115	8×10.5	GA5	0.70	115	
	10×10.5	HA5	0.50	155	10×10.5	HA5	0.50	155	
100	8×10.5	GA5	0.70	115	8×10.5	GA5	0.70	115	
	10×10.5	HA5	0.50	155	10×10.5	HA5	0.50	155	
220	8×10.5	GA5	0.70	115	10×10.5	HA5	0.50	155	
	10×10.5	HA5	0.50	155	—	—	—	—	
330	10×10.5	HA5	0.50	155	—	—	—	—	

(Note) ESR : 20°C, 100kHz
Rated ripple current : 135°C, 100kHz

Chip Type 105°C Use, Long Life Bipolar Capacitors

GREEN CAP SMD 105°C 2000hours Anti-cleaning solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 2000 hours 105°C.



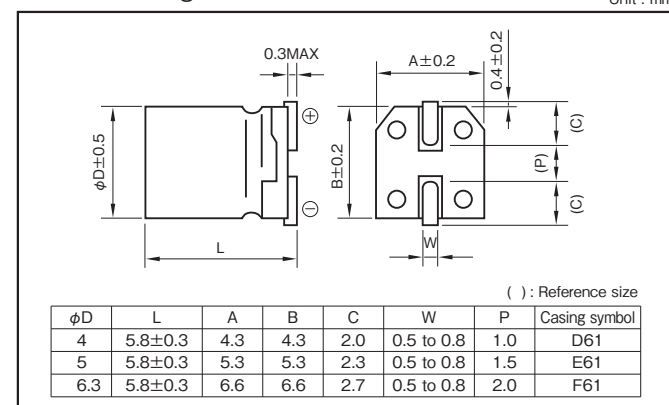
Marking color : Black print

Specifications

Item	Performance							
Category temperature range (°C)	-40 to +105							
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)							
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) , V : Rated voltage (V) (20°C)							
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50	
	tanδ (max.)	0.30	0.22	0.16	0.14	0.12	0.12	
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	2
		Z-40°C/Z+20°C	8	6	4	4	3	3
Endurance (105°C)	Test time	2000 hours (with the polarity inverted every 250 hours)						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±20% of initial value						
	Tangent of loss angle	200% or less of the initial specified value						
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment							
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)							

Outline Drawing

Unit : mm



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (μF)	6.3		10		16		25		35		50	
	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)
0.22	—	—	—	—	—	—	—	—	—	—	4	3
0.33	—	—	—	—	—	—	—	—	—	—	4	3
0.47	—	—	—	—	—	—	—	—	—	—	4	5
1	—	—	—	—	—	—	—	—	—	—	4	10
2.2	—	—	—	—	—	—	—	—	4	10	—	—
3.3	—	—	—	—	—	—	4	12	—	—	5	17
4.7	—	—	—	—	—	—	4	12	—	—	6.3	20
10	—	—	4	20	5	25	6.3	28	—	—	6.3	23
22	—	—	—	—	—	—	6.3	55	—	—	—	—
33	—	—	6.3	41	—	—	—	—	—	—	—	—
47	6.3	45	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 120Hz

Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)				
	50 · 60	120	1k	10k · 100k	
6.3 to 16	0.80	1.00	1.15	1.25	
25 to 35	0.80	1.00	1.25	1.40	
50	0.1 to 3.3μF	0.50	1.00	1.35	
	4.7μF	0.70	1.00	1.35	

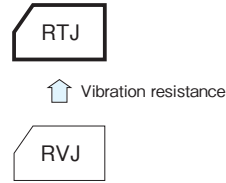
Part numbering system (example : 6.3V47μF)

RVI	—	6	V	470	M	F61	U	—	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol				

Chip Type, 105°C Use, Large Capacitance Capacitors

- SMD
- Vibration Resistance
- 105°C 2000hours
- Anti-cleaning solvent

- Compatible with surface mounting.
- For Vibration resistance.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C.



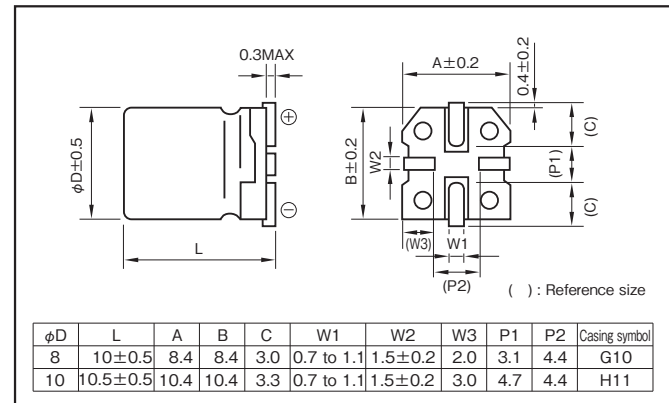
Marking color : White print on a brown sleeve

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (105°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (105°C)	Test time : 1000 hours; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)

Aluminum Electrolytic Capacitors

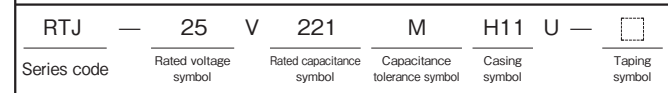
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50 · 60	120	1k	10k · 100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50 to 63	0.80	1	1.35	1.50
100	0.70	1	1.35	1.50

Part numbering system (example: 25V220µF)



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

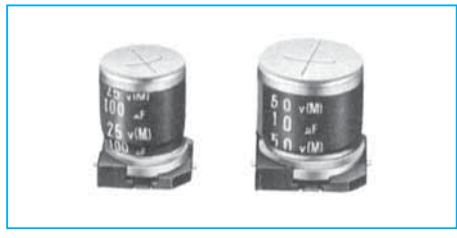
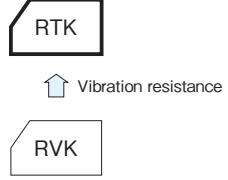
Rated capacitance (µF)	6.3		10		16		25		35		50		63		100	
	Case	ESR	Case	ESR	Case	ESR	Case	ESR	Case	ESR	Case	ESR	Case	ESR	Case	ESR
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	8×10	G10	3.6	178	8×10	G10	2.7	178	10×10.5	H11	2.2	324
220	8×10	G10	2.3	178	8×10	G10	2.0	178	10×10.5	H11	1.7	324	10×10.5	H11	1.2	324
330	8×10	G10	1.5	178	10×10.5	H11	1.3	324	10×10.5	H11	1.1	324	10×10.5	H11	0.80	324
470	10×10.5	H11	1.0	324	10×10.5	H11	0.92	324	10×10.5	H11	0.78	324	—	—	—	—

(Note) Rated ripple current : 105°C, 120Hz ; ESR : 20°C, 120Hz

Chip Type 125°C Capacitors

SMD
Vibration Resistance
125°C 1250hours
105°C 5000hours
Anti-cleaning solvent

- Compatible with surface mounting.
- For Vibration resistance.
- Supplied with carrier taping.
- Guarantees 1250 hours at 125°C. ($\phi 8$: 1000 hours)
- Guarantees 5000 hours at 105°C. ($\phi 8$: 4000 hours)

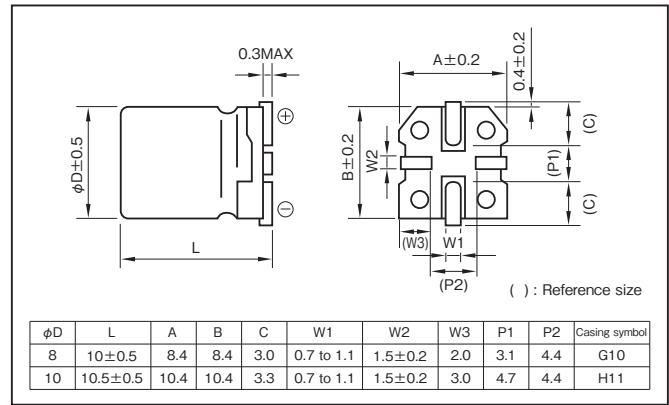


Marking color : Gold print on a brown sleeve

Specifications

Item	Performance						
Category temperature range (°C)	-40 to +125						
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)						
Leakage current (μA)	Less than 0.02CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	10	16	25	35	50	63
	tanδ (max.)	0.28	0.26	0.24	0.20	0.19	0.18
(20°C,120Hz)							
Characteristics at high and low temperature	Rated voltage (V)	10	16	25	35	50	63
	Impedance ratio (max.)	Z-25°C/Z+20°C		Z-40°C/Z+20°C			
(120Hz)							
Endurance (Applied ripple current)	Test temp.	125°C			105°C		
	Test time	φ10 : 1250h, φ8 : 1000h			φ10 : 5000h, φ8 : 4000h		
	Percentage of capacitance change	Within ±30% of initial value					
	Tangent of the loss angle	300% or less of the initial specified value					
Shelf life	Test temp.	125°C			105°C		
	Test time	500 h			1000h		
	Percentage of capacitance change	Within ±20% of initial value					
	Tangent of the loss angle	200% or less of the initial specified value					
Leakage current The initial specified value or less							
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

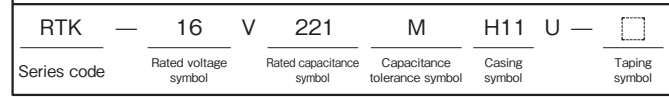


- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage (V)	120	1k	10k	100k
10 to 63	0.77	0.88	0.96	1

Part numbering system (example : 16V220μF)



Standard Ratings

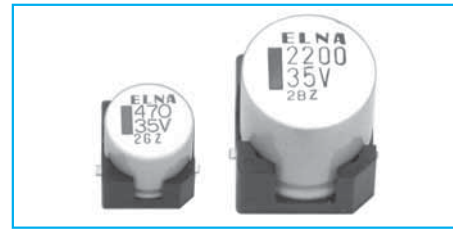
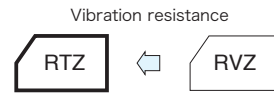
Rated voltage (V)	10				16				25				35				50				63			
	Case	ESR	Impedance	Rated ripple current	Case	ESR	Impedance	Rated ripple current	Case	ESR	Impedance	Rated ripple current	Case	ESR	Impedance	Rated ripple current	Case	ESR	Impedance	Rated ripple current	Case	ESR	Impedance	Rated ripple current
Rated capacitance (μF)	φD×L(mm)	(Ω)	(Ω max.)	(mArms)	φD×L(mm)	(Ω)	(Ω max.)	(mArms)	φD×L(mm)	(Ω)	(Ω max.)	(mArms)	φD×L(mm)	(Ω)	(Ω max.)	(mArms)	φD×L(mm)	(Ω)	(Ω max.)	(mArms)	φD×L(mm)	(Ω)	(Ω max.)	(mArms)
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	32	0.80	38	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	14	0.80	38	8×10	14	1.00	33
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	14	0.85	48	10×10.5	14	0.67	48
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	10	0.80	40	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8×10	7.1	0.68	65	—	—	—	—
220	8×10	2.1	0.88	60	10×10.5	2.0	0.55	107	10×10.5	1.8	0.55	107	—	—	—	—	—	—	—	—	—	—	—	—
330	10×10.5	1.4	0.55	111	10×10.5	1.3	0.55	111	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Impedance : 20°C, 100kHz ; Rated ripple current : 125°C, 100kHz ; ESR : 20°C, 120Hz

Chip Type 105°C Use, Low Impedance Capacitors

GREEN CAP SMD Low Impedance 105°C 2000hours Anti-cleaning solvent

- Compatible with surface mounting.
- For Vibration resistance.
- Supplied with carrier taping.
- Guarantees 2000 hours at 105°C. (φ12.5 to φ18 : 5000hours)



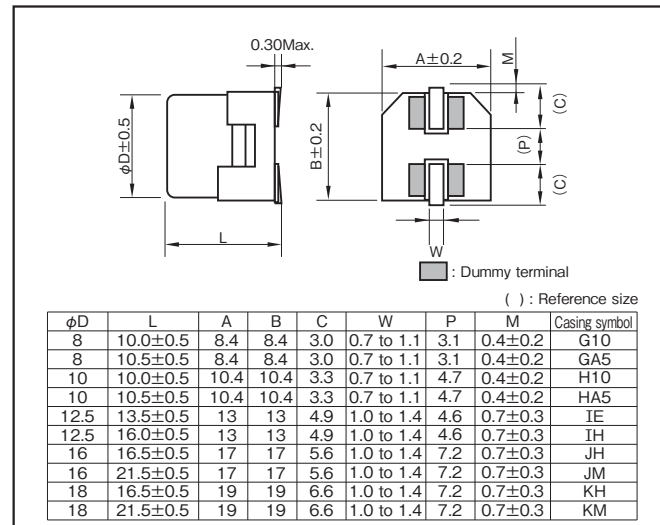
Marking color : Black print

Specifications

Item	Performance					
Category temperature range (°C)	-55 to +105					
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)					
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)					
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35
	tanδ (max.)	0.28	0.24	0.20	0.16	0.14
0.02 is added to every 1000μF increase over 1000μF (20°C, 120Hz)						
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2
Z-55°C/Z+20°C 8 5 4 3 3 (120Hz)						
Endurance (105°C) (Applied ripple current)	Test time	2000 hours (φ8, 10) 5000 hours (φ12.5 to 18)				
	Leakage current	The initial specified value or less				
	Percentage of capacitance change	Within ±25% of initial value				
	Tangent of loss angle	200% or less of the initial specified value				
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1					
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)					

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage (V)	0.5	0.75	0.9	1.0
6.3 to 35				

Part numbering system

φ8, φ10 (6.3V1500μF)

RTZ — 6 V 152 M HA5 SU —

Series code Rated voltage symbol Rated capacitance symbol Capacitance tolerance symbol Casing symbol Taping symbol

φ12.5 or more (6.3V2200μF)

RTZ — 6 V 222 M IE T —

Series code Rated voltage symbol Rated capacitance symbol Capacitance tolerance symbol Casing symbol Taping symbol

- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated voltage (V)	Rated capacitance (μF)	6.3				10				16				25				35							
		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA)				
150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
220	—	—	—	—	—	—	—	—	—	8×10	G10	0.20	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450
330	—	—	—	—	—	—	—	—	—	8×10.5	GA5	0.17	450	8×10.5	H10	0.10	670	8×10.5	H10	0.10	670	10×10	H10	0.10	670
470	—	—	—	—	—	—	—	—	—	8×10.5	GA5	0.17	450	8×10.5	GA5	0.17	450	10×10.5	HA5	0.090	670	10×10.5	HA5	0.090	670
680	—	—	—	—	—	—	—	—	—	10×10.5	HA5	0.090	670	10×10.5	HA5	0.090	670	12.5×13.5	IE	0.060	1100	12.5×13.5	IE	0.060	1100
1000	—	—	—	—	—	—	—	—	—	8×10.5	GA5	0.17	450	8×10.5	H10	0.10	670	10×10.5	HA5	0.090	670	12.5×13.5	IE	0.060	1100
1500	—	—	—	—	—	—	—	—	—	10×10.5	HA5	0.090	670	12.5×13.5	IE	0.060	1100	12.5×13.5	IE	0.060	1100	16×16.5	JH	0.046	1540
2200	—	—	—	—	—	—	—	—	—	12.5×13.5	IE	0.060	1100	12.5×13.5	IE	0.060	1100	16×16.5	JH	0.046	1540	16×16.5	JH	0.046	1540
3300	—	—	—	—	—	—	—	—	—	16×16.5	JH	0.046	1540	16×16.5	JH	0.046	1540	18×16.5	KH	0.042	1760	18×16.5	KH	0.042	1760
4700	—	—	—	—	—	—	—	—	—	18×16.5	KH	0.042	1760	18×16.5	KH	0.042	1760	18×21.5	JM	0.040	1840	18×21.5	JM	0.040	1840
6800	—	—	—	—	—	—	—	—	—	18×21.5	KM	0.038	1960	18×21.5	KM	0.038	1960	—	—	—	—	—	—	—	—
8200	—	—	—	—	—	—	—	—	—	18×21.5	KM	0.038	1960	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 100kHz, Impedance : 20°C, 100kHz

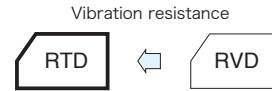
NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

Chip Type 105°C Use, Long Life Capacitors

GREEN CAP SMD Low Impedance 105°C 5000hours Anti-cleaning solvent

- Compatible with surface mounting.
- For Vibration resistance.
- Supplied with carrier taping.
- Guarantees 5000 hours at 105°C.



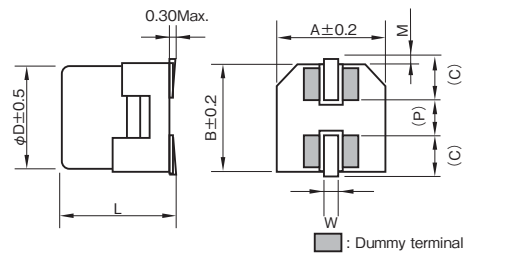
Marking color : Black print

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) , V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Z-25°C/Z+20°C
	Z-40°C/Z+20°C
	Z-55°C/Z+20°C
Endurance (105°C)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of loss angle
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)

Outline Drawing

Unit : mm



φD	L	A	B	C	W	P	M	Casing symbol
8	10.0±0.5	8.4	8.4	3.0	0.7 to 1.1	3.1	0.4±0.2	G10
8	10.5±0.5	8.4	8.4	3.0	0.7 to 1.1	3.1	0.4±0.2	GA5
10	10.0±0.5	10.4	10.4	3.3	0.7 to 1.1	4.7	0.4±0.2	H10
10	10.5±0.5	10.4	10.4	3.3	0.7 to 1.1	4.7	0.4±0.2	HA5
12.5	13.5±0.5	13	13	4.9	1.0 to 1.4	4.6	0.7±0.3	IE
12.5	16.0±0.5	13	13	4.9	1.0 to 1.4	4.6	0.7±0.3	IH
16	16.5±0.5	17	17	5.6	1.0 to 1.4	7.2	0.7±0.3	JH
16	21.5±0.5	17	17	5.6	1.0 to 1.4	7.2	0.7±0.3	JM
18	16.5±0.5	19	19	6.6	1.0 to 1.4	7.2	0.7±0.3	KH
18	21.5±0.5	19	19	6.6	1.0 to 1.4	7.2	0.7±0.3	KM

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage (V)	0.5	0.75	0.9	1.0
6.3 to 100				

Part numbering system

Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol
RTD	6	V	152	M	HA5 SU
RTD	6	V	222	M	IE T

- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (μF)	Item	6.3				10				16				25				35						
		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)			
100																								
220																								
330																								
470	8×10.5	GA5	0.16	600	8×10.5	GA5	0.16	600	8×10.5	GA5	0.16	600	8×10.5	GA5	0.16	600	8×10.5	GA5	0.16	600	8×10.5	GA5	0.16	600
680	8×10.5	GA5	0.16	600	10×10.5	HA5	0.090	850	10×10.5	HA5	0.090	850	12.5×13.5	IE	0.054	1160	12.5×13.5	IE	0.054	1160	12.5×13.5	IE	0.054	1160
1000	8×10.5	GA5	0.16	600	10×10.5	HA5	0.090	850	12.5×13.5	IE	0.054	1160	12.5×13.5	IE	0.054	1160	16×16.5	JH	0.044	1620	16×16.5	JH	0.044	1620
1500	10×10.5	HA5	0.090	850	12.5×13.5	IE	0.054	1160	12.5×13.5	IE	0.054	1160	16×16.5	JH	0.044	1620	18×16.5	KH	0.040	1840	18×16.5	KH	0.040	1840
2200	12.5×13.5	IE	0.054	1160	12.5×13.5	IE	0.054	1160	16×16.5	JH	0.044	1620	16×16.5	JH	0.044	1620	18×16.5	KH	0.040	1840	18×21.5	KM	0.036	2080
3300	16×16.5	JH	0.044	1620	16×16.5	JH	0.044	1620	16×21.5	JM	0.038	1920	18×16.5	KH	0.040	1840	18×21.5	KM	0.036	2080				
4700	18×16.5	KH	0.040	1840	18×16.5	KH	0.040	1840	18×16.5	KH	0.040	1840	18×16.5	KH	0.040	1840								
6800	18×16.5	KH	0.040	1840																				
8200	18×21.5	KM	0.036	2080																				

Rated capacitance (μF)	Item	50				63				80				100			
		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)
100	8×10.5	GA5	0.32	350	12.5×13.5	IE	0.16	600	12.5×13.5	IE	0.18	550	16×16.5	JH	0.17	700	
220	10×10.5	HA5	0.18	700	12.5×13.5	IE	0.16	600	16×16.5	JH	0.16	720	18×16.5	KH	0.15	800	
330	12.5×13.5	IE	0.12	900	16×16.5	JH	0.14	800	18×16.5	KH	0.13	830	18×21.5	KM	0.13	940	
470	16×16.5	JH	0.080	1000	18×16.5	KH	0.12	900	18×21.5	KM	0.11	1000					
680	16×16.5	JH	0.080	1000	18×21.5	KM	0.10	1050									
1000	18×16.5	KH	0.076	1100													

(Note) Rated ripple current : 105°C , 100kHz, Impedance : 20°C , 100kHz

Chip Type 125°C Use, Low ESR, Long Life Capacitors

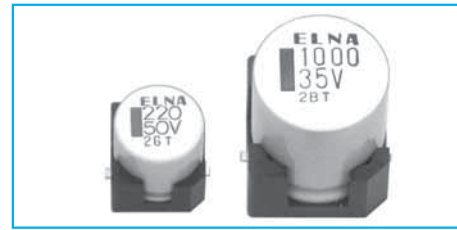
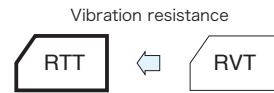
GREEN CAP

SMD

125°C
2000hours

Anti-cleaning solvent

- Compatible with surface mounting.
- For Vibration resistance.
- Supplied with carrier taping.
- Guarantees 2000 hours at 125°C.
(φ12.5 or more : 5000h)

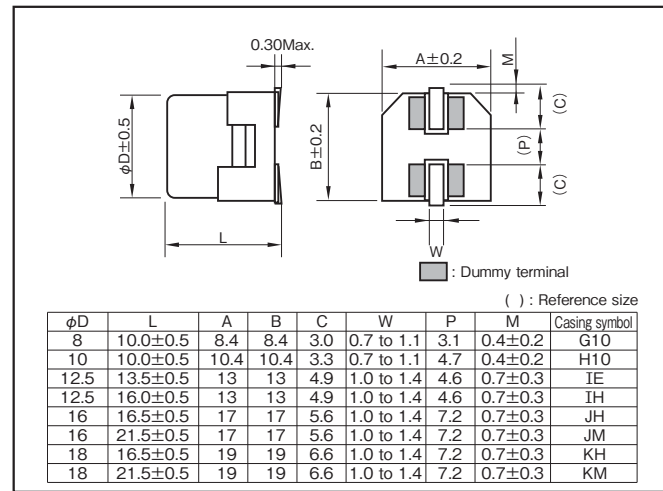


Marking color : Black print

Specifications

Item	Performance	
Category temperature range (°C)	-40 to +125	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	Rated voltage (V)	10 16 25 35 50 63 80 100
	Tangent of loss angle	0.24 0.20 0.16 0.14 0.14 0.12 0.12 0.10
0.02 is added to every 1000μF increase over 1000μF (20°C, 120Hz)		
Characteristics at high and low temperature	Rated voltage (V)	10 16 25 35 50 63 80 100
	Impedance ratio (max.)	Z-25°C/Z+20°C 3 2 2 2 2 2 2 2 Z-40°C/Z+20°C 4 3 3 3 3 3 3 3
(120Hz)		
Endurance (125°C)	Test time	2000 hours (φ 12.5 or more : 5000h)
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within -30% to +30% of initial value
	Tangent of loss angle	300% or less of the initial specified value
Shelf life (125°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1	
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)	

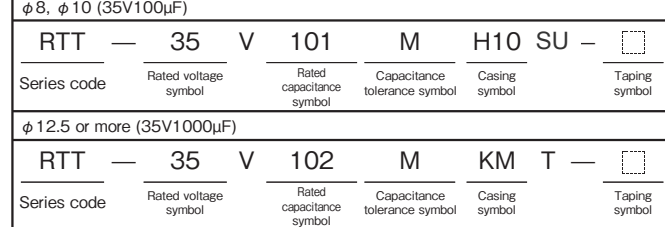
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage (V)				
10 to 100	0.77	0.88	0.96	1.00

Part numbering system



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (μF)	Item	10			16			25			35			50		
		Case	ESR (Ω max.)	Rated ripple current	Case	ESR (Ω max.)	Rated ripple current	Case	ESR (Ω max.)	Rated ripple current	Case	ESR (Ω max.)	Rated ripple current	Case	ESR (Ω max.)	Rated ripple current
100		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
220		8×10	0.25	2.5	340	8×10	0.25	2.5	340	8×10	0.25	2.5	340	10×10	0.50	7.5
		10×10	0.15	1.5	500	10×10	0.15	1.5	500	10×10	0.15	1.5	500	12.5×13.5	0.18	2.7
330		8×10	0.25	2.5	340	10×10	0.15	1.5	500	10×10	0.15	1.5	500	12.5×13.5	0.086	1.29
		10×10	0.15	1.5	500	12.5×13.5	0.086	1.29	750	16×16.5	0.060	0.90	1000	16×16.5	0.12	1.8
470		10×10	0.15	1.5	500	12.5×13.5	0.086	1.29	750	12.5×13.5	0.086	1.29	750	16×16.5	0.060	0.90
		12.5×13.5	0.086	1.29	750	16×16.5	0.060	0.90	1000	16×16.5	0.060	0.90	1000	18×16.5	0.10	1.5
680		12.5×13.5	0.086	1.29	750	16×16.5	0.060	0.90	1000	16×16.5	0.060	0.90	1000	18×16.5	0.050	0.75
		16×16.5	0.060	0.90	1000	18×16.5	0.050	0.75	1200	18×16.5	0.050	0.75	1200	—	—	—
1000		12.5×13.5	0.086	1.29	750	18×16.5	0.050	0.75	1200	18×21.5	0.042	0.63	1550	—	—	—
2200		16×16.5	0.06	0.90	1000	18×16.5	0.050	0.75	1200	—	—	—	—	—	—	—
3300		18×16.5	0.05	0.75	1200	18×21.5	0.042	0.63	1550	—	—	—	—	—	—	—
4700		18×21.5	0.042	0.63	1550	—	—	—	—	—	—	—	—	—	—	—

Rated capacitance (μF)	Item	63			80			100		
		Case	ESR (Ω max.)	Rated ripple current	Case	ESR (Ω max.)	Rated ripple current	Case	ESR (Ω max.)	Rated ripple current
47		—	—	—	—	—	—	—	—	—
100		12.5×13.5	0.25	3.75	16×16.5	0.24	3.6	16×16.5	0.24	3.6
220		16×16.5	0.22	3.3	16×21.5	0.18	2.7	16×16.5	0.16	2.4
330		16×16.5	0.22	3.3	18×21.5	0.12	1.8	18×21.5	—	—
470		16×21.5	0.16	2.4	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 100kHz, ESR : 100kHz

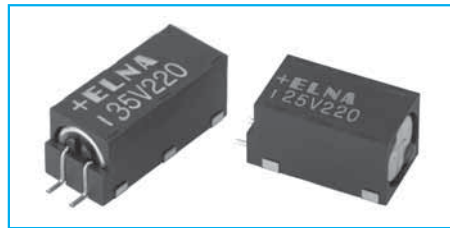
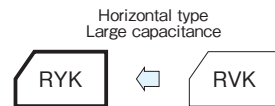
NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

Chip Type Aluminum Electrolytic Capacitors

Horizontal type, 125°C Use, High-temperature Capacitors

- SMD
- Vibration Resistance
- 125°C 1000hours
- Anti-cleaning solvent

- 125°C high temperature surface mount.
- Highly resistant to vibration.
- Available in horizontal configurations only.
- Carrier taping supplied.
- Guarantees 1000 hours at 125°C.



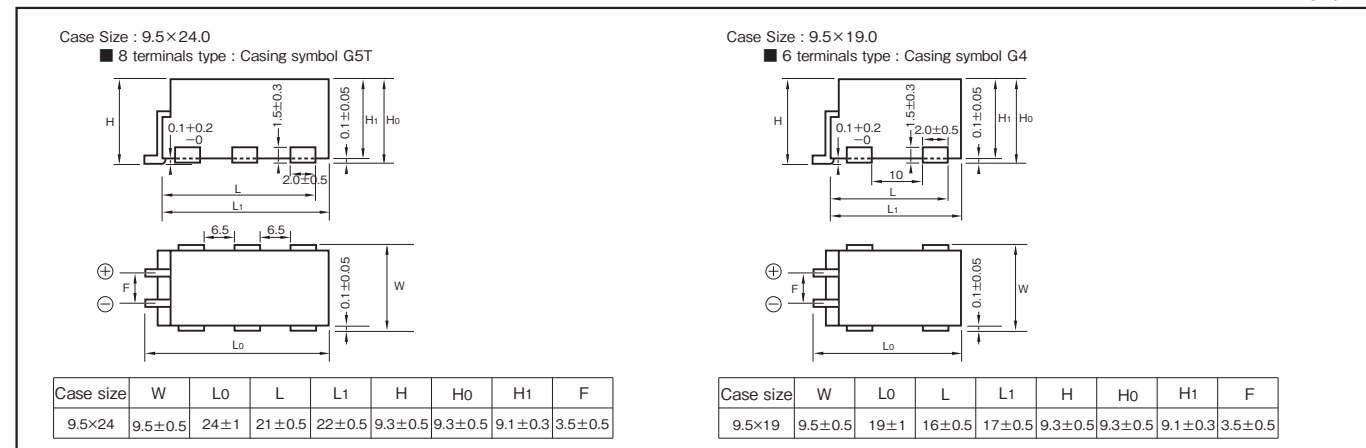
Marking color : White print on a black case

Specifications

Item	Performance
Category temperature range (°C)	-40 to +125
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (µA)	Less than 0.02CV (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
	Z-25°C/Z+20°C
Endurance (125°C) (Applied ripple current)	Test time
	Percentage of capacitance change
	Tangent of the loss angle
	Leakage current
Shelf life (125°C)	Test time
	Percentage of capacitance change
	Tangent of the loss angle
	Leakage current
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)

Outline Drawing

Unit : mm



• Soldering conditions are described on page 11. • Land pattern size are described on page 12. • The taping specifications are described on page 13.

Part numbering system (example: 10V560µF)

RYK	10	V	561	M	G5T	T	FL
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Tray polarity symbol		

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	120	1k	10k	100k
Rated voltage (V)				
10 to 63	0.77	0.88	0.96	1

Standard Ratings

Rated capacitance (µF)	6.3			10			16			25			35			50			63		
	Case	Impedance	Rated ripple current	Case	Impedance	Rated ripple current	Case	Impedance	Rated ripple current	Case	Impedance	Rated ripple current	Case	Impedance	Rated ripple current	Case	Impedance	Rated ripple current	Case	Impedance	Rated ripple current
	W×L (mm)	(Ω)	(mA _{RMS})	W×L (mm)	(Ω)	(mA _{RMS})	W×L (mm)	(Ω)	(mA _{RMS})	W×L (mm)	(Ω)	(mA _{RMS})	W×L (mm)	(Ω)	(mA _{RMS})	W×L (mm)	(Ω)	(mA _{RMS})	W×L (mm)	(Ω)	(mA _{RMS})
56	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.5×19.0	0.52	204
82	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9.5×19.0	0.49	210	9.5×24.0	0.37	272
100	—	—	—	—	—	—	—	—	—	—	—	—	9.5×19.0	0.40	232	9.5×24.0	0.35	279	—	—	—
220	—	—	—	—	—	—	—	—	—	9.5×19.0	0.40	232	9.5×24.0	0.30	302	—	—	—	—	—	—
270	—	—	—	—	—	—	9.5×19.0	0.40	232	9.5×24.0	0.30	302	—	—	—	—	—	—	—	—	—
470	—	—	—	9.5×19.0	0.40	232	9.5×24.0	0.30	302	—	—	—	—	—	—	—	—	—	—	—	—
560	9.5×19.0	0.40	232	9.5×24.0	0.30	302	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
820	9.5×24.0	0.30	302	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 125°C, 100kHz ; Impedance : 20°C, 100kHz

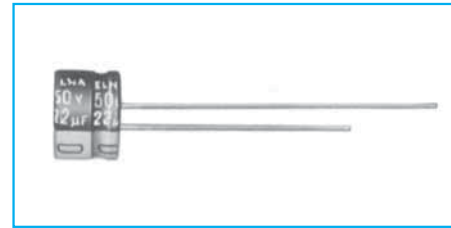
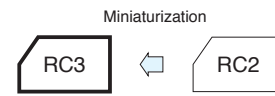
Miniature Aluminum Electrolytic Capacitors

Miniature
Aluminum Electrolytic Capacitors

5mm L Standard Capacitors

GREEN CAP

• Diameters from $\phi 3$ to $\phi 8$ mm and a height of 5mm.



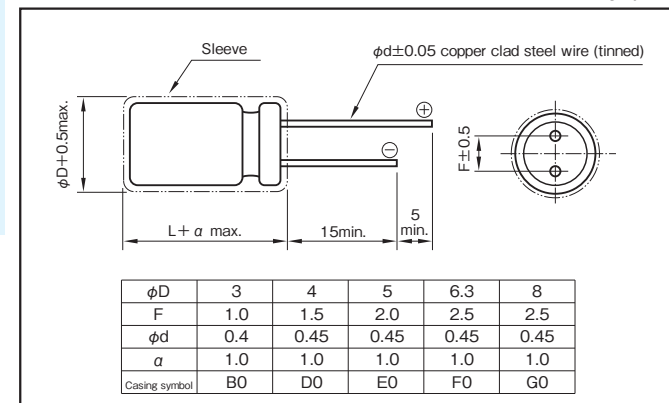
Marking color : White print on a blue sleeve ($\phi 3$: black sleeve)

Specifications

Item	Performance
Category temperature range (°C)	-40 to +85
Tolerance at rated capacitance (%)	± 20 (20°C, 120Hz)
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF); V : Rated voltage (V) (20°C)
Tangent of loss angle (tan δ)	Rated voltage (V)
	tan δ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
	Impedance ratio (max.)
Endurance (85°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (85°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Rated voltage (V)				
4 to 16	0.8	1	1.1	1.2
25 to 35	0.8	1	1.5	1.7
50	0.8	1	1.6	1.9

Part numbering system (example : 6.3V100 μF)

RC3	—	6	V	101	M	F0	#	*	—	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol	Taping (Forming)				

*Should add "2", when size is $\phi 3 \times 5L$.

Standard Ratings

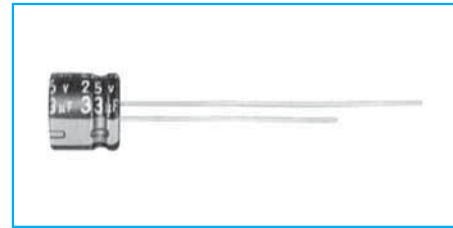
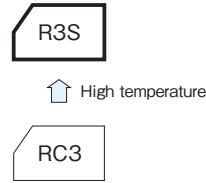
Rated capacitance (μF)	4		6.3		10		16		25		35		50	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
Item	$\phi D \times L$ (mm)	(mA rms)	$\phi D \times L$ (mm)	(mA rms)	$\phi D \times L$ (mm)	(mA rms)	$\phi D \times L$ (mm)	(mA rms)	$\phi D \times L$ (mm)	(mA rms)	$\phi D \times L$ (mm)	(mA rms)	$\phi D \times L$ (mm)	(mA rms)
0.1	—	—	—	—	—	—	—	—	—	—	—	—	3×5	3
0.22	—	—	—	—	—	—	—	—	—	—	—	—	· 4×5	5 (4)
0.33	—	—	—	—	—	—	—	—	—	—	—	—	· 4×5	6 (5)
0.47	—	—	—	—	—	—	—	—	—	—	—	—	· 4×5	7 (6)
1	—	—	—	—	—	—	—	—	—	—	—	—	· 4×5	10 (8)
2.2	—	—	—	—	—	—	—	—	—	—	—	—	· 4×5	15
3.3	—	—	—	—	—	—	—	—	· 4×5	15 (13)	4×5	17	4×5	18
4.7	—	—	—	—	—	—	· 4×5	17 (14)	4×5	18	4×5	20	5×5	25
10	—	—	· 4×5	20 (17)	4×5	22	4×5	25	5×5	30	5×5	30	6.3×5	40
22	· 4×5	25 (21)	4×5	30	5×5	35	5×5	40	6.3×5	50	6.3×5	55	8×5	75
33	4×5	30	5×5	40	5×5	45	6.3×5	60	6.3×5	65	8×5	80	8×5	90
47	4×5	35	5×5	50	6.3×5	65	6.3×5	70	8×5	95	8×5	100	—	—
100	5×5	60	6.3×5	85	6.3×5	95	8×5	125	8×5	135	—	—	—	—
220	6.3×5	105	8×5	145	8×5	155	—	—	—	—	—	—	—	—
330	8×5	150	8×5	175	—	—	—	—	—	—	—	—	—	—
470	8×5	180	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz ; The types of capacitor marked with a black circle are manufactured in the $\phi 3 \times 5$ size also ; the figures in the parentheses are applicable to capacitors with $\phi 3$.

5mm L, 105°C Use Capacitors

GREEN CAP 105°C 1000hours Anti-cleaning solvent

- Diameters from $\phi 4$ to $\phi 6.3$ mm and a height of 5mm.
- Guarantees 1000 hours at 105°C.

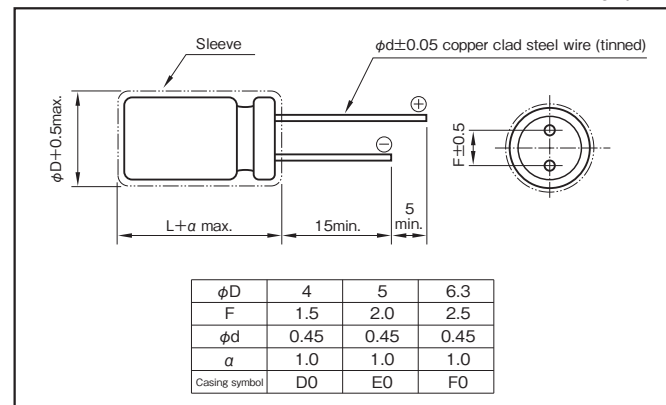


Marking color : White print on a black sleeve

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF); V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (105°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)

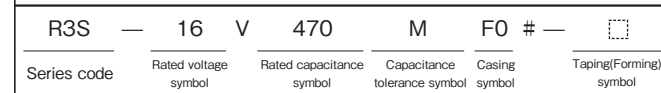
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	50 · 60	120	1k	10k · 100k
6.3 to 16	0.64	0.80	0.92	1
25 to 35	0.57	0.71	0.89	1
50	0.53	0.67	0.90	1

Part numbering system (example : 16V470 M F0 #)



Aluminum Electrolytic Capacitors

Standard Ratings

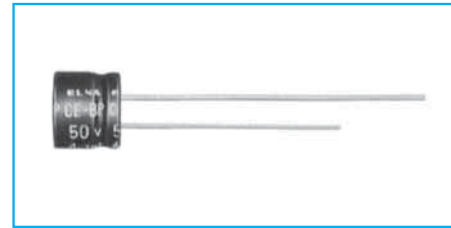
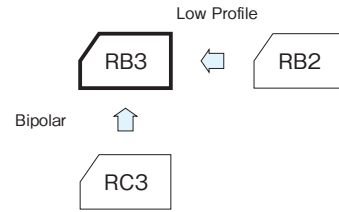
Rated capacitance (µF)	6.3		10		16		25		35		50	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
Item	φD×L (mm)	(mAmps)	φD×L (mm)	(mAmps)	φD×L (mm)	(mAmps)	φD×L (mm)	(mAmps)	φD×L (mm)	(mAmps)	φD×L (mm)	(mAmps)
0.22	—	—	—	—	—	—	—	—	—	—	4×5	5
0.33	—	—	—	—	—	—	—	—	—	—	4×5	6
0.47	—	—	—	—	—	—	—	—	—	—	4×5	8
1	—	—	—	—	—	—	—	—	—	—	4×5	11
2.2	—	—	—	—	—	—	—	—	—	—	4×5	17
3.3	—	—	—	—	—	—	—	—	4×5	17	4×5	20
4.7	—	—	—	—	4×5	15	4×5	18	4×5	20	5×5	27
10	—	—	4×5	20	4×5	23	5×5	31	5×5	34	6.3×5	45
22	4×5	26	5×5	34	5×5	38	6.3×5	53	6.3×5	57	—	—
33	5×5	33	5×5	43	6.3×5	56	6.3×5	66	—	—	—	—
47	5×5	45	6.3×5	58	6.3×5	65	—	—	—	—	—	—
100	6.3×5	78	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 100kHz.

5mm L Bipolar Capacitors

GREEN CAP

• Diameters from $\phi 4$ to $\phi 6.3$ mm and a height of 5mm.



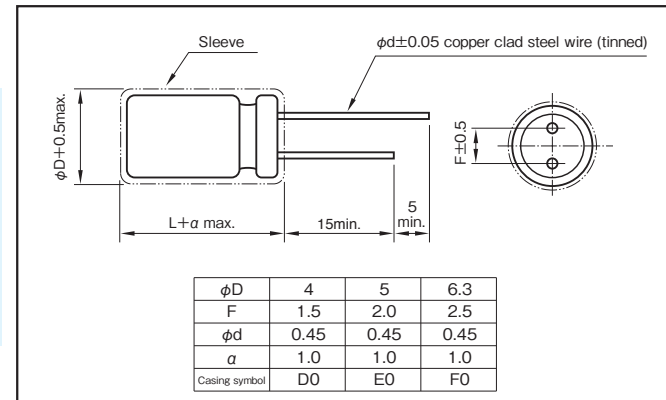
Marking color : White print on a blue sleeve

Specifications

Item	Performance
Category temperature range (°C)	-40 to +85
Tolerance at rated capacitance (%)	± 20 (20°C, 120Hz)
Leakage current (μA)	Less than $0.03CV + 3$ (after 5 minutes) C : Rated capacitance (μF); V : Rated voltage (V) (20°C)
Tangent of loss angle (tan δ)	Rated voltage (V)
	tan δ (max.)
Endurance (85°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.8	1	1.1	1.2
25 to 35	0.8	1	1.5	1.7
50	0.8	1	1.6	1.9

Part numbering system (example : 10V47 μF)

RB3	—	10	V	470	M	F0	#	—	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping/Forming symbol				

Standard Ratings

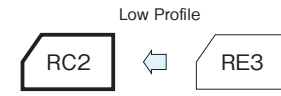
Rated capacitance (μF)	6.3		10		16		25		35		50	
	Case	Rated ripple current (mA)	Case	Rated ripple current (mA)	Case	Rated ripple current (mA)	Case	Rated ripple current (mA)	Case	Rated ripple current (mA)	Case	Rated ripple current (mA)
Item	$\phi D \times L$ (mm)	(mA)	$\phi D \times L$ (mm)	(mA)	$\phi D \times L$ (mm)	(mA)	$\phi D \times L$ (mm)	(mA)	$\phi D \times L$ (mm)	(mA)	$\phi D \times L$ (mm)	(mA)
0.22	—	—	—	—	—	—	—	—	—	—	4×5	3
0.33	—	—	—	—	—	—	—	—	—	—	4×5	4
0.47	—	—	—	—	—	—	—	—	—	—	4×5	5
1	—	—	—	—	—	—	—	—	—	—	4×5	7
2.2	—	—	—	—	—	—	—	—	4×5	11	5×5	14
3.3	—	—	—	—	—	—	4×5	13	5×5	17	6.3×5	20
4.7	—	—	—	—	4×5	14	5×5	21	6.3×5	24	6.3×5	24
10	—	—	4×5	18	5×5	26	6.3×5	35	6.3×5	35	—	—
22	5×5	31	6.3×5	40	6.3×5	45	—	—	—	—	—	—
33	6.3×5	45	6.3×5	49	—	—	—	—	—	—	—	—
47	6.3×5	54	6.3×5	59	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz.

7mm L, Standard Capacitors

GREEN CAP Anti-cleaning solvent

- Conventional RC2 further downsized, diameters from $\phi 4$ to $\phi 8$ mm.
- Guarantees 1000 hours at 85°C.

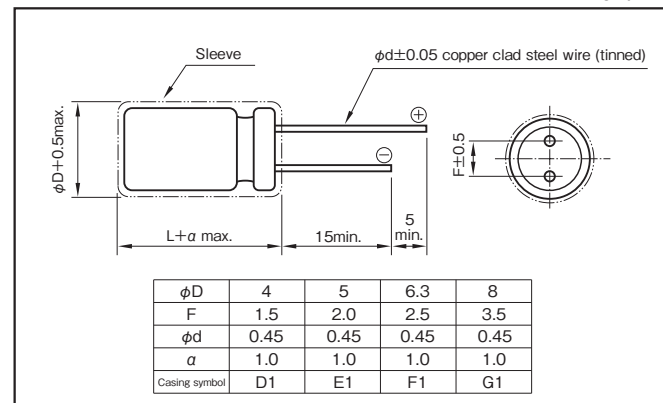


Marking color : White print on a blue sleeve

Specifications

Item	Performance																													
Category temperature range (°C)	-40 to +85																													
Tolerance at rated capacitance (%)	± 20 (20°C, 120Hz)																													
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF); V : Rated voltage (V) (20°C)																													
Tangent of loss angle ($\tan\delta$)	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>$\tan\delta$ (max.)</td> <td>0.35</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> </tr> </tbody> </table> (20°C, 120Hz)	Rated voltage (V)	4	6.3	10	16	25	35	50	63	100	$\tan\delta$ (max.)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.08									
Rated voltage (V)	4	6.3	10	16	25	35	50	63	100																					
$\tan\delta$ (max.)	0.35	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.08																					
Characteristics at high and low temperature	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance ratio (max.)</td> <td>Z-25°C/Z+20°C</td> <td>6</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>16</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> </tbody> </table> (120Hz)	Rated voltage (V)	4	6.3	10	16	25	35	50	63	100	Impedance ratio (max.)	Z-25°C/Z+20°C	6	4	3	2	2	2	2	2	Z-40°C/Z+20°C	16	10	8	6	4	4	4	4
Rated voltage (V)	4	6.3	10	16	25	35	50	63	100																					
Impedance ratio (max.)	Z-25°C/Z+20°C	6	4	3	2	2	2	2	2																					
	Z-40°C/Z+20°C	16	10	8	6	4	4	4	4																					
Endurance (85°C) (Applied ripple current)	<table border="1"> <tbody> <tr> <td>Test time</td> <td>1000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within $\pm 20\%$ of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>200% or less of the initial specified value</td> </tr> </tbody> </table>	Test time	1000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within $\pm 20\%$ of initial value	Tangent of the loss angle	200% or less of the initial specified value																					
Test time	1000 hours																													
Leakage current	The initial specified value or less																													
Percentage of capacitance change	Within $\pm 20\%$ of initial value																													
Tangent of the loss angle	200% or less of the initial specified value																													
Shelf life (85°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1																													
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																													

Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	50 · 60	120	1k	10k · 100k
4 to 16		0.8	1	1.1	1.2
25 to 35		0.8	1	1.5	1.7
50 to 100		0.8	1	1.6	1.9

Part numbering system (example : 10V220 μF)



Aluminum Electrolytic Capacitors Miniature

Standard Ratings

Rated capacitance (μF)	4		6.3		10		16		25		35		50		63		100	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	4x7	25	4x7	30	4x7	30	5x7	40	6.3x7	50	—	—
22	—	—	4x7	35	4x7	35	4x7	40	5x7	50	5x7	55	6.3x7	70	—	—	—	—
33	4x7	35	4x7	40	4x7	45	5x7	55	6.3x7	70	6.3x7	75	8x7	100	—	—	—	—
47	4x7	40	4x7	50	5x7	60	5x7	70	6.3x7	85	8x7	110	—	—	—	—	—	—
100	5x7	70	5x7	80	6.3x7	105	6.3x7	120	8x7	145	—	—	—	—	—	—	—	—
220	6.3x7	120	6.3x7	140	8x7	185	8x7	205	—	—	—	—	—	—	—	—	—	—
330	8x7	170	8x7	205	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz.

7mm L, 105°C Use Capacitors

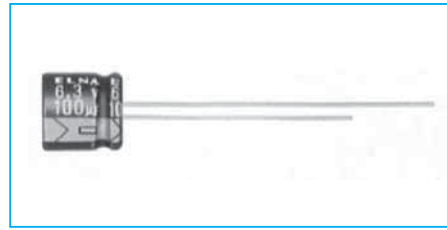
GREEN CAP 105°C 1000hours Anti-cleaning solvent

- Diameters from $\phi 4$ to $\phi 6.3$ mm and a height of 7mm.
- Guarantees 1000 hours at 105°C.

R2S

High temperature

RC2



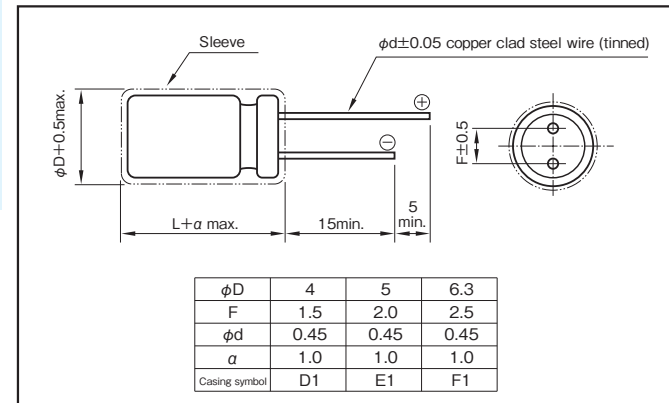
Marking color : White print on a black sleeve

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF); V : Rated voltage (V) (20°C)
Tangent of loss angle (tan δ)	Rated voltage (V)
	tan δ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (105°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.68	0.72	0.92	1
25 to 35	0.48	0.63	0.80	1
50	0.45	0.50	0.70	1

Part numbering system (example : 25V33μF)

R2S	—	25	V	330	M	F1	#	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping(Forming) symbol

Standard Ratings

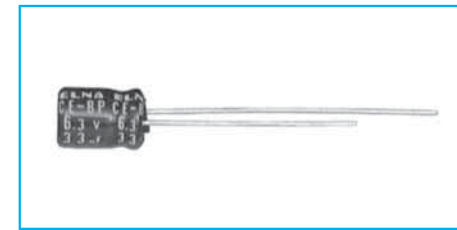
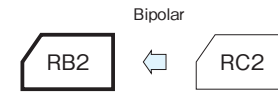
Rated capacitance (μF)	6.3		10		16		25		35		50	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
Item	$\phi D \times L$ (mm)	(mArms)	$\phi D \times L$ (mm)	(mArms)	$\phi D \times L$ (mm)	(mArms)	$\phi D \times L$ (mm)	(mArms)	$\phi D \times L$ (mm)	(mArms)	$\phi D \times L$ (mm)	(mArms)
0.33	—	—	—	—	—	—	—	—	—	—	4×7	10
0.47	—	—	—	—	—	—	—	—	—	—	4×7	12
1	—	—	—	—	—	—	—	—	—	—	4×7	16
2.2	—	—	—	—	—	—	—	—	—	—	4×7	25
3.3	—	—	—	—	—	—	4×7	21	4×7	23	4×7	28
4.7	—	—	—	—	—	—	4×7	25	4×7	25	5×7	48
10	—	—	—	—	4×7	39	5×7	47	5×7	48	6.3×7	75
22	4×7	42	4×7	49	5×7	54	6.3×7	87	6.3×7	90	—	—
33	5×7	53	5×7	60	6.3×7	83	6.3×7	90	—	—	—	—
47	5×7	64	6.3×7	95	6.3×7	95	—	—	—	—	—	—
100	6.3×7	96	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 100kHz.

7mm L Bipolar Capacitors

GREEN CAP Anti-cleaning solvent

• Diameters from $\phi 4$ to $\phi 6.3$ mm and a height of 7mm.



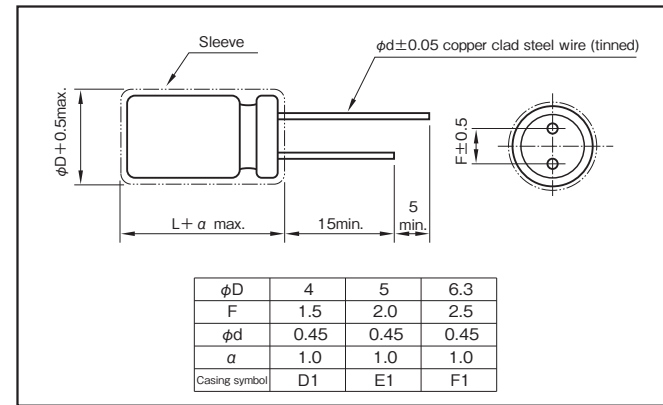
Marking color : White print on a blue sleeve

Specifications

Item	Performance														
Category temperature range (°C)	-40 to +85														
Tolerance at rated capacitance (%)	± 20 (20°C, 120Hz)														
Leakage current (μ A)	Less than $0.03CV + 3$ (after 5 minutes) C : Rated capacitance (μ F) ; V : Rated voltage (V) (20°C)														
Tangent of loss angle ($\tan \delta$)	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>$\tan \delta$ (max.)</td> <td>0.30</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> </tr> </tbody> </table> (20°C, 120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	$\tan \delta$ (max.)	0.30	0.25	0.20	0.15	0.15	0.15
Rated voltage (V)	6.3	10	16	25	35	50									
$\tan \delta$ (max.)	0.30	0.25	0.20	0.15	0.15	0.15									
Endurance (85°C)	<table border="1"> <thead> <tr> <th>Test time</th> <td>1000 hours (with the polarity inverted every 250 hours)</td> </tr> <tr> <th>Leakage current</th> <td>The initial specified value or less</td> </tr> <tr> <th>Percentage of capacitance change</th> <td>Within $\pm 20\%$ of initial value</td> </tr> <tr> <th>Tangent of the loss angle</th> <td>200% or less of the initial specified value</td> </tr> </thead> </table>	Test time	1000 hours (with the polarity inverted every 250 hours)	Leakage current	The initial specified value or less	Percentage of capacitance change	Within $\pm 20\%$ of initial value	Tangent of the loss angle	200% or less of the initial specified value						
Test time	1000 hours (with the polarity inverted every 250 hours)														
Leakage current	The initial specified value or less														
Percentage of capacitance change	Within $\pm 20\%$ of initial value														
Tangent of the loss angle	200% or less of the initial specified value														
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)														

Outline Drawing

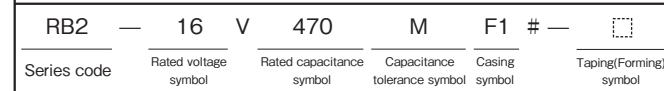
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50 · 60	120	1k	10k · 100k
6.3 to 16	0.8	1	1.1	1.2
25 to 35	0.8	1	1.5	1.7
50	0.8	1	1.6	1.9

Part numbering system (example: 16V47 μ F)



Aluminum Electrolytic Capacitors Miniature

Standard Ratings

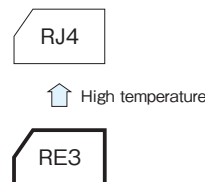
Rated capacitance (μ F)	6.3		10		16		25		35		50	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
		$\phi D \times L$ (mm)		(mA _{rms})		$\phi D \times L$ (mm)		(mA _{rms})		$\phi D \times L$ (mm)		(mA _{rms})
0.22	—	—	—	—	—	—	—	—	—	—	4×7	4
0.33	—	—	—	—	—	—	—	—	—	—	4×7	5
0.47	—	—	—	—	—	—	—	—	—	—	4×7	6
1	—	—	—	—	—	—	—	—	—	—	4×7	9
2.2	—	—	—	—	—	—	—	—	4×7	14	5×7	16
3.3	—	—	—	—	—	—	4×7	17	5×7	19	5×7	19
4.7	—	—	—	—	4×7	17	5×7	23	5×7	23	6.3×7	27
10	—	—	4×7	23	5×7	29	6.3×7	39	6.3×7	39	—	—
22	5×7	35	5×7	39	6.3×7	50	6.3×7	58	—	—	—	—
33	5×7	43	6.3×7	55	6.3×7	61	6.3×7	71	—	—	—	—
47	6.3×7	60	6.3×7	66	6.3×7	73	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz.

Standard Capacitors

GREEN CAP Anti-cleaning solvent 250V Max.

• Guarantees 2000 hours at 85°C.



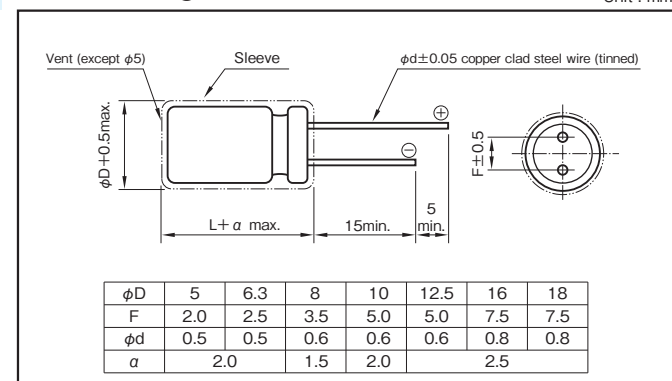
Marking color : White print on a blue sleeve

Specifications

Item		Performance	
Category temperature range (°C)		-40 to +85	
Tolerance at rated capacitance (%)		±20 (20°C, 120Hz)	
Leakage current (μA)	Rated voltage (V)	6.3 to 100	160 to 450
	Leakage current (μA)	Less than 0.03CV or 4 whichever is larger (after 1 minute) Less than 0.01CV or 3 whichever is larger (after 2 minutes)	CV ≤ 1000 : Less than 0.1CV + 40 (after 1 minute) CV > 1000 : Less than 0.04CV + 100 (after 1 minute)
C : Rated capacitance (μF) V : Rated voltage (V) (20°C)			
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10
	tanδ (max.)	0.28	0.24
0.02 is added to every 1000μF increase over 1000μF. (20°C, 120Hz)			
Characteristics at high and low temperature	Rated voltage (V)	6.3	10
	Impedance ratio (max.)	Z-25°C/Z+20°C	5
Z-40°C/Z+20°C			
Endurance (85°C) (Applied ripple current)	Test time	2000 hours	
	Leakage current	The initial specified value or less	
Shelf life (85°C)	Percentage of capacitance change	Within ±20% of initial value	
	Tangent of the loss angle	200% or less of the initial specified value	
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)		

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)					
	CV (μF×VV)	50 · 60	120	1k	10k	100k
6.3 to 16	All CV value	0.8	1	1.1	1.2	1.2
	≤ 1000	0.8	1	1.5	1.7	1.7
25 to 35	1000 <	0.8	1	1.2	1.3	1.3
	≤ 1000	0.8	1	1.6	1.9	1.9
50 to 100	1000 <	0.8	1	1.2	1.3	1.3
	All CV value	0.8	1	1.3	1.5	1.6

Part numbering system (example : 16V1000μF)

RE3 — 16 V 102 M H4 # □ — □

Series code | Rated voltage symbol | Rated capacitance symbol | Capacitance tolerance symbol | Casing symbol | Optional symbol | Taping/Forming symbol

Casing symbol

Size phi D × L (mm)	Casing Symbol	Size phi D × L (mm)	Casing Symbol
5 × 11	E3	12.5 × 25	I6
6.3 × 11	F3	16 × 25	J6
8 × 11.5	G3	16 × 31.5	J7
10 × 12.5	H3	16 × 35.5	J8
10 × 16	H4	18 × 35.5	K8
10 × 20	H5	18 × 40	K9
12.5 × 20	I5		

Standard Bipolar Capacitors

GREEN CAP Anti-cleaning solvent

- Guarantees 2000 hours at 85°C.



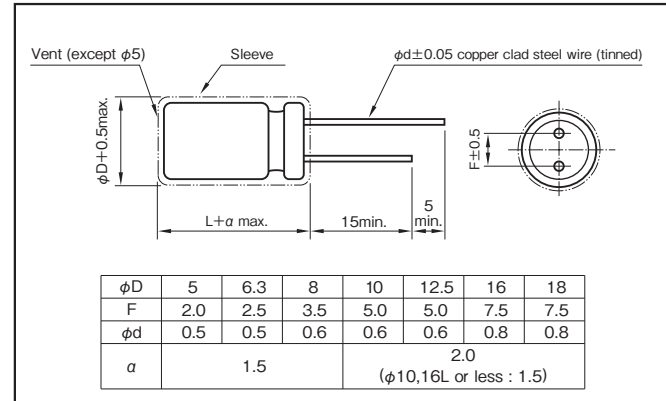
Marking color : White print on a blue sleeve

Specifications

Item	Performance								
Category temperature range (°C)	-40 to +85								
Tolerance at rated capacitance (%)	±20								(20°C,120Hz)
Leakage current (μA)	Less than 0.03CV + 3 (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)								
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100
	tan δ (max.)	0.24	0.24	0.20	0.20	0.16	0.14	0.12	0.10
0.02 is added to every 1000μF increase over 1000μF (20°C,120Hz)									
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50	63	100
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	2	2
0.5 for -25°C, 1 for -40°C are added to every 1000μF increase over 1000μF (120Hz)									
Endurance (85°C) (Applied ripple current)	Test time	2000 hours (with the polarity inverted every 250 hours)							
	Leakage current	The initial specified value or less							
	Percentage of capacitance change	Within ±20% of initial value							
	Tangent of the loss angle	150% or less of the initial specified value							
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment								
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)								

Outline Drawing

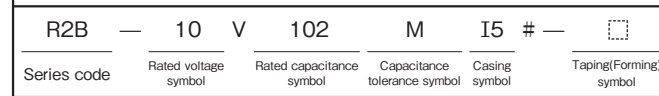
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	50-60	120	1k	10k-100k
6.3 to 16	0.8	1	1.1	1.2
25 to 35	0.8	1	1.5	1.7
50 to 100	0.8	1	1.6	1.9

Part numbering system (example : 10V1000μF)



Casing symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J 7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J 8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8

Standard Ratings

Rated voltage (V)	6.3		10		16		25		35		50		63		100	
	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)	Case φD×L (mm)	Rated ripple current (mArms)
0.47	—	—	—	—	—	—	—	—	—	—	5×11	10	—	—	5×11	11
1	—	—	—	—	—	—	—	—	—	—	5×11	14	—	—	5×11	16
2.2	—	—	—	—	—	—	—	—	—	—	5×11	21	5×11	23	5×11	24
3.3	—	—	—	—	—	—	—	—	—	—	5×11	26	5×11	28	6.3×11	34
4.7	—	—	—	—	—	—	5×11	28	5×11	28	5×11	31	5×11	34	6.3×11	41
10	—	—	—	—	5×11	39	5×11	40	5×11	42	5×11	45	6.3×11	57	8×11.5	70
22	—	—	5×11	52	5×11	58	5×11	60	6.3×11	71	6.3×11	77	8×11.5	89	10×16	136
33	5×11	58	5×11	63	5×11	71	6.3×11	84	6.3×11	87	8×11.5	111	10×12.5	144	10×20	181
47	5×11	69	5×11	75	6.3×11	97	6.3×11	100	8×11.5	122	10×12.5	157	10×16	188	12.5×20	248
100	6.3×11	115	6.3×11	126	8×11.5	167	10×12.5	204	10×12.5	212	10×20	273	12.5×20	343	16×25	458
220	8×11.5	202	8×11.5	221	10×12.5	294	10×16	332	10×20	375	12.5×25	506	16×25	645	18×35.5	837
330	8×11.5	247	10×12.5	322	10×16	394	10×20	444	12.5×20	526	12.5×25	620	—	—	—	—
470	10×12.5	350	10×16	420	10×20	513	12.5×20	607	12.5×25	685	16×25	861	—	—	—	—
1000	10×20	611	12.5×20	767	12.5×25	935	16×25	1120	16×31.5	1270	—	—	—	—	—	—
2200	12.5×25	1090	16×25	1380	16×31.5	1660	—	—	—	—	—	—	—	—	—	—
3300	16×25	1490	16×31.5	1760	—	—	—	—	—	—	—	—	—	—	—	—
4700	16×31.5	1880	18×35.5	2280	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz

NOTE

Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

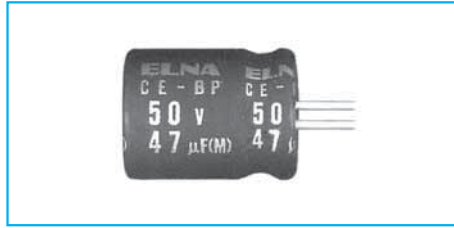
105°C Bipolar Capacitors

GREEN CAP Anti-cleaning solvent

• Guarantees 2000 hours at 105°C.



High temperature



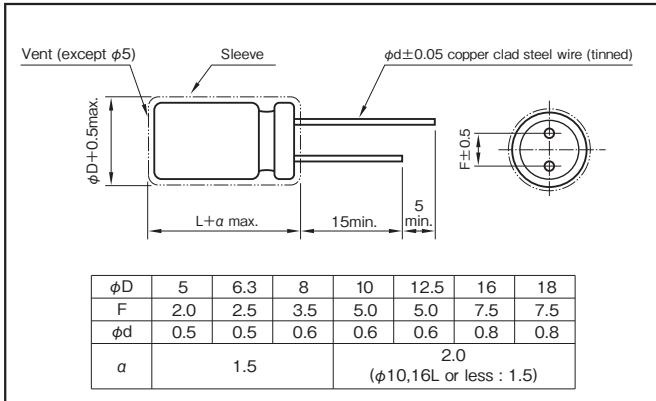
Marking color : White print on a black sleeve

Specifications

Table with 2 columns: Item, Performance. Rows include Category temperature range, Tolerance at rated capacitance, Leakage current, Tangent of loss angle, Characteristics at high and low temperature, Endurance, Shelf life, and Applicable standards.

Outline Drawing

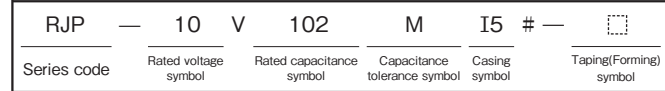
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Table with 5 columns: Frequency (Hz), 50-60, 120, 1k, 10k-100k. Rows show coefficients for different rated voltages.

Part numbering system (example : 10V1000μF)



Casing symbol

Table mapping Case phi D x L (mm) and Casing Symbol to Case phi D x L (mm) and Casing Symbol for various voltage and capacitance ratings.

Standard Ratings

Large table showing Standard Ratings with columns for Rated voltage (V) and Rated capacitance (μF), and rows for various capacitor types and sizes.

(Note) Rated ripple current : 105°C , 120Hz

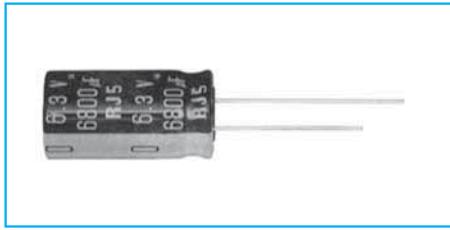
RJ5 MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS



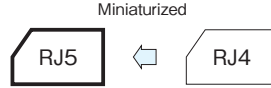
105°C Miniature Capacitors

GREEN CAP 105°C 1000hours Anti-cleaning solvent

• Case size is one rank smaller than Series RJ4.



Marking color : White print on a black sleeve

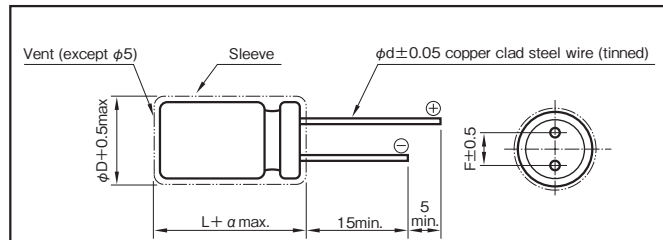


Specifications

Item	Performance																																							
Category temperature range (°C)	-55~+105	-40~+105																																						
Rated voltage (V)	6.3~100	160~450																																						
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	±20 (20°C, 120Hz)																																						
Leakage current (µA)	Less than 0.03CV or 4 whichever is larger (after 1 minute) Less than 0.01CV or 3 whichever is larger (after 2 minutes) (20°C)	CV≤1000 : Less than 0.1CV+40 (after 1 minute) CV>1000 : Less than 0.04CV+100 (after 1 minute) (20°C)																																						
Tangent of loss angle (tanδ)	C : Rated capacitance (µF) V : Rated voltage (V)																																							
	<table border="1"> <tr> <th>Rated voltage (V)</th><th>6.3</th><th>10</th><th>16</th><th>25</th><th>35</th><th>50</th><th>63</th><th>100</th></tr> <tr> <th>tanδ (max.)</th><td>0.34</td><td>0.26</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.08</td></tr> </table> <p>0.02 is added to every 1000µF increase over 1000µF. (20°C, 120Hz)</p>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	tanδ (max.)	0.34	0.26	0.20	0.16	0.14	0.12	0.10	0.08	<table border="1"> <tr> <th>Rated voltage (V)</th><th>160</th><th>200</th><th>250</th><th>315</th><th>350</th><th>400</th><th>450</th></tr> <tr> <th>tanδ (max.)</th><td>0.20</td><td>0.20</td><td>0.20</td><td>0.24</td><td>0.24</td><td>0.24</td><td>0.24</td></tr> </table> <p>(20°C, 120Hz)</p>	Rated voltage (V)	160	200	250	315	350	400	450	tanδ (max.)	0.20	0.20	0.20	0.24	0.24	0.24	0.24				
Rated voltage (V)	6.3	10	16	25	35	50	63	100																																
tanδ (max.)	0.34	0.26	0.20	0.16	0.14	0.12	0.10	0.08																																
Rated voltage (V)	160	200	250	315	350	400	450																																	
tanδ (max.)	0.20	0.20	0.20	0.24	0.24	0.24	0.24																																	
Characteristics at high and low temperature	<table border="1"> <tr> <th>Rated voltage (V)</th><th>6.3</th><th>10</th><th>16</th><th>25</th><th>35</th><th>50</th><th>63</th><th>100</th></tr> <tr> <th>Impedance ratio (max.)</th><td>Z-25°C/Z+20°C</td><td>5</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> <tr> <td></td><td>Z-40°C/Z+20°C</td><td>10</td><td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td></tr> </table> <p>(120Hz)</p>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	Impedance ratio (max.)	Z-25°C/Z+20°C	5	4	3	2	2	2	2		Z-40°C/Z+20°C	10	8	6	4	3	3	3	<table border="1"> <tr> <th>Rated voltage (V)</th><th>160 to 250</th><th>315 to 450</th></tr> <tr> <th>Impedance ratio (max.)</th><td>Z-25°C/Z+20°C</td><td>4</td><td>4</td></tr> <tr> <td></td><td>Z-40°C/Z+20°C</td><td>15</td><td>10</td></tr> </table> <p>(120Hz)</p>	Rated voltage (V)	160 to 250	315 to 450	Impedance ratio (max.)	Z-25°C/Z+20°C	4	4		Z-40°C/Z+20°C	15	10
	Rated voltage (V)	6.3	10	16	25	35	50	63	100																															
Impedance ratio (max.)	Z-25°C/Z+20°C	5	4	3	2	2	2	2																																
	Z-40°C/Z+20°C	10	8	6	4	3	3	3																																
Rated voltage (V)	160 to 250	315 to 450																																						
Impedance ratio (max.)	Z-25°C/Z+20°C	4	4																																					
	Z-40°C/Z+20°C	15	10																																					
Endurance (105°C) (Applied ripple current)	Test time	2000 hours (φ5 to φ8, 100V or less : 1000 hours)																																						
	Leakage current	The initial specified value or less																																						
	Percentage of capacitance change	Within ±20% of initial value																																						
	Tangent of the loss angle	200% or less of the initial specified value																																						
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment																																							
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																																							

Outline Drawing

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	≤100V : 1.5 ≥160V : 2.0	1.5	≤100V 12.5, 16L : 1.5 ≤100V 20L or ≥160 : 2.0	≤100V : 2.0 ≥160V : 2.5			

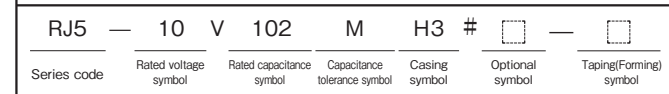
Casing symbol

Size	Casing Symbol	Size	Casing Symbol	Size	Casing Symbol	Size	Casing Symbol
φD×L (mm)		φD×L (mm)		φD×L (mm)		φD×L (mm)	
5×11	E3	10×12.5	H3	16×20	J5	18×20	K5
6.3×11	F3	10×16	H4	16×25	J6	18×25	K6
8×11.5	G3	10×20	H5	16×31.5	J7	18×31.5	K7
—	—	12.5×20	I5	16×35.5	J8	18×35.5	K8
—	—	12.5×25	I6	—	—	18×40	K9

Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Rated capacitance (µF)	Frequency (Hz)				
		50 - 60	120	1k	10k	100k
6.3 to 100	0.1 to 47	0.8	1	1.5	1.7	2.0
	100 to 220	0.8	1	1.2	1.3	1.4
	330 to 1000	0.8	1	1.2	1.2	1.3
	2200 to 22000	0.8	1	1.1	1.1	1.1
160 to 450	0.47 to 470	0.8	1	1.3	1.4	1.6

Part numbering system (example : 10V1000µF)



In the case of 160V and beyond, should put in optional symbol "B".

Standard Ratings

Rated capacitance (μF)	6.3		10		16		25		35		50		63		100	
	Item		Case		Case		Case		Case		Case		Case		Case	
	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)
1	—	—	—	—	—	—	—	—	—	—	5×11	15	—	—	5×11	15
2.2	—	—	—	—	—	—	—	—	—	—	5×11	22	—	—	5×11	21
3.3	—	—	—	—	—	—	—	—	—	—	5×11	27	—	—	5×11	29
4.7	—	—	—	—	—	—	—	—	—	—	5×11	32	—	—	5×11	32
10	—	—	—	—	—	—	—	—	—	—	5×11	47	—	—	5×11	50
22	—	—	—	—	—	—	—	—	—	—	5×11	70	5×11	71	6.3×11	93
33	—	—	—	—	—	—	—	—	—	—	5×11	90	6.3×11	100	8×11.5	130
47	—	—	—	—	—	—	—	—	5×11	93	6.3×11	115	6.3×11	120	8×11.5	140
68	—	—	—	—	—	—	—	—	6.3×11	110	6.3×11	150	8×11.5	155	10×12.5	190
100	—	—	—	—	—	—	5×11	125	6.3×11	151	8×11.5	190	8×11.5	200	10×16	240
220	—	—	5×11	155	6.3×11	190	6.3×11	200	8×11.5	270	10×12.5	314	10×16	335	12.5×20	390
330	—	—	6.3×11	210	6.3×11	225	8×11.5	310	10×12.5	384	10×16	421	10×20	510	—	—
470	—	—	6.3×11	250	8×11.5	323	10×12.5	429	10×16	470	10×20	540	12.5×20	640	16×25	715
1000	8×11.5	398	10×12.5	460	10×12.5	500	10×16	610	12.5×20	857	12.5×25	1000	16×25	930	18×35.5	960
2200	10×16	635	10×16	705	10×20	710	12.5×25	1180	16×25	1380	16×31.5	1410	18×35.5	1650	—	—
3300	10×20	882	12.5×20	1010	12.5×25	1200	16×25	1440	16×31.5	1500	18×35.5	1990	—	—	—	—
4700	12.5×20	1120	12.5×25	1260	16×25	1500	16×25	1570	16×35.5	1780	—	—	—	—	—	—
6800	12.5×25	1380	16×25	1570	16×25	1600	16×35.5	1850	18×40	2000	—	—	—	—	—	—
10000	16×25	1750	16×31.5	1820	16×35.5	1930	18×40	2000	—	—	—	—	—	—	—	—
15000	16×31.5	1820	16×35.5	2050	18×40	2210	—	—	—	—	—	—	—	—	—	—
22000	18×35.5	2280	18×40	2420	—	—	—	—	—	—	—	—	—	—	—	—

Rated capacitance (μF)	160		200		250		315		350		400		450	
	Item		Case		Case		Case		Case		Case		Case	
	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)	φD×L (mm)	Rated ripple current (mAmps)
1	—	—	—	—	—	—	—	—	—	—	—	—	6.3×11	12
2.2	—	—	—	—	—	—	6.3×11	21	6.3×11	21	—	—	8×11.5	20
3.3	—	—	—	—	6.3×11	35	6.3×11	26	6.3×11	26	—	—	10×12.5	41
4.7	—	—	6.3×11	42	6.3×11	42	8×11.5	35	8×11.5	35	8×11.5	35	10×12.5	49
10	6.3×11	61	8×11.5	72	8×11.5	72	10×16	74	10×16	67	10×16	67	10×20	86
22	10×12.5	125	10×16	135	10×16	135	12.5×20	135	12.5×20	140	12.5×20	140	12.5×25	170
33	10×16	170	10×20	185	12.5×20	210	12.5×25	195	12.5×25	195	12.5×25	195	16×20	225
47	10×20	220	—	—	12.5×20	250	—	—	—	—	16×25	350	16×25	296
68	12.5×25	330	12.5×20	305	16×20	355	18×20	350	16×31.5	390	16×31.5	460	16×31.5	390
100	16×20	430	12.5×25	400	16×25	465	16×35.5	500	16×35.5	500	18×20	350	18×25	380
120	16×25	510	16×20	430	18×20	465	18×25	460	18×25	460	18×31.5	505	18×35.5	540
150	16×25	570	16×25	510	16×31.5	560	18×31.5	560	18×31.5	560	18×35.5	588	18×40	615
180	18×25	675	18×20	510	16×35.5	655	18×35.5	648	18×35.5	648	18×40	688	—	—
220	18×25	745	18×25	570	18×25	615	18×25	615	18×40	688	—	—	—	—
330	—	—	16×31.5	685	18×31.5	735	18×40	750	—	—	—	—	—	—
470	18×40	1300	18×25	675	18×35.5	790	18×35.5	855	—	—	—	—	—	—
—	—	—	16×35.5	790	—	—	—	—	—	—	—	—	—	—
—	—	—	18×31.5	810	—	—	—	—	—	—	—	—	—	—
—	—	—	18×40	1090	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

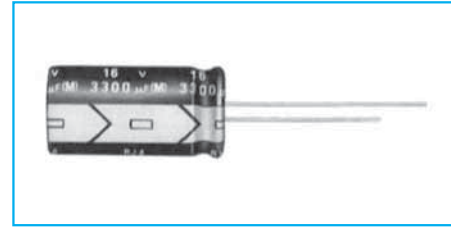
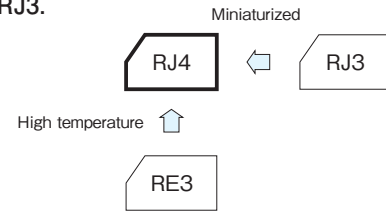
(Note) Rated ripple current : 105°C , 120Hz

Aluminum Electrolytic Capacitors

105°C Miniature Capacitors

GREEN CAP 105°C 2000hours Anti-cleaning solvent 250V Max.

- Case size is one rank smaller than Series RJ3.
- Guarantees 2000 hours at 105°C. ($\phi 5$ to $\phi 8$: 1000 hours)



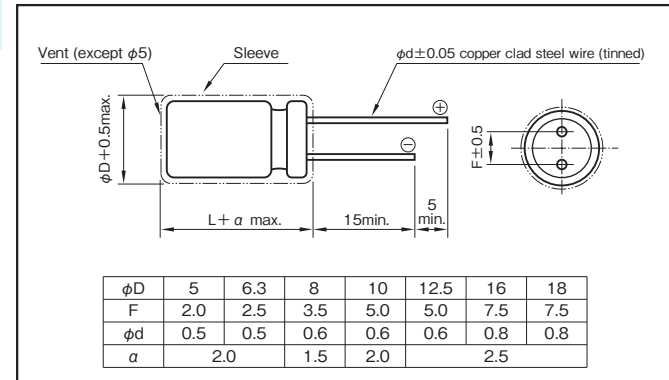
Marking color : White print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-55 to +105	-40 to +105
Rated voltage (V)	6.3 to 100	160 to 450
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	±20 (20°C,120Hz)
Leakage current (µA)	Less than 0.03CV or 4 whichever is larger (after 1 minute) Less than 0.01CV or 3 whichever is larger (after 2 minutes) (20°C)	CV≤1000 : Less than 0.1CV+40 (after 1 minute) CV>1000 : Less than 0.04CV+100 (after 1 minute) (20°C)
C: Rated capacitance (µF) V: Rated voltage (V)		
Tangent of loss angle (tanδ)	Rated voltage (V) 6.3 10 16 25 35 50 63 100 tanδ (max.) 0.28 0.24 0.20 0.16 0.14 0.12 0.10 0.08 0.02 is added to every 1000µF increase over 1000µF (20°C,120Hz)	Rated voltage (V) 160 200 250 315 350 400 450 tanδ (max.) 0.20 0.20 0.20 0.24 0.24 0.24 0.24 (20°C,120Hz)
	0.02 is added to every 1000µF increase over 1000µF (20°C,120Hz)	
Characteristics at high and low temperature	Rated voltage (V) 6.3 10 16 25 35 50 63 100 Impedance ratio (max.) Z-25°C/Z+20°C 5 4 3 2 2 2 2 2 Z-40°C/Z+20°C 10 8 6 4 3 3 3 3 (120Hz)	Rated voltage (V) 160 to 250 315 to 450 Impedance ratio (max.) Z-25°C/Z+20°C 4 4 Z-40°C/Z+20°C 15 10 (120Hz)
Endurance (105°C) (Applied ripple current)	Test time	2000 hours ($\phi 5$ to $\phi 8$: 1000 hours)
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment	
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)	

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	Rated capacitance (µF)					
		50 · 60	120	1k	10k	100k	
6.3 to 100	0.1 to 47	0.8	1	1.5	1.7	2.0	
	100 to 220	0.8	1	1.2	1.3	1.4	
	330 to 1000	0.8	1	1.2	1.2	1.3	
	2200 to 22000	0.8	1	1.1	1.1	1.1	
160 to 450	0.47 to 330	0.8	1	1.3	1.4	1.6	

Part numbering system (example : 16V2200µF)

RJ4	—	16	V	222	M	I5	#	□	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol			Taping/Forming symbol

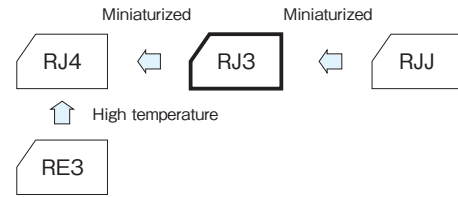
Casing symbol

Size φD×L (mm)	Casing Symbol	Size φD×L (mm)	Casing Symbol
5×11	E3	12.5×25	I6
6.3×11	F3	16×25	J6
8×11.5	G3	16×31.5	J7
10×12.5	H3	16×35.5	J8
10×16	H4	18×31.5	K7
10×20	H5	18×35.5	K8
12.5×20	I5	18×40	K9

105°C Use, Standard Capacitors

GREEN CAP 105°C 2000hours Anti-cleaning solvent 250V Max.

• Guarantees 2000 hours at 105°C (φ5~8 : 1000 hours).



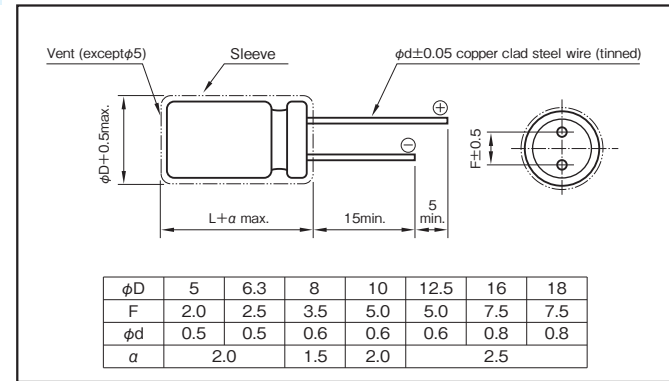
Marking color : White print on a black sleeve

Specifications

Item	Performance																																					
	−55 to +105	−40 to +105																																				
Category temperature range (°C)	−55 to +105	−40 to +105																																				
Rated voltage (V)	6.3 to 100	160 to 450																																				
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	±20 (20°C, 120Hz)																																				
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) (20°C)																																					
	CV ≤ 1000 : Less than 0.1CV+40 (after 1 minute) CV > 1000 : Less than 0.04CV+100 (after 1 minute) (20°C)																																					
Tangent of loss angle (tanδ)	C : Rated capacitance (µF) V : Rated voltage (V)																																					
	<table border="1"> <tr><td>Rated voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr> <tr><td>tanδ (max.)</td><td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td></tr> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	<table border="1"> <tr><td>Rated voltage (V)</td><td>160</td><td>200</td><td>250</td><td>315</td><td>350</td><td>400</td></tr> <tr><td>tanδ (max.)</td><td>0.15</td><td>0.15</td><td>0.15</td><td>0.20</td><td>0.20</td><td>0.20</td></tr> </table>	Rated voltage (V)	160	200	250	315	350	400	tanδ (max.)	0.15	0.15	0.15	0.20	0.20	0.20				
	Rated voltage (V)	6.3	10	16	25	35	50	63	100																													
tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08																														
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0.02 is added to every 1000µF increase over 1000µF (20°C, 120Hz)																																						
Characteristics at high and low temperature	<table border="1"> <tr><td>Rated voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td></tr> <tr><td>Impedance ratio (max.) Z−25°C/Z+20°C</td><td>5</td><td>4</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr> <tr><td>Z−55°C/Z+20°C</td><td>10</td><td>8</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td></tr> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	Impedance ratio (max.) Z−25°C/Z+20°C	5	4	3	2	2	2	2	2	Z−55°C/Z+20°C	10	8	6	4	3	3	3	3	<table border="1"> <tr><td>Rated voltage (V)</td><td>160 to 250</td><td>315 to 400</td></tr> <tr><td>Impedance ratio (max.) Z−25°C/Z+20°C</td><td>3</td><td>3</td></tr> <tr><td>Z−40°C/Z+20°C</td><td>8</td><td>6</td></tr> </table>	Rated voltage (V)	160 to 250	315 to 400	Impedance ratio (max.) Z−25°C/Z+20°C	3	3	Z−40°C/Z+20°C	8	6
	Rated voltage (V)	6.3	10	16	25	35	50	63	100																													
Impedance ratio (max.) Z−25°C/Z+20°C	5	4	3	2	2	2	2	2																														
Z−55°C/Z+20°C	10	8	6	4	3	3	3	3																														
Rated voltage (V)	160 to 250	315 to 400																																				
Impedance ratio (max.) Z−25°C/Z+20°C	3	3																																				
Z−40°C/Z+20°C	8	6																																				
Endurance (105°C) (Applied ripple current)	Test time	2000 hours (φ5 to φ8 : 1000 hours)																																				
	Leakage current	The initial specified value or less																																				
	Percentage of capacitance change	Within ±20% of initial value																																				
	Tangent of the loss angle	200% or less of the initial specified value																																				
Shelf life (105°C)	Test time : 1000 hours; other items are the same as those for the endurance. Voltage application treatment																																					
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																																					

Outline Drawing

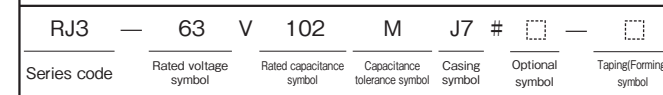
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Rated capacitance (µF)	Frequency (Hz)					
		50 · 60	120	1k	10k	100k	
6.3 to 100	0.1 to 4.7	—	0.4	0.7	0.8	1	
	10 to 47	—	0.5	0.8	0.9	1	
	100 to 220	—	0.7	0.9	0.9	1	
	330 to 1000	—	0.8	0.9	1.0	1	
	2200 to 15000	—	0.9	1.0	1	1	
160 to 400	0.47 to 220	0.8	1	1.3	1.4	1.6	

Part numbering system (example : 63V1000µF)



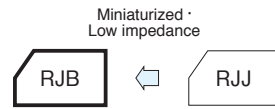
Casing symbol

Size φD×L (mm)	Casing Symbol	Size φD×L (mm)	Casing Symbol
5×11	E3	12.5×25	I6
6.3×11	F3	16×25	J6
8×11.5	G3	16×31.5	J7
10×12.5	H3	16×35.5	J8
10×16	H4	18×35.5	K8
10×20	H5	18×40	K9
12.5×20	I5		

105°C Use, Miniature, High-Reliability, Low Impedance Capacitors

GREEN CAP Low impedance 105°C 5000hours Anti-cleaning solvent

- Smaller and higher ripple current than RJB Series.
- Guarantees 5000 hours at 105°C.
(φ 5 to 6.3 : 2000 hours ; φ 8 to 10 : 3000 hours)



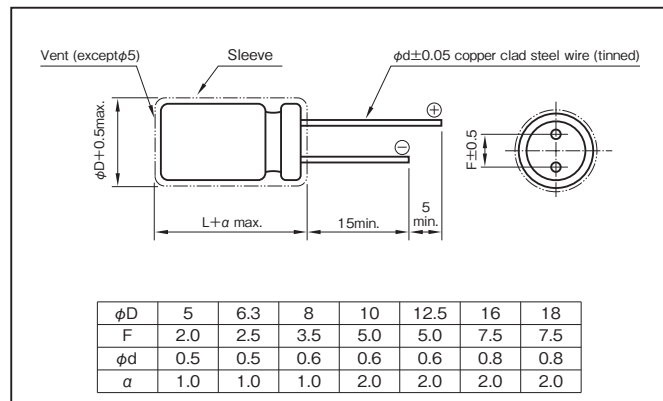
Marking color : White print on a black sleeve

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)
Leakage current (μA)	Less than 0.01CV + 2 (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Characteristics at high and low temperature	Rated voltage (V)
	Impedance ratio (max.)
Endurance (105°C) (Applied ripple current)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Shelf life (105°C)	Test time
	Leakage current
	Percentage of capacitance change
	Tangent of the loss angle
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (μF)	Frequency (Hz)			
	120	1k	10k	100k
0.47 to 180	0.40	0.75	0.90	1
220 to 390	0.50	0.85	0.95	1
470 to 1800	0.60	0.88	0.96	1
2200 to 3900	0.75	0.90	0.98	1
4700 to 10000	0.85	0.95	1	1

Part numbering system (example : 10V1000μF)

RJB	—	10	V	102	M	H4	#	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping/Forming symbol

- The electric characteristics are described on page 172.

Standard Ratings

Rated voltage (V) Rated capacitance (µF)	Item φD×L (mm)	Case φD×L (mm)	6.3			10				16					
			Casing symbol	Impedance (Ω max.)		Rated ripple current (mAmps)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)		Rated ripple current (mAmps)
				20°C	-10°C				20°C	-10°C			20°C	-10°C	
100	—	—	—	—	—	5×11.5	E3	0.65	1.3	181	—	—	—	—	
220	—	—	—	—	—	6.3×11.5	F3	0.32	0.64	290	—	—	—	—	
330	6.3×11.5	F3	0.32	0.64	290	8×12	G3	0.17	0.34	555	8×12	G3	0.17	0.34	555
470	8×12	G3	0.17	0.34	555	8×12	G3	0.17	0.34	555	10×12.5	H3	0.12	0.24	760
680	8×12	G3	0.17	0.34	555	10×12.5	H3	0.12	0.24	760	10×16	H4	0.080	0.16	1050
1000	10×12.5	H3	0.12	0.24	760	10×16	H4	0.080	0.16	1050	10×20	H5	0.062	0.124	1220
2200	10×25	H6	0.052	0.104	1440	12.5×20	I5	0.042	0.084	1690	12.5×25	I6	0.034	0.068	1950
3300	12.5×20	I5	0.042	0.084	1690	12.5×25	I6	0.034	0.068	1950	16×25	J6	0.028	0.056	2560
4700	12.5×30	I7	0.030	0.060	2310	16×25	J6	0.028	0.056	2560	16×31.5	J7	0.025	0.050	3010
6800	16×25	J6	0.028	0.056	2560	16×31.5	J7	0.025	0.050	3010	—	—	—	—	
10000	16×31.5	J7	0.025	0.050	3010	—	—	—	—	—	—	—	—	—	

Rated voltage (V) Rated capacitance (µF)	Item φD×L (mm)	Case φD×L (mm)	25			35				50					
			Casing symbol	Impedance (Ω max.)		Rated ripple current (mAmps)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)		Case φD×L (mm)	Casing symbol	Impedance (Ω max.)		Rated ripple current (mAmps)
				20°C	-10°C				20°C	-10°C			20°C	-10°C	
22	—	—	—	—	—	—	—	—	—	—	5×11.5	E3	0.95	1.9	170
33	—	—	—	—	—	5×11.5	E3	0.65	1.3	181	6.3×11.5	F3	0.46	0.92	260
47	5×11.5	E3	0.65	1.3	181	6.3×11.5	F3	0.32	0.64	290	6.3×11.5	F3	0.46	0.92	260
100	6.3×11.5	F3	0.32	0.64	290	8×12	G3	0.17	0.34	555	8×12	G3	0.21	0.42	485
150	—	—	—	—	—	—	—	—	—	—	10×12.5	H3	0.19	0.38	615
220	8×12	G3	0.17	0.34	555	10×12.5	H3	0.12	0.24	760	10×16	H4	0.16	0.32	850
330	10×12.5	H3	0.12	0.24	760	10×16	H4	0.080	0.16	1050	10×20	H5	0.085	0.17	1050
470	10×16	H4	0.080	0.16	1050	10×20	H5	0.062	0.124	1220	12.5×20	I5	0.060	0.12	1500
680	10×20	H5	0.062	0.124	1220	12.5×20	I5	0.042	0.084	1690	12.5×25	I6	0.045	0.090	1832
1000	12.5×20	I5	0.042	0.084	1690	12.5×25	I6	0.034	0.068	1950	16×25	J6	0.038	0.076	2240
2200	16×25	J6	0.028	0.056	2560	16×31.5	J7	0.025	0.050	3010	—	—	—	—	
3300	16×31.5	J7	0.025	0.050	3010	—	—	—	—	—	—	—	—	—	

Rated voltage (V) Rated capacitance (µF)	Item φD×L (mm)	Case φD×L (mm)	6.3			100					
			Casing symbol	Impedance (Ω max.)		Rated ripple current (mAmps)	Case φD×L (mm)	Casing symbol	Impedance (Ω max.)		Rated ripple current (mAmps)
				20°C	-10°C				20°C	-10°C	
3.3	—	—	—	—	—	5×11.5	E3	1.9	7.6	57	
4.7	5×11.5	E3	1.2	3.6	120	5×11.5	E3	1.9	7.6	57	
10	5×11.5	E3	1.2	3.6	120	6.3×11.5	F3	1.1	4.4	78	
22	6.3×11.5	F3	0.55	1.7	148	8×12	G3	0.53	2.1	275	
33	6.3×11.5	F3	0.55	1.7	148	10×12.5	H3	0.47	1.9	319	
47	8×12	G3	0.32	0.96	360	10×16	H4	0.32	1.3	424	
100	10×12.5	H3	0.23	0.69	448	12.5×20	I5	0.13	0.52	805	
220	10×20	H5	0.12	0.36	676	16×25	J6	0.081	0.32	1290	
330	12.5×20	I5	0.075	0.23	979	16×25	J6	0.081	0.32	1290	
470	12.5×25	I6	0.065	0.20	1180	16×31.5	J7	0.059	0.23	1630	
1000	16×31.5	J7	0.042	0.13	1890	—	—	—	—	—	

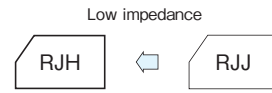
(Note) Impedance : 100kHz ; Rated ripple current : 105°C, 100kHz

Miniature Aluminum Electrolytic Capacitors

105°C Use, High-Reliability, Low Impedance Capacitors

- GREEN CAP
- Low Impedance
- 105°C 5000hours
- Anti-cleaning solvent

- The capacitor of this Series achieves high reliability under the environmental loading prevailing in a piece of equipment on which it is mounted.
- Guarantees 5000 hours at 105°C.
(φ5 to 6.3 : 2000 hours ; φ8 to 10 : 3000 hours)



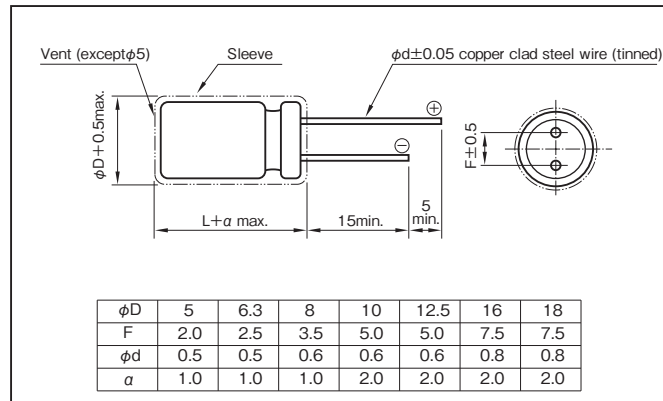
Marking color : White print on a black sleeve

Specifications

Item	Performance																										
Category temperature range (°C)	-55 to +105																										
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)																										
Leakage current (μA)	Less than 0.01CV + 2 (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)																										
Tangent of loss angle (tanδ)	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.08</td> <td>0.07</td> </tr> </tbody> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07								
	Rated voltage (V)	6.3	10	16	25	35	50	63	100																		
tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.08	0.07																			
0.02 is added to every 1000μF increase over 1000μF. (20°C,120Hz)																											
Characteristics at high and low temperature	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance ratio (max.)</td> <td>Z-25°C/Z+20°C</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-55°C/Z+20°C</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	100	Impedance ratio (max.)	Z-25°C/Z+20°C	2	2	2	2	2	2	2	Z-55°C/Z+20°C	3	3	3	3	3	3	3
	Rated voltage (V)	6.3	10	16	25	35	50	63	100																		
Impedance ratio (max.)	Z-25°C/Z+20°C	2	2	2	2	2	2	2																			
	Z-55°C/Z+20°C	3	3	3	3	3	3	3																			
(120Hz)																											
Endurance (105°C) (Applied ripple current)	Test time	5000 hours (φ5 to 6.3 : 2000 hours) (φ8 to 10 : 3000 hours)																									
	Leakage current	The initial specified value or less																									
	Percentage of capacitance change	Within ±20% of initial value																									
	Tangent of the loss angle	200% or less of the initial specified value																									
Shelf life (105°C)	Test time	1000 hours																									
	Leakage current	The initial specified value or less																									
	Percentage of capacitance change	Within ±15% of initial value																									
	Tangent of the loss angle	150% or less of the initial specified value																									
Voltage application treatment																											
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																										

Outline Drawing

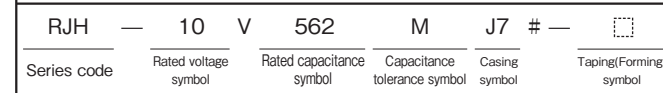
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
0.47 to 4.7	0.40	0.68	0.78	1
5.6 to 47	0.50	0.76	0.87	1
56 to 270	0.70	0.85	0.90	1
330 to 1000	0.80	0.93	0.98	1
1200 to 15000	0.90	0.95	1	1

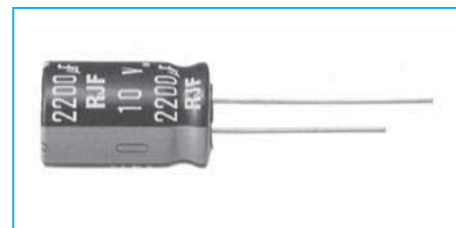
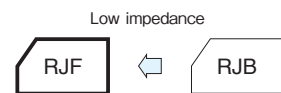
Part numbering system (example : 10V5600μF)



105°C Use, Miniature, High-Reliability, Extra Low Impedance Capacitors

GREEN CAP Low Impedance 105°C 5000hours Anti-cleaning solvent

- Higher ripple current than RJB Series.



Marking color : White print on a black sleeve

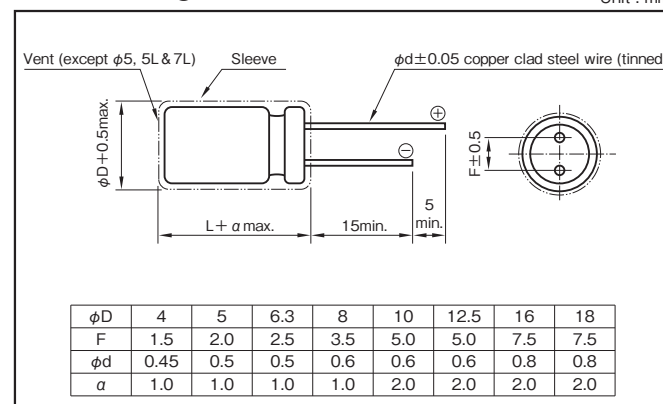
Specifications

Item	Performance																													
Category temperature range (°C)	-40 to +105																													
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																													
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)																													
Tangent of loss angle (tanδ)	<table border="1"> <tr> <th>Rated voltage (V)</th> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td> </tr> <tr> <th>tanδ (max.)</th> <td>0.22</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.09</td><td>0.08</td> </tr> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100	tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.09	0.08									
	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100																				
tanδ (max.)	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.09	0.08																					
0.02 is added to every 1000µF increase over 1000µF. (20°C, 120Hz)																														
Characteristics at high and low temperature	<table border="1"> <tr> <th>Rated voltage (V)</th> <td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td> </tr> <tr> <th rowspan="2">Impedance ratio (max.)</th> <th>Z-25°C/Z+20°C</th> <td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td> </tr> <tr> <th>Z-40°C/Z+20°C</th> <td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td> </tr> </table>	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100	Impedance ratio (max.)	Z-25°C/Z+20°C	2	2	2	2	2	2	2	2	Z-40°C/Z+20°C	3	3	3	3	3	3	3	3
	Rated voltage (V)	6.3	10	16	25	35	50	63	80	100																				
Impedance ratio (max.)	Z-25°C/Z+20°C	2	2	2	2	2	2	2	2																					
	Z-40°C/Z+20°C	3	3	3	3	3	3	3	3																					
(120Hz)																														
Endurance (105°C) (Applied ripple current)	<table border="1"> <tr> <th>Test time</th> <td>5L & 7L : 1000 hours φ5 & φ6.3 : 2000 hours (63 to 100WV:5000 hours) φ8 & φ10 : 3000 hours (63 to 100WV:7000 hours) φ12.5 to φ18 : 5000 hours (63 to 100WV:10000 hours)</td> </tr> <tr> <th>Leakage current</th> <td>The initial specified value or less</td> </tr> <tr> <th>Percentage of capacitance change</th> <td>Within ±25% of initial value</td> </tr> <tr> <th>Tangent of the loss angle</th> <td>200% or less of the initial specified value</td> </tr> </table>	Test time	5L & 7L : 1000 hours φ5 & φ6.3 : 2000 hours (63 to 100WV:5000 hours) φ8 & φ10 : 3000 hours (63 to 100WV:7000 hours) φ12.5 to φ18 : 5000 hours (63 to 100WV:10000 hours)	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±25% of initial value	Tangent of the loss angle	200% or less of the initial specified value																					
	Test time	5L & 7L : 1000 hours φ5 & φ6.3 : 2000 hours (63 to 100WV:5000 hours) φ8 & φ10 : 3000 hours (63 to 100WV:7000 hours) φ12.5 to φ18 : 5000 hours (63 to 100WV:10000 hours)																												
	Leakage current	The initial specified value or less																												
	Percentage of capacitance change	Within ±25% of initial value																												
Tangent of the loss angle	200% or less of the initial specified value																													
Shelf life (105°C)	<table border="1"> <tr> <th>Test time</th> <td>1000 hours</td> </tr> <tr> <th>Leakage current</th> <td>The initial specified value or less</td> </tr> <tr> <th>Percentage of capacitance change</th> <td>Within ±25% of initial value</td> </tr> <tr> <th>Tangent of the loss angle</th> <td>200% or less of the initial specified value</td> </tr> </table>	Test time	1000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±25% of initial value	Tangent of the loss angle	200% or less of the initial specified value																					
	Test time	1000 hours																												
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	Percentage of capacitance change	Within ±25% of initial value																												
Tangent of the loss angle	200% or less of the initial specified value																													
Voltage application treatment																														
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																													

Aluminum Electrolytic Capacitors

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (µF)	Frequency (Hz)	120	1k	10k	100k
5.6 to 180		0.40	0.75	0.90	1
220 to 390		0.50	0.85	0.94	1
470 to 1800		0.60	0.87	0.95	1
2200 to 3900		0.75	0.90	0.95	1
4700 to 6800		0.85	0.95	0.98	1

Part numbering system (example : 10V1000µF)

RJF	—	10	V	102	M	H4	#	—	
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping(Forming) symbol

• The electric characteristics are described on page 172.

• The standard ratings are described on the next page.

Standard Ratings

Rated voltage (V)	Item	6.3					10					16				
		Case	Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)
				20°C	-10°C				20°C	-10°C				20°C	-10°C	
18											4x7	D1	0.92	2.8	130	
27						4x7	D1	0.89	2.7	130	6.3x5	F0	0.30	0.95	210	
33											5x7	E1	0.45	1.4	210	
39	4x7	D1	0.85	2.6	130						6.3x5	F0	0.30	0.95	210	
47						6.3x5	F0	0.29	0.93	210						
56						5x7	E1	0.44	1.4	210	5x11.5	E3	0.22	0.80	345	
68	5x7	E1	0.43	1.3	210						6.3x7	F1	0.24	0.72	300	
100	6.3x5	F0	0.28	0.91	210	5x11.5	E3	0.22	0.8	345						
120						6.3x7	F1	0.23	0.69	300	8x7	G1	0.15	0.45	380	
150	5x11.5	E3	0.22	0.80	345						6.3x11.5	F3	0.094	0.35	540	
180	6.3x7	F1	0.23	0.69	300											
220						8x7	G1	0.15	0.45	380						
330	6.3x11.5	F3	0.094	0.35	540	6.3x11.5	F3	0.094	0.35	540						
470						8x12	G3	0.056	0.19	945	8x15	G4	0.045	0.15	1250	
560	8x12	G3	0.056	0.19	945						10x16	H4	0.028	0.10	1760	
680						10x12.5	H3	0.039	0.14	1330						
820	8x15	G4	0.046	0.15	1250											
1000	10x12.5	H3	0.039	0.14	1330	10x16	H4	0.028	0.10	1760	10x20	H5	0.020	0.060	1960	
1200	10x16	H4	0.028	0.10	1760	10x20	H5	0.020	0.060	1960	10x25	H6	0.018	0.054	2250	
1500	10x20	H5	0.020	0.060	1960	10x25	H6	0.018	0.054	2250	12.5x20	I5	0.017	0.043	2480	
2200	10x25	H6	0.018	0.054	2250	12.5x20	I5	0.017	0.043	2480	12.5x25	I6	0.015	0.038	2900	
2700											16x20	J5	0.015	0.038	3250	
3300	12.5x20	I5	0.017	0.043	2480	12.5x25	I6	0.015	0.038	2900	16x25	J6	0.013	0.035	3630	
3900	12.5x25	I6	0.015	0.038	2900	16x20	J5	0.015	0.038	3250	16x25	J6	0.013	0.035	3630	
4700	12.5x30	I7	0.013	0.033	3450	16x25	J6	0.013	0.035	3630						
5600	16x20	J5	0.015	0.038	3570	16x25	J6	0.013	0.035	3630						
6800	16x25	J6	0.013	0.035	3630											

Rated voltage (V)	Item	25					35					50				
		Case	Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)
				20°C	-10°C				20°C	-10°C				20°C	-10°C	
5.6											4x7	D1	1.0	3.0	130	
10	5x5	E0	0.61	1.5	130	5x5	E0	0.63	1.5	130	5x7	E1	0.50	1.5	210	
15	4x7	D1	0.94	2.9	130	4x7	D1	0.96	2.9	130						
18						5x7	E1	0.47	1.5	210						
22	6.3x5	F0	0.31	0.97	210	6.3x5	F0	0.32	1.0	210	6.3x7	F1	0.26	0.78	300	
27	5x7	E1	0.46	1.4	210						5x11.5	E3	0.34	1.18	238	
33						5x11.5	E3	0.22	0.80	345	8x7	G1	0.17	0.51	380	
39						6.3x7	F1	0.25	0.75	300						
47	5x11.5	E3	0.22	0.80	345											
56	6.3x7	F1	0.24	0.72	300	8x7	G1	0.16	0.48	380	6.3x11.5	F3	0.14	0.50	385	
100	6.3x7	F1	0.24	0.72	300	6.3x11.5	F3	0.094	0.35	540						
100	8x7	G1	0.15	0.45	380						8x12	G3	0.074	0.22	724	
120	6.3x11.5	F3	0.13	0.41	405											
150						8x12	G3	0.056	0.19	945	10x12.5	H3	0.061	0.18	979	
180											8x20	G5	0.046	0.14	1190	
220	8x12	G3	0.056	0.19	945	10x12.5	H3	0.039	0.14	1330	10x16	H4	0.042	0.12	1370	
270						8x20	G5	0.029	0.11	1500	10x20	H5	0.030	0.090	1580	
330	10x12.5	H3	0.039	0.14	1330	10x16	H4	0.028	0.10	1760	10x25	H6	0.028	0.085	1870	
470	10x16	H4	0.028	0.10	1760	10x20	H5	0.020	0.060	1960	12.5x20	I5	0.027	0.068	2050	
560						10x25	H6	0.018	0.054	2250	12.5x25	I6	0.023	0.059	2410	
680	10x20	H5	0.020	0.060	1960	12.5x20	I5	0.017	0.043	2480	16x20	J5	0.023	0.059	2730	
820	10x25	H6	0.018	0.054	2250						16x20	J5	0.023	0.059	2730	
1000	12.5x20	I5	0.017	0.043	2480	12.5x25	I6	0.015	0.038	2900	16x25	J6	0.021	0.056	3010	
1200						16x20	J5	0.015	0.038	3250						
1500	12.5x25	I6	0.015	0.038	2900	16x25	J6	0.013	0.035	3630						
1800	16x20	J5	0.015	0.038	3250	16x25	J6	0.013	0.035	3630						
2200	16x25	J6	0.013	0.035	3630											
2700	16x25	J6	0.013	0.035	3630											

(Note) Impedance : 100kHz Rated ripple current : 105°C, 100kHz

Standard Ratings

Rated voltage (V)	Item	63					80					100						
		Case		Impedance (Ω max.)	Rated ripple current (mA _{rms})		Case		Impedance (Ω max.)	Rated ripple current (mA _{rms})		Case		Impedance (Ω max.)	Rated ripple current (mA _{rms})			
		φD	L				Casing symbol	20°C				-10°C	φD				L	Casing symbol
6.8	-	-	-	-	-	-	-	-	-	-	-	-	5	11.5	E3	1.40	5.60	125
15	5	11.5	E3	0.88	3.50	165	-	-	-	-	-	-	6.3	11.5	F3	0.57	2.30	205
27	-	-	-	-	-	-	-	-	-	-	-	-	8	12	G3	0.36	1.40	335
33	6.3	11.5	F3	0.35	1.40	265	-	-	-	-	-	-	-	-	-	-	-	-
39	-	-	-	-	-	-	-	-	-	-	-	-	8	15	G4	0.25	1.00	450
47	-	-	-	-	-	-	-	-	-	-	-	-	10	12.5	H3	0.17	0.66	480
56	8	12	G3	0.22	0.88	500	-	-	-	-	-	-	8	20	G5	0.19	0.76	565
68	-	-	-	-	-	-	10	12.5	H3	0.17	0.66	480	10	16	H4	0.11	0.47	600
82	10	12.5	H3	0.11	0.44	690	-	-	-	-	-	-	10	20	H5	0.084	0.34	800
100	-	-	-	-	-	-	10	16	H4	0.11	0.47	600	12.5	15	I4	0.11	0.34	750
120	8	20	G5	0.12	0.48	820	10	20	H5	0.084	0.34	800	10	25	H6	0.069	0.28	900
	10	16	H4	0.076	0.31	950	-	-	-	-	-	-	-	-	-	-	-	-
150	-	-	-	-	-	-	10	25	H6	0.069	0.28	900	12.5	20	I5	0.062	0.18	1100
180	10	20	H5	0.056	0.23	1150	-	-	-	-	-	-	-	-	-	-	-	-
220	10	25	H6	0.046	0.19	1350	12.5	20	I5	0.062	0.18	1100	16	20	J5	0.048	0.15	1350
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	12.5	20	I5	0.041	0.13	1500	-	-	-	-	-	-	12.5	30	I7	0.042	0.13	1500
330	-	-	-	-	-	-	12.5	25	I6	0.047	0.14	1250	12.5	35	I8	0.036	0.11	1650
	-	-	-	-	-	-	16	20	J5	0.048	0.15	1350	16	25	J6	0.038	0.12	1700
	-	-	-	-	-	-	-	-	-	-	-	-	18	20	K5	0.045	0.14	1500
390	12.5	25	I6	0.031	0.093	1900	12.5	30	I7	0.042	0.13	1500	12.5	40	I9	0.032	0.095	1800
470	12.5	30	I7	0.028	0.084	2300	12.5	35	I8	0.036	0.11	1650	16	31.5	J7	0.032	0.095	1850
	16	20	J5	0.032	0.096	2000	16	25	J6	0.038	0.12	1700	18	25	K6	0.036	0.11	1750
	-	-	-	-	-	-	18	20	K5	0.045	0.14	1500	-	-	-	-	-	-
560	12.5	35	I8	0.024	0.07	2500	-	-	-	-	-	-	16	35.5	J8	0.029	0.086	2000
	-	-	-	-	-	-	-	-	-	-	-	-	18	31.5	K7	0.030	0.090	1900
680	12.5	40	I9	0.021	0.063	2800	16	31.5	J7	0.032	0.095	1850	16	40	J9	0.027	0.081	2480
	16	25	J6	0.025	0.075	2600	-	-	-	-	-	-	18	35.5	K8	0.027	0.081	2200
	18	20	K5	0.030	0.090	2500	-	-	-	-	-	-	-	-	-	-	-	-
820	16	31.5	J7	0.021	0.063	2850	16	35.5	J8	0.029	0.086	2000	18	40	K9	0.026	0.077	2700
	18	25	K6	0.024	0.072	2800	18	31.5	K7	0.030	0.090	1900	-	-	-	-	-	-
1000	16	35.5	J8	0.019	0.057	2900	-	-	-	-	-	-	-	-	-	-	-	-
1200	16	40	J9	0.018	0.054	3400	18	40	K9	0.026	0.077	2700	-	-	-	-	-	-
	18	31.5	K7	0.020	0.060	3300	-	-	-	-	-	-	-	-	-	-	-	-
1500	18	35.5	K8	0.018	0.054	3400	-	-	-	-	-	-	-	-	-	-	-	-
1800	18	40	K9	0.017	0.051	3500	-	-	-	-	-	-	-	-	-	-	-	-

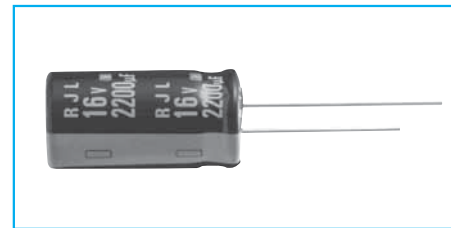
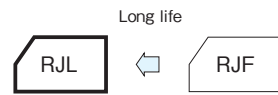
(Note) Impedance : 100kHz Rated ripple current : 105°C, 100kHz

Miniature Aluminum Electrolytic Capacitors

105°C Use, Miniature, Long Life, extra Low Impedance Capacitors

GREEN CAP Low impedance 105°C 10000hours Anti-cleaning solvent

- Long life than RJF Series.
- Guarantees 4000 to 10000 hours at 105°C.



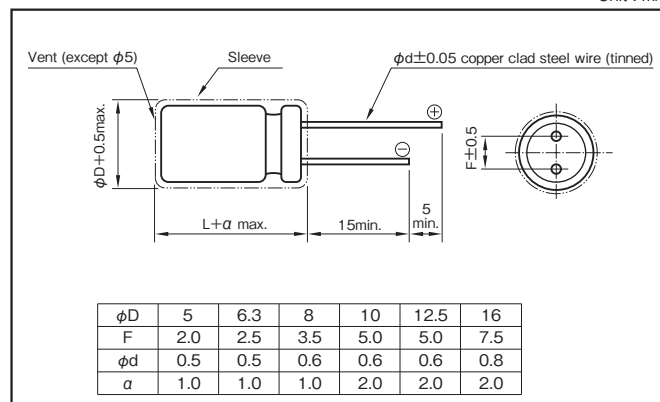
Marking color : White print on a black sleeve

Specifications

Item	Performance		
Category temperature range (°C)	-40 to +105		
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)		
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF), V : Rated voltage (V) (20°C)		
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3 10 16 25 35 50 63 100	
	tanδ (max.)	0.22 0.19 0.16 0.14 0.12 0.10 0.09 0.08	
0.02 is added to every 1000µF increase over 1000µF. (20°C, 120Hz)			
Characteristics at high and low temperature	Rated voltage (V)	6.3 10 16 25 35 50 63 100	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4 3 2 2 2 2 2 2
		Z-40°C/Z+20°C	8 6 4 3 3 3 3 3
(120Hz)			
Endurance (105°C) (Applied ripple current)	Test time	φ5, φ6.3 : 5000 hours (6.3~10WV : 4000 hours) φ8, φ10 : 7000 hours (6.3~10WV : 6000 hours) φ12.5, φ16 : 10000 hours (6.3~10WV : 8000 hours)	
	Leakage current	The initial specified value or less	
	Percentage of capacitance change	Within ±25% of initial value	
	Tangent of the loss angle	200% or less of the initial specified value	
Shelf life (105°C)	Test time	1000 hours	
	Leakage current	The initial specified value or less	
	Percentage of capacitance change	Within ±25% of initial value	
	Tangent of the loss angle	200% or less of initial specified value	
Voltage application treatment			
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)		

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (µF)	Frequency (Hz)			
	120	1k	10k	100k
to 33	0.42	0.70	0.90	1.00
47 to 270	0.50	0.73	0.92	1.00
330 to 680	0.55	0.77	0.94	1.00
820 to 1800	0.60	0.80	0.96	1.00
2200 to 6800	0.70	0.85	0.98	1.00

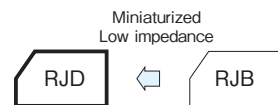
Part numbering system (example : 10V1000µF)

RJL	—	10	V	102	M	H4	#	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping(Forming) symbol

105°C Use,miniature,Hi-Reliability, Low impedance Capacitors

GREEN CAP Low Impedance 105°C 8000hours Anti-cleaning solvent

- Smaller and higher ripple current than RJB series.
- Guarantees 8000 hours at 105°C.
($\phi 5$ to 6.3 : 2000 hours : $\phi 8$ to 10 : 3000 hours)



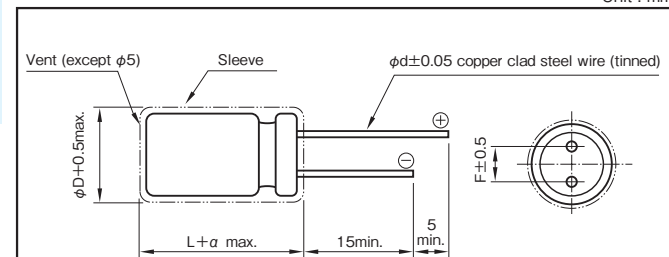
Marking color : White print on a black sleeve

Specifications

Item	Performance												
Category temperature range (°C)	-55 to +105												
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)												
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF), V : Rated voltage (V) (20°C)												
Tangent of loss angle (tanδ)	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> </tr> <tr> <td>tanδ (max.)</td> <td>0.22</td> <td>0.19</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table> <p>0.02 is added to every 1000µF increase over 1000µF. (20°C, 120Hz)</p>	Rated voltage (V)	6.3	10	16	25	35	tanδ (max.)	0.22	0.19	0.16	0.14	0.12
Rated voltage (V)	6.3	10	16	25	35								
tanδ (max.)	0.22	0.19	0.16	0.14	0.12								
Characteristics at high and low temperature	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> </tr> <tr> <td>Impedance ratio (max.) Z-55°C/Z+20°C</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table> <p>(120Hz)</p>	Rated voltage (V)	6.3	10	16	25	35	Impedance ratio (max.) Z-55°C/Z+20°C	3	3	3	3	3
Rated voltage (V)	6.3	10	16	25	35								
Impedance ratio (max.) Z-55°C/Z+20°C	3	3	3	3	3								
Endurance (105°C) (Applied ripple current)	<table border="1"> <tr> <td>Test time</td> <td>$\phi 5$ to 6.3 : 2000 hours $\phi 8$ to 10 : 3000 hours $\phi 12.5$ to 18 : 8000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>200% or less of the initial specified value</td> </tr> </table>	Test time	$\phi 5$ to 6.3 : 2000 hours $\phi 8$ to 10 : 3000 hours $\phi 12.5$ to 18 : 8000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	200% or less of the initial specified value				
Test time	$\phi 5$ to 6.3 : 2000 hours $\phi 8$ to 10 : 3000 hours $\phi 12.5$ to 18 : 8000 hours												
Leakage current	The initial specified value or less												
Percentage of capacitance change	Within ±20% of initial value												
Tangent of the loss angle	200% or less of the initial specified value												
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment												
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)												

Outline Drawing

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	1.0	1.0	1.0	2.0	2.0	2.0	2.0

(Note) Whisker preventive structure is possible for more than φ8.

Coefficient of Frequency for Rated Ripple Current

Rated Capacitance (µF)	Frequency (Hz)					
	50 · 60	120	300	1k	10k · 100k	
to 56	0.20	0.30	0.50	0.80	1	
68 to 330	0.55	0.65	0.75	0.85	1	
390 to 1000	0.70	0.75	0.80	0.90	1	
1200 to 18000	0.80	0.85	0.90	0.95	1	

Part numbering system (example : 6.3V10000µF)

RJD	—	6	V	103	M	J7	#	—	
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping(Forming) symbol		

If it is whisker preventive structure, should change "#" into "G".

Miniature Aluminum Electrolytic Capacitors

Standard Ratings

Rated voltage (V)	Item	6.3						10						16					
		Case		Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case		Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case		Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)
		φD	L		20°C	-10°C		φD	L		20°C	-10°C		φD	L		20°C	-10°C	
22	—	—	—	—	—	—	—	—	—	—	—	—	5	11.5	E3	0.5	1.0	182	
33	—	—	—	—	—	—	—	—	—	—	—	—	5	11.5	E3	0.5	1.0	182	
47	—	—	—	—	—	—	—	—	—	—	—	—	5	11.5	E3	0.5	1.0	182	
82	—	—	—	—	—	—	—	—	—	—	—	—	5	15	E4	0.46	0.92	237	
100	—	—	—	—	—	—	5	11.5	E3	0.5	1.0	182	6.3	11.5	F3	0.25	0.50	295	
150	5	11.5	E3	0.50	1.0	182	—	—	—	—	—	—	6.3	11.5	F3	0.25	0.50	295	
180	—	—	—	—	—	—	6.3	11.5	F3	0.25	0.50	295	6.3	15	F4	0.18	0.36	432	
220	—	—	—	—	—	—	6.3	11.5	F3	0.25	0.50	295	6.3	15	F4	0.18	0.36	432	
330	6.3	11.5	F3	0.25	0.5	295	6.3	15	F4	0.18	0.36	432	8	12	G3	0.117	0.234	567	
390	—	—	—	—	—	—	—	—	—	—	—	—	8	12	G3	0.117	0.234	567	
470	6.3	15	F4	0.18	0.36	432	8	12	G3	0.117	0.234	567	8	15	G4	0.085	0.170	733	
560	8	12	G3	0.117	0.234	567	8	12	G3	0.117	0.234	567	10	12.5	H3	0.090	0.180	764	
680	8	12	G3	0.117	0.234	567	—	—	—	—	—	—	8	20	G5	0.065	0.130	996	
820	—	—	—	—	—	—	8	15	G4	0.085	0.170	733	8	15	G4	0.085	0.170	733	
1000	8	15	G4	0.085	0.170	733	10	12.5	H3	0.090	0.180	764	10	12.5	H3	0.090	0.180	764	
1200	10	12.5	H3	0.090	0.180	764	10	16	H4	0.068	0.136	1060	10	16	H4	0.068	0.136	1060	
1500	10	16	H4	0.068	0.136	1060	10	20	H5	0.052	0.104	1230	10	20	H5	0.052	0.104	1230	
1800	8	20	G5	0.065	0.130	996	10	25	H6	0.045	0.090	1450	10	25	H6	0.045	0.090	1450	
2200	10	20	H5	0.052	0.104	1230	12.5	15	I4	0.062	0.124	1210	10	30	H7	0.035	0.070	1830	
2700	10	25	H6	0.045	0.090	1450	10	20	H5	0.052	0.104	1230	12.5	20	I5	0.038	0.076	1700	
3300	10	30	H7	0.035	0.070	1830	10	25	H6	0.045	0.090	1450	16	16	J4	0.043	0.086	1700	
3900	12.5	25	I6	0.030	0.060	1950	12.5	20	I5	0.038	0.076	1700	12.5	25	I6	0.030	0.060	1950	
4700	12.5	25	I6	0.030	0.060	1950	12.5	30	I7	0.025	0.050	2330	12.5	30	I7	0.025	0.050	2330	
5600	16	20	J5	0.029	0.058	2230	12.5	25	I6	0.030	0.060	1950	16	20	J5	0.029	0.058	2230	
6800	12.5	30	I7	0.025	0.050	2330	16	16	K4	0.038	0.076	2010	16	20	J5	0.029	0.058	2230	
8200	16	25	J6	0.022	0.044	2650	16	20	J5	0.029	0.058	2230	16	25	J6	0.022	0.044	2650	
10000	16	31.5	J7	0.018	0.036	3210	16	25	K6	0.020	0.040	3000	18	25	K6	0.020	0.040	3000	
12000	18	25	K6	0.020	0.040	3000	16	40	J9	0.015	0.030	3880	18	25	K6	0.020	0.040	3000	
15000	18	35.5	K8	0.015	0.030	3960	18	35.5	K8	0.015	0.030	3960	18	40	K9	0.014	0.028	4300	
18000	18	40	K9	0.014	0.028	4300	—	—	—	—	—	—	—	—	—	—	—	—	

Aluminum Electrolytic Capacitors

(Note) Rated ripple current : 105°C , 100kHz, Impedance : 20°C , 100kHz



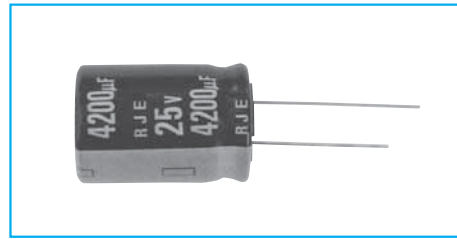
Standard Ratings

Rated voltage (V)	Item	25						35					
		Case		Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)	Case		Casing symbol	Impedance (Ω max.)		Rated ripple current (mA rms)
		φD	L		20°C	-10°C		φD	L		20°C	-10°C	
10		5.0	11.5	E3	0.50	1.0	182	5.0	11.5	E3	0.50	1.0	182
22		5.0	11.5	E3	0.50	1.0	182	5.0	11.5	E3	0.50	1.0	182
27		5.0	11.5	E3	0.50	1.0	182	5.0	11.5	E3	0.50	1.0	182
33		5.0	11.5	E3	0.50	1.0	182	5.0	11.5	E3	0.50	1.0	182
47		5.0	11.5	E3	0.50	1.0	182	6.3	11.5	F3	0.25	0.50	295
56		5.0	15	E4	0.46	0.92	237	6.3	11.5	F3	0.25	0.50	295
82		6.3	11.5	F3	0.25	0.50	295	6.3	15	F4	0.18	0.36	432
100		6.3	11.5	F3	0.25	0.50	295	8.0	12	G3	0.117	0.234	567
120		6.3	15	F4	0.18	0.36	432	—	—	—	—	—	—
150		8.0	12	G3	0.117	0.234	567	8.0	12	G3	0.117	0.234	567
180		—	—	—	—	—	—	8.0	12	G3	0.117	0.234	567
220		8.0	12	G3	0.117	0.234	567	8.0	15	G4	0.085	0.170	733
270		8.0	12	G3	0.117	0.234	567	8.0	15	G4	0.085	0.170	733
								10.0	12.5	H3	0.090	0.180	764
330		8.0	12	G3	0.117	0.234	567	8.0	20	G5	0.065	0.130	996
		10.0	12.5	H3	0.090	0.180	764	10.0	16	H4	0.068	0.136	1060
390		8.0	15	G4	0.085	0.170	733	8.0	20	G5	0.065	0.130	996
								10.0	16	H4	0.068	0.136	1060
470		8.0	15	G4	0.085	0.170	733	10.0	20	H5	0.052	0.104	1230
		10.0	12.5	H3	0.090	0.180	764						
560		8.0	20	G5	0.065	0.130	996	10.0	20	H5	0.052	0.104	1230
		10.0	16	H4	0.068	0.136	1060	12.5	15	I4	0.062	0.124	1210
680		10.0	16	H4	0.068	0.136	1060	10.0	25	H6	0.045	0.090	1450
820		10.0	20	H5	0.052	0.104	1230	12.5	20	I5	0.038	0.076	1700
		12.5	15	I4	0.062	0.124	1210						
1000		10.0	25	H6	0.045	0.090	1450	10.0	30	H7	0.035	0.070	1830
		12.5	20	I5	0.038	0.076	1700	12.5	20	I5	0.038	0.076	1700
1200		12.5	20	I5	0.038	0.076	1700	12.5	25	I6	0.030	0.060	1950
								18.0	16	K4	0.038	0.076	2010
1500		10.0	30	H7	0.035	0.070	1830	12.5	30	I7	0.025	0.050	2330
		16.0	16	J4	0.043	0.086	1700	16.0	20	J5	0.029	0.058	2230
1800		12.5	25	I6	0.030	0.060	1950	12.5	35	I8	0.022	0.044	2620
		18.0	16	K4	0.038	0.076	2010	16.0	20	J5	0.029	0.058	2230
2200		12.5	30	I7	0.025	0.050	2330	12.5	40	I9	0.017	0.034	3160
		16.0	20	J5	0.029	0.058	2230	16.0	25	J6	0.022	0.044	2650
								18.0	20	K5	0.028	0.056	2500
2700		12.5	35	I8	0.022	0.044	2620	16.0	31.5	J7	0.018	0.036	3210
		18.0	25	K6	0.020	0.040	3000						
3300		12.5	40	I9	0.017	0.034	3160	18.0	25	K6	0.020	0.040	3000
		16.0	25	J6	0.022	0.044	2650						
		18.0	20	K5	0.028	0.056	2500	18.0	31.5	K7	0.016	0.032	3660
3900		—	—	—	—	—	—	18.0	35.5	K8	0.015	0.030	3960
								18.0	40	K9	0.014	0.028	4300
4700		18.0	25	K6	0.020	0.040	3000	18.0	35.5	K8	0.015	0.030	3960
								18.0	40	K9	0.014	0.028	4300
5600		18.0	35.5	K8	0.015	0.030	3960	18.0	40	K9	0.014	0.028	4300
6800		18.0	35.5	K8	0.015	0.030	3960	18.0	40	K9	0.014	0.028	4300
8200		—	—	—	—	—	—	18.0	40	K9	0.014	0.028	4300

(Note) Rated ripple current : 105°C , 100kHz, Impedance : 20°C , 100kHz

For AirBag GREEN CAP 105°C 5000hours Anti-cleaning solvent For AirBag

- For AirBag application
- High capacitance, low impedance, and good low temperature behavior
- Guarantees 5000 hours at 105°C.

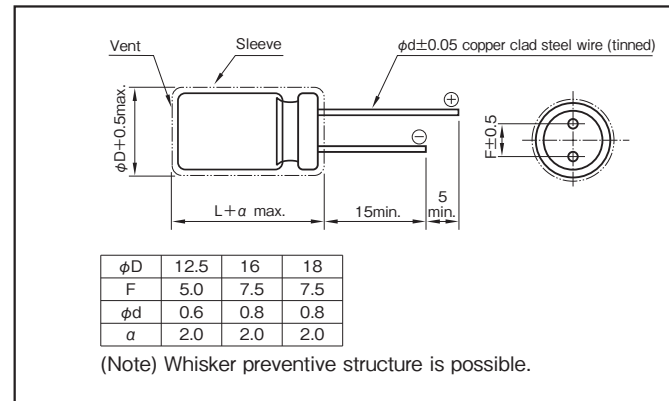


Marking color : White print on a black sleeve

Specifications

Item	Performance
Category temperature range (°C)	-55 to +105
Tolerance at rated capacitance (%)	0 to +30 (20°C, 120Hz)
Leakage current (µA)	Less than 0.01CV (after 2 minutes) C : Rated capacitance (µF) , V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V) 25 35
	tanδ (max.) 0.20 0.16
0.02 is added to every 1000µF increase over 1000µF (20°C, 120Hz)	
Characteristics at high and low temperature	Rated voltage (V) 25 35
	Impedance ratio (max.) Z-55°C/Z+20°C 3 3 (120Hz)
Endurance (105°C)	Test time 5000 hours
	Leakage current The initial specified value or less
	Percentage of capacitance change Within -20% to +20% of initial value
	Tangent of loss angle 200% or less of the initial specified value
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -4 1985)

Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (µF)	Frequency (Hz)			
	50 · 60	120	1k	10k-100k
830 to 1100	0.70	0.75	0.90	1
1200 to 11000	0.80	0.85	0.95	1

Part numbering system (example : 25V4200µF)

RJE	—	25	V	422	A	I9	(#)Q	—	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol	Taping(Forming) symbol			

If it is whisker preventive structure, should change “#” into “G”.

Aluminum Electrolytic Capacitors

Standard Ratings

Case size φD×L (mm)	Casing symbol	Item	25				35			
			Capacitance (µF)	ESR Ω (max.) / 100kHz		Rated ripple current (mA rms)	Capacitance (µF)	ESR Ω (max.) / 100kHz		Rated ripple current (mA rms)
				20°C	-40°C			20°C	-40°C	
12.5×15	I4	1100	0.174	0.52	1210	830	0.174	0.52	1210	
12.5×20	I5	1800	0.107	0.27	1670	1300	0.107	0.27	1670	
12.5×25	I6	2400	0.084	0.21	1950	1600	0.084	0.21	1950	
12.5×30	I7	3200	0.070	0.18	2330	2200	0.070	0.18	2330	
12.5×35	I8	3700	0.062	0.16	2620	2500	0.062	0.16	2620	
12.5×40	I9	4200	0.048	0.12	3160	2900	0.048	0.12	3160	
16×16	J4	2100	0.121	0.36	1700	1500	0.121	0.36	1700	
16×20	J5	3100	0.082	0.21	2230	2100	0.082	0.21	2230	
16×25	J6	4300	0.062	0.16	2650	3000	0.062	0.16	2650	
16×31.5	J7	5800	0.051	0.13	3210	4000	0.051	0.13	3210	
16×35.5	J8	6800	0.045	0.11	3570	4600	0.045	0.11	3570	
16×40	J9	7800	0.042	0.11	3880	5300	0.042	0.11	3880	
18×16	K4	3000	0.107	0.32	2010	2100	0.107	0.32	2010	
18×20	K5	4300	0.079	0.20	2500	3000	0.079	0.20	2500	
18×25	K6	6000	0.056	0.14	3000	4200	0.056	0.14	3000	
18×31.5	K7	8000	0.045	0.11	3660	5600	0.045	0.11	3660	
18×35.5	K8	9300	0.042	0.11	3960	6500	0.042	0.11	3960	
18×40	K9	11000	0.040	0.10	4300	7400	0.040	0.10	4300	

(Note) Rated ripple current : 105°C, 100kHz

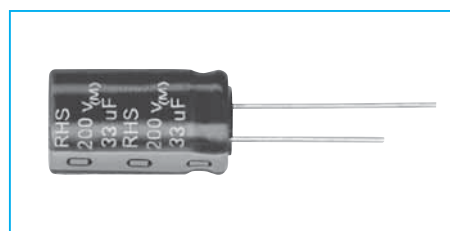
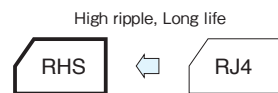
NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

105°C Use, Miniature, High-Ripple, Long Life Capacitors

GREEN CAP 105°C 5000hours

- Higher ripple current.
- Guarantees 4000 to 5000 hours at 105°C.
- Best-suited to electronic ballast.



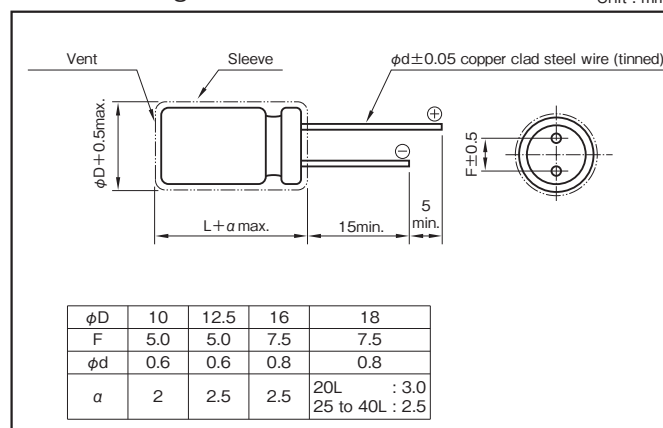
Marking color : White print on a black sleeve

Specifications

Item	Performance										
Category temperature range (°C)	-40 to +105 (-25 to +105 at 350V or more)										
Rated Voltage (V)	160 to 450										
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)										
Leakage current (μA)	CV≥1000 : Less than 0.06CV+40 (after 1 minutes) CV<1000 : Less than 0.03CV+70 (after 1 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)										
Tangent of loss angle	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>160 to 250</th> <th>350 to 400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Tangent of loss angle</td> <td>0.12</td> <td>0.15</td> <td>0.20</td> </tr> </tbody> </table> <p>(20°C, 120Hz)</p>	Rated voltage (V)	160 to 250	350 to 400	450	Tangent of loss angle	0.12	0.15	0.20		
Rated voltage (V)	160 to 250	350 to 400	450								
Tangent of loss angle	0.12	0.15	0.20								
Characteristics at high and low temperature	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>160 to 250</th> <th>350 to 450</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance ratio</td> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>4</td> <td>-</td> </tr> </tbody> </table> <p>(120Hz)</p>	Rated voltage (V)	160 to 250	350 to 450	Impedance ratio	Z-25°C/Z+20°C	3	6	Z-40°C/Z+20°C	4	-
Rated voltage (V)	160 to 250	350 to 450									
Impedance ratio	Z-25°C/Z+20°C	3	6								
	Z-40°C/Z+20°C	4	-								
Endurance (105°C) (Applied ripple current)	<table border="1"> <tbody> <tr> <td>Test time</td> <td>φ10 : 4000 hours φ12.5 to 18 : 5000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Capacitance change</td> <td>Within -20% to +20% of initial value</td> </tr> <tr> <td>Tangent of loss angle</td> <td>300% or less of the initial specified value</td> </tr> </tbody> </table>	Test time	φ10 : 4000 hours φ12.5 to 18 : 5000 hours	Leakage current	The initial specified value or less	Capacitance change	Within -20% to +20% of initial value	Tangent of loss angle	300% or less of the initial specified value		
Test time	φ10 : 4000 hours φ12.5 to 18 : 5000 hours										
Leakage current	The initial specified value or less										
Capacitance change	Within -20% to +20% of initial value										
Tangent of loss angle	300% or less of the initial specified value										
Shelf life (105°C)	<table border="1"> <tbody> <tr> <td>Test time</td> <td>1000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Capacitance change</td> <td>Within -20% to +20% of initial value</td> </tr> <tr> <td>Tangent of loss angle</td> <td>200% or less of the initial specified value</td> </tr> </tbody> </table> <p>Voltage application treatment</p>	Test time	1000 hours	Leakage current	The initial specified value or less	Capacitance change	Within -20% to +20% of initial value	Tangent of loss angle	200% or less of the initial specified value		
Test time	1000 hours										
Leakage current	The initial specified value or less										
Capacitance change	Within -20% to +20% of initial value										
Tangent of loss angle	200% or less of the initial specified value										
Applicable Standards	JIS C 5101-01, -04 1998 (IEC 60384-1 1992, 60384-4 1985)										

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	50,60	120	300	1k	10k or more
160 to 450		0.75	1.00	1.20	1.35	1.50

Part numbering system (example : 400V10μF)

RHS	—	400	V	100	M	I5	#	B	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol			Taping/Forming symbol

Standard Ratings

Rated voltage(V)		160			200			250			350		
Case φD×L(mm)	Item Casing symbol	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)
10×12.5	H3	—	—	—	4.7	41	60	4.7	41	60	3.3	72	50
		—	—	—	—	—	—	10	19	82	4.7	51	55
10×16	H4	10	19	96	10	19	95	10	19	90	4.7	51	65
		—	—	—	22	9.0	111	—	—	—	—	—	—
10×20	H5	22	9.0	145	22	9.0	145	10	19	105	—	—	—
		—	—	—	—	—	—	22	15	150	—	—	—
12.5×20	I5	33	6.0	190	33	6.0	190	—	—	—	10	24	120
12.5×25	I6	47	4.0	280	47	4.0	280	22	9.0	180	22	11	180
		—	—	—	—	—	—	33	6.0	250	—	—	—
16×20	J5	47	4.0	280	47	4.0	280	33	6.0	250	22	11	180
16×25	J6	100	2.0	380	—	—	—	47	4.0	300	33	7.0	210
16×31.5	J7	—	—	—	100	2.0	410	100	2.0	410	—	—	—
16×35.5	J8	—	—	—	—	—	—	—	—	—	47	5.0	300
18×20	K5	100	2.0	380	—	—	—	47	4.0	300	—	—	—
18×25	K6	—	—	—	100	2.0	410	100	2.0	410	—	—	—
18×31.5	K7	—	—	—	—	—	—	—	—	—	47	5.0	300
18×35.5	K8	220	0.9	630	—	—	—	—	—	—	—	—	—

Rated voltage(V)		400			450		
Case φD×L(mm)	Item Casing symbol	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)
10×12.5	H3	2.2	109	40	1	318	30
10×16	H4	3.3	72	50	2.2	145	45
10×20	H5	4.7	51	70	3.3	96	65
12.5×20	I5	10	24	120	—	—	—
		22	11	200	—	—	—
12.5×25	I6	—	—	—	4.7	68	80
		—	—	—	10	32	140
16×25	J6	22	11	200	22	14	220
		—	—	—	33	10	280
16×31.5	J7	33	7.0	245	47	5.6	420
16×35.5	J8	82	3.2	500	68	3.9	520
18×20	K5	22	11	200	—	—	—
18×25	K6	33	7.0	245	68	3.9	424
18×31.5	K7	47	5.0	300	82	3.2	580
		82	3.2	500	—	—	—
18×35.5	K8	—	—	—	100	2.6	750
18×40	K9	—	—	—	120	2.2	800

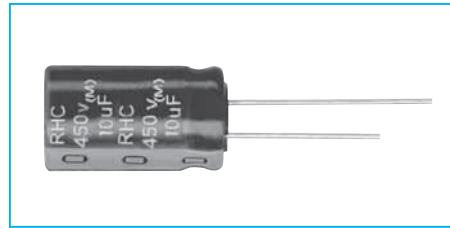
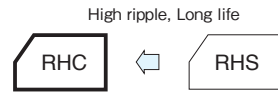
(Note) ESR : 20°C, 120Hz ; Rated ripple current : 105°C, 120Hz.

Miniature
Aluminum Electrolytic Capacitors

105°C Use, Miniature, High-Ripple, Long Life Capacitors

GREEN CAP 105°C 10000hours

- Higher ripple current.
- Guarantees 5000 to 10000 hours at 105°C.
- Best-suited to electronic ballast.



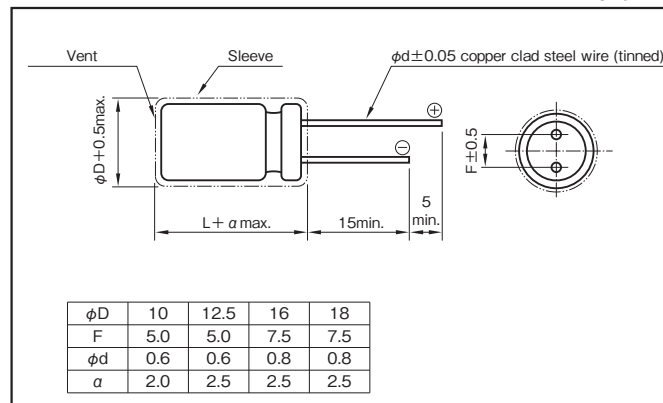
Marking color : White print on a black sleeve

Specifications

Item	Performance		
Category temperature range (°C)	-25 to +105		
Rated Voltage (V)	160 to 450		
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)		
Leakage current (μA)	Less than 0.04CV + 100 (after 1 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)		
Tangent of loss angle	Rated voltage (V)	160 to 250	350 to 450
	Tangent of loss angle	0.10 (0.15*)	0.12 (0.20*)
* The black circles in the capacitance column correspond. (20°C, 120Hz)			
Characteristics at high and low temperature	Rated voltage (V)	160 to 250	350 to 450
	Impedance ratio Z-25°C/Z+20°C	3	6
(120Hz)			
Endurance (105°C) (Applied ripple current)	Test time	φ10×12.5 : 5000 hours φ10×16 to 20 : 8000 hours φ12.5 to 18 : 10000 hours	
	Leakage current	The initial specific value or less	
	Capacitance change	Within -30% to +30% of initial value	
	Tangent of loss angle	300% or less of the initial specified value	
Shelf life (105°C)	Test time	1000 hours	
	Leakage current	The initial specific value or less	
	Capacitance change	Within -20% to +20% of initial value	
	Tangent of loss angle	200% or less of the initial specified value	
Voltage application treatment			
Applicable standards	JIS C 5101-01, -04 1998 (IEC 60384-1 1992, 60384-4 1985)		

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	50	120	1k	10k	100k
160 to 450		0.30	0.50	0.80	0.90	1.00

Part numbering system (example : 400V10μF)

RHC	—	400	V	100	M	H5	#	B	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol			Taping/Forming symbol

Standard Ratings

Rated voltage(V)		160			200			250			350		
Case φD×L(mm)	Item Casing symbol	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)
10×12.5	H3	—	—	—	4.7	28	200	4.7	28	200	1.5	106	100
		—	—	—	—	—	—	—	—	—	2.2	72	140
		—	—	—	—	—	—	—	—	—	3.3	48	180
10×16	H4	10	13	320	6.8	20	220	6.8	20	250	4.7	34	220
		—	—	—	10	13	320	10	13	320	5.6	28	250
		—	—	—	—	—	—	● 22	9.0	450	—	—	—
10×20	H5	22	6.6	500	22	6.0	500	22	6.0	500	6.8	23	280
		33	4.0	650	33	4.0	650	—	—	—	10	16	350
		47	2.8	750	—	—	—	—	—	—	—	—	—
10×25	H6	—	—	—	—	—	—	33	4.0	720	—	—	—
10×30	H7	—	—	—	—	—	—	47	2.8	880	—	—	—
12.5×20	I5	68	2.0	1180	47	2.8	980	33	4.0	800	22	7.0	650
12.5×25	I6	100	1.3	1420	68	2.0	1300	47	2.8	980	—	—	—
12.5×30	I6	120	1.7	1500	—	—	—	—	—	—	—	—	—
12.5×35	I8	—	—	—	—	—	—	100	1.3	1350	—	—	—
16×20	J5	68	2.0	1180	68	2.0	1300	68	2.0	1300	33	4.8	900
		100	1.3	1420	100	1.3	1420	—	—	—	47	3.4	1080
16×25	J6	150	0.9	1890	150	0.9	1890	100	1.3	1530	68	3.9	1120
16×31.5	J6	—	—	—	● 180	1.1	2200	—	—	—	—	—	—
18×25	K6	220	0.6	2370	● 220	0.9	2380	150	0.9	1940	68	2.0	1470
		● 270	0.7	2470	—	—	—	—	—	—	—	—	—
18×31.5	K7	—	—	—	—	—	—	● 220	0.9	2200	● 100	2.7	1650

Rated voltage(V)		400			450		
Case φD×L(mm)	Item Casing symbol	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mA rms)
10×12.5	H3	1	160	70	—	—	—
		1.5	107	100	—	—	—
		2.2	72	140	—	—	—
		● 3.3	80	160	—	—	—
10×16	H4	3.3	48	180	2.2	72	150
		4.7	34	220	3.3	48	180
		● 10	27	320	—	—	—
10×20	H5	5.6	28	250	4.7	34	220
		6.8	23	280	5.6	28	250
		10	16	350	6.8	23	280
		● 12	22	450	● 10	27	330
10×25	H6	● 18	15	290	—	—	—
12.5×20	I5	15	11	550	10	16	450
		● 22	12	650	—	—	—
12.5×25	I6	22	7.2	760	15	11	600
		27	10	760	● 22	12	650
12.5×30	I7	33	8.0	720	—	—	—
12.5×35	I8	47	5.6	960	● 33	8.0	800
16×20	J5	22	7.2	760	22	7.2	730
		33	4.8	900	—	—	—
16×25	J6	47	3.4	1180	33	4.8	980
18×25	K6	68	2.3	1470	47	3.4	1200
18×31.5	K7	82	3.2	1600	● 68	3.9	1260
		100	2.7	1720	—	—	—
18×35.5	K8	—	—	—	● 100	2.7	1500
18×40	K9	● 120	2.2	1945	● 120	2.2	1660
18×45	KA	● 150	1.8	2215	—	—	—
18×50	KB	—	—	—	● 150	1.8	2050

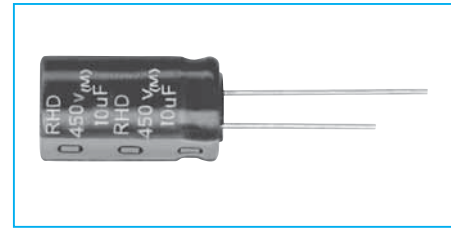
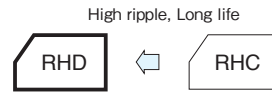
(Note) ESR : 20°C , 120Hz ; Rated ripple current : 105°C , 100kHz

Aluminum Electrolytic Capacitors

105°C Use, Miniature, High-Ripple, Long Life Capacitors

GREEN CAP 105°C 12000hours

- Higher ripple current.
- Guarantees 8000 to 12000 hours at 105°C.
- Best-suited to electronic ballast.



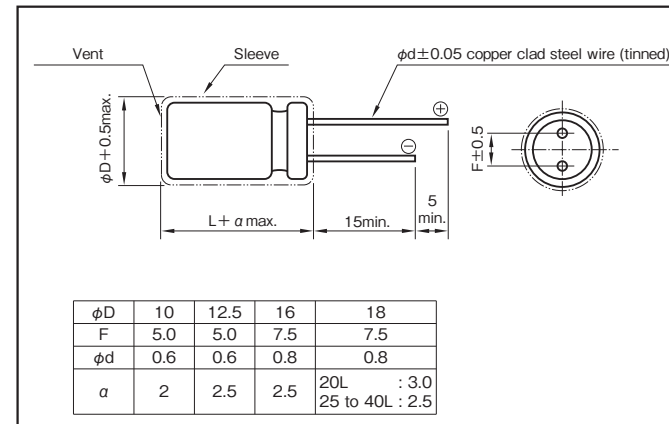
Marking color : White print on a black sleeve

Specifications

Item	Performance		
Category temperature range (°C)	-25 to +105		
Rated Voltage (V)	160 to 450		
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)		
Leakage current(µA)	Less than 0.04CV + 100 (after 1 minutes) C:Rated capacitance (µF),V:Rated Voltage (V) (20°C)		
Tangent of loss angle	Rated voltage (V)	160 to 250	350 to 450
	Tangent of loss angle	0.15	0.20
Characteristics at high and low temperature	Rated voltage (V)	160 to 250	350 to 450
	Impedance ratio Z-25°C/Z+20°C	3	6
Endurance (105°C) (Applied ripple current)	Test time	φ10×12.5L : 8000hours φ10×16,20L : 10000hours φ12.5 to 18 : 12000hours	
	Leakage current	The initial specified value or less	
	Capacitance change	Within -30% to +30% of initial value	
	Tangent of loss angle	300% or less of the initial specified value	
Shelf life (105°C)	Test time	1000hours	
	Leakage current	The initial specified value or less	
	Capacitance change	Within -20% to +20% of initial value	
	Tangent of loss angle	200% or less of the initial specified value	
Voltage application treatment			
Applicable Standards	JIS C 5101-01, -04 1998 (IEC 60384-1 1992,60384-4 1985)		

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	50	120	1k	10k	100k
160 to 450		0.30	0.50	0.80	0.90	1.00

Part numbering system (example : 400V47µF)

RHD	—	400	V	470	M	K6	#	B	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol			Taping(Forming) symbol

Standard Ratings

Rated voltage(V)			160			200			250			350		
Case φD×L(mm)	Case symbol	Item	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mAmps)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mAmps)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mAmps)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mAmps)
10×12.5	H3		—	—	—	10	20	250	6.8	29	250	4.7	56	200
10×16	H4		10	20	250	10	20	250	—	—	—	6.8	39	220
10×20	H5		22	9.0	500	22	9.0	500	10	20	280	10	27	280
			33	6.0	500	33	6.0	600	—	—	—	—	—	—
10×25	H6		—	—	—	47	4.2	660	—	—	—	—	—	—
10×30	H7		—	—	—	56	3.5	700	—	—	—	—	—	—
12.5×20	I5		47	4.2	660	33	6.0	600	22	9.0	600	22	12	350
			—	—	—	47	4.2	660	33	6.0	600	—	—	—
			—	—	—	56	3.5	700	—	—	—	—	—	—
12.5×25	I6		68	2.9	760	68	2.9	760	47	4.2	720	—	—	—
12.5×30	I7		—	—	—	—	—	—	—	—	—	47	5.6	425
16×20	J5		68	2.9	760	68	2.9	760	47	4.2	720	33	8.0	500
16×25	J6		100	2.0	1120	100	2.0	1120	68	2.9	920	47	5.6	660
16×31.5	J7		150	1.3	1360	150	1.3	1360	100	2.0	1200	68	3.9	850
			220	0.9	1400	—	—	—	—	—	—	—	—	—
18×20	K5		100	2.0	1120	100	2.0	1120	68	2.9	920	47	5.6	660
18×25	K6		150	1.3	1360	150	1.3	1360	100	2.0	1200	68	3.9	850
			220	0.9	1400	220	0.9	1400	—	—	—	—	—	—
18×31.5	K7		330	0.6	2580	220	0.9	1700	150	1.3	1500	100	2.6	1420
18×35.5	K8		—	—	—	—	—	—	—	—	—	150	1.7	2115

Rated voltage(V)			400			450		
Case φD×L(mm)	Case symbol	Item	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mAmps)	Rated capacitance (μF)	ESR (Ω max.)	Rated ripple current (mAmps)
10×16	H4		3.3	80	200	4.7	56	130
			6.8	39	220	6.8	39	140
10×20	H5		10	27	280	4.7	56	140
			—	—	—	6.8	39	150
			—	—	—	10	27	280
10×25	H6		18	14	500	15	18	380
12.5×20	I5		—	—	—	10	27	320
			—	—	—	15	18	380
12.5×25	I6		22	12	430	22	12	430
12.5×30	I7		47	5.6	910	—	—	—
12.5×40	I9		—	—	—	47	5.6	880
16×20	J5		22	12	430	—	—	—
			33	8.0	640	22	12	560
16×25	J6		47	5.6	1180	—	—	—
			47	5.6	840	33	8.0	700
16×40	J9		100	2.6	1510	—	—	—
18×20	K5		33	8.0	640	22	12	560
18×25	K6		47	5.6	840	33	8.0	700
			—	—	—	56	4.7	800
18×31.5	K7		68	3.9	1000	47	5.6	880
			82	3.2	1280	—	—	—
18×35.5	K8		100	2.6	1640	68	3.9	1130
			—	—	—	82	3.2	1200
18×40	K9		120	2.2	1740	100	2.6	1670
18×45	KA		150	1.7	1970	—	—	—

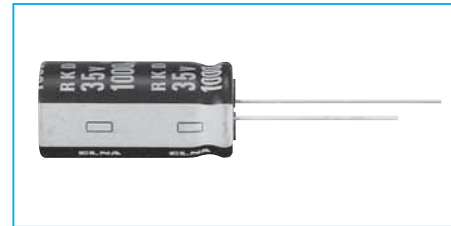
(Note) ESR : 20°C , 120Hz ; Rated ripple current : 105°C , 100kHz

Aluminum Electrolytic Capacitors
Miniature

125°C Use, Miniature, Low Impedance

GREEN CAP Low Z 125°C 5000hours Anti-cleaning solvent

- Smaller and low impedance than RK series.
- Guarantees 5000 hours at 125°C ($\phi 8$: 2000h, $\phi 10$: 3000h)



Marking color : White print on a black sleeve

Specifications

Item	Performance																		
Category temperature range (°C)	-40 to +125																		
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																		
Leakage current (μA)	Less than 0.01CV or 4 whichever is larger (after 2 minute) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)																		
Tangent of loss angle (tanδ)	<table border="1"> <tr><td>Rated voltage (V)</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td></tr> <tr><td>tanδ (max.)</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.10</td><td>0.08</td><td>0.08</td></tr> </table>	Rated voltage (V)	10	16	25	35	50	63	80	100	tanδ (max.)	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08
	Rated voltage (V)	10	16	25	35	50	63	80	100										
tanδ (max.)	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08											
0.02 is added to every 1000μF increase over 1000μF. (20°C, 120Hz)																			
Characteristics at high and low temperature	<table border="1"> <tr><td>Rated voltage (V)</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>80</td><td>100</td></tr> <tr><td>Impedance ratio (max.)</td><td>Z-40°C/Z+20°C</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr> </table>	Rated voltage (V)	10	16	25	35	50	63	80	100	Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3	3	3	3	3
	Rated voltage (V)	10	16	25	35	50	63	80	100										
Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3	3	3	3	3											
(120Hz)																			
Endurance (125°C) (Applied ripple current)	Test time	5000 hours ($\phi 8$: 2000 hours) ($\phi 10$: 3000 hours)																	
	Leakage current	The initial specified value or less																	
	Percentage of capacitance change	Within -30% to +30% of initial value																	
	Tangent of the loss angle	300% or less of the initial specified value																	
Shelf life (125°C)	Test time : 1000 hours; other items are the same as those for the endurance. Voltage application treatment																		
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																		

Outline Drawing

Unit : mm

ϕD	8	10	12.5	16	18
F	3.5	5.0	5.0	7.5	7.5
ϕd	0.6	0.6	0.6	0.8	0.8
a	1.0	2.0	2.0	2.0	2.0

(Note) Whisker preventive structure is possible for more than $\phi 8$.

Coefficient of Frequency for Rated Ripple Current

Rated capacitance (μF)	Frequency (Hz)			
	50 · 60	120	1k	10k · 100k
100 to 180	0.40	0.75	0.90	1
220 to 390	0.50	0.85	0.95	1
470 to 1800	0.60	0.88	0.96	1
2200 to 6800	0.68	0.90	0.98	1

Part numbering system (example : 10V1000μF)

RKD	—	10	V	102	M	H5	#	—	
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping/Forming symbol

If it is whisker preventive structure, should change “#” into “G”.

Standard Ratings

Rated voltage (V)	10				16				25				35							
	Item	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)			
Rated capacitance (μF)	φD×L (mm)				φD×L (mm)				φD×L (mm)				φD×L (mm)							
100	—	—	—	—	8×12	G3	0.153	500	8×12	G3	0.153	500	8×12	G3	0.153	500	8×12	G3	0.153	500
220	8×12	G3	0.153	500	8×12	G3	0.153	500	8×12	G3	0.153	500	10×12.5	H3	0.098	725	10×16	H4	0.075	951
330	8×12	G3	0.153	500	8×12	G3	0.153	500	10×12.5	H3	0.098	725	10×16	H4	0.075	951	10×20	H5	0.057	1130
470	10×12.5	H3	0.098	725	10×12.5	H3	0.098	725	10×16	H4	0.075	951	10×20	H5	0.057	1130	12.5×20	I5	0.040	1550
1000	10×20	H5	0.057	1130	10×20	H5	0.057	1130	12.5×20	I5	0.040	1550	12.5×20	I5	0.040	1550	16×25	J6	0.024	2550
1200	—	—	—	—	—	—	—	—	12.5×20	I5	0.040	1550	16×16	J4	0.044	1600	18×20	K5	0.029	2320
1500	—	—	—	—	—	—	—	—	—	—	—	—	12.5×30	I7	0.029	2160	12.5×35	I8	0.023	2580
1800	—	—	—	—	—	—	—	—	12.5×25	I6	0.032	1880	16×31.5	J7	0.020	3040	18×25	K6	0.022	2880
2200	12.5×25	I6	0.032	1880	12.5×25	I6	0.032	1880	12.5×30	I7	0.029	2160	16×25	J6	0.024	2550	16×35.5	J8	0.019	3280
2700	16×20	J5	0.032	2020	16×20	J5	0.032	2020	16×25	J6	0.024	2550	18×25	K6	0.022	2880	18×35.5	J8	0.019	3280
3300	18×16	K4	0.041	1800	18×20	K5	0.029	2320	18×20	K5	0.029	2320	18×25	K6	0.022	2880	18×31.5	K7	0.018	3410
3900	—	—	—	—	—	—	—	—	12.5×35	I8	0.023	2580	16×35.5	J8	0.019	3280	16×40	J9	0.017	3630
4700	16×25	J6	0.024	2550	16×31.5	J7	0.020	3040	16×25	J6	0.024	2550	18×20	K5	0.029	2320	16×31.5	J7	0.020	3040
5600	—	—	—	—	—	—	—	—	18×20	K5	0.029	2320	18×25	K6	0.022	2880	18×35.5	K8	0.017	3710
6800	—	—	—	—	—	—	—	—	16×31.5	J7	0.020	3040	16×31.5	J7	0.020	3040	18×40	K9	0.016	4000

Rated voltage (V)	50				63				80				100							
	Item	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)	Case	Casing symbol	Impedance (Ω max.)	Rated ripple current (mA rms)			
Rated capacitance (μF)	φD×L (mm)				φD×L (mm)				φD×L (mm)				φD×L (mm)							
220	10×20	—	0.098	930	—	—	—	—	—	—	—	—	16×20	J5	0.131	1070	—	—	—	—
330	—	—	—	—	—	—	—	—	16×20	J5	0.131	1070	16×25	J6	0.097	1350	16×35.5	J8	0.077	1740
470	12.5×20	I5	0.070	1170	16×20	J5	0.099	1230	16×25	J6	0.097	1350	16×40	J9	0.069	1980	18×40	K9	0.066	2120
560	—	—	—	—	—	—	—	—	18×25	K6	0.088	1530	—	—	—	—	—	—	—	—
820	12.5×30	I7	0.047	1680	16×31.5	J7	0.062	1850	18×35.5	K8	0.069	1980	—	—	—	—	—	—	—	—
1000	16×25	J6	0.039	1990	16×35.5	J8	0.058	2010	18×40	K9	0.066	2120	—	—	—	—	—	—	—	—
1800	18×31.5	K7	0.030	2670	18×40	K9	0.053	2350	—	—	—	—	—	—	—	—	—	—	—	—
2200	18×35.5	K8	0.028	2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 125°C , 100kHz, Impedance : 20°C , 100kHz

Aluminum Electrolytic Capacitors

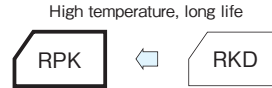
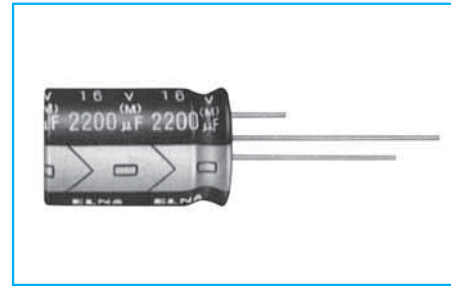
NOTE

Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

125°C Use, Long Life Capacitors

- GREEN CAP
- Low Impedance
- 125°C 5000hours
- Anti-cleaning solvent

- Guarantees 5000 hours at 125°C.
- Best-suited to smoothing circuits and control circuits for industrial equipment power supplies of which long life and high reliability are required.
- NC terminal added items are lineup for vibration resistance.



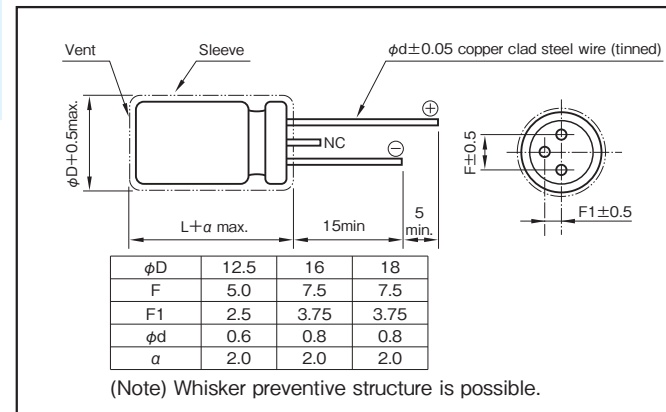
Marking color : White print on a black sleeve

Specifications

Item	Performance																				
Category temperature range (°C)	-40 to +125																				
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																				
Leakage current (μA)	Less than 0.01CV or 4 whichever is larger (after 2 minutes) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)																				
Tangent of loss angle (tanδ)	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Rated voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> </tr> </tbody> </table> <p>0.02 is added to every 1000μF increase over 1000μF. (20°C, 120Hz)</p>	Rated voltage (V)	10	16	25	35	50	63	80	100	tanδ (max.)	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08		
Rated voltage (V)	10	16	25	35	50	63	80	100													
tanδ (max.)	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08													
Characteristics at high and low temperature	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="2">Rated voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Impedance ratio (max.)</td> <td>Z-40°C/Z+20°C</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table> <p>(120Hz)</p>	Rated voltage (V)		10	16	25	35	50	63	80	100	Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3	3	3	3	3	3
Rated voltage (V)		10	16	25	35	50	63	80	100												
Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3	3	3	3	3	3												
Endurance (125°C) (Applied ripple current)	<table border="1" style="width: 100%;"> <tbody> <tr> <td>Test time</td> <td>5000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within -30% to +30% of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>300% or less of the initial specified value</td> </tr> </tbody> </table>	Test time	5000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within -30% to +30% of initial value	Tangent of the loss angle	300% or less of the initial specified value												
Test time	5000 hours																				
Leakage current	The initial specified value or less																				
Percentage of capacitance change	Within -30% to +30% of initial value																				
Tangent of the loss angle	300% or less of the initial specified value																				
Shelf life (125°C)	Test time :1000 hours; other items are the same as those for the endurance. Voltage application treatment																				
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																				

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (μF) \ Frequency (Hz)	120	1k	10k	100k
220 to 330	0.50	0.85	0.95	1
470 to 1000	0.60	0.88	0.96	1
2200 to 6800	0.68	0.90	0.98	1

Part numbering system

RPK series 16V2200μF

RPK	—	16	V	222	M	J6	D#	—	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Case symbol	Case symbol	Taping/Forming symbol			

If it is whisker preventive structure, should change "#" into "G".

Standard Ratings

Rated voltage (V)	10				16				25				35											
	Item	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)							
		φD×L (mm)	Symbol			φD×L (mm)	Symbol			φD×L (mm)	Symbol			φD×L (mm)	Symbol									
470	—	—	—	—	—	—	—	—	—	—	—	—	12.5×20	I5	0.040	1550								
1000	12.5×15	I4	0.059	1150	12.5×20	I5	0.040	1550	12.5×20	I5	0.040	1550	12.5×25	I6	0.032	1880								
					16×16	J4	0.044	1600	12.5×25	I6	0.032	1880	16×25	J6	0.024	2550								
1200	—	—	—	—	—	—	—	—	12.5×20	I5	0.040	1550	16×16	J4	0.044	1600	18×20	K5	0.029	2320				
													16×20	J5	0.032	2020	12.5×30	I7	0.029	2160				
1500	—	—	—	—	—	—	—	—	—	—	—	—	16×20	J5	0.032	2020	12.5×35	I8	0.023	2580				
													16×31.5	J7	0.020	3040	16×31.5	J7	0.020	3040				
1800	—	—	—	—	—	—	—	—	12.5×25	I6	0.032	1880	18×25	K6	0.022	2880	12.5×40	I9	0.020	2920				
													16×20	J5	0.032	2020	16×25	J6	0.024	2550				
2200	12.5×25	I6	0.032	1880	12.5×25	I6	0.032	1880	12.5×30	I7	0.029	2160	16×25	J6	0.024	2550	16×31.5	J7	0.020	3040				
	16×20	J5	0.032	2020	16×25	J6	0.024	2550	16×25	J6	0.024	2550	16×35.5	J8	0.019	3280	18×25	K6	0.022	2880				
	18×16	K4	0.041	1800	18×20	K5	0.029	2320	18×20	K5	0.029	2320	18×25	K6	0.022	2880	16×35.5	J8	0.019	3280				
2700	—	—	—	—	—	—	—	—	—	—	—	—	12.5×35	I8	0.023	2580	18×31.5	K7	0.018	3410				
													16×25	J6	0.024	2550					16×25	J6	0.024	2550
													18×20	K5	0.029	2320					18×20	K5	0.029	2320
3300	16×25	J6	0.024	2550	16×31.5	J7	0.020	3040	16×31.5	J7	0.020	3040	16×31.5	J7	0.020	3040	16×40	J9	0.017	3630				
	18×20	K5	0.029	2320	18×25	K6	0.022	2880	16×35.5	J8	0.019	3280	18×35.5	K8	0.017	3710	18×40	K9	0.016	4000				
	—	—	—	—	—	—	—	—	18×25	K6	0.022	2880	—	—	—	—								
3900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—					
4700	16×31.5	J7	0.020	3040	16×35.5	J8	0.019	3280	18×35.5	K8	0.017	3710	18×40	K9	0.016	4000								
	18×25	K6	0.022	2880	18×31.5	K7	0.018	3410	18×31.5	K7	0.018	3410												
5600	—	—	—	—	—	—	—	—	16×40	J9	0.017	3630	—	—	—	—	—	—	—					
6800	—	—	—	—	—	—	—	—	18×35.5	K8	0.017	3710	—	—	—	—	—	—	—					
	—	—	—	—	—	—	—	—	18×40	K9	0.016	4000	—	—	—	—	—	—	—					

Rated voltage (V)	50				63				80				100							
	Item	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)	Case	Casing	Impedance (Ω max.)	Rated ripple current (mA)			
		φD×L (mm)	Symbol			φD×L (mm)	Symbol			φD×L (mm)	Symbol			φD×L (mm)	Symbol					
220	—	—	—	—	—	—	—	—	—	—	—	—	—	16×20	J5	0.131	1070			
330	—	—	—	—	—	—	—	—	—	—	—	—	—	16×25	J6	0.097	1350			
470	12.5×20	I5	0.070	1170	16×20	J5	0.099	1230	16×20	J5	0.131	1070	16×35.5	J8	0.077	1740				
560	—	—	—	—	—	—	—	—	18×25	K6	0.088	1530	16×40	J9	0.069	1940				
820	12.5×30	I7	0.047	1680	16×31.5	J7	0.062	1850	18×35.5	K8	0.069	1980	18×40	K9	0.066	2120				
1000	16×25	J6	0.039	1990	16×35.5	J8	0.058	2010	18×40	K9	0.066	2120	—	—	—	—	—	—	—	
1800	18×31.5	K7	0.030	2670	18×40	K9	0.053	2350	—	—	—	—	—	—	—	—	—	—	—	
2200	18×35.5	K8	0.028	2900	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 125°C, 100kHz , Impedance : 20°C, 100kHz

Miniature Aluminum Electrolytic Capacitors

150°C Use, Miniature, Low Impedance

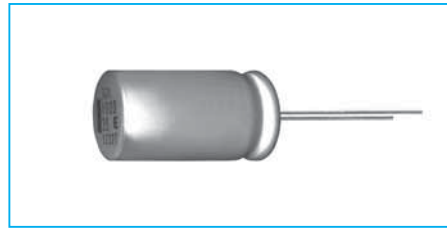
GREEN CAP Low Z 150°C 1000hours Anti-cleaning solvent

- 150°C, High temperature guaranteed.
- Guarantees 1000 hours at 150°C.

RQA

High temperature

RKB



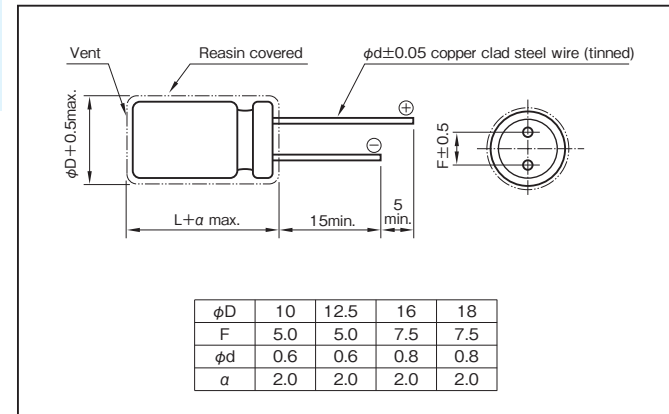
Marking color : Black print

Specifications

Item	Performance				
Category temperature range (°C)	-40 to +150				
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)				
Leakage current (μA)	Less than 0.01CV or 4 whichever is larger (after 2 minute) C : Rated capacitance (μF), V : Rated voltage (V) (20°C)				
Tangent of loss angle (tanδ)	Rated voltage (V)	10	16	25	35
	tanδ (max.)	0.20	0.16	0.14	0.12
0.02 is added to every 1000μF increase over 1000μF. (20°C, 120Hz)					
Characteristics at high and low temperature	Rated voltage (V)	10	16	25	35
	Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3
(120Hz)					
Endurance (150°C) (Applied ripple current)	Test time	1000 hours			
	Leakage current	The initial specified value or less			
	Percentage of capacitance change	Within -30% to +30% of initial value			
	Tangent of the loss angle	300% or less of the initial specified value			
Shelf life (150°C)					
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)				

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)			
220 to 330			
470 to 1000			
2200 to 10000			

Part numbering system (example : 35V1000μF)

RQA	—	35	V	102	M	I6	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping(Forming) symbol

Standard Ratings

Rated voltage (V)	Item	10			16			25			35		
		Case	Casing symbol	Rated ripple current (mArms)	Case	Casing symbol	Rated ripple current (mArms)	Case	Casing symbol	Rated ripple current (mArms)	Case	Casing symbol	Rated ripple current (mArms)
220	—	—	—	—	—	—	10×14	H3	510	10×14	H3	510	
330	—	—	—	—	—	—	10×17	H3	660	10×17	H4	660	
470	—	—	—	10×17	H4	510	10×22	H5	820	10×22	H5	820	
1000	10×22	H5	820	10×22	H5	820	12.5×27	I6	1200	12.5×27	I6	1200	
2200	12.5×22	I5	1000	12.5×27	I6	1000	16×27	J6	1370	16×27	J6	1370	
3300	12.5×22	I5	1280	16×27	J6	1200	16×37.5	J8	1720	18×33.5	K7	1670	
4700	16×27	J6	1370	16×33.5	J7	1370	18×37.5	K8	1790	18×42	K9	1870	
10000	18×37.5	K8	1790	—	—	—	—	—	—	—	—	—	

(Note) Rated ripple current : 150°C, 100kHz

Aluminum Electrolytic Capacitors

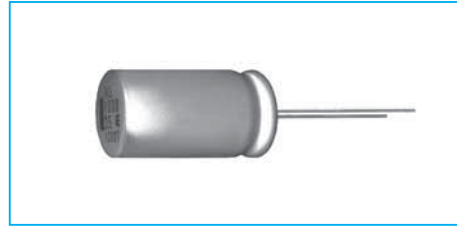
135°C Use, Miniature, Low Impedance

- GREEN CAP
- Low Z
- 135°C 3000hours
- Anti-cleaning solvent

- High temperature guaranteed and low ESR series for automotive.
- Guarantees 3000 hours at 135°C. (φ10 : 2000 hours)



High temperature



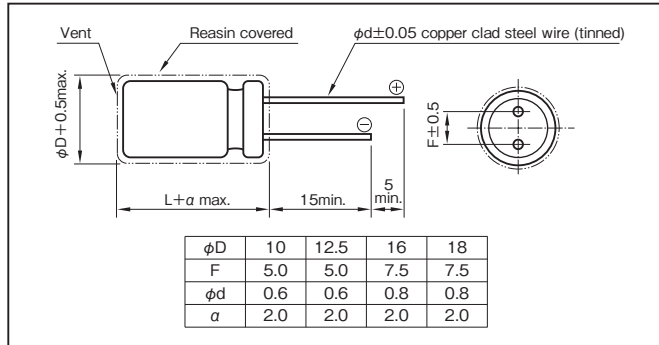
Marking color : Black print

Specifications

Item	Performance															
Category temperature range (°C)	-40 to +135															
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)															
Leakage current (µA)	Less than 0.01CV or 4 whichever is larger (after 2 minute) C : Rated capacitance (µF), V : Rated voltage (V) (20°C)															
Tangent of loss angle (tanδ)	<table border="1"> <tr> <th>Rated voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> </tr> <tr> <td>tanδ (max.)</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table>					Rated voltage (V)	10	16	25	35	tanδ (max.)	0.20	0.16	0.14	0.12	
	Rated voltage (V)	10	16	25	35											
tanδ (max.)	0.20	0.16	0.14	0.12												
0.02 is added to every 1000µF increase over 1000µF. (20°C,120Hz)																
Characteristics at high and low temperature	<table border="1"> <tr> <th>Rated voltage (V)</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> </tr> <tr> <td>Impedance ratio (max.)</td> <td>Z-40°C/Z+20°C</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </table>					Rated voltage (V)	10	16	25	35	Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3	3
	Rated voltage (V)	10	16	25	35											
Impedance ratio (max.)	Z-40°C/Z+20°C	4	3	3	3											
(120Hz)																
Endurance (135°C) (Applied ripple current)	Test time															
	3000 hours (φ10 : 2000 hours)															
	Leakage current															
	The initial specified value or less															
Percentage of capacitance change																
Within -30% to +30% of initial value																
Tangent of the loss angle																
300% or less of the initial specified value																
Shelf life (135°C)	Test time :1000 hours; other items are the same as those for the endurance. Voltage application treatment															
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)															

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated capacitance (µF) \ Frequency (Hz)	50 · 60	120	1k	10k · 100k
220 to 330	0.50	0.85	0.95	1
470 to 1000	0.60	0.88	0.96	1
1200 to 6800	0.68	0.90	0.98	1

Part numbering system (example : 10V1000µF)

RKB	—	10	V	102	M	H5	#	—	Ⓝ
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping/Forming symbol				

Miniature Aluminum Electrolytic Capacitors

Standard Ratings

Rated voltage (V) \ Rated capacitance (µF)	10				16				25				35			
	Case φD×L (mm)	Casing symbol	ESR (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	ESR (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	ESR (Ω max.)	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	ESR (Ω max.)	Rated ripple current (mA rms)
220	—	—	—	—	10×12.5	H3	0.098	725	10×12.5	H3	0.098	725	10×12.5	H3	0.098	725
330	10×12.5	H3	0.098	725	10×12.5	H3	0.098	725	10×12.5	H3	0.098	725	10×16	H4	0.075	951
470	10×12.5	H3	0.098	725	10×16	H4	0.075	951	10×16	H4	0.075	951	10×20	H5	0.057	1130
1000	10×20	H5	0.057	1130	10×20	H5	0.057	1130	12.5×20	I5	0.040	1550	12.5×25	I6	0.032	1880
1200	—	—	—	—	12.5×20	I5	0.040	1550	12.5×25	I6	0.032	1880	16×25	J6	0.024	2550
1500	—	—	—	—	—	—	—	—	—	—	—	—	12.5×30	I7	0.029	2160
1800	—	—	—	—	—	—	—	—	—	—	—	—	16×20	J5	0.032	2020
2200	12.5×25	I6	0.032	1880	12.5×25	I6	0.032	1880	12.5×30	I7	0.029	2160	12.5×35	I8	0.023	2580
2700	16×20	J5	0.032	2020	16×25	J6	0.024	2550	16×25	J6	0.024	2550	16×31.5	J7	0.020	3040
3300	16×25	J6	0.024	2550	16×31.5	J7	0.020	3040	16×35.5	J8	0.019	3280	12.5×40	I9	0.020	2920
4700	18×20	K5	0.029	2320	18×25	K6	0.022	2880	16×40	J9	0.017	3630	16×20	J5	0.032	2020
5600	16×31.5	J7	0.020	3040	16×35.5	J8	0.019	3280	16×25	J6	0.024	2550	16×35.5	J8	0.019	3280
6800	18×25	K6	0.022	2880	18×31.5	K7	0.018	3410	16×35.5	J8	0.019	3280	18×31.5	K7	0.018	3410
	—	—	—	—	—	—	—	—	18×31.5	K7	0.018	3410	18×40	K9	0.016	4000
	—	—	—	—	—	—	—	—	16×40	J9	0.017	3630	—	—	—	—
	—	—	—	—	—	—	—	—	18×40	K9	0.016	4000	—	—	—	—

(Note) Rated ripple current : 135°C , 100kHz, ESR : 20°C , 100kHz

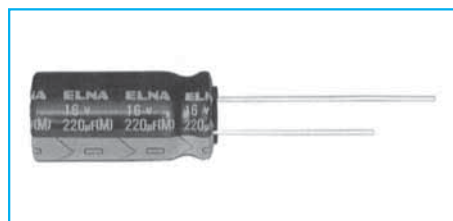
NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

Low Leakage Current Capacitors

GREEN CAP

- Low leakage current (after 1 minute) : 0.006CV or 0.5 (μA).



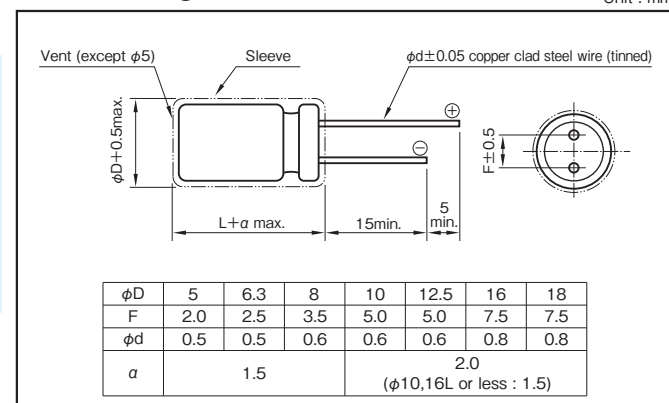
Marking color : White print on a blue sleeve

Specifications

Item	Performance																					
Category temperature range (°C)	-40 to +85																					
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																					
Leakage current (μA)	Less than 0.006CV or 0.5 whichever is larger (after 1 minute) Less than 0.002CV or 0.3 whichever is larger (after 2 minutes), C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)																					
Tangent of loss angle (tanδ)	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>More than 1μF</td> <td>0.20</td> <td>0.17</td> <td>0.13</td> <td>0.10</td> <td>0.10</td> <td>0.08</td> </tr> <tr> <td>1μF or less</td> <td>0.06</td> <td>0.06</td> <td>0.06</td> <td>0.06</td> <td>0.06</td> <td>0.06</td> </tr> </tbody> </table> (20°C, 120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	More than 1μF	0.20	0.17	0.13	0.10	0.10	0.08	1μF or less	0.06	0.06	0.06	0.06	0.06	0.06
Rated voltage (V)	6.3	10	16	25	35	50																
More than 1μF	0.20	0.17	0.13	0.10	0.10	0.08																
1μF or less	0.06	0.06	0.06	0.06	0.06	0.06																
Characteristics at high and low temperature	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Z-25°C/Z+20°C</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> <td>3</td> <td>3</td> </tr> </tbody> </table> (120Hz)	Rated voltage (V)	6.3	10	16	25	35	50	Z-25°C/Z+20°C	4	3	2	2	2	2	Z-40°C/Z+20°C	8	6	4	4	3	3
Rated voltage (V)	6.3	10	16	25	35	50																
Z-25°C/Z+20°C	4	3	2	2	2	2																
Z-40°C/Z+20°C	8	6	4	4	3	3																
Endurance (85°C) (Applied ripple current)	<table border="1"> <tbody> <tr> <td>Test time</td> <td>1000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>150% or less of the initial specified value</td> </tr> </tbody> </table>	Test time	1000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	150% or less of the initial specified value													
Test time	1000 hours																					
Leakage current	The initial specified value or less																					
Percentage of capacitance change	Within ±20% of initial value																					
Tangent of the loss angle	150% or less of the initial specified value																					
Shelf life (85°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment																					
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																					

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	CV (μF×V)	Frequency (Hz)			
			50 · 60	120	1k	10k · 100k
6.3 to 10	≤ 1000	All CV value	0.8	1	1.1	1.2
		≤ 1000	0.8	1	1.5	1.7
16 to 25	1000 <	All CV value	0.8	1	1.2	1.3
		All CV value	0.8	1	1.6	1.9

Part numbering system (example : 10V1000μF)

RLB	—	10	V	102	M	I6	#	—
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Taping/Forming symbol

Casing symbol

Case φD×L (mm)	Casing symbol	Case φD×L (mm)	Casing symbol	Case φD×L (mm)	Casing symbol	Case φD×L (mm)	Casing symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8
						18×40	K9

Standard Ratings

Rated capacitance (μF)	6.3		10		16		25		35		50	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
1	—	—	—	—	—	—	—	—	—	—	5×11	20
2.2	—	—	—	—	—	—	—	—	—	—	5×11	26
3.3	—	—	—	—	—	—	—	—	—	—	5×11	32
4.7	—	—	—	—	—	—	5×11	34	5×11	34	6.3×11	43
10	—	—	—	—	5×11	543	6.3×11	57	6.3×11	57	8×11.5	75
22	—	—	5×11	56	6.3×11	74	8×11.5	99	8×11.5	99	10×12.5	131
33	—	—	6.3×11	79	6.3×11	90	8×11.5	121	10×12.5	144	10×16	176
47	—	—	6.3×11	94	8×11.5	127	10×12.5	172	10×12.5	172	10×16	210
100	—	—	8×11.5	160	10×12.5	220	10×16	270	10×20	300	12.5×20	380
220	10×12.5	260	10×16	350	10×20	390	12.5×20	510	12.5×25	550	16×25	720
330	10×16	350	10×20	460	12.5×20	550	12.5×25	680	16×25	790	16×31.5	970
470	10×20	460	12.5×20	570	12.5×25	650	16×25	940	16×25	940	16×35.5	1210
1000	12.5×25	840	12.5×25	910	16×25	1210	16×35.5	1580	18×35.5	1690	—	—
2200	16×25	1440	16×31.5	1710	18×35.5	2200	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz

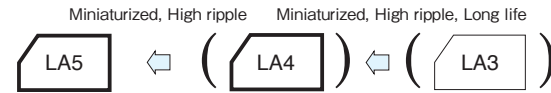
**Large Capacitance
Aluminum Electrolytic Capacitors**

Large Capacitance
Aluminum Electrolytic Capacitors

PCB Snap-In Miniaturized Capacitors

GREEN CAP

- 20mm-tall products for every diameter of $\phi 22$ to $\phi 35$ are now offered in series.
- As many as 4 case sizes available for the same rating.



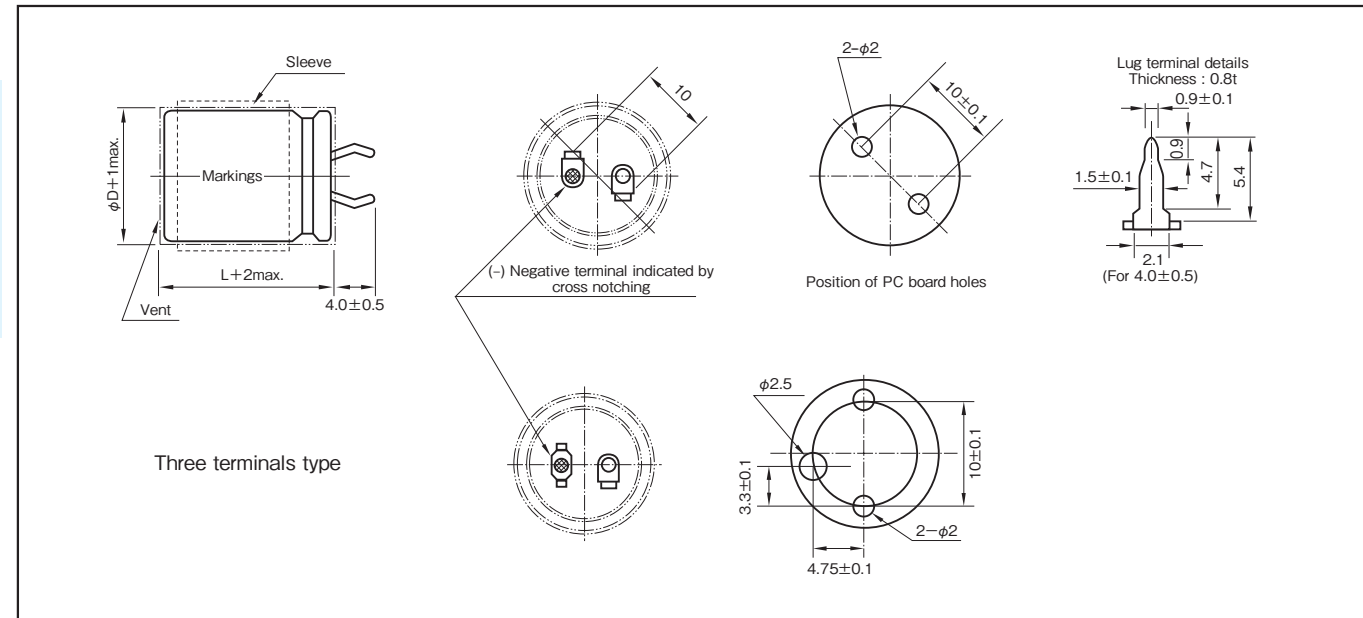
Marking color : White print on a black sleeve

Specifications

Item	Performance																						
Category temperature range (°C)	-40 to +85 (450V is at -25 to +85)																						
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																						
Leakage current (μA)	Less than 0.01CV or 1.5mA whichever is smaller (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)																						
Tangent of loss angle	<table border="1"> <tr> <th>Rated voltage (V)</th> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63 to 100</td> </tr> <tr> <th>tanδ (max.)</th> <td>0.80</td> <td>0.60</td> <td>0.50</td> <td>0.40</td> <td>0.30</td> <td>0.20</td> </tr> </table>	Rated voltage (V)	10	16	25	35	50	63 to 100	tanδ (max.)	0.80	0.60	0.50	0.40	0.30	0.20								
	Rated voltage (V)	10	16	25	35	50	63 to 100																
tanδ (max.)	0.80	0.60	0.50	0.40	0.30	0.20																	
	<table border="1"> <tr> <th rowspan="2">tanδ (max.)</th> <th rowspan="2">φD</th> <th colspan="2">Rated voltage (V)</th> </tr> <tr> <th>160 to 250</th> <th>315 to 450</th> </tr> <tr> <td></td> <td>22 to 30</td> <td>0.10</td> <td>0.15</td> </tr> <tr> <td></td> <td>35</td> <td>0.15</td> <td>0.15</td> </tr> </table> <p>(20°C, 120Hz)</p>	tanδ (max.)	φD	Rated voltage (V)		160 to 250	315 to 450		22 to 30	0.10	0.15		35	0.15	0.15								
tanδ (max.)	φD			Rated voltage (V)																			
		160 to 250	315 to 450																				
	22 to 30	0.10	0.15																				
	35	0.15	0.15																				
Characteristics at high and low temperature	<table border="1"> <tr> <th>Rated voltage (V)</th> <td>10</td> <td>16 to 35</td> <td>50 to 100</td> <td>160 to 200</td> <td>250 to 400</td> <td>450</td> </tr> <tr> <th rowspan="2">Impedance ratio (max.)</th> <td>Z-25°C/Z+20°C</td> <td>5</td> <td>4</td> <td>3</td> <td>3</td> <td>4</td> <td>4</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>18</td> <td>15</td> <td>10</td> <td>6</td> <td>8</td> <td>—</td> </tr> </table> <p>(120Hz)</p>	Rated voltage (V)	10	16 to 35	50 to 100	160 to 200	250 to 400	450	Impedance ratio (max.)	Z-25°C/Z+20°C	5	4	3	3	4	4	Z-40°C/Z+20°C	18	15	10	6	8	—
	Rated voltage (V)	10	16 to 35	50 to 100	160 to 200	250 to 400	450																
Impedance ratio (max.)	Z-25°C/Z+20°C	5	4	3	3	4	4																
	Z-40°C/Z+20°C	18	15	10	6	8	—																
Endurance (85°C) (Applied ripple current)	Test time	2000 hours																					
	Leakage current	The initial specified value or less																					
	Percentage of capacitance change	Within ±20% of initial value																					
	Tangent of the loss angle	200% or less of the initial specified value																					
Shelf life (85°C)	Test time	1000 hours																					
	Leakage current	The initial specified value or less																					
	Percentage of capacitance change	Within ±15% of initial value																					
	Tangent of the loss angle	150% or less of the initial specified value																					
	Voltage application treatment																						
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																						

Outline Drawing

Unit : mm



Part numbering system (example : 400V220μF)					
LA5	—	400 V	221	M	S43 # B
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol

In the case of three terminals type, a series name is "LT5".

Rated voltage (V)	Frequency (Hz)				
	50	120	1k	10k	20k
100 or less	0.95	1	1.10	1.15	1.15
160 to 250	0.87	1	1.11	1.18	1.20
315 or more	0.80	1	1.14	1.19	1.20

Standard Ratings

Table with 19 columns (Rated voltage, Item, 10, 16, 25, 35, 50, 63, 80, 100) and 28 rows of capacitor specifications including capacitance, ESR, and ripple current.

Table with 19 columns (Rated voltage, Item, 160, 180, 200, 250, 315, 350, 400, 450) and 28 rows of capacitor specifications including capacitance, ESR, and ripple current.

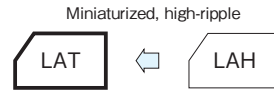
(Note) ESR : 20°C, 120Hz ; Rated ripple current : 85°C, 120Hz

Large Capacitance Aluminum Electrolytic Capacitors

Ultra Miniaturized, High-Reliability, High-Ripple Capacitors

GREEN CAP 105°C 2000hours

- Best suited as input filters for various power supplies.
- Guarantees 2000 hours at 105°C.



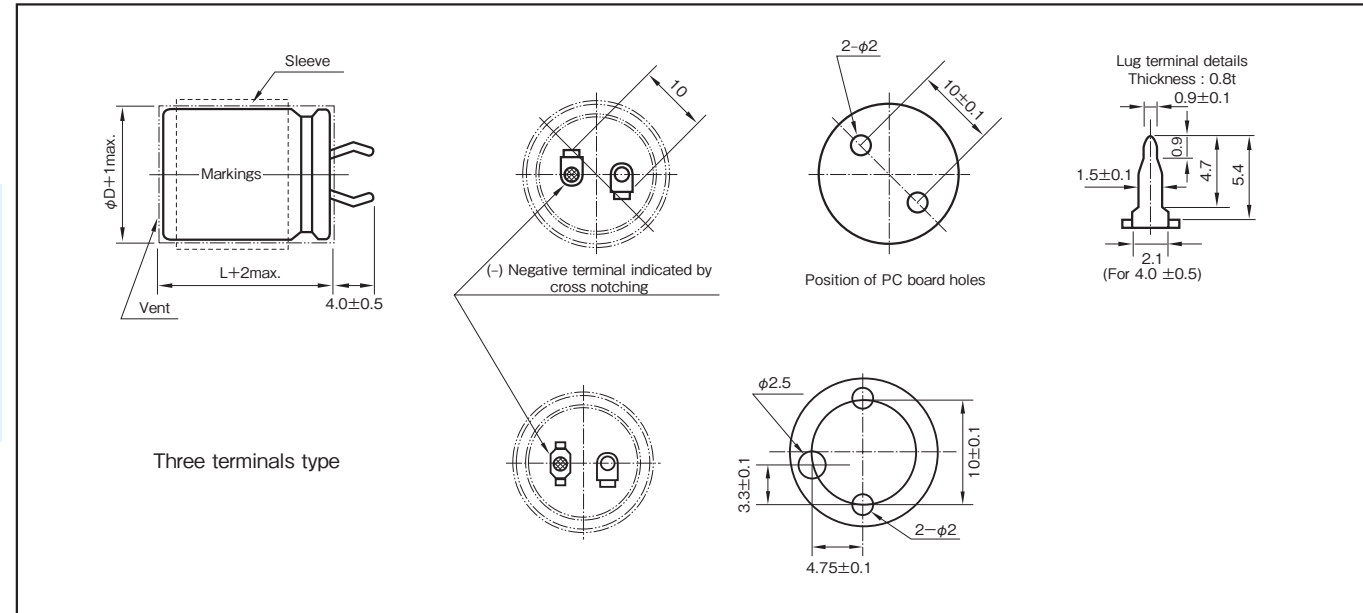
Marking color : White print on a black sleeve

Specifications

Item	Performance		
Category temperature range (°C)	-25 to +105		
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)		
Leakage current (μA)	Less than 0.02CV or 3mA whichever is smaller (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)		
Tangent of loss angle (tanδ)	Rated voltage (V)	160 to 250	315 to 500
	tanδ (max.)	0.15	0.20
Characteristics at high and low temperature	Percentage of capacitance change (%)	-25°C	Within ±30% of the value at 20°C
	Impedance ratio (max.)	Z-25°C/Z+20°C	4
Endurance (105°C) (Applied ripple current)	Test time	2000 hours	
	Leakage current	The initial specified value or less	
	Percentage of capacitance change	Within ±20% of initial value	
	Tangent of the loss angle	200% or less of the initial specified value	
Shelf life (105°C)	Test time	1000 hours	
	Leakage current	The initial specified value or less	
	Percentage of capacitance change	Within ±15% of initial value	
	Tangent of the loss angle	150% or less of the initial specified value	
Applicable standards	Voltage application treatment JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)		

Outline Drawing

Unit : mm



Part numbering system (example : 200V470μF)					
LAT	—	200 V	471	M	S24 # B
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol

In the case of three terminals type, a series name is "LTT".

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k	30k
Rated voltage (V)					
160 to 250	0.87	1	1.11	1.18	1.20
315 or more	0.80	1	1.14	1.19	1.20

Standard Ratings

Rated voltage(V)		160		180		200		250		315		350	
Case	Item	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)
22×20	S21	220	0.70	180	0.63	150	0.58	120	0.52	68	0.39	56	0.35
22×25	S22	390	1.30	330	1.20	270	1.10	220	1.00	120	0.75	100	0.51
22×30	S23	470	1.47	390	1.30	390	1.31	270	1.14	150	0.82	120	0.61
22×35	S24	560	1.58	470	1.50	470	1.50	330	1.26	180	0.91	150	0.73
22×40	S25	680	1.71	560	1.62	560	1.56	390	1.49	220	1.02	180	0.84
22×45	S26	820	2.00	680	1.70	680	1.74	470	1.57	270	1.16	220	0.98
22×50	S27	1000	2.20	820	2.00	820	1.99	560	1.67	330	1.20	270	1.09
25×20	S31	270	0.84	220	0.76	180	0.68	150	0.62	100	0.51	82	0.46
25×25	S32	470	1.55	390	1.35	390	1.35	270	1.18	180	0.90	150	0.68
25×30	S33	680	1.70	560	1.53	560	1.53	330	1.30	220	1.00	180	0.80
25×35	S34	820	2.00	680	1.74	680	1.74	470	1.57	270	1.10	220	0.99
25×40	S35	1000	2.20	820	2.00	820	1.95	560	1.79	330	1.20	270	1.09
25×45	S36	1200	2.45	1000	2.23	820	2.04	680	1.81	390	1.30	330	1.20
25×50	S37	1500	2.86	1200	2.51	1000	2.30	680	1.84	470	1.40	390	1.28
30×20	S41	390	1.13	330	1.04	330	1.04	220	0.92	150	0.70	120	0.69
30×25	S42	680	1.82	560	1.67	560	1.67	390	1.31	270	1.10	220	0.99
30×30	S43	1000	2.20	820	2.00	820	2.00	560	1.79	330	1.20	270	1.09
30×35	S44	1200	2.44	1000	2.24	1000	2.24	680	2.00	390	1.30	330	1.20
30×40	S45	1500	2.82	1200	2.52	1200	2.52	820	2.16	470	1.40	390	1.28
30×45	S46	1800	3.31	1500	2.89	1500	2.91	1000	2.37	560	1.50	470	1.37
30×50	S47	2200	3.81	1800	3.30	1500	3.03	1000	2.47	680	1.70	560	1.54
35×20	S51	560	1.49	470	1.37	470	1.37	330	1.14	180	0.83	150	0.76
35×25	S52	1000	2.20	820	2.00	820	2.00	560	1.68	330	1.20	270	1.09
35×30	S53	1500	2.50	1200	2.50	1000	2.30	680	1.75	470	1.40	390	1.28
35×35	S54	1800	2.92	1500	2.89	1200	2.65	820	2.00	560	1.50	470	1.37
35×40	S55	2200	3.34	1800	3.05	1500	3.08	1000	2.30	680	1.70	560	1.54
35×45	S56	2200	3.48	2200	3.46	1800	3.47	1200	2.43	820	2.00	680	1.82
35×50	S57	2700	3.97	2200	3.60	2200	3.78	1500	2.96	—	—	820	2.08

Rated voltage(V)		400		450		500	
Case	Item	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)
22×20	S21	56	0.39	56	0.35	22	0.24
		68	0.43	—	—	27	0.28
22×25	S22	82	0.64	68	0.52	33	0.32
		100	0.56	82	0.47	39	0.37
22×30	S23	100	0.69	100	0.56	47	0.41
		120	0.73	—	—	56	0.47
22×35	S24	120	0.75	120	0.65	68	0.54
		150	0.73	150	0.73	—	—
22×40	S25	150	0.82	150	0.77	82	0.62
		180	0.84	180	0.84	—	—
22×45	S26	180	0.90	180	0.89	100	0.67
		220	0.99	220	0.98	—	—
22×50	S27	220	1.05	220	1.03	120	0.77
		270	1.16	—	—	—	—
25×20	S31	68	0.46	56	0.38	—	—
		82	0.51	—	—	—	—
25×25	S32	120	0.75	100	0.71	—	—
		150	0.68	120	0.61	—	—
25×30	S33	150	0.84	150	0.82	68	0.54
		180	0.80	150	0.82	—	—
25×35	S34	180	0.94	180	0.96	82	0.62
		220	1.04	—	—	—	—
25×40	S35	220	1.07	220	1.00	100	0.67
		270	1.11	—	—	120	0.74
25×45	S36	270	1.20	270	1.17	150	0.82
		330	1.29	—	—	—	—
25×50	S37	330	1.32	270	1.22	180	0.98
		390	1.43	330	1.35	—	—
30×20	S41	82	0.52	82	0.52	—	—
		100	0.57	100	0.57	—	—
30×25	S42	150	0.82	150	0.83	—	—
		180	0.90	180	0.72	—	—
30×30	S43	220	1.06	220	1.12	100	0.67
		270	1.09	220	0.86	—	—
30×35	S44	270	1.21	270	1.24	120	0.77
		330	1.34	—	—	—	—
30×40	S45	330	1.39	330	1.18	150	0.85
		390	1.51	330	1.18	—	—
30×45	S46	390	1.55	330	1.46	180	1.01
		470	1.65	390	1.35	—	—
30×50	S47	470	1.69	390	1.58	220	1.12
		560	1.84	470	1.55	270	1.25
35×20	S51	120	0.75	120	0.72	—	—
		150	0.84	150	0.67	—	—
35×25	S52	220	1.08	220	1.04	—	—
		270	1.20	—	—	—	—
35×30	S53	330	1.20	270	1.26	120	0.80
		390	1.30	330	1.15	—	—
35×35	S54	390	1.54	390	1.54	150	0.85
		470	1.69	—	—	—	—
35×40	S55	470	1.74	470	1.59	220	1.12
		560	1.82	—	—	270	1.25
35×45	S56	560	1.85	470	1.64	330	1.36
		680	1.95	560	1.79	—	—
35×50	S57	680	2.03	560	2.02	390	1.54
		820	2.33	680	2.03	—	—

(Note) Rated ripple current : 105°C , 120Hz

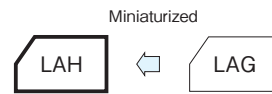
NOTE

Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

Miniaturized, High-Reliability, High-Ripple Capacitors

GREEN CAP 105°C 2000hours

- High-reliability, high-ripple capacitors.
- Guarantees 2000 hours at 105°C.



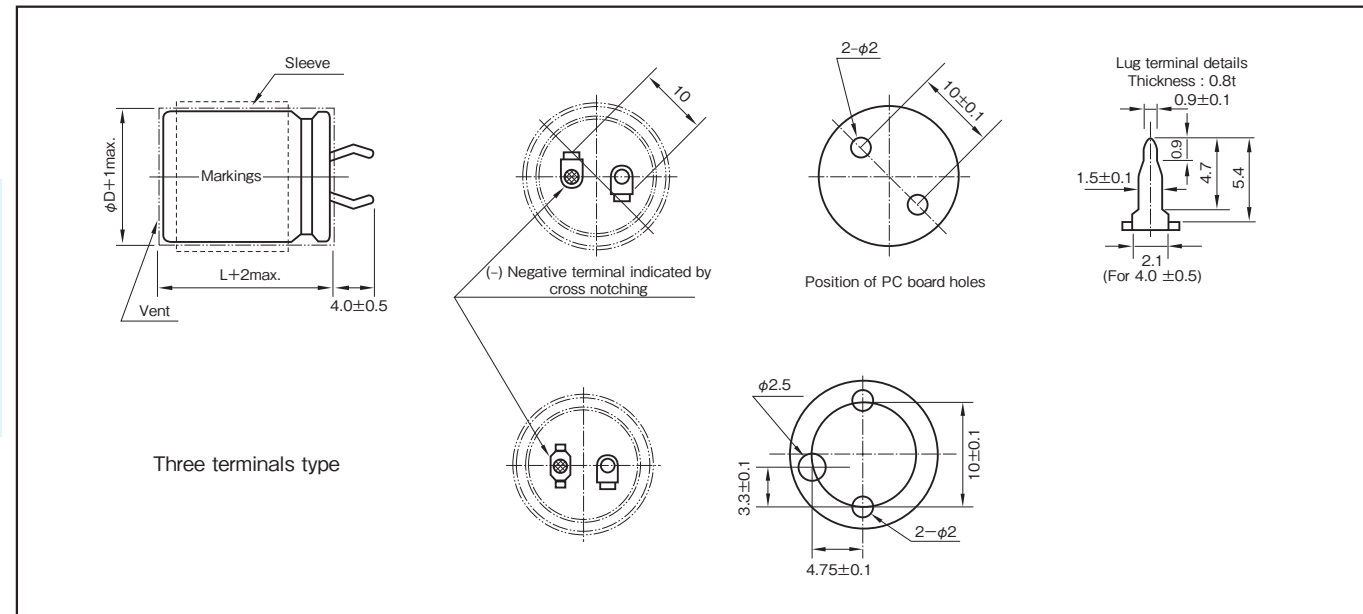
Marking color : White print on a black sleeve

Specifications

Item	Performance							
Category temperature range (°C)	-40 to +105 (-25 to +105 at 160V or more)							
Tolerance at rated capacitance (%)	± 20 (20°C, 120Hz)							
Leakage current (μA)	Less than 0.02CV or 3mA whichever is smaller (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)							
Tangent of loss angle (tanδ)	Rated voltage (V)	16	25	35	50	63 to 100	160 to 250	400 to 450
	tanδ (max.)	0.50	0.40	0.35	0.30	0.20	0.15	0.20
		(20°C, 120Hz)						
Characteristics at high and low temperature	Rated voltage (V)	16 to 100	160 to 200	250 to 400				
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	4	4			
		(120Hz)						
Endurance (105°C) (Applied ripple current)	Test time	2000 hours						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±20% of initial value						
	Tangent of the loss angle	200% or less of the initial specified value						
Shelf life (105°C)	Test time	1000 hours						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±15% of initial value						
	Tangent of the loss angle	150% or less of the initial specified value						
Voltage application treatment								
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)							

Outline Drawing

Unit: mm



Coefficient of Frequency for Rated Ripple Current

Part numbering system (example : 200V470μF)	Frequency (Hz)				
	50	120	1k	10k	30k
100 or less	0.95	1	1.10	1.15	1.15
160 to 250	0.87	1	1.11	1.18	1.20
315 or more	0.80	1	1.14	1.19	1.20

In the case of three terminals type, a series name is "LTH".

Standard Ratings

Case φD×L (mm)	Casing Item Symbol	16		25		35		50		63		80		100	
		Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)
22×25	S22	6800	1.60	4700	1.55	3300	1.43	1800	1.31	1200	1.25	820	1.11	560	1.07
22×30	S23	10000	1.99	6800	1.91	3900	1.65	2700	1.70	1800	1.52	1200	1.39	820	1.35
22×35	S24	12000	2.28	8200	2.14	5600	2.02	3300	1.98	220	1.73	1500	1.61	1000	1.54
22×40	S25	15000	2.64	10000	2.40	6800	2.28	3900	2.25	2700	1.97	1800	1.83	1200	1.74
22×45	S26	18000	2.98	12000	2.69	—	—	4700	2.56	—	—	2200	2.09	1500	1.99
22×50	S27	—	—	—	—	8200	2.67	5600	2.89	3300	2.32	—	—	—	—
25×25	S32	10000	1.99	6800	1.91	4700	1.78	2700	1.70	1800	1.52	1200	1.39	820	1.35
25×30	S33	12000	2.30	8200	2.16	5600	2.04	3300	2.00	2200	1.75	1500	1.62	1000	1.56
25×35	S34	15000	2.68	10000	2.44	6800	2.31	3900	2.28	2700	1.99	2200	2.01	1200	1.76
25×40	S35	18000	3.04	12000	2.74	8200	2.60	5600	2.81	3300	2.27	—	—	1500	2.03
25×45	S36	22000	3.40	15000	3.15	10000	2.92	—	—	3900	2.54	2700	2.43	1800	2.28
25×50	S37	27000	3.81	18000	3.54	12000	3.26	6800	3.37	4700	2.88	3300	2.76	2200	2.57
30×25	S42	12000	2.38	8200	2.25	5600	2.12	3900	2.22	2700	1.93	1800	1.81	1200	1.71
30×30	S43	18000	3.00	12000	2.70	8200	2.56	4700	2.58	3300	2.24	2200	2.10	1500	2.00
30×35	S44	22000	3.39	15000	3.13	10000	2.92	5600	2.95	3900	2.55	2700	2.43	1800	2.27
30×40	S45	27000	3.83	18000	3.54	12000	3.28	6800	3.39	4700	2.90	3300	2.78	2200	2.59
30×45	S46	33000	4.30	22000	4.24	15000	3.74	8200	3.71	5600	3.28	3900	3.12	2700	2.94
30×50	S47	39000	4.74	—	—	—	—	10000	4.09	6800	3.73	4700	3.56	3300	3.32
35×25	S52	18000	3.10	12000	2.80	8200	2.78	4700	2.67	3300	2.41	2200	2.17	1500	2.07
35×30	S53	27000	3.74	15000	3.22	12000	3.20	6800	3.31	4700	2.83	3300	2.71	2200	2.52
35×35	S54	33000	4.24	22000	3.96	15000	3.69	8200	3.66	5600	3.24	3900	3.07	2700	2.90
35×40	S55	39000	4.72	—	—	18000	4.16	10000	4.07	6800	3.71	4700	3.50	3300	3.31
35×45	S56	47000	5.27	27000	4.75	—	—	12000	4.50	8200	4.16	5600	3.87	3900	3.69
35×50	S57	—	—	33000	5.39	22000	4.92	—	—	10000	4.69	6800	4.19	4700	4.14

Case φD×L (mm)	Casing Item Symbol	160		180		200		250		400		450	
		Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)
22×25	S22	330	1.16	270	1.08	220	1.08	180	0.94	68	0.47	56	0.47
22×30	S23	390	1.43	330	1.30	330	1.30	220	1.10	82	0.56	68	0.56
22×35	S24	470	1.52	470	1.50	390	1.41	270	1.13	120	0.64	82	0.64
22×40	S25	560	1.62	560	1.62	470	1.50	330	1.20	150	0.70	100	0.70
22×45	S26	680	1.70	—	—	560	1.58	390	1.26	—	—	120	0.73
22×50	S27	820	1.81	680	1.76	680	1.68	470	1.37	180	0.78	150	0.78
25×25	S32	470	1.55	390	1.35	330	1.35	220	1.15	82	0.65	68	0.65
25×30	S33	560	1.73	470	1.62	470	1.47	330	1.30	120	0.70	100	0.70
25×35	S34	680	1.81	560	1.69	560	1.65	390	1.41	150	0.73	120	0.73
25×40	S35	820	1.98	680	1.72	680	1.80	470	1.52	180	0.82	150	0.82
25×45	S36	1000	2.04	820	1.78	—	—	560	1.59	220	0.87	180	0.87
25×50	S37	1200	2.12	1000	1.91	820	1.87	680	1.66	270	0.94	220	0.94
30×25	S42	680	1.82	560	1.67	470	1.56	330	1.30	120	0.78	100	0.78
30×30	S43	820	1.98	680	1.74	680	1.82	470	1.36	180	0.83	150	0.83
30×35	S44	1000	2.14	820	1.85	820	1.99	560	1.57	220	0.86	180	0.86
30×40	S45	1200	2.22	1000	2.01	—	—	680	1.76	270	0.95	220	0.95
30×45	S46	1500	2.46	1200	2.19	1000	2.17	820	1.83	330	1.11	270	1.11
30×50	S47	—	—	1500	2.36	1200	2.22	1000	1.87	390	1.15	330	1.15
35×25	S52	820	1.93	680	1.92	680	1.96	470	1.40	180	0.86	150	0.86
35×30	S53	1200	2.40	1000	2.16	820	2.07	560	1.56	270	0.91	220	0.91
35×35	S54	1500	2.53	1200	2.34	1000	2.22	820	1.82	330	1.13	270	1.13
35×40	S55	—	—	1500	2.56	1200	2.42	1000	1.99	390	1.26	330	1.26
35×45	S56	1800	2.98	1800	2.67	1500	2.59	1200	2.10	470	1.31	390	1.31
35×50	S57	2200	3.10	—	—	1800	2.70	—	—	560	1.50	470	1.50

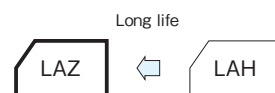
(Note) Rated ripple current : 105°C , 120Hz

Large Capacitance Aluminum Electrolytic Capacitors

High-Reliability, High-Ripple, Long Life Capacitors

GREEN CAP 105°C 3000hours

- High-reliability, high-ripple, long life capacitors.
- Guarantees 3000 hours at 105°C.



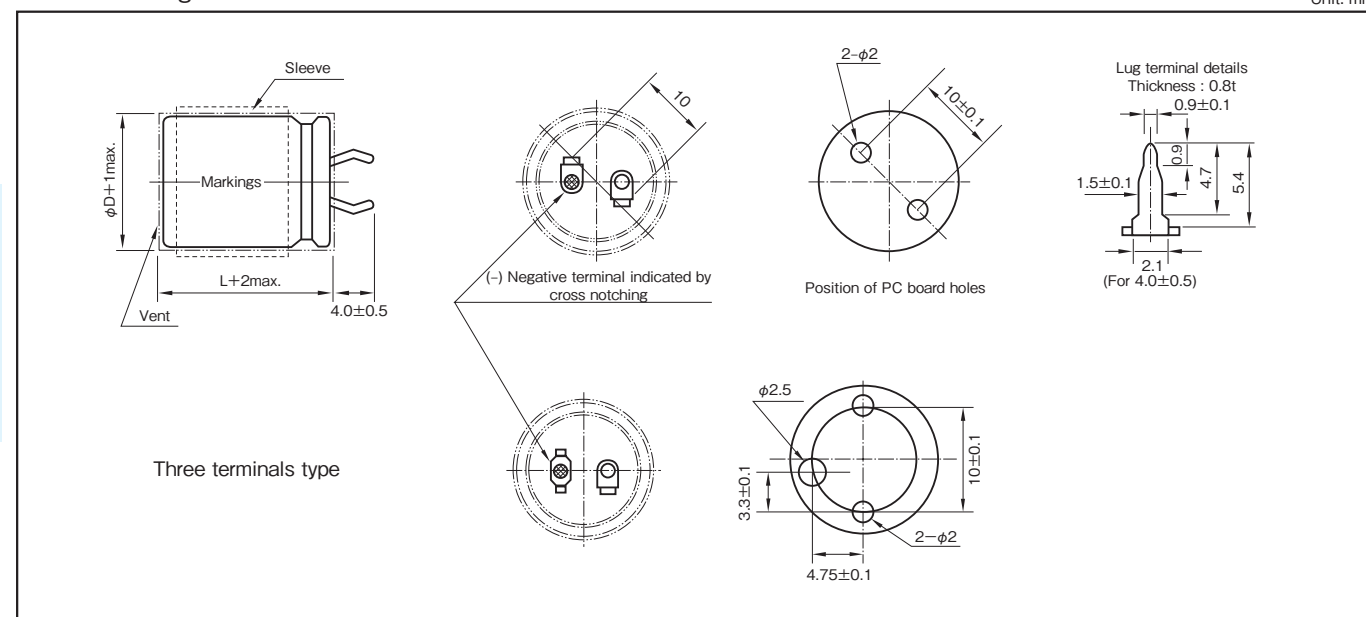
Marking color : White print on a black sleeve

Specifications

Item	Performance							
Category temperature range (°C)	-40 to +105 (-25 to +105 at 160V or more)							
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)							
Leakage current (μA)	Less than 0.02CV or 3mA whichever is smaller (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)							
Tangent of loss angle (tanδ)	Rated voltage (V)	16	25	35	50	63 to 100	160 to 250	400 to 450
	tanδ (max.)	0.50	0.40	0.35	0.30	0.20	0.15	0.20
		(20°C, 120Hz)						
Characteristics at high and low temperature	Rated voltage (V)	16 to 100	160 to 200	250 to 400				
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	4	4			
		(120Hz)						
Endurance (105°C) (Applied ripple current)	Test time	3000 hours						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±20% of initial value						
	Tangent of the loss angle	200% or less of the initial specified value						
Shelf life (105°C)	Test time	1000 hours						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±15% of initial value						
	Tangent of the loss angle	150% or less of the initial specified value						
Voltage application treatment								
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)							

Outline Drawing

Unit: mm



Part numbering system (example : 200V470μF)						
LAZ	—	200 V	471	M	S33 # B	
Series code		Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol

In the case of three terminals type, a series name is "LTZ".

- The electric characteristics are described on page 174.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k	30k
Rated voltage (V)					
100 or less	0.95	1	1.10	1.15	1.15
160 to 250	0.87	1	1.11	1.18	1.20
315 or more	0.80	1	1.14	1.19	1.20

Standard Ratings

Case φD×L(mm)	Item Casing symbol	16		25		35		50		63		80		100	
		Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)
		22×25	S22	6800	1.60	4700	1.55	3300	1.43	1800	1.31	1200	1.25	820	1.11
22×30	S23	10000	1.99	6800	1.91	3900	1.65	2700	1.70	1800	1.52	1200	1.39	820	1.35
22×35	S24	12000	2.28	8200	2.14	5600	2.02	3300	1.98	2200	1.73	1500	1.61	1000	1.54
22×40	S25	15000	2.64	10000	2.40	6800	2.28	3900	2.25	2700	1.97	1800	1.83	1200	1.74
22×45	S26	18000	2.98	12000	2.69	—	—	4700	2.56	—	—	2200	2.09	1500	1.99
22×50	S27	—	—	—	—	8200	2.67	5600	2.89	3300	2.32	—	—	—	—
25×25	S32	10000	1.99	6800	1.91	4700	1.78	2700	1.70	1800	1.52	1200	1.39	820	1.35
25×30	S33	12000	2.30	8200	2.16	5600	2.04	3300	2.00	2200	1.75	1500	1.62	1000	1.56
25×35	S34	15000	2.68	10000	2.44	6800	2.31	3900	2.28	2700	1.99	2200	2.01	1200	1.76
25×40	S35	18000	3.04	12000	2.74	8200	2.60	5600	2.81	3300	2.27	—	—	1500	2.03
25×45	S36	22000	3.40	15000	3.15	10000	2.92	—	—	3900	2.54	2700	2.43	1800	2.28
25×50	S37	27000	3.81	18000	3.54	12000	3.26	6800	3.37	4700	2.88	3300	2.76	2200	2.57
30×25	S42	12000	2.38	8200	2.25	5600	2.12	3900	2.22	2700	1.93	1800	1.81	1200	1.71
30×30	S43	18000	3.00	12000	2.70	8200	2.56	4700	2.58	3300	2.24	2200	2.10	1500	2.00
30×35	S44	22000	3.39	15000	3.13	10000	2.92	5600	2.95	3900	2.55	2700	2.43	1800	2.27
30×40	S45	27000	3.83	18000	3.54	12000	3.28	6800	3.39	4700	2.90	3300	2.78	2200	2.59
30×45	S46	33000	4.30	22000	4.24	15000	3.74	8200	3.71	5600	3.28	3900	3.12	2700	2.94
30×50	S47	39000	4.74	—	—	—	—	10000	4.09	6800	3.73	4700	3.56	3300	3.32
35×25	S52	18000	3.10	12000	2.80	8200	2.78	4700	2.67	3300	2.41	2200	2.17	1500	2.07
35×30	S53	27000	3.74	15000	3.22	12000	3.20	6800	3.31	4700	2.83	3300	2.71	2200	2.52
35×35	S54	33000	4.24	22000	3.96	15000	3.69	8200	3.66	5600	3.24	3900	3.07	2700	2.90
35×40	S55	39000	4.72	—	—	18000	4.16	10000	4.07	6800	3.71	4700	3.50	3300	3.31
35×45	S56	47000	5.27	27000	4.75	—	—	12000	4.50	8200	4.16	5600	3.87	3900	3.69
35×50	S57	—	—	33000	5.39	22000	4.92	—	—	10000	4.69	6800	4.19	4700	4.14

Case φD×L(mm)	Item Casing symbol	160		180		200		250		400		450	
		Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)	Rated capacitance (μF)	Rated ripple current (Arms)
		22×20	S21	180	0.70	180	0.70	150	0.65	120	0.60	47	0.37
22×25	S22	330	1.16	270	1.08	220	1.08	180	0.94	68	0.47	56	0.47
22×30	S23	390	1.43	330	1.30	330	1.30	220	1.10	82	0.56	68	0.56
22×35	S24	—	—	390	1.35	—	—	—	—	100	0.62	82	0.64
22×40	S25	470	1.52	470	1.50	390	1.41	270	1.13	120	0.75	82	0.65
22×45	S26	560	1.50	—	—	—	—	—	—	—	—	100	0.70
22×50	S27	560	1.62	560	1.62	470	1.50	330	1.30	150	0.83	100	0.70
25×20	S31	—	—	—	—	—	—	390	1.41	—	—	120	0.73
25×25	S32	680	1.70	680	1.75	560	1.58	390	1.49	180	0.98	120	0.77
25×30	S33	—	—	—	—	—	—	—	—	—	—	150	0.88
25×35	S34	820	1.91	680	1.80	680	1.78	470	1.50	220	1.10	150	0.90
25×40	S35	—	—	—	—	—	—	—	—	—	—	180	1.00
25×45	S36	220	0.81	220	0.85	220	0.85	150	0.74	68	0.46	—	—
25×50	S37	270	0.95	—	—	—	—	—	—	—	—	—	—
30×20	S41	390	1.30	390	1.35	330	1.35	220	1.15	82	0.65	68	0.56
30×25	S42	470	1.55	—	—	—	—	—	—	100	0.62	82	0.64
30×30	S43	560	1.73	470	1.62	470	1.47	330	1.30	120	0.70	100	0.70
30×35	S44	680	1.82	—	—	—	—	—	—	150	0.83	120	0.73
30×40	S45	680	1.85	560	1.69	560	1.65	390	1.41	150	0.85	120	0.77
30×45	S46	—	—	680	1.72	—	—	—	—	180	0.98	150	0.88
30×50	S47	820	1.98	680	1.75	680	1.80	470	1.52	180	1.01	150	0.90
35×20	S51	—	—	820	1.85	—	—	—	—	220	1.05	180	1.00
35×25	S52	1000	2.04	820	1.85	820	1.97	560	1.80	220	1.05	180	1.02
35×30	S53	1200	2.12	1000	1.91	—	—	—	—	270	1.22	220	1.12
35×35	S54	1200	2.20	1000	1.95	820	1.99	680	2.00	270	1.25	220	1.15
35×40	S55	—	—	—	—	1000	2.17	—	—	330	1.44	—	—
35×45	S56	390	1.25	330	1.15	270	1.05	220	0.95	100	0.60	—	—
35×50	S57	680	1.82	560	1.67	470	1.56	330	1.30	120	0.78	100	0.70
40×20	S41	—	—	—	—	—	—	390	1.41	150	0.83	120	0.73
40×25	S42	820	1.98	680	1.74	680	1.82	470	1.51	180	0.98	150	0.88
40×30	S43	—	—	820	1.85	—	—	560	1.70	220	1.03	180	0.95
40×35	S44	1000	2.14	820	1.90	820	1.99	560	1.80	220	1.10	180	0.99
40×40	S45	—	—	1000	2.01	—	—	680	1.90	270	1.22	220	1.12
40×45	S46	1200	2.22	1000	2.10	1000	2.17	680	2.00	270	1.23	220	1.16
40×50	S47	1500	2.46	1200	2.19	—	—	820	2.20	330	1.44	270	1.28
45×20	S46	1500	2.60	1200	2.19	1000	2.20	820	2.25	330	1.45	270	1.32
45×25	S46	—	—	1500	2.36	1200	2.32	—	—	390	1.60	—	—
45×30	S47	1800	2.98	1500	2.52	1200	2.39	1000	2.47	390	1.60	330	1.45
45×35	S47	—	—	—	—	1500	2.59	—	—	470	1.90	—	—
45×40	S51	560	1.55	470	1.40	470	1.56	330	1.16	150	0.80	—	—
45×45	S52	820	1.93	680	1.92	680	1.96	470	1.51	180	0.95	150	0.86
45×50	S52	—	—	820	1.95	—	—	560	1.65	220	1.03	—	—
50×20	S53	1200	2.40	1000	2.16	820	2.07	560	1.65	270	1.22	220	1.12
50×25	S53	—	—	—	—	1000	2.22	680	2.00	330	1.37	—	—
50×30	S54	1500	2.53	1200	2.34	1000	2.22	820	2.20	330	1.39	270	1.28
50×35	S54	—	—	1500	2.56	1200	2.42	—	—	390	1.60	—	—
50×40	S55	1800	2.98	1500	2.56	1200	2.42	1000	2.47	390	1.60	330	1.45
50×45	S55	—	—	1800	2.60	1500	2.59	—	—	470	1.85	390	1.45
50×50	S56	1800	3.00	1800	2.67	1500	2.61	1200	2.60	470	1.91	390	1.49
50×55	S56	2200	3.10	—	—	1800	2.70	—	—	560	2.12	—	—
50×60	S57	2200	3.20	2200	3.15	1800	2.85	1500	3.00	560	2.15	470	1.85
50×65	S57	2700	3.89	—	—	2200	3.30	—	—	—	—	—	—

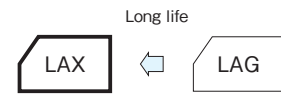
(Note) Rated ripple current : 105°C , 120Hz

Large Capacitance Aluminum Electrolytic Capacitors

Ultra Long Life, High-Reliability Capacitors

GREEN CAP **105°C**
5000hours

- Ultra Long Life, high-reliability capacitors.
- Guarantees 5000 hours at 105°C.



Marking color : White print on a black sleeve

Specifications

Item	Performance											
Category temperature range (°C)	-25 to +105											
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)											
Leakage current (µA)	Less than 0.02CV or 3mA whichever is smaller (after 5 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)											
Tangent of loss angle (tanδ)	<table border="1"> <tr> <td>Rated voltage (V)</td> <td>160</td> <td>200</td> <td>250</td> <td>400</td> </tr> <tr> <td>tanδ (max.)</td> <td>0.215</td> <td>0.15</td> <td>0.15</td> <td>0.20</td> </tr> </table> (20°C, 120Hz)		Rated voltage (V)	160	200	250	400	tanδ (max.)	0.215	0.15	0.15	0.20
Rated voltage (V)	160	200	250	400								
tanδ (max.)	0.215	0.15	0.15	0.20								
Characteristics at high and low temperature	Percentage of capacitance change (%)	-25°C	Within ±30% of the value at 20°C									
	Impedance ratio (max.)	Z-25°C/Z+20°C	4									
Endurance (105°C) (Applied ripple current)	Test time	5000 hours										
	Leakage current	The initial specified value or less										
	Percentage of capacitance change	Within ±20% of initial value										
	Tangent of the loss angle	200% or less of the initial specified value										
Shelf life (105°C)	Test time	1000 hours										
	Leakage current	The initial specified value or less										
	Percentage of capacitance change	Within ±15% of initial value										
	Tangent of the loss angle	150% or less of the initial specified value										
Applicable standards	Voltage application treatment JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)											

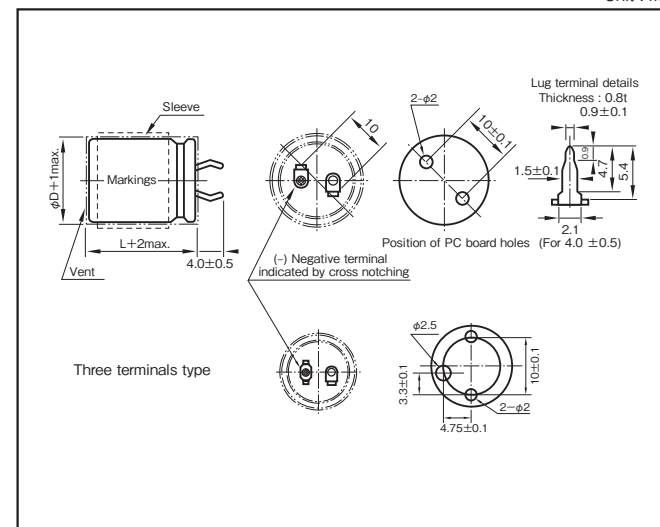
Standard Ratings

Rated voltage (V)		160		200		250		400	
Case φDxL (mm)	Casing symbol	Rated capacitance (µF)	Rated ripple current (Arms)	Rated capacitance (µF)	Rated ripple current (Arms)	Rated capacitance (µF)	Rated ripple current (Arms)	Rated capacitance (µF)	Rated ripple current (Arms)
22x25	S22	270	0.91	180	0.75	150	0.68	56	0.34
22x30	S23	330	1.09	270	0.99	180	0.81	68	0.40
22x35	S24	390	1.27	330	1.16	220	0.95	82	0.47
22x40	S25	470	1.36	390	1.24	270	1.03	120	0.56
22x50	S27	680	1.52	470	1.37	390	1.16	150	0.63
25x25	S32	390	1.15	270	0.96	180	0.78	68	0.39
25x30	S33	470	1.36	330	1.14	270	1.03	100	0.51
25x35	S34	560	1.54	470	1.45	330	1.21	120	0.60
25x40	S35	680	1.68	560	1.55	390	1.29	150	0.66
25x50	S37	820	1.81	680	1.72	470	1.43	220	0.80
30x25	S42	560	1.45	330	1.11	270	1.01	100	0.50
30x30	S43	680	1.68	470	1.43	330	1.16	150	0.66
30x35	S44	820	1.82	560	1.66	470	1.33	180	0.77
30x40	S45	1000	1.90	680	1.79	560	1.48	220	0.83
30x50	S47	1200	2.09	1000	2.00	680	1.59	270	0.92
35x30	S53	820	1.93	680	1.76	470	1.33	180	0.74
35x35	S54	1000	2.15	820	2.05	560	1.55	220	0.87
35x40	S55	1500	2.52	1000	2.22	680	1.69	270	0.94
35x50	S57	1800	2.63	1200	2.43	1000	2.22	330	1.04

(Note) Rated ripple current : 105°C, 120Hz.

Outline Drawing

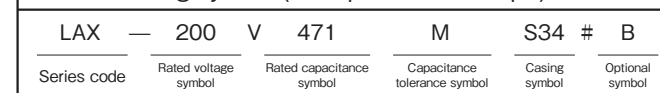
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k	30k
160 to 250	0.87	1	1.11	1.18	1.20
400	0.80	1	1.14	1.19	1.20

Part numbering system (example : 200V470µF)



In the case of three terminals type, a series name is "LTX".

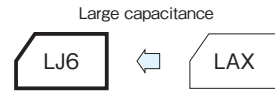
• The electric characteristics are described on page 175.

MEMO

Large-capacitance, Long-Life, High-Reliability Capacitors

GREEN CAP 105°C 5000hours

- Large-capacitance, Long-Life, High-reliability capacitors.
- Guarantees 5000 hours at 105°C.



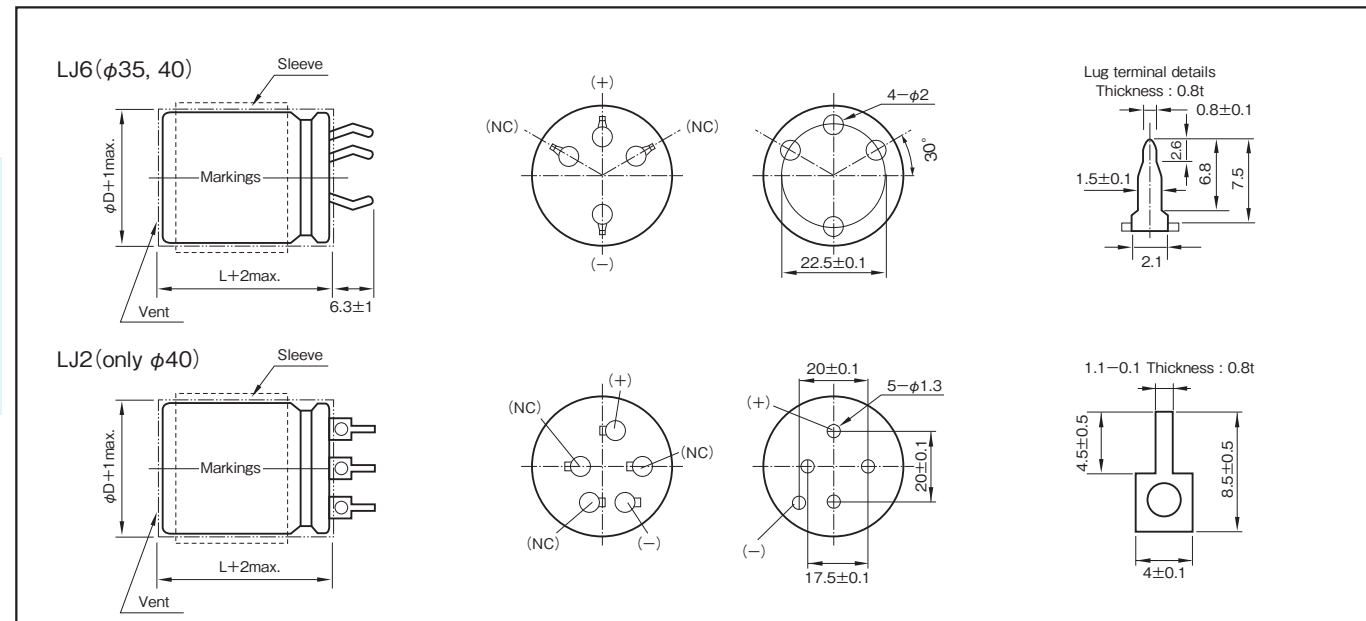
Marking color : White print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-25~+105	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA)	Less than 0.02CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	Rated voltage (V)	200 to 500
	tanδ (max.)	0.15 (20°C, 120Hz)
Characteristics at high and low temperature	Percentage of capacitance change (%)	-25°C Within ±30% of the value at 20°C
	Impedance ratio (max.)	Z-25°C/Z+20°C 4 (120Hz)
Endurance (105°C) (Applied ripple current)	Test time	5000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (105°C)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±15% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
Voltage application treatment		
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)	

Outline Drawing

Unit : mm



Part numbering system (example : 350V1500μF)

LJ6	—	350	V	152	M	S6D	#	B
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Optional symbol

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k	30k
Rated voltage (V)					
200 to 250	0.87	1	1.11	1.18	1.20
315 to 500	0.80	1	1.14	1.19	1.20

Standard Ratings

Rated voltage(V)		200			250			315			350		
Case φD×L(mm)	Item Case symbol	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)
35×60	S59	2200	0.090	4.05	1500	0.13	3.17	820	0.24	2.23	820	0.24	2.10
35×70	S5B	2700	0.073	4.77	1800	0.11	3.69	1000	0.20	2.62	1000	0.20	2.46
35×80	S5C	3300	0.060	5.56	2200	0.090	4.31	1200	0.17	3.03	1200	0.17	2.84
35×90	S5D	—	—	—	—	—	—	1500	0.13	3.55	1500	0.13	3.34
35×100	S5E	3900	0.051	6.64	2700	0.073	5.24	1800	0.11	4.07	1800	0.11	3.82
40×60	S69	2200	0.090	4.40	1800	0.11	3.77	1000	0.20	2.68	1000	0.20	2.50
40×70	S6B	2700	0.073	5.17	2200	0.090	4.43	1200	0.17	3.11	1200	0.17	2.90
40×80	S6C	3300	0.060	6.02	—	—	—	1500	0.13	3.67	1500	0.13	3.40
40×90	S6D	3900	0.051	7.00	2700	0.073	5.42	1800	0.11	4.21	1800	0.11	3.95

Rated voltage(V)		400			450			500		
Case φD×L(mm)	Item Case symbol	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)	Rated capacitance (μF)	ESR (Ω)	Rated ripple current (Arms)
35×60	S59	820	0.24	2.49	560	0.36	2.16	390	0.51	1.65
35×70	S5B	1000	0.20	2.93	680	0.29	2.53	470	0.42	1.92
35×80	S5C	—	—	—	820	0.24	2.94	560	0.36	2.22
35×90	S5D	1200	0.17	3.55	1000	0.20	3.41	680	0.29	2.57
35×100	S5E	1500	0.13	4.15	1200	0.17	3.90	—	—	—
40×60	S69	—	—	—	680	0.29	2.45	560	0.36	2.15
40×70	S6B	1000	0.20	3.10	820	0.24	2.84	680	0.29	2.51
40×80	S6C	—	—	—	1000	0.20	3.33	—	—	—
40×90	S6D	1200	0.17	3.65	1200	0.17	3.65	820	0.24	3.05
40×100	S6E	1500	0.13	4.30	—	—	—	1000	0.20	3.51

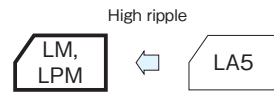
(Note) ESR : 20°C , 120Hz ; Rated ripple current : 105°C , 120Hz

LM, LPM LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS ELNA®

For-Inverter, High-Ripple Capacitors

GREEN CAP 85°C 2000hours

- Withstands high-ripple current generated by the voltage doubler rectifier system.
- Guarantees 2000 hours at 85°C.



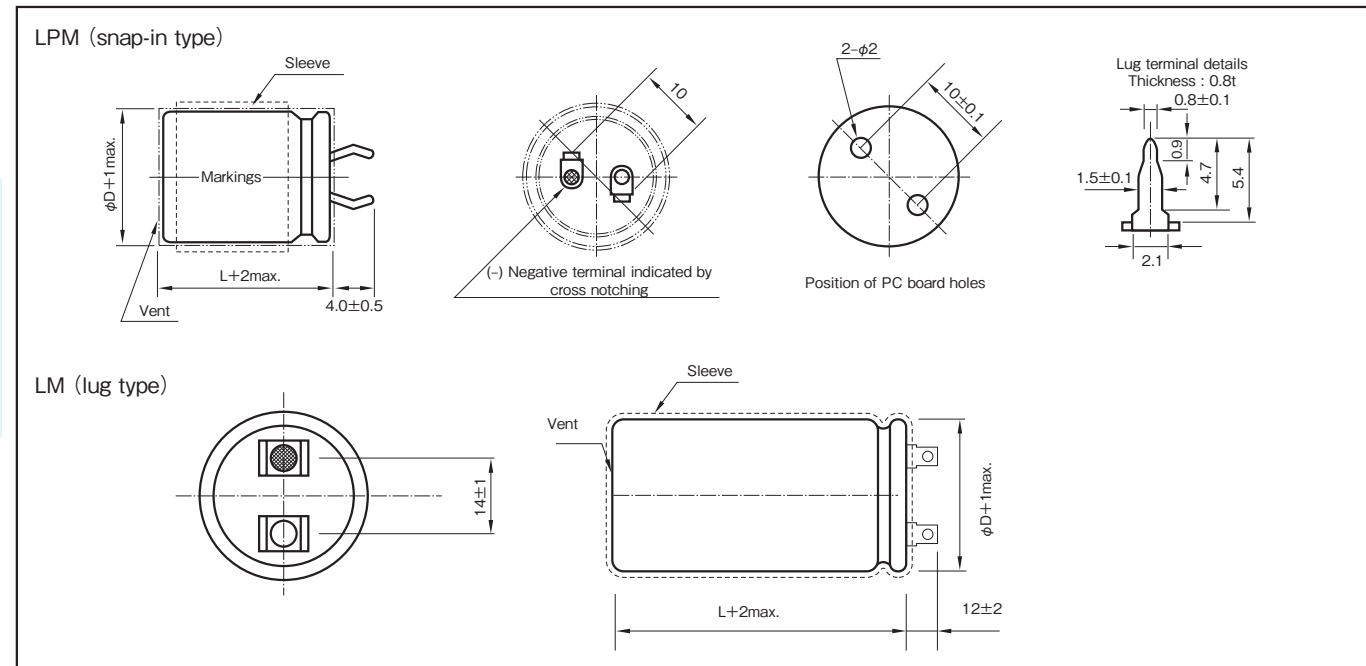
Marking color : White print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-25 to +85	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (µA)	Less than 0.01CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	Rated voltage (V)	250, 400
	tanδ (max.)	0.05 (20°C, 120Hz)
Characteristics at high and low temperature	Rated voltage (V)	250, 400
	Impedance ratio (max.) Z-25°C/Z+20°C	4 (120Hz)
Endurance (85°C) (Applied ripple current)	Test time	2000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (85°C)	Test time	500 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±15% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
Applicable standards	Voltage application treatment JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)	

Outline Drawing

Unit : mm



Part numbering system (example : 250V440µF)

LM	—	250 V	441	K	S6E #	B
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol	

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	400	1k	10k	
Rated voltage (V)	250, 400	0.80	1	1.32	1.46	1.61

LM series Standard Ratings

250V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (Ω max.)	Rated ripple current (Arms)
	ϕ D	L			
200	40	100	S6E	0.33	3.80
220	40	100	S6E	0.30	4.00
330	40	100	S6E	0.20	4.85
360	40	100	S6E	0.18	5.10
390	40	100	S6E	0.17	5.30
420	40	100	S6E	0.16	5.50
440	40	100	S6E	0.15	5.60

400V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (Ω max.)	Rated ripple current (Arms)
	ϕ D	L			
90	35	80	S5C	0.74	3.00
	40	80	S6C	0.74	3.00
100	35	90	S5D	0.66	3.20
	40	90	S6D	0.66	3.20
110	35	100	S5E	0.60	3.30
	40	100	S6E	0.60	3.30
150	35	100	S5E	0.44	3.90
	40	100	S6E	0.44	3.90
165	40	100	S6E	0.40	4.10
220	40	100	S6E	0.30	4.10

(Note) ESR : 20°C, 120Hz ; Rated ripple current : 85°C , 120Hz

LPM series Standard Ratings

250V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (Ω max.)	Rated ripple current (Arms)
	ϕ D	L			
100	35	40	S55	0.66	1.90
110	35	40	S55	0.60	2.00
165	35	45	S56	0.40	2.45
180	35	50	S57	0.37	2.58
195	35	50	S57	0.34	2.68
210	35	50	S57	0.32	2.78
220	35	50	S57	0.30	2.80

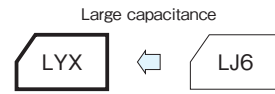
400V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (Ω max.)	Rated ripple current (Arms)
	ϕ D	L			
45	35	50	S57	1.47	1.50
55	35	40	S55	1.21	1.70
75	35	50	S57	0.88	1.98
82	35	50	S57	0.81	2.00

(Note) ESR : 20°C, 120Hz ; Rated ripple current : 85°C , 120Hz

Screw Terminal, Long Life, High Temperature capacitors

GREEN CAP 105°C 2000hours

- Screw Terminal, Long Life, High Temperature capacitors.
- Guarantees 5000 hours at 105°C.



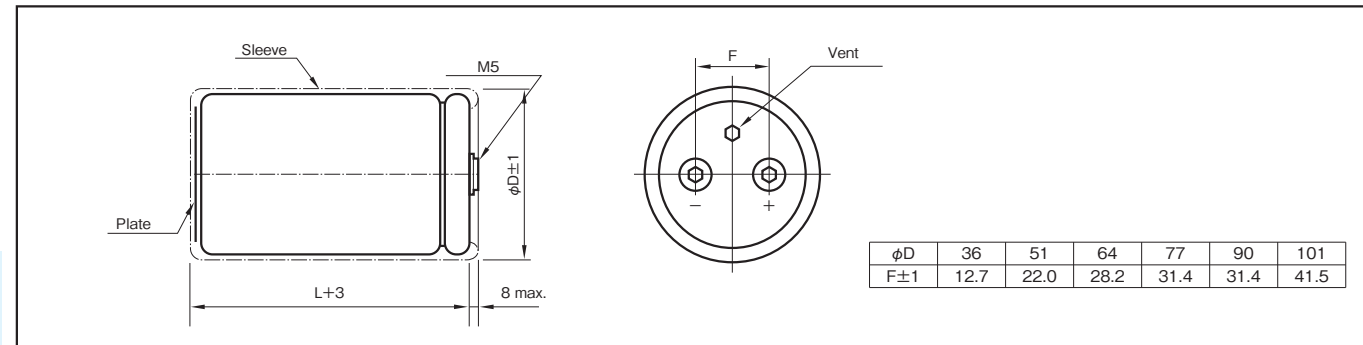
Marking color : Silver print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-25 to +105	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA)	Less than 0.01CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	0.20 (20°C, 120Hz)	
Endurance (105°C) (Applied ripple current)	Test time	5000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (105°C)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Voltage application treatment		
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1995)	

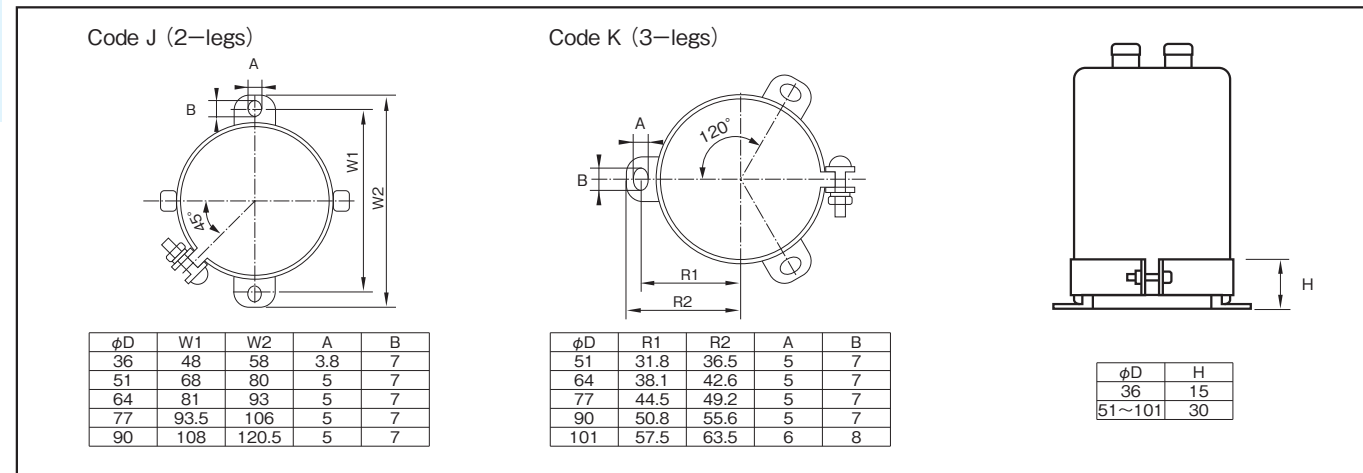
Outline Drawing

Unit : mm

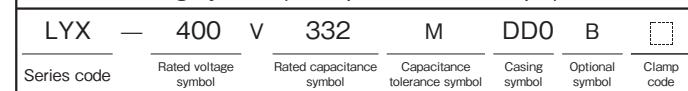


Mounting Clamp

Unit : mm



Part numbering system (example : 400V3300μF)



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	300	1k	10k
Rated voltage (V)	0.80	1.00	1.10	1.30	1.40
350 to 450					

Standard Ratings

350V						400V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (m Ω max.)	Rated ripple current (Arms)	Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (m Ω max.)	Rated ripple current (Arms)
	ϕ D	L					ϕ D	L			
1000	51	75	C75	259	3.9	1000	51	75	C75	215	3.9
1200	51	75	C75	215	4.2	1200	51	96	C96	179	4.6
1500	51	96	C96	172	5.2	1500	51	115	CB5	143	5.6
1800	51	96	C96	143	5.7	1800	51	130	CD0	119	6.4
2200	51	130	CD0	117	7.1	2200	64	96	D96	98	6.9
2700	64	96	D96	96	7.7	2700	64	115	DB5	80	8.2
3300	64	115	DB5	78	9.1	3300	64	130	DD0	65	9.5
3900	64	130	DD0	66	10.4	3900	64	155	DF5	55	11.1
4700	64	155	DF5	55	12.2		77	115	EB5	55	10.4
	77	115	EB5	55	11.5	4700	64	195	DJ5	46	13.4
5600	64	195	DJ5	46	14.6		77	130	ED0	46	12.0
	77	130	ED0	46	13.1	5600	64	195	DJ5	39	14.6
6800	77	155	EF5	38	15.5		77	155	EF5	39	14.0
8200	90	157	FF7	31	18.1	6800	90	157	FF7	32	16.5
10000	90	157	FF7	26	19.9	8200	90	157	FF7	26	18.1
12000	90	196	FJ6	22	23.8	10000	90	196	FJ6	22	21.7
15000	90	236	FN6	17	28.8	12000	90	236	FN6	18	25.8

450V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (m Ω max.)	Rated ripple current (Arms)
	ϕ D	L			
1000	51	96	C96	215	4.2
1200	51	115	CB5	179	5.0
1500	51	130	CD0	143	5.9
1800	64	96	D96	119	6.3
2200	64	115	DB5	98	7.4
2700	64	130	DD0	80	8.6
	77	115	EB5	80	8.7
3300	64	155	DF5	65	10.2
	77	130	ED0	65	10.1
3900	64	195	DJ5	55	12.3
4700	77	155	EF5	46	12.9
5600	77	195	EJ5	38	15.4
	90	157	FF7	38	14.9
6800	90	196	FJ6	32	18.0
8200	90	196	FJ6	27	19.8
10000	90	236	FN6	22	23.6

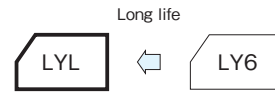
(Note) ESR : 20°C, 120Hz ; Rated ripple current : 105°C, 120Hz

Large Capacitance
Aluminum Electrolytic Capacitors

Screw Terminal, Long Life capacitors

GREEN CAP 85°C 20000hours

- Screw Terminal, Long Life capacitors.
- Guarantees 20000 hours at 85°C.



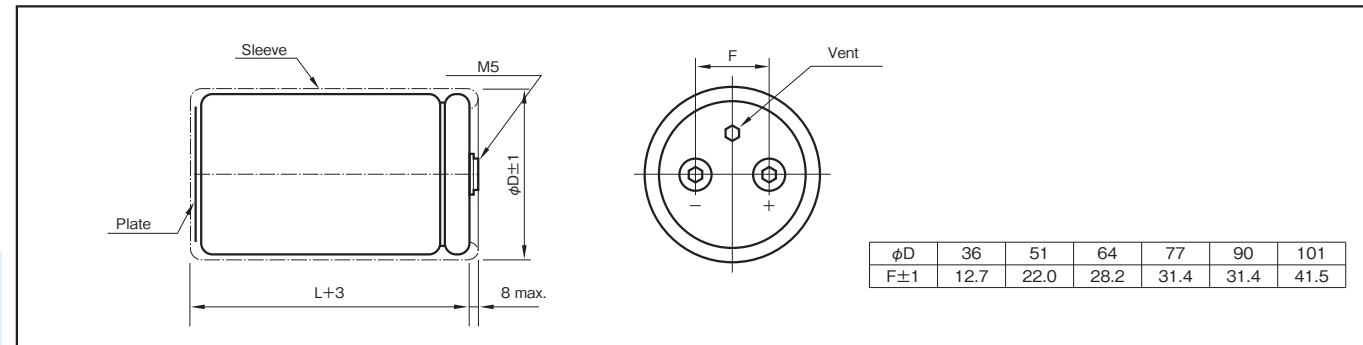
Marking color : Silver print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (µA)	Less than 0.01CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	0.20 (20°C,120Hz)	
Endurance (85°C) (Applied ripple current)	Test time	20000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (85°C)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1995)	

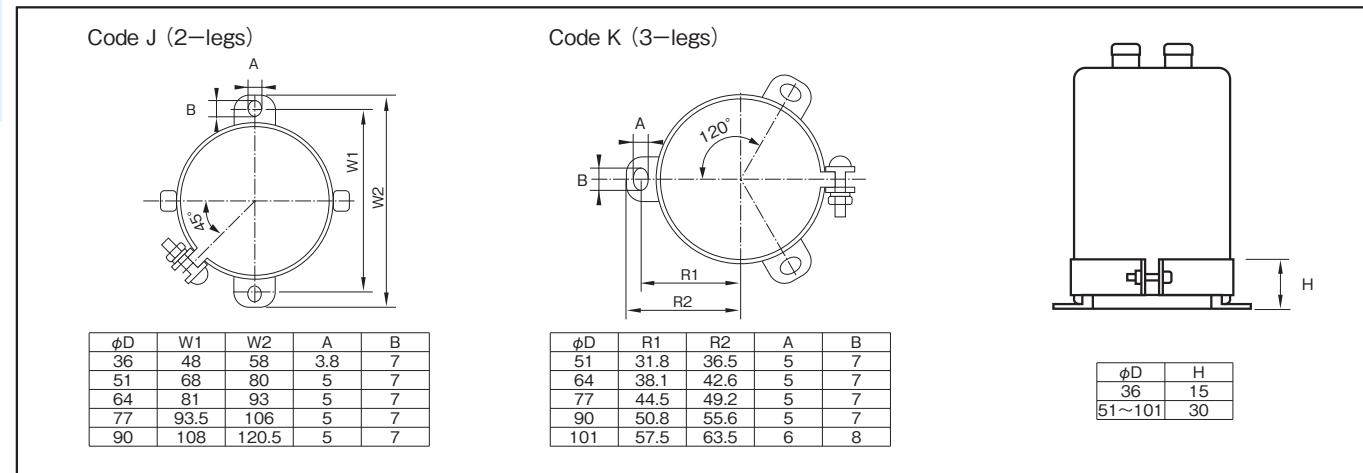
Outline Drawing

Unit : mm



Mounting Clamp

Unit : mm



Part numbering system (example : 450V4700µF)

LYL	—	450	V	472	M	EF5	B	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol	Clamp code

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	300	1k	10k
Rated voltage (V)					
350 to 450	0.80	1.00	1.10	1.30	1.40

Standard Ratings

350V						400V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (m Ω max.)	Rated ripple current (Arms)	Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (m Ω max.)	Rated ripple current (Arms)
	ϕ D	L					ϕ D	L			
1000	51	75	C75	259	3.9	1000	51	75	C75	215	3.9
1200	51	75	C75	215	4.2	1200	51	96	C96	179	4.6
1500	51	96	C96	172	5.2	1500	51	115	CB5	143	5.6
1800	51	96	C96	143	5.7	1800	51	130	CD0	119	6.4
2200	51	130	CD0	117	7.1	2200	64	96	D96	98	6.9
2700	64	96	D96	96	7.7	2700	64	115	DB5	80	8.2
3300	64	115	DB5	78	9.1	3300	64	130	DD0	65	9.5
3900	64	130	DD0	66	10.4	3900	64	155	DF5	55	11.1
4700	64	155	DF5	55	12.2		77	115	EB5	55	10.4
	77	115	EB5	55	11.5	4700	64	195	DJ5	46	13.4
5600	64	195	DJ5	46	14.6		77	130	ED0	46	12.0
	77	130	ED0	46	13.1	5600	64	195	DJ5	39	14.6
6800	77	155	EF5	38	15.5		77	155	EF5	39	14.0
8200	90	157	FF7	31	18.1	6800	90	157	FF7	32	16.5
10000	90	157	FF7	26	19.9	8200	90	157	FF7	26	18.1
12000	90	196	FJ6	22	23.8	10000	90	196	FJ6	22	21.7
15000	90	236	FN6	17	28.8	12000	90	236	FN6	18	25.8

450V					
Rated capacitance (μ F)	Case (mm)		Casing symbol	ESR (m Ω max.)	Rated ripple current (Arms)
	ϕ D	L			
1000	51	96	C96	215	4.2
1200	51	115	CB5	179	5.0
1500	51	130	CD0	143	5.9
1800	64	96	D96	119	6.3
2200	64	115	DB5	98	7.4
2700	64	130	DD0	80	8.6
	77	115	EB5	80	8.7
3300	64	155	DF5	65	10.2
	77	130	ED0	65	10.1
3900	64	195	DJ5	55	12.3
4700	77	155	EF5	46	12.9
5600	77	195	EJ5	38	15.4
	90	157	FF7	38	14.9
6800	90	196	FJ6	32	18.0
8200	90	196	FJ6	27	19.8
10000	90	236	FN6	22	23.6

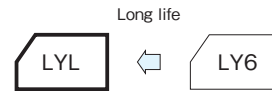
(Note) ESR : 20°C, 120Hz ; Rated ripple current : 85°C, 120Hz

Large Capacitance Aluminum Electrolytic Capacitors

Screw Terminal, Miniaturized, High Ripple capacitors

GREEN CAP 85°C 5000hours

- Screw Terminal, Miniaturized, High Ripple capacitors.
- Guarantees 5000 hours at 85°C.



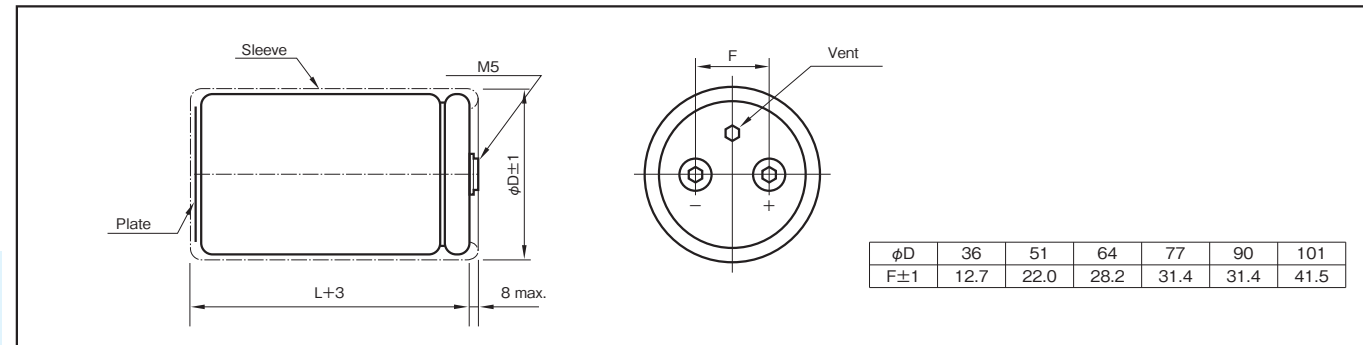
Marking color : Silver print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-25 to +85	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (µA)	Less than 0.01CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	0.20 (20°C,120Hz)	
Endurance (85°C) (Applied ripple current)	Test time	5000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (85°C)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1995)	

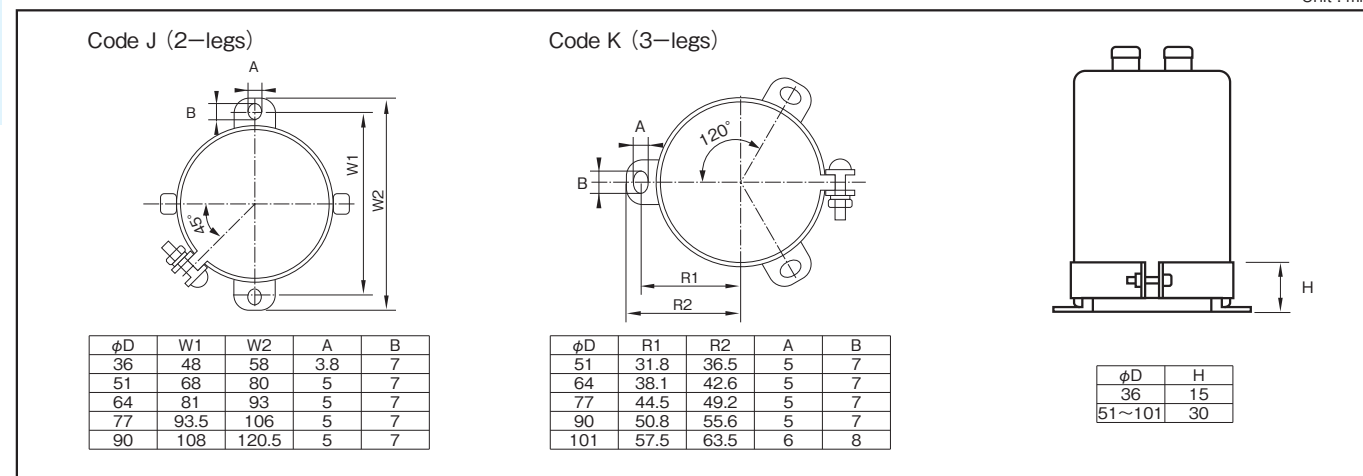
Outline Drawing

Unit : mm



Mounting Clamp

Unit : mm



Part numbering system (example : 400V12000µF)

LY6	—	400	V	123	M	FF7	B	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Optional symbol	Clamp code

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	300	1k	10k
Rated voltage (V)					
400 to 550	0.80	1.00	1.10	1.30	1.40

Standard Ratings

400V						450V					
Rated capacitance (μF)	Case (mm)		Casing symbol	ESR (mΩ max.)	Rated ripple current (Arms)	Rated capacitance (μF)	Case (mm)		Casing symbol	ESR (mΩ max.)	Rated ripple current (Arms)
	φD	L					φD	L			
2200	51	115	CB5	98	8.8	1800	51	115	CB5	119	7.6
2700	51	130	CD0	80	10.2	2200	51	130	CD0	98	8.8
3300	64	96	D96	65	11.0	2700	64	96	D96	80	9.5
3900	64	115	DB5	55	12.8	3300	64	115	DB5	65	11.2
4700	64	130	DD0	46	14.8	3900	64	130	DD0	55	12.8
5600	77	115	EB5	38	16.2	4700	77	115	EB5	46	14.1
6800	77	130	ED0	32	18.7	5600	77	130	ED0	38	16.2
8200	77	155	EF5	26	22.0	6800	77	155	EF5	32	19.1
10000	77	195	EJ5	22	26.7	8200	77	195	EJ5	26	23.0
	90	131	FD1	22	24.2		90	131	FD1	26	21.0
12000	90	157	FF7	18	28.5	10000	90	171	FH1	22	25.7
15000	90	196	FJ6	14	34.8	12000	90	196	FJ6	18	29.7
18000	90	236	FN6	12	41.2		101	175	GH5	18	29.3
22000	101	237	GN7	10	47.0	15000	90	236	FN6	14	35.9
—	—	—	—	—	—		101	195	GJ5	14	24.2
—	—	—	—	—	—	18000	101	237	GN7	12	40.5

500V						550V					
Rated capacitance (μF)	Case (mm)		Casing symbol	ESR (mΩ max.)	Rated ripple current (Arms)	Rated capacitance (μF)	Case (mm)		Casing symbol	ESR (mΩ max.)	Rated ripple current (Arms)
	φD	L					φD	L			
1200	51	115	CB5	215	6.2	1000	51	130	CD0	258	5.9
	64	96	D96	215	6.3	1200	64	115	DB5	215	6.8
1500	51	130	CD0	172	7.3	1500	64	130	DD0	172	8.0
	64	96	D96	172	7.1	1800	77	115	EB5	143	8.7
1800	64	115	DB5	143	8.3	2200	77	130	ED0	117	10.1
2200	64	130	DD0	117	9.6	2700	77	155	EF5	96	12.0
2700	77	115	EB5	96	10.7	3300	77	155	EF5	78	13.3
3300	77	130	ED0	78	12.4	3900	90	157	FF7	66	15.5
3900	77	155	EF5	66	14.4	4700	90	171	FH1	55	17.6
4700	77	171	EH1	55	16.5	5600	90	196	FJ6	46	20.3
	90	131	FD1	55	15.8	6800	90	236	FN6	38	24.1
5600	77	195	EJ5	46	19.0	8200	101	237	GN7	31	27.3
	90	157	FF7	46	18.6						
6800	90	171	FH1	38	21.2						
8200	90	196	FJ6	31	24.5						
	101	175	GH5	31	24.2						
10000	90	236	FN6	26	29.3						
	101	195	GJ5	26	27.9						
12000	101	237	GN7	22	33.1						

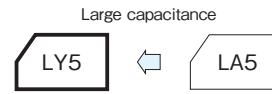
(Note) ESR : 20°C, 120Hz ; Rated ripple current : 85°C, 120Hz

Large Capacitance Aluminum Electrolytic Capacitors

Screw Terminal, Standard capacitors

GREEN CAP 85°C 2000hours

- Screw Terminal, Standard capacitors.
- Guarantees 2000 hours at 85°C.



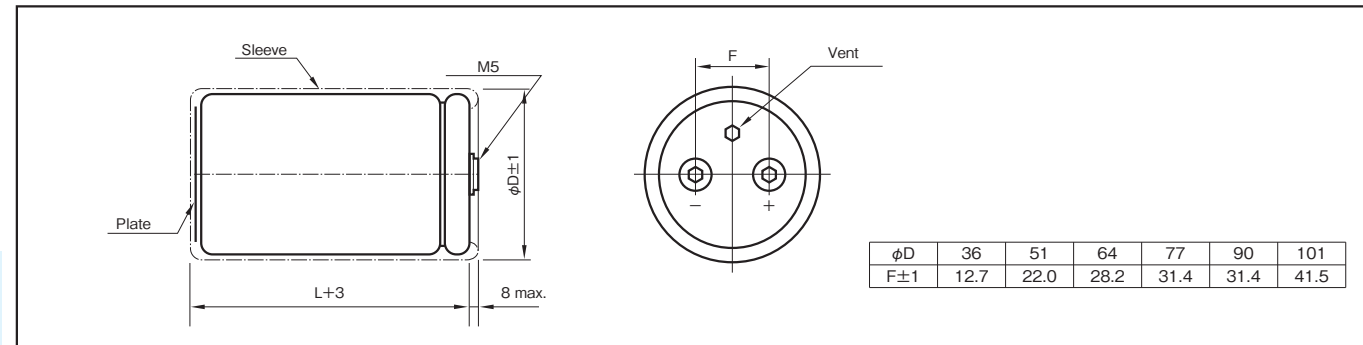
Marking color : Silver print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85	-25 to +85
Rated voltage (V)	10 to 250	350 to 500
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (µA)	Less than 0.01CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	0.20 (20°C,120Hz)	
Endurance (85°C) (Applied ripple current)	Test time	2000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Shelf life (85°C)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	200% or less of the initial specified value
Applicable standards	Voltage application treatment JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1995)	

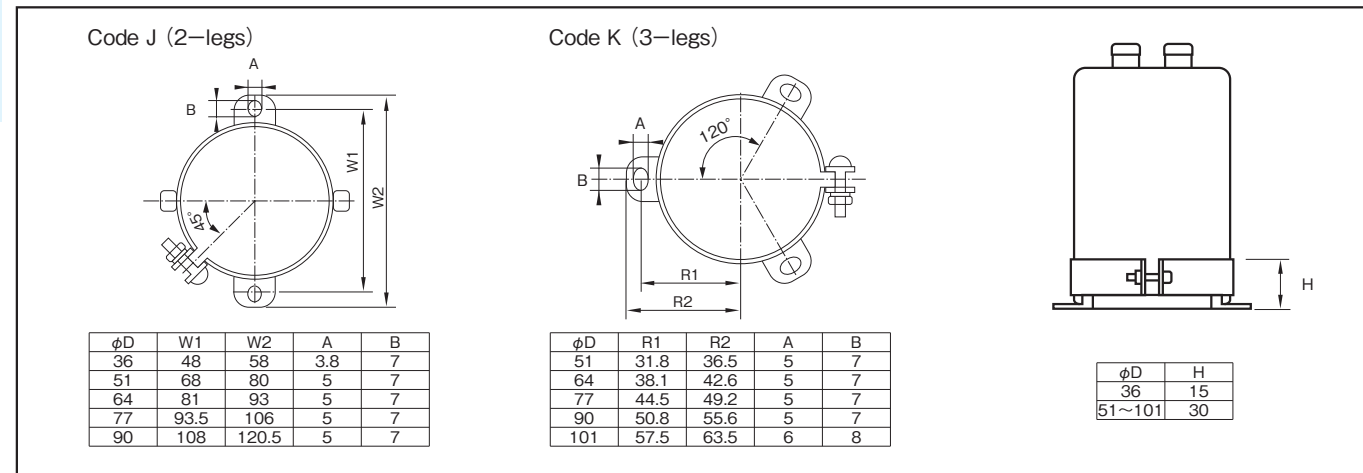
Outline Drawing

Unit : mm

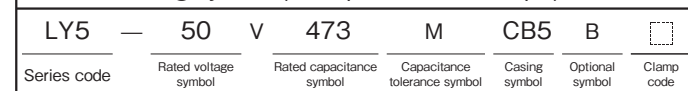


Mounting Clamp

Unit : mm



Part numbering system (example : 50V47000µF)



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)				
	50	120	300	1k	10k
10 to 50	0.95	1.00	1.04	1.10	1.15
63 to 160	0.95	1.00	1.06	1.16	1.30
200 to 500	0.80	1.00	1.10	1.25	1.50

Standard Ratings

10V						16V						25V					
Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)
		φD	L					φD	L					φD	L		
33,000	0.80	36	53	A53	4.3	22,000	0.60	36	53	A53	4.1	15,000	0.50	36	53	A53	3.7
39,000	0.80	36	53	A53	4.7	27,000	0.60	36	53	A53	4.5	18,000	0.50	36	53	A53	4.1
47,000	0.80	36	65	A65	5.2	33,000	0.60	36	53	A53	5.0	22,000	0.50	36	53	A53	4.5
56,000	0.80	36	83	A83	6.1	39,000	0.60	36	65	A65	5.9	27,000	0.50	36	65	A65	5.0
68,000	0.80	36	83	A83	6.7	47,000	0.60	36	83	A83	6.4	33,000	0.50	36	83	A83	5.9
82,000	0.80	36	100	AA0	7.7	56,000	0.60	36	83	A83	7.3	39,000	0.50	36	83	A83	6.7
100,000	0.80	36	101	AA1	8.8	68,000	0.60	36	100	AA0	8.4	47,000	0.50	36	100	AA0	7.7
120,000	0.80	36	121	AC1	10.0	82,000	0.80	36	100	AA0	8.3	56,000	0.60	36	100	AA0	7.9
150,000	1.00	36	121	AC1	10.8	100,000	0.80	36	121	AC1	9.5	68,000	0.60	36	121	AC1	9.2
180,000	1.00	51	96	C96	12.0	120,000	0.80	36	121	AC1	10.9	82,000	0.60	36	121	AC1	10.4
220,000	1.50	51	121	CC1	11.2	150,000	1.00	51	96	C96	11.3	100,000	0.60	51	96	C96	10.3
270,000	1.50	51	122	CC2	12.8	180,000	1.00	51	115	CB5	12.8	120,000	0.80	51	115	CB5	11.7
330,000	1.50	64	96	D96	15.3	220,000	1.00	51	130	CD0	15.3	150,000	0.80	51	130	CD0	14.1
390,000	1.50	64	115	DB5	17.3	270,000	1.00	64	96	D96	17.6	180,000	0.80	64	96	D96	15.7
470,000	2.00	64	130	DD0	16.7	330,000	1.50	64	115	DB5	16.8	220,000	1.00	64	115	DB5	16.1
560,000	2.00	77	115	EB5	19.0	390,000	1.50	64	130	DD0	18.3	270,000	1.00	64	130	DD0	18.6
680,000	2.00	77	130	ED0	21.7	470,000	1.50	77	115	EB5	21.3	330,000	1.00	64	155	DF5	21.9
820,000	2.00	77	155	EF5	24.7	560,000	1.50	77	130	ED0	23.6	390,000	1.20	77	115	EB5	22.0
—	—	—	—	—	—	680,000	1.50	77	155	EF5	27.6	470,000	1.20	77	155	EF5	25.6
—	—	—	—	—	—	820,000	2.00	90	157	FF7	27.1	560,000	1.20	90	131	FD1	27.9
—	—	—	—	—	—	—	—	—	—	—	—	680,000	1.20	90	157	FF7	32.5

35V						50V						63V					
Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)
		φD	L					φD	L					φD	L		
10,000	0.40	36	53	A53	3.4	5,600	0.30	36	53	A53	3.0	3,900	0.25	36	53	A53	2.7
12,000	0.40	36	53	A53	3.7	6,800	0.30	36	53	A53	3.3	4,700	0.25	36	53	A53	3.0
15,000	0.40	36	65	A65	4.2	8,200	0.30	36	53	A53	3.6	5,600	0.25	36	53	A53	3.3
18,000	0.40	36	83	A83	4.7	10,000	0.30	36	65	A65	4.0	6,800	0.25	36	65	A65	3.6
22,000	0.40	36	83	A83	5.7	12,000	0.30	36	83	A83	4.7	8,200	0.25	36	83	A83	4.3
27,000	0.40	36	100	AA0	6.3	15,000	0.30	36	83	A83	5.5	10,000	0.25	36	83	A83	4.9
33,000	0.40	36	100	AA0	7.2	18,000	0.30	36	100	AA0	6.2	12,000	0.25	36	100	AA0	5.6
39,000	0.50	36	121	AC1	8.3	22,000	0.40	36	121	AC1	6.3	15,000	0.30	36	100	AA0	5.9
47,000	0.50	51	96	C96	8.7	27,000	0.40	36	121	AC1	7.1	18,000	0.30	36	121	AC1	6.7
56,000	0.60	51	96	C96	8.6	33,000	0.40	51	96	C96	8.2	22,000	0.30	36	121	AC1	7.8
68,000	0.60	51	115	CB5	9.8	39,000	0.50	51	96	C96	8.1	27,000	0.40	51	96	C96	7.4
82,000	0.60	64	96	D96	11.6	47,000	0.50	51	115	CB5	9.3	33,000	0.40	51	96	C96	8.4
100,000	0.60	64	115	DB5	13.3	56,000	0.50	64	96	D96	10.5	39,000	0.40	51	115	CB5	9.5
120,000	0.80	64	121	DC1	14.8	68,000	0.50	64	96	D96	12.0	47,000	0.40	51	130	CD0	11.3
150,000	0.80	64	130	DD0	14.9	82,000	0.50	64	115	DB5	13.7	56,000	0.40	64	115	DB5	12.8
180,000	0.80	77	115	EB5	17.0	100,000	0.60	77	115	EB5	14.7	68,000	0.50	64	121	DC1	12.7
220,000	0.80	77	130	ED0	20.0	120,000	0.60	77	115	EB5	16.7	82,000	0.50	64	130	DD0	14.5
270,000	1.00	77	155	EF5	20.3	150,000	0.60	77	130	ED0	19.3	100,000	0.50	77	115	EB5	16.7
330,000	1.00	90	131	FD1	23.5	180,000	0.60	77	155	EF5	21.9	120,000	0.50	77	130	ED0	18.9
390,000	1.00	90	157	FF7	26.4	220,000	0.60	90	131	FD1	21.4	150,000	0.50	77	155	EF5	22.4
470,000	1.00	90	157	FF7	29.6	270,000	0.60	90	157	FF7	24.6	180,000	0.60	90	131	FD1	22.4
—	—	—	—	—	—	—	—	—	—	—	—	220,000	0.60	90	157	FF7	26.2

80V						100V					
Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (µF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)
		φD	L					φD	L		
3,300	0.25	36	53	A53	2.5	1,800	0.25	36	53	A53	1.9
3,900	0.25	36	53	A53	2.8	2,200	0.25	36	53	A53	2.1
4,700	0.25	36	65	A65	3.0	2,700	0.25	36	53	A53	2.3
5,600	0.25	36	83	A83	3.6	3,300	0.25	36	65	A65	2.6
6,800	0.25	36	83	A83	3.9	3,900	0.25	36	83	A83	3.0
8,200	0.25	36	83	A83	4.5	4,700	0.25	36	83	A83	3.5
10,000	0.25	36	100	AA0	5.2	5,600	0.25	36	100	AA0	3.9
12,000	0.25	36	100	AA0	5.9	6,800	0.25	36	100	AA0	4.5
15,000	0.25	36	121	AC1	6.8	8,200	0.25	36	121	AC1	5.1
18,000	0.25	36	121	AC1	7.8	10,000	0.25	36	121	AC1	5.9
22,000	0.30	51	96	C96	8.0	12,000	0.25	51	75	C75	6.4
27,000	0.30	51	96	C96	9.2	15,000	0.25	51	96	C96	7.0
33,000	0.30	51	115	CB5	10.5	18,000	0.25	51	115	CB5	8.3
39,000	0.30	51	130	CD0	12.0	22,000	0.25	51	130	CD0	10.0
47,000	0.30	64	115	DB5	13.6	27,000	0.25	64	115	DB5	11.5
56,000	0.40	64	130	DD0	13.4	33,000	0.25	64	130	DD0	11.9
68,000	0.40	77	115	EB5	15.4	39,000	0.25	77	115	EB5	13.4
82,000	0.40	77	130	ED0	17.5	47,000	0.35	77	130	ED0	14.2
100,000	0.40	77	155	EF5	20.5	56,000	0.35	77	155	EF5	16.0
120,000	0.40	90	131	FD1	22.4	68,000	0.35	90	131	FD1	18.8
150,000	0.40	90	157	FF7	26.5	82,000	0.35	90	157	FF7	20.5
—	—	—	—	—	—	100,000	0.35	90	171	FH1	24.0

(Note) tan δ : 20°C, 120Hz ; Rated ripple current : 85°C, 120Hz

Large Capacitance Aluminum Electrolytic Capacitors

Standard Ratings

160V					200V					250V							
Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)
		φD	L					φD	L					φD	L		
3,300	0.25	36	121	AC1	5.2	2,200	0.25	36	100	AA0	3.9	1,500	0.25	36	100	AA0	3.2
4,700	0.25	51	75	C75	5.9	3,300	0.25	51	75	C75	4.9	2,200	0.25	51	75	C75	4.0
5,600	0.25	51	96	C96	7.0	4,700	0.25	51	96	C96	6.4	3,300	0.25	51	96	C96	5.4
6,800	0.25	51	96	C96	7.8	5,600	0.25	51	115	CB5	7.6	4,700	0.25	64	96	D96	7.1
10,000	0.25	64	96	D96	10.4	6,800	0.25	51	130	CD0	8.8	6,800	0.25	64	115	DB5	9.1
12,000	0.25	51	120	CC0	11.3	8,200	0.25	64	96	D96	9.4	8,200	0.25	64	115	DB5	10.0
15,000	0.25	64	130	DD0	14.3	10,000	0.25	64	96	D96	10.4	10,000	0.25	64	130	DD0	11.7
18,000	0.25	64	130	DD0	15.6	15,000	0.25	77	96	E96	14.4	15,000	0.25	77	130	ED0	15.1
22,000	0.25	77	130	ED0	18.3	18,000	0.25	77	130	ED0	16.5	18,000	0.25	77	155	EF5	17.7
33,000	0.25	90	131	FD1	23.8	22,000	0.25	77	150	EF0	19.6	22,000	0.25	90	157	FF7	20.9
39,000	0.25	90	157	FF7	27.9	33,000	0.25	90	157	FF7	25.3	—	—	—	—	—	—

350V					400V					450V							
Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)	Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)
		φD	L					φD	L					φD	L		
470	0.20	36	83	A83	2.2	470	0.20	36	83	A83	2.2	470	0.20	36	83	A83	2.2
680	0.20	36	83	A83	2.6	680	0.20	36	100	AA0	2.8	680	0.20	36	100	AA0	2.8
1,000	0.20	36	100	AA0	3.4	1,000	0.20	51	75	C75	3.5	820	0.20	51	75	C75	3.2
1,500	0.20	51	75	C75	4.3	1,200	0.20	51	75	C75	3.8	1,000	0.20	51	75	C75	3.5
1,800	0.20	51	96	C96	5.1	1,500	0.20	51	96	C96	4.7	1,200	0.20	51	96	C96	4.2
2,200	0.20	51	96	C96	5.7	1,800	0.20	51	96	C96	5.2	1,500	0.20	51	115	CB5	5.0
2,700	0.20	51	130	CD0	7.1	2,200	0.20	51	120	CC0	6.4	1,800	0.20	51	130	CD0	5.9
3,300	0.20	51	130	CD0	7.9	2,700	0.20	64	96	D96	7.0	2,200	0.20	64	96	D96	6.3
3,900	0.20	64	115	DB5	9.0	3,300	0.20	64	115	DB5	8.2	2,700	0.20	64	115	DB5	7.5
4,700	0.20	64	130	DD0	10.3	3,900	0.20	64	130	DD0	9.4	3,300	0.20	64	130	DD0	8.7
5,600	0.20	77	115	EB5	11.4	4,700	0.20	77	115	EB5	10.4	3,900	0.20	77	115	EB5	9.5
6,800	0.20	77	130	ED0	13.1	5,600	0.20	77	130	ED0	11.9	4,700	0.20	77	130	ED0	10.9
8,200	0.20	77	155	EF5	15.4	6,800	0.20	77	155	EF5	14.1	5,600	0.20	77	155	EF5	12.8
10,000	0.20	90	157	FF7	18.1	8,200	0.20	90	157	FF7	16.4	6,800	0.20	90	157	FF7	15.0
12,000	0.20	90	157	FF7	20.0	10,000	0.20	90	157	FF7	18.3	8,200	0.20	90	157	FF7	16.5
15,000	0.20	90	196	FJ6	24.5	12,000	0.20	90	196	FJ6	21.8	10,000	0.20	90	196	FJ6	20.0
18,000	0.20	90	236	FN6	28.8	15,000	0.20	90	236	FN6	26.3	12,000	0.20	90	236	FN6	23.6

500V					
Rated capacitance (μF)	tan δ	Case (mm)		Casing symbol	Rated ripple current (Arms)
		φD	L		
1,000	0.25	51	115	CB5	4.6
1,500	0.25	64	96	D96	5.7
2,200	0.25	64	130	DD0	6.9
2,700	0.25	77	115	EB5	8.1
3,300	0.25	77	130	ED0	9.6
3,900	0.25	77	130	ED0	10.8
4,700	0.25	77	155	EF5	12.1
5,600	0.25	90	157	FF7	13.8
6,800	0.25	90	171	FH1	15.8
8,200	0.25	77	220	EM0	17.2
10,000	0.25	90	236	FN6	22.1

(Note) tan δ : 20°C, 120Hz ; Rated ripple current : 85°C, 120Hz

Aluminum Electrolytic Capacitors for Audio

Aluminum Electrolytic Capacitors
for Audio

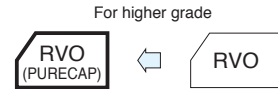
Chip Type Audio Use Capacitors

GREEN CAP SMD For audio

- Audio grade surface mount product with completely new components using synthetic mica paper for the separator.
- Both quality sense and sound field that could not be realized by the surface mount products are reproducible.



Marking color : Black print (except height : 10mm)
White print on a brown sleeve (φ8×10L, φ10×10L)

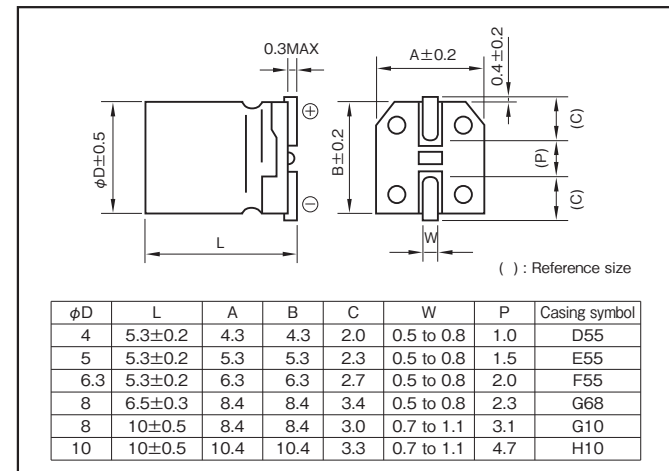


Specifications

Item	Performance						
Category temperature range (°C)	-40 to +85						
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)						
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50
	tanδ (max.)	0.28	0.24	0.20	0.14	0.12	0.10
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50
	Impedance ratio (max.)	Z-25°C/Z+20°C	3	3	2	2	2
Endurance (85°C) (Applied ripple current)	Test time	2000 hours					
	Leakage current	The initial specified value or less					
	Percentage of capacitance change	Within ±20% of initial value					
	Tangent of the loss angle	200% or less of the initial specified value					
Shelf life (85°C)	Test time : 1000 hours; other items are the same as those for the endurance. Voltage application treatment						
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k·100k
Rated voltage (V)				
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.80	1	1.35	1.50

Part numbering system (example : 16V471 M H10 P2 U)

RVO	—	16	V	471	M	H10	P2	U	□
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol				

• Soldering conditions are described on page 13. • Land pattern size are described on page 11. • The taping specifications are described on page 14.

Standard Ratings

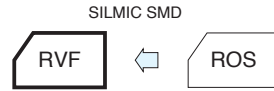
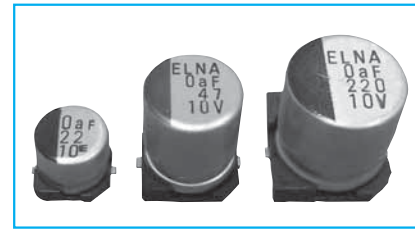
Rated capacitance (μF)	6.3		10		16		25		35		50	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
Item	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)
0.22	—	—	—	—	—	—	—	—	—	—	4×5.3	5
0.33	—	—	—	—	—	—	—	—	—	—	4×5.3	6
0.47	—	—	—	—	—	—	—	—	—	—	4×5.3	7
1	—	—	—	—	—	—	—	—	—	—	4×5.3	10
2.2	—	—	—	—	—	—	—	—	—	—	4×5.3	15
3.3	—	—	—	—	—	—	—	—	4×5.3	17	4×5.3	19
4.7	—	—	—	—	4×5.3	18	4×5.3	19	4×5.3	20	5×5.3	26
10	—	—	4×5.3	23	4×5.3	26	5×5.3	32	5×5.3	34	6.3×5.3	44
22	4×5.3	31	5×5.3	40	5×5.3	44	6.3×5.3	55	6.3×5.3	59	8×6.5	124
33	5×5.3	44	5×5.3	49	6.3×5.3	63	6.3×5.3	67	8×6.5	124	8×6.5	124
47	5×5.3	53	6.3×5.3	68	6.3×5.3	76	8×6.5	124	8×6.5	124	8×10	200
100	6.3×5.3	90	6.3×5.3	99	8×6.5	124	8×6.5	137	8×10	200	10×10	366
220	8×6.5	149	8×6.5	149	8×10	200	8×10	235	10×10	366	—	—
330	8×6.5	160	8×10	226	8×10	245	10×10	366	—	—	—	—
470	8×10	251	10×10	366	10×10	366	—	—	—	—	—	—
1000	10×10	423	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz.

Chip Type, For Audio, High Grade (SILMIC)

GREEN CAP SMD For audio

- Silk fiber paper products used surface mount device.
- Completely new audio products for the high-grade paper using silk fiber paper.
- Silk "flexibility" to reduce the vibration energy of the music, in the sense of high-frequency peak, a significant decrease in roughness of the midrange and bass increase.



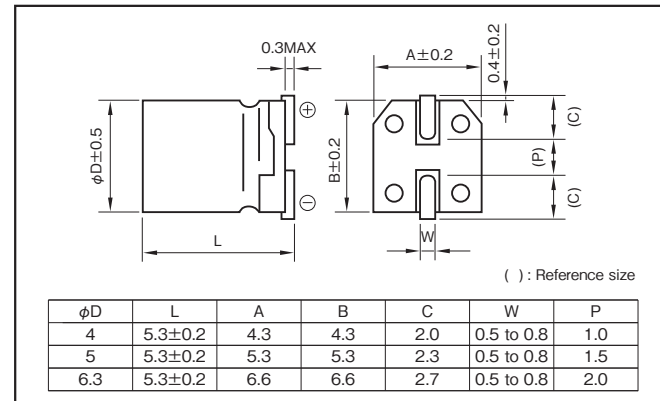
Marking color : Black print

Specifications

Item	Performance															
Category temperature range (°C)	-40 to +85															
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)															
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 min.) C : Rated capacitance (µF) , V : Rated voltage (V) (20°C)															
Tangent of loss angle (tanδ)	<table border="1"> <thead> <tr> <th>Rated voltage (V)</th> <th>10</th> <th>16</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>tanδ (max.)</td> <td>0.32</td> <td>0.26</td> <td>0.12</td> </tr> </tbody> </table> (20°C, 120Hz)	Rated voltage (V)	10	16	50	tanδ (max.)	0.32	0.26	0.12							
Rated voltage (V)	10	16	50													
tanδ (max.)	0.32	0.26	0.12													
Characteristics at high and low temperature	<table border="1"> <thead> <tr> <th rowspan="2">Impedance ratio (max.)</th> <th colspan="3">Rated voltage (V)</th> </tr> <tr> <th>10</th> <th>16</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>Z-25°C/Z+20°C</td> <td>3</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>8</td> <td>4</td> <td>4</td> </tr> </tbody> </table> (120Hz)	Impedance ratio (max.)	Rated voltage (V)			10	16	50	Z-25°C/Z+20°C	3	2	2	Z-40°C/Z+20°C	8	4	4
Impedance ratio (max.)	Rated voltage (V)															
	10	16	50													
Z-25°C/Z+20°C	3	2	2													
Z-40°C/Z+20°C	8	4	4													
Endurance (85°C)	<table border="1"> <tbody> <tr> <td>Test time</td> <td>2000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>200% or less of the initial specified value</td> </tr> </tbody> </table>	Test time	2000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	200% or less of the initial specified value							
Test time	2000 hours															
Leakage current	The initial specified value or less															
Percentage of capacitance change	Within ±20% of initial value															
Tangent of the loss angle	200% or less of the initial specified value															
Shelf life (85°C)	Test time : 500 hours ; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1															
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)															

Outline Drawing

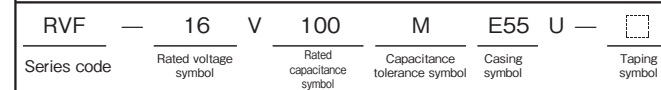
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k-100k
Rated voltage (V)				
10 to 16	0.80	1	1.15	1.25
50	0.80	1	1.35	1.50

Part numbering system (example : 16V10µF)



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

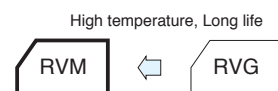
Rated voltage (V)	10		16		50	
	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)
0.33	—	—	—	—	4×5.3	4
0.47	—	—	—	—	4×5.3	5
1	—	—	—	—	4×5.3	7
2.2	—	—	—	—	5×5.3	11
3.3	—	—	—	—	6.3×5.3	16
4.7	—	—	4×5.3	10	8×10	28
10	5×5.3	15	5×5.3	16	8×10	41
22	6.3×5.3	25	6.3×5.3	28	—	—
33	6.3×5.3	31	8×10	50	—	—
47	8×10	54	8×10	60	—	—
100	8×10	79	8×10	87	—	—

(Note) Rated ripple current : 85°C, 120Hz.

Chip Type, For Audio, High Grade

GREEN CAP SMD 105°C 2000hours For audio

- New developed Al-Foil and Electrolyte for Audio grade allow lower distortion.
- New range of bright and smooth sound is achieved in SMD area.
- Guarantees 2000 hours 105°C.

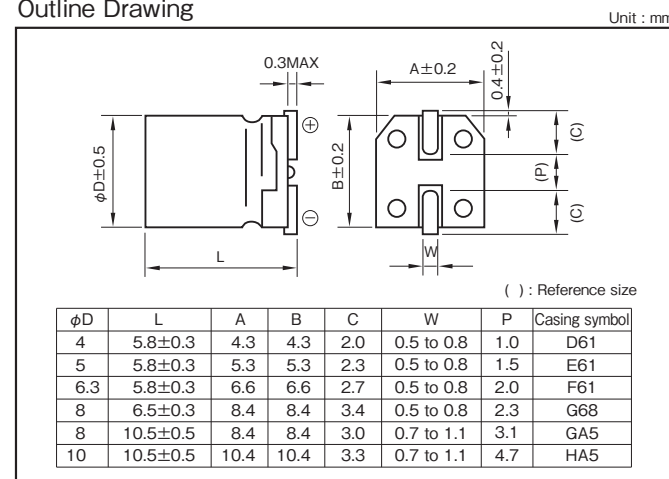


Marking color : Black print

Specifications

Item	Performance						
Category temperature range (°C)	-55 to +105						
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)						
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 min.) C : Rated capacitance (µF), V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50
	tanδ (max.)	0.28	0.24	0.20	0.16	0.13	0.12
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50
	Impedance ratio (max.)	Z-25°C/Z+20°C	2	2	2	2	2
Endurance (85°C)	Test time	2000 hours					
	Leakage current	The initial specified value or less					
Shelf life (85°C)	Percentage of capacitance change	Within ±30% of initial value					
	Tangent of the loss angle	300% or less of the initial specified value					
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)						

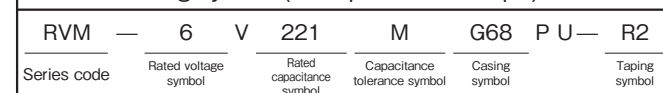
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	50	120	1k	10k·100k
6.3 to 16	0.80	1.00	1.15	1.25
25 to 35	0.80	1.00	1.25	1.40
50	1 to 3.3µF	0.50	1.00	1.35
	4.7µF to	0.70	1.00	1.35

Part numbering system (example : 6.3V220µF)



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

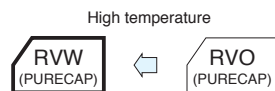
Rated capacitance (µF)	6.3		10		16		25		35		50	
	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)	Case	Rated ripple current (mArms)
1	—	—	—	—	—	—	—	—	—	—	4×5.8	7
2.2	—	—	—	—	—	—	—	—	—	—	4×5.8	10
3.3	—	—	—	—	—	—	—	—	—	—	4×5.8	12
4.7	—	—	—	—	4×5.8	11	4×5.8	13	4×5.8	14	5×5.8	17
10	—	—	4×5.8	15	4×5.8	17	5×5.8	21	5×5.8	24	6.3×5.8	29
	22	4×5.8	21	5×5.8	26	5×5.8	28	6.3×5.8	37	6.3×5.8	41	8×6.5
33	5×5.8	29	5×5.8	32	6.3×5.8	41	6.3×5.8	45	8×6.5	62	8×10.5	75
47	5×5.8	35	6.3×5.8	44	6.3×5.8	48	8×6.5	66	8×10.5	86	8×10.5	90
100	6.3×5.8	60	8×6.5	79	8×6.5	86	8×10.5	113	10×10.5	145	10×10.5	151
					8×10.5	101						
220	8×10.5	127	8×10.5	137	8×10.5	150	10×10.5	194	10×10.5	216	—	—
					10×10.5	174						
330	8×10.5	156	10×10.5	194	10×10.5	213	—	—	—	—	—	—
470	10×10.5	215	10×10.5	232	10×10.5	254	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 120Hz.

Chip Type Audio Use Capacitors

GREEN CAP SMD For audio 105°C 1000hours

- Audio grade surface mount product with completely new components using synthetic mica paper for the separator.
- Both quality sense and sound field that could not be realized by the surface mount products are reproducible.

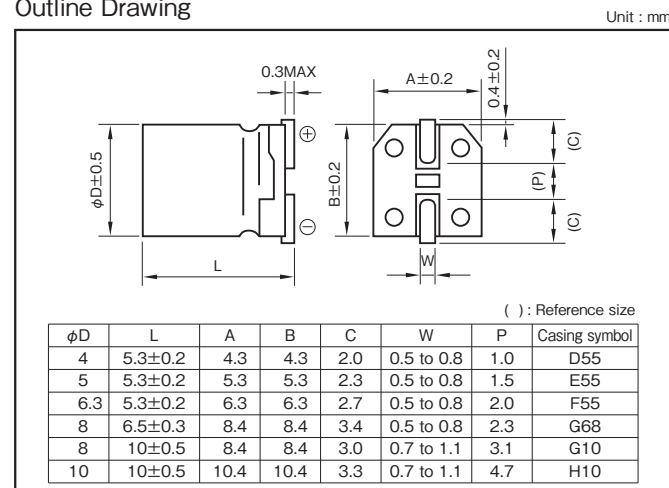


Marking color : Black print (except height : 10mm)
White print on a brown sleeve (φ8×10L, φ10×10L)

Specifications

Item	Performance							
Category temperature range (°C)	-55 to +105							
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)							
Leakage current (μA)	Less than 0.01 CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)							
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50	
	tanδ (max.)	0.30	0.26	0.22	0.16	0.13	0.12	
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	2
		Z-40°C/Z+20°C	8	5	4	3	3	3
Endurance (105°C) (Applied ripple current)	Test time	1000 hours						
	Leakage current	The initial specified value or less						
	Percentage of capacitance change	Within ±20% of initial value						
	Tangent of the loss angle	200% or less of the initial specified value						
Shelf life (105°C)	Test time : 1000 hours ; other items are the same as those for the endurance. Voltage application treatment							
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)							

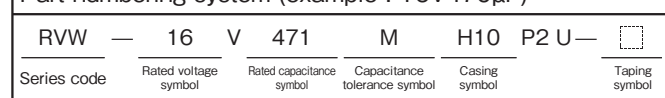
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)			
	50	120	1k	10k-100k
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40
50	0.80	1	1.35	1.50

Part numbering system (example : 16V470μF)



• Soldering conditions are described on page 13. • Land pattern size are described on page 11. • The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (μF)	Item	6.3		10		16		25		35		50	
		Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
		φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)
0.22	—	—	—	—	—	—	—	—	—	—	—	4×5.3	3
0.33	—	—	—	—	—	—	—	—	—	—	—	4×5.3	4
0.47	—	—	—	—	—	—	—	—	—	—	—	4×5.3	5
1	—	—	—	—	—	—	—	—	—	—	—	4×5.3	7
2.2	—	—	—	—	—	—	—	—	—	—	—	4×5.3	10
3.3	—	—	—	—	—	—	—	—	—	—	—	4×5.3	12
4.7	—	—	—	—	—	—	—	4×5.3	12	4×5.3	14	5×5.3	17
10	—	—	4×5.3	15	4×5.3	16	5×5.3	21	5×5.3	23	6.3×5.3	26	
22	4×5.3	21	5×5.3	25	5×5.3	28	6.3×5.3	36	6.3×5.3	50	8×6.5	110	
33	5×5.3	30	5×5.3	31	6.3×5.3	40	6.3×5.3	44	8×6.5	110	8×10	178	
47	5×5.3	36	6.3×5.3	43	6.3×5.3	47	8×6.5	110	8×10	178	8×10	178	
100	6.3×5.3	61	8×6.5	110	8×10	178	8×10	178	10×10	324	10×10	324	
220	8×10	178	8×10	178	10×10	324	10×10	324	10×10	324	—	—	
330	8×10	178	10×10	324	10×10	324	—	—	—	—	—	—	
470	10×10	324	10×10	324	10×10	324	—	—	—	—	—	—	

(Note) Rated ripple current : 105°C, 120Hz.

NOTE

Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

Chip Type Audio Use Capacitors

GREEN CAP SMD For audio

- New developed Al-Foil and Electrolyte for Audio grade allow lower distortion.
- New range of bright and smooth sound is achieved in SMD area.



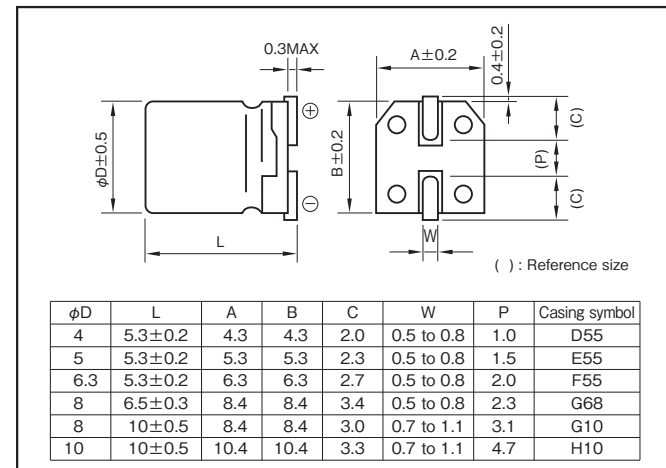
Marking color : Black print

Specifications

Item	Performance						
Category temperature range (°C)	-40 to +85						
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)						
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)						
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	
	tanδ (max.)	0.28	0.24	0.20	0.16	0.14	
Characteristics at high and low temperature	Impedance ratio (max.)	(20°C,120Hz)					
		Rated voltage (V)	6.3	10	16	25	35
		Z-25°C/Z+20°C	4	3	2	2	2
	Z-40°C/Z+20°C	8	5	4	3	3	
Endurance (85°C) (Applied ripple current)	Test time	2000 hours					
	Leakage current	The initial specified value or less					
	Percentage of capacitance change	Within ±20% of initial value					
	Tangent of the loss angle	200% or less of the initial specified value					
Shelf life (85°C)	Test time : 500 hours ; other items are the same as those for the endurance. Voltage application treatment						
Applicable standards	JIS C5101-1 1998, -18 1999 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

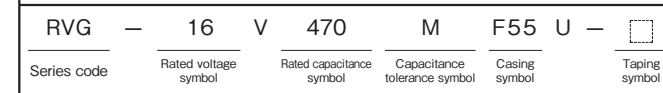
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.80	1	1.15	1.25
25 to 35	0.80	1	1.25	1.40

Part numbering system (example : 16V47 µF)



- Soldering conditions are described on page 13.
- Land pattern size are described on page 11.
- The taping specifications are described on page 14.

Standard Ratings

Rated capacitance (µF)	6.3		10		16		25		35	
	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current	Case	Rated ripple current
	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)	φD×L (mm)	(mArms)
3.3	—	—	—	—	—	—	—	—	4×5.3	11
4.7	—	—	—	—	4×5.3	11	4×5.3	12	4×5.3	13
10	—	—	—	—	5×5.3	19	5×5.3	21	5×5.3	22
22	4×5.3	20	—	—	5×5.3	28	6.3×5.3	36	6.3×5.3	39
33	5×5.3	29	5×5.3	31	6.3×5.3	40	6.3×5.3	44	8×6.5	60
47	5×5.3	34	6.3×5.3	43	6.3×5.3	47	8×6.5	66	8×10	82
100	6.3×5.3	58	8×6.5	79	8×6.5	87	8×10	112	10×10	139
220	8×6.5	107	8×10	136	8×10	149	10×10	192	—	—
330	8×10	153	8×10	166	10×10	221	—	—	—	—
470	8×10	183	10×10	229	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz

SILMIC series Silk fiber using audio purpose capacitor

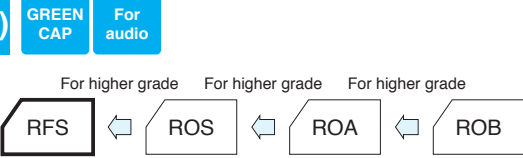
- ELNA developed new raw material for the separate paper which use a silk fibers. Therefore, this capacitor can give you high grade sound for your audio design.
- Due to the silk fiber's pliability, the capacitor makes a dream of the high quality sound.

- For examples ;
- To relieve the music's vibration energy.
 - To decrease the peak feeling sound at high compass and rough quality sound at middle compass.
 - To increase massive sound at low compass.
 - For bipolar capacitors, consult with us.



Marking color : White print on a brown sleeve

Miniature High Grade Capacitors for Audio(SILMIC II)

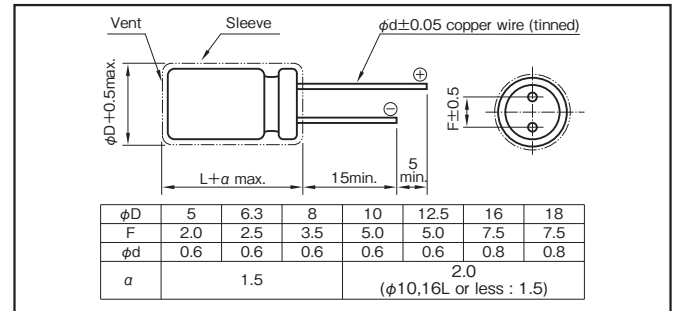


- All lead wires oxygen-free copper for extremely low distortion. (Third high frequency distortion 10kHz,0.1A,-120dB or less)
- "SILMIC II" mark on sleeve.

Specifications

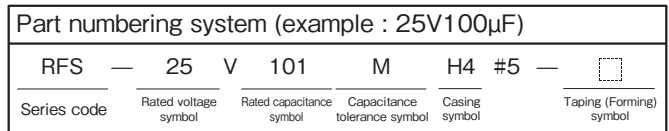
Item	Performance
Category temperature range (°C)	-40 to +85
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 5 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)
Tangent of loss angle (tanδ)	Rated voltage (V)
	tanδ (max.)
Endurance (85°C) (Applied ripple current)	1000 hours (with the polarity inverted every 250 hours) The initial specified value or less Within ±20% of initial value 150% or less of the initial specified value
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)

Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz)	CV (µF×VV)				
		50 - 60	120	1k	10k	100k
6.3 to 16	All CV value	0.8	1	1.1	1.2	1.2
	≤1000	0.8	1	1.5	1.7	1.7
25 to 35	1000<	0.8	1	1.2	1.3	1.3
	≤1000	0.8	1	1.6	1.9	1.9
50 to 100	1000<	0.8	1	1.2	1.3	1.3
	≤1000	0.8	1	1.2	1.3	1.3



Case symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8
						18×40	K9

Standard Ratings

Rated capacitance (µF)	6.3		10		16		25		35		50		63		100	
	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4.7	—	—	—	—	—	—	5×11	25	5×11	30	5×11	35	5×11	35	10×12.5	60
10	—	—	—	—	5×11	35	5×11	35	5×11	35	8×11.5	75	8×11.5	75	10×16	95
22	—	—	5×11	50	5×11	55	5×11	60	8×11.5	95	10×12.5	130	10×16	140	10×20	155
33	5×11	55	5×11	65	5×11	70	8×11.5	120	10×12.5	140	10×16	175	10×20	190	12.5×20	220
47	5×11	65	5×11	75	8×11.5	125	8×11.5	140	10×12.5	170	10×16	210	10×20	225	12.5×25	285
100	8×11.5	135	8×11.5	145	10×12.5	215	10×16	270	10×20	295	12.5×20	380	12.5×25	415	16×25	485
220	10×12.5	240	10×16	260	10×20	385	12.5×20	505	12.5×25	550	16×25	720	16×31.5	785	18×40	930
330	10×16	290	10×20	350	12.5×20	545	12.5×25	675	16×25	785	16×31.5	965	16×35.5	1010	—	—
470	10×20	390	12.5×20	455	12.5×25	710	16×25	940	16×31.5	1030	16×35.5	1210	18×35.5	1295	—	—
1000	12.5×20	710	16×25	835	16×31.5	1315	16×35.5	1575	18×35.5	1690	18×40	1985	—	—	—	—
2200	—	—	16×35.5	1500	18×40	2150	—	—	—	—	—	—	—	—	—	—
3300	—	—	18×40	1980	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz

SILMIC series Silk fiber using audio purpose capacitor

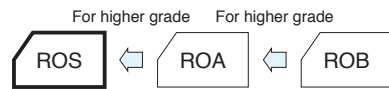
High Grade Capacitors for Audio(SILMIC)

GREEN CAP For audio

- All lead wires oxygen-free copper for extremely low distortion. (Third high frequency distortion 10kHz,0.1A,-120dB or less)
- "SILMIC" mark on sleeve.



Marking color : White print on a brown sleeve

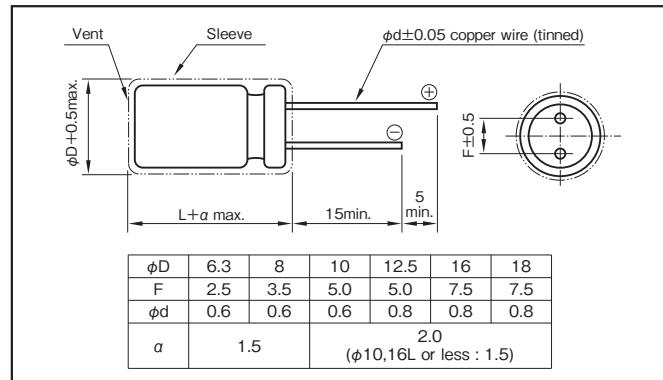


Specifications

Item	Performance														
Category temperature range (°C)	-40 to +85														
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)														
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 5 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)														
Tangent of loss angle (tanδ)	<table border="1"> <tr> <th>Rated voltage (V)</th> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> <td>100</td> </tr> <tr> <th>tanδ (max.)</th> <td>0.13</td> <td>0.10</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> <td>0.08</td> </tr> </table>	Rated voltage (V)	16	25	35	50	63	100	tanδ (max.)	0.13	0.10	0.10	0.08	0.08	0.08
	Rated voltage (V)	16	25	35	50	63	100								
tanδ (max.)	0.13	0.10	0.10	0.08	0.08	0.08									
	0.02 is added to every 1000μF increase over 1000μF (20°C,120Hz)														
Endurance (85°C) (Applied ripple current)	Test time	1000 hours													
	Leakage current	The initial specified value or less													
	Percentage of capacitance change	Within ±20% of initial value													
	Tangent of the loss angle	150% or less of the initial specified value													
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment														
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)														

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz) CV(μF×VV)	50·60	120	1k	10k	100k
		All CV value	0.80	1	1.1	1.2
25 to 35	≤1000	0.80	1	1.5	1.7	1.7
	1000<	0.80	1	1.2	1.3	1.3
50 to 100	≤1000	0.80	1	1.6	1.9	1.9
	1000<	0.80	1	1.2	1.3	1.3

Part numbering system (example : 25V100μF)



Case symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8
				18×40			K9

Standard Ratings

Rated voltage (V)	Item	16		25		35		50		63		100	
		Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)
2.2												6.3×11	25
3.3												8×11.5	35
4.7								6.3×11	40	6.3×11	40	10×12.5	60
10						6.3×11	55	8×11.5	75	8×11.5	75	10×16	95
22	6.3×11	70	6.3×11	80	8×11.5	95	10×12.5	130	10×16	140	10×20	155	
33	6.3×11	90	8×11.5	120	10×12.5	140	10×16	175	10×20	190	12.5×20	220	
47	8×11.5	125	8×11.5	140	10×12.5	170	10×16	210	10×20	225	12.5×25	285	
100	10×12.5	215	10×16	270	10×20	295	12.5×20	380	12.5×25	415	16×25	485	
220	10×20	385	12.5×20	505	12.5×25	550	16×25	720	16×31.5	785	18×40	930	
330	12.5×20	545	12.5×25	675	16×25	785	16×31.5	965	16×35.5	1010			
470	12.5×25	710	16×25	940	16×31.5	1030	16×35.5	1210	18×35.5	1295			
1000	16×31.5	1315	16×35.5	1575	18×35.5	1690	18×40	1985					
2200	18×40	2150											

(Note) Rated ripple current : 85°C, 120Hz.

Miniature Standard Capacitors for Audio

GREEN CAP For audio



Marking color : Gold print on a black sleeve

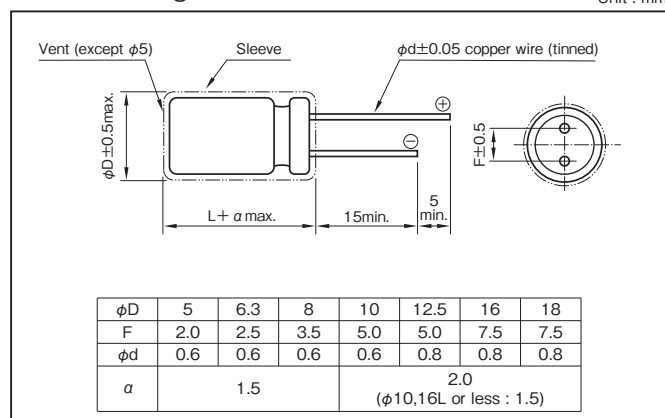
TONEREX

- Adopting the newly developed formation method and composite electrolytic paper for audio application has reduced distortion, achieving high-quality sound.
- All lead wires are oxygen-free copper wires to reduce distortion.

Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85	
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)	
Leakage current (μA)	Less than 0.01CV or 4 whichever is larger (after 5 minutes) C : Rated capacitance (μF) ; V: Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3 10 16 25 35 50 63 100
	tanδ (max.)	0.24 0.20 0.16 0.14 0.12 0.10 0.09 0.08
0.02 is added to every 1000μF increase over 1000μF (20°C, 120Hz)		
Endurance (85°C) (Applied ripple current)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment	
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)	

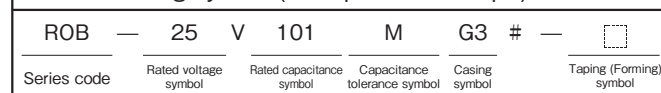
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage (V)	Frequency (Hz) CV (μF×WV)	CV (μF×WV)				
		50·60	120	1k	10k	100k
6.3 to 16	All CV value	0.80	1	1.1	1.2	1.2
	≤1000	0.80	1	1.5	1.7	1.7
25 to 35	1000<	0.80	1	1.2	1.3	1.3
	≤1000	0.80	1	1.6	1.9	1.9
50 to 100	1000<	0.80	1	1.2	1.3	1.3
	≤1000	0.80	1	1.2	1.3	1.3

Part numbering system (example : 25V100μF)



Case symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8
				18×40			K9

Standard Ratings

Rated capacitance (μF)	6.3		10		16		25		35		50		63		100	
	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4.7	—	—	—	—	—	—	5×11	25	—	—	5×11	25	—	—	5×11	30
10	—	—	—	—	—	5×11	35	5×11	40	5×11	35	5×11	35	6.3×11	40	—
22	—	—	5×11	50	5×11	60	5×11	60	6.3×11	75	6.3×11	80	8×11.5	100	10×12.5	120
33	5×11	55	5×11	65	5×11	70	6.3×11	80	6.3×11	90	8×11.5	110	8×11.5	115	10×16	160
47	5×11	65	5×11	75	6.3×11	95	6.3×11	100	8×11.5	120	8×11.5	130	10×12.5	165	10×20	210
100	6.3×11	110	6.3×11	120	8×11.5	150	8×11.5	165	10×12.5	210	10×16	250	10×20	285	12.5×20	340
220	8×11.5	185	8×11.5	200	10×12.5	265	10×16	310	10×20	365	12.5×20	440	12.5×20	470	16×25	620
330	10×12.5	265	10×12.5	200	10×16	350	10×20	410	12.5×20	500	12.5×20	540	12.5×25	620	16×31.5	820
470	10×12.5	315	10×16	380	10×20	460	12.5×20	550	12.5×25	640	16×25	800	16×25	840	18×35.5	1000
1000	10×20	550	12.5×20	670	12.5×25	810	16×25	1000	16×25	1050	16×31.5	1200	18×35.5	1500	—	—
2200	12.5×25	980	16×25	1200	16×25	1350	16×35.5	1650	18×35.5	1900	—	—	—	—	—	—
3300	16×25	1300	16×31.5	1600	16×35.5	1800	18×40	2100	—	—	—	—	—	—	—	—
4700	16×31.5	1700	16×35.5	1900	18×35.5	2400	—	—	—	—	—	—	—	—	—	—
6800	16×35.5	2100	18×40	2600	—	—	—	—	—	—	—	—	—	—	—	—
10000	18×40	2800	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 85°C, 120Hz

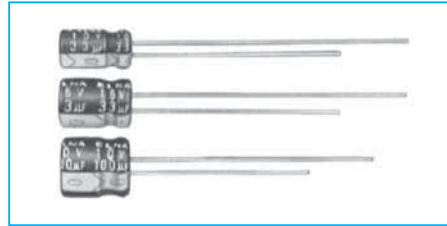
NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

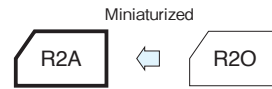
For Audio, Ultra Miniaturized (PURECAP)

GREEN CAP For audio

- A new foil and electrolyte makes powerful and clear sound.
- New type ultra miniaturized capacitor for audio, using synthetic mica paper for the separator.



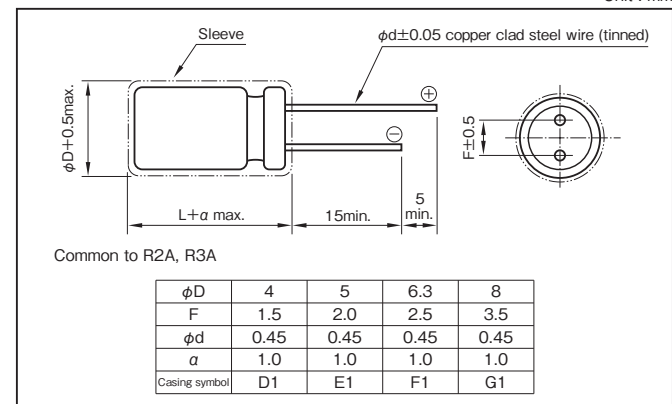
Marking color : White print on a black sleeve



Specifications

Item	Performance								
Category temperature range (°C)	-40 to +85								
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)								
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)								
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50		
	tanδ (max.)	0.35	0.27	0.22	0.20	0.17	0.15		
Characteristics at high and low temperature	Impedance ratio (max.)	Rated voltage (V)		6.3	10	16	25	35	50
		Z-25°C/Z+20°C	4	3	2	2	2	2	
		Z-40°C/Z+20°C	10	8	6	4	4	4	
Endurance (85°C) (Applied ripple current)	Test time	1000 hours							
	Leakage current	The initial specified value or less							
	Percentage of capacitance change	Within ±20% of initial value							
	Tangent of the loss angle	200% or less of the initial specified value							
Shelf life (85°C)	Test time : 500 hours; other items are the same as those for the endurance. Voltage application treatment								
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)								

Outline Drawing



Part numbering system (example : 25V10µF)

R2A	—	25	V	100	M	D1	P6#	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping (Forming) symbol

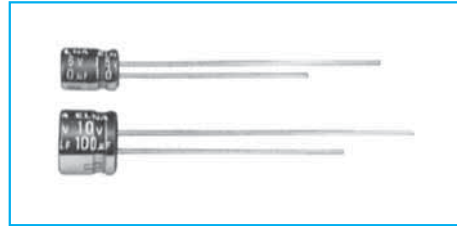
Standard Ratings

Rated voltage (V) \ Rated capacitance (µF)	6.3	10	16	25	35	50
0.33	—	—	—	—	—	4×7
0.47	—	—	—	—	—	4×7
1	—	—	—	—	—	4×7
2.2	—	—	—	—	—	4×7
3.3	—	—	—	—	—	4×7
4.7	—	—	—	—	4×7	5×7
10	—	—	—	4×7	5×7	6.3×7
22	—	4×7	—	5×7	—	6.3×7
33	4×7	—	5×7	6.3×7	6.3×7	8×7
47	—	5×7	—	6.3×7	8×7	—
100	5×7	6.3×7	6.3×7	8×7	—	—
220	6.3×7	8×7	—	—	—	—
330	8×7	—	—	—	—	—

(Note) "→" items are refer to the right.

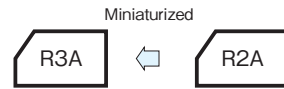
For Audio, Ultra Miniaturized (PURECAP)

GREEN CAP For audio



Marking color : White print on a reddish purple sleeve

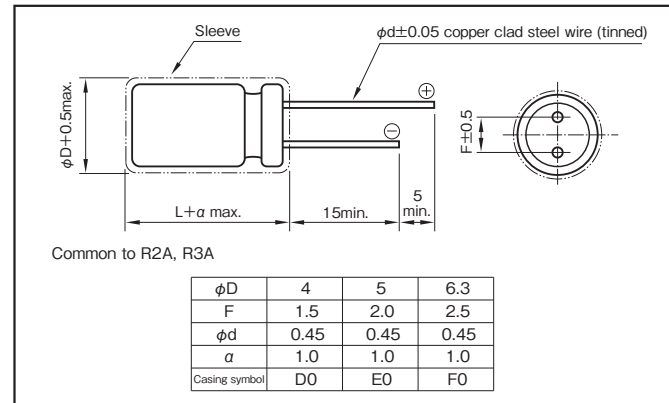
- A new foil and electrolyte makes powerful and clear sound.
- New type ultra miniaturized capacitor for audio, using synthetic mica paper for the separator.



Specifications

Item	Performance																							
Category temperature range (°C)	-40 to +85																							
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)																							
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)																							
Tangent of loss angle (tanδ)	<table border="1"> <tr> <th>Rated voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> <tr> <td>tanδ (max.)</td> <td>0.46</td> <td>0.30</td> <td>0.26</td> <td>0.20</td> <td>0.17</td> <td>0.13</td> <td>0.11</td> </tr> </table> <p>(20°C, 120Hz)</p>	Rated voltage (V)	4	6.3	10	16	25	35	50	tanδ (max.)	0.46	0.30	0.26	0.20	0.17	0.13	0.11							
Rated voltage (V)	4	6.3	10	16	25	35	50																	
tanδ (max.)	0.46	0.30	0.26	0.20	0.17	0.13	0.11																	
Characteristics at high and low temperature	<table border="1"> <tr> <th>Rated voltage (V)</th> <th>4</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> </tr> <tr> <td rowspan="2">Impedance ratio (max.)</td> <td>Z-25°C/Z+20°C</td> <td>6</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z-40°C/Z+20°C</td> <td>16</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>4</td> </tr> </table> <p>(120Hz)</p>	Rated voltage (V)	4	6.3	10	16	25	35	50	Impedance ratio (max.)	Z-25°C/Z+20°C	6	4	3	2	2	2	Z-40°C/Z+20°C	16	10	8	6	4	4
Rated voltage (V)	4	6.3	10	16	25	35	50																	
Impedance ratio (max.)	Z-25°C/Z+20°C	6	4	3	2	2	2																	
	Z-40°C/Z+20°C	16	10	8	6	4	4																	
Endurance (85°C) (Applied ripple current)	<table border="1"> <tr> <td>Test time</td> <td>1000 hours</td> </tr> <tr> <td>Leakage current</td> <td>The initial specified value or less</td> </tr> <tr> <td>Percentage of capacitance change</td> <td>Within ±20% of initial value</td> </tr> <tr> <td>Tangent of the loss angle</td> <td>200% or less of the initial specified value</td> </tr> </table>	Test time	1000 hours	Leakage current	The initial specified value or less	Percentage of capacitance change	Within ±20% of initial value	Tangent of the loss angle	200% or less of the initial specified value															
Test time	1000 hours																							
Leakage current	The initial specified value or less																							
Percentage of capacitance change	Within ±20% of initial value																							
Tangent of the loss angle	200% or less of the initial specified value																							
Shelf life (85°C)	Test time : 500hours ; other items are the same as those for the endurance. Voltage application treatment																							
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)																							

Outline Drawing



Part numbering system (example : 35V10µF)

R3A	—	35	V	101	M	E0	P3#	—	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol			Taping (Forming) symbol

Standard Ratings

Rated capacitance (µF)	φD×L (mm)						
	4	6.3	10	16	25	35	50
0.22	—	—	—	—	—	—	4×5
0.33	—	—	—	—	—	—	4×5
0.47	—	—	—	—	—	—	4×5
1	—	—	—	—	—	—	4×5
2.2	—	—	—	—	—	—	4×5
3.3	—	—	—	—	—	—	4×5
4.7	—	—	—	—	—	4×5	5×5
10	—	—	→	4×5	→	5×5	6.3×5
22	—	4×5	→	5×5	→	6.3×5	—
33	4×5	→	5×5	→	6.3×5	—	—
47	4×5	→	5×5	→	6.3×5	—	—
100	5×5	→	6.3×5	→	—	—	—
220	6.3×5	→	—	→	—	—	—

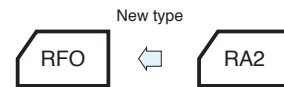
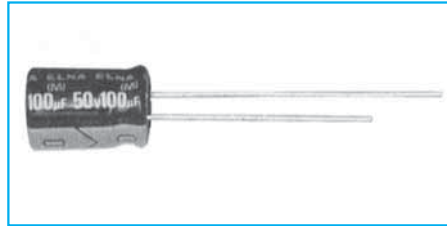
(Note) "→" items refer to the right.

Aluminum Electrolytic Capacitors for Audio

Miniature Capacitors for Audio

GREEN CAP For audio

- A standard capacitor utilizing a newly developed material for a high grade of audio reproduction.
- Copper clad steel wire is used for leads.
- New type miniaturized capacitor for audio, using synthetic mica paper for the separator.

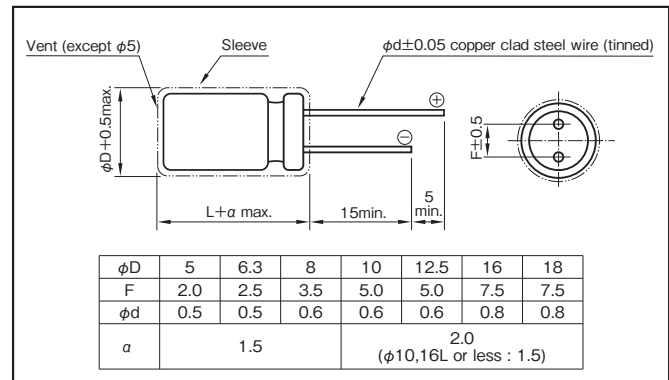


Marking color : Gold print on a black sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85	
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)	
Leakage current (µA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (µF) ; V : Rated voltage (V) (20°C)	
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3 10 16 25 35 50 63 100
	tanδ (max.)	0.22 0.19 0.16 0.14 0.12 0.10 0.09 0.08
0.02 is added to every 1000µF increase over 1000µF (20°C,120Hz)		
Endurance (85°C) (Applied ripple current)	Test time	1000 hours
	Leakage current	The initial specified value or less
	Percentage of capacitance change	Within ±20% of initial value
	Tangent of the loss angle	150% or less of the initial specified value
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment	
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)	

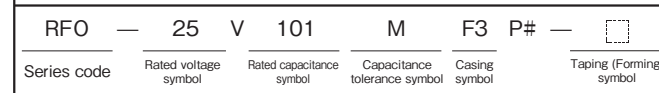
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage(V)	Frequency(Hz) CV(µF×VV)	Frequency(Hz)				
		50 · 60	120	1k	10k	100k
6.3 to 16	All CV value	0.80	1	1.1	1.2	1.2
	≤1000	0.80	1	1.5	1.7	1.7
25 to 35	1000<	0.80	1	1.2	1.3	1.3
	≤1000	0.80	1	1.6	1.9	1.9
50 to 100	1000<	0.80	1	1.2	1.3	1.3
	≤1000	0.80	1	1.6	1.9	1.9

Part numbering system (example : 25V100µF)



Case symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8
						18×40	K9

Standard Ratings

Rated capacitance (µF)	6.3		10		16		25		35		50		63		100	
	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)	Case φD×L (mm)	Rated ripple current (mAmps)
1	—	—	—	—	—	—	—	—	—	—	5×11	15	—	—	5×11	15
2.2	—	—	—	—	—	—	—	—	—	—	5×11	20	—	—	5×11	25
3.3	—	—	—	—	—	—	—	—	—	—	5×11	25	—	—	5×11	30
4.7	—	—	—	—	—	—	—	—	5×11	30	5×11	30	5×11	35	5×11	35
10	—	—	—	—	—	—	—	—	5×11	45	5×11	45	5×11	50	6.3×11	60
22	—	—	—	—	5×11	50	5×11	55	5×11	60	5×11	70	6.3×11	85	8×11.5	110
33	—	—	5×11	55	5×11	60	5×11	70	5×11	80	6.3×11	100	6.3×11	100	10×12.5	160
47	—	—	5×11	65	5×11	75	5×11	85	6.3×11	110	6.3×11	120	8×11.5	150	10×16	210
100	5×11	85	5×11	95	6.3×11	120	6.3×11	140	8×11.5	190	8×11.5	210	10×12.5	260	12.5×20	380
220	6.3×11	150	6.3×11	165	8×11.5	220	8×11.5	250	10×12.5	330	10×16	400	10×20	460	16×25	720
330	6.3×11	180	8×11.5	240	8×11.5	270	10×12.5	370	10×16	450	10×20	540	12.5×20	650	16×25	880
470	8×11.5	260	8×11.5	280	10×12.5	390	10×16	480	10×20	590	12.5×20	740	12.5×25	850	16×31.5	1150
1000	10×12.5	450	10×16	540	10×20	680	12.5×20	880	12.5×25	1050	16×25	1350	16×31.5	1550	—	—
2200	12.5×20	890	12.5×20	970	12.5×25	1200	16×25	1550	16×31.5	1750	16×35.5	2100	—	—	—	—
3300	12.5×20	1050	12.5×25	1250	16×25	1600	16×31.5	1950	18×35.5	2250	—	—	—	—	—	—
4700	16×25	1550	16×25	1650	16×31.5	2050	18×35.5	2500	—	—	—	—	—	—	—	—
6800	16×25	1750	16×31.5	2050	18×35.5	2550	—	—	—	—	—	—	—	—	—	—
10000	16×31.5	2150	18×35.5	2550	—	—	—	—	—	—	—	—	—	—	—	—
15000	18×35.5	2700	—	—	—	—	—	—	—	—	—	—	—	—	—	—

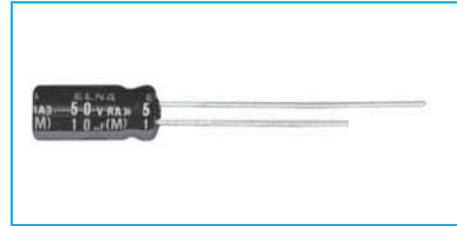
(Note) Rated ripple current : 85°C, 120Hz

Aluminum Electrolytic Capacitors for Audio

Miniature Capacitors for Audio

GREEN CAP For audio

- With the same size as that for Series RE3 miniaturized standard capacitors, a high resolution sound quality grade has been realized.
- The newly developed audio use material makes clear sound a reality.
- All lead wires are copper clad steel.

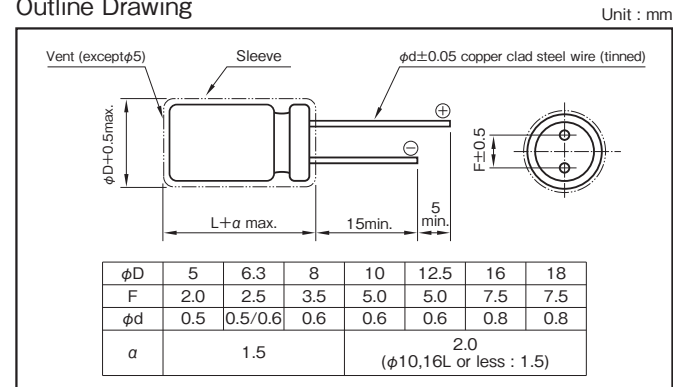


Marking color : White print on a brown sleeve

Specifications

Item	Performance									
Category temperature range (°C)	-40 to +85									
Tolerance at rated capacitance (%)	±20 (20°C,120Hz)									
Leakage current (μA)	Less than 0.01CV or 3 whichever is larger (after 2 minutes) C : Rated capacitance (μF) ; V : Rated voltage (V) (20°C)									
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	
	tanδ (max.)	0.28	0.24	0.20	0.16	0.14	0.12	0.11	0.10	
0.02 is added to every 1000μF increase over 1000μF (20°C,120Hz)										
Endurance (85°C) (Applied ripple current)	Test time	2000 hours								
	Leakage current	The initial specified value or less								
	Percentage of capacitance change	Within ±20% of initial value								
	Tangent of the loss angle	200% or less of the initial specified value								
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment									
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)									

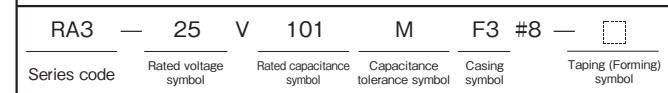
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Rated voltage(V)	Frequency (Hz)	CV (μF×VV)				
		50 · 60	120	1k	10k	100k
6.3 to 16	All CV value	0.80	1	1.1	1.2	1.2
	≤1000	0.80	1	1.5	1.7	1.7
25 to 35	1000<	0.80	1	1.2	1.3	1.3
	≤1000	0.80	1	1.6	1.9	1.9
50 to 100	1000<	0.80	1	1.2	1.3	1.3
	≤1000	0.80	1	1.2	1.3	1.3

Part numbering system (example : 25V100μF)



Case symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	18×35.5	K8
8×11.5	G3	10×20	H5	16×25	J6	—	—

Standard Ratings

Rated capacitance (μF)	Item	6.3		10		16		25		35		50		63		100	
		Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	5×11	21	—	—	5×11	21
3.3	—	—	—	—	—	—	—	—	—	—	—	5×11	31	—	—	5×11	31
4.7	—	—	—	—	—	—	—	—	—	—	—	5×11	38	—	—	5×11	40
10	—	—	—	—	—	5×11	50	5×11	55	5×11	60	5×11	66	5×11	70	5×11	70
22	—	—	—	—	—	5×11	75	5×11	90	5×11	95	5×11	100	5×11	105	6.3×11	115
33	—	—	—	—	—	5×11	110	5×11	110	5×11	110	5×11	110	6.3×11	130	8×11.5	158
47	—	—	—	—	—	5×11	130	5×11	130	5×11	130	6.3×11	155	6.3×11	160	8×11.5	188
100	5×11	130	5×11	150	5×11	180	6.3×11	199	6.3×11	214	8×11.5	250	8×11.5	270	10×16	358	
220	5×11	240	6.3×11	250	6.3×11	280	8×11.5	349	8×11.5	350	10×12.5	429	10×16	505	12.5×20	663	
330	6.3×11	300	6.3×11	330	8×11.5	383	8×11.5	383	10×12.5	542	10×16	595	10×20	676	12.5×25	886	
470	6.3×11	380	8×11.5	417	8×11.5	480	10×12.5	545	10×16	664	12.5×20	887	12.5×20	924	16×25	1230	
1000	8×11.5	580	10×12.5	650	10×16	791	10×20	996	12.5×20	1210	12.5×25	1400	16×25	1710	18×35.5	2210	
2200	10×16	939	10×20	1080	12.5×20	1350	12.5×25	1660	16×25	1950	16×31.5	2340	18×35.5	2870	—	—	
3300	16×20	1230	12.5×20	1430	12.5×25	1690	16×25	2030	16×31.5	2320	18×35.5	2810	—	—	—	—	
4700	12.5×20	1710	12.5×25	1780	16×25	2100	16×31.5	2650	18×35.5	2290	—	—	—	—	—	—	
6800	12.5×25	1930	16×25	2270	16×31.5	2480	18×35.5	3290	—	—	—	—	—	—	—	—	
10000	16×25	2450	16×31.5	2500	18×35.5	3130	—	—	—	—	—	—	—	—	—	—	
15000	16×31.5	2580	18×35.5	3100	—	—	—	—	—	—	—	—	—	—	—	—	
22000	18×35.5	3150	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

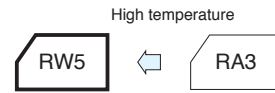
(Note) Rated ripple current : 85°C, 120Hz

Aluminum Electrolytic Capacitors for Audio

For Audio, 105°C Miniature Capacitors

GREEN CAP 105°C 1000hours For Audio

- With the same size as that for Series RJ5 miniaturized standard capacitors, a high resolution sound quality grade has been realized.
- Guarantees 1000 hours at 105°C



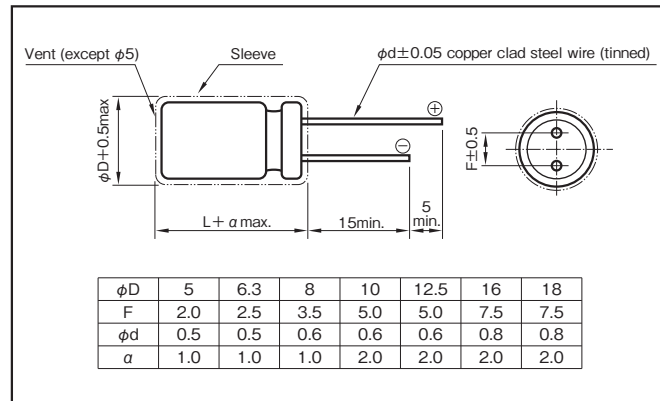
Marking color : Gold print on a black sleeve

Specifications

Item	Performance			
Category temperature range (°C)	-55 to +105			
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)			
Leakage current (µA)	Less than 0.03CV or 4 whichever is larger (after 1 minutes) C : Rated capacitance (µF), V : Rated voltage (V) (20°C)			
Tangent of loss angle (tanδ)	Rated voltage (V)	16	25	
	tanδ (max.)	0.24	0.20	
0.02CV is added to every 1000µF increase over 1000µF (20°C, 120Hz)				
Characteristics at high and low temperature	Rated voltage (V)	16	25	
	Impedance ratio (max.)	Z-25°C/Z+20°C	3	2
		Z-40°C/Z+20°C	6	4
(120Hz)				
Endurance (105°C) (Applied ripple current)	Test time	1000 hours		
	Leakage current	The initial specified value or less		
	Percentage of capacitance change	Within ±20% of initial value		
	Tangent of the loss angle	200% or less of the initial specified value		
Shelf life (105°C)	Test time : 1000 hours; Other have same as endurance. Voltage application treatment			
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)			

Outline Drawing

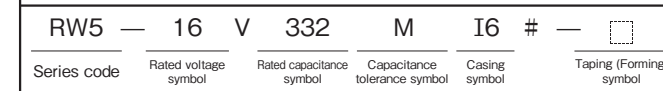
Unit : mm



Coefficient of Frequency for Rated Ripple Current

Rated Capacitance (µF)	Frequency (Hz)					
	50 · 60	120	1k	10k	100k	
100 to 220	0.8	1	1.2	1.3	1.4	
330 to 1000	0.8	1	1.2	1.2	1.3	
1200 to 15000	0.8	1	1.1	1.1	1.1	

Part numbering system (example : 16V3300µF)



Standard Ratings

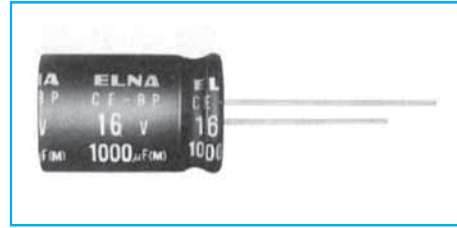
Rated capacitance (µF)	16			25		
	Case φD×L (mm)	Casing symbol	Rated ripple current (mA rms)	Case φD×L (mm)	Casing symbol	Rated ripple current (mA rms)
100	—	—	—	5×11.5	E3	125
220	6.3×11.5	F3	190	6.3×11.5	F3	200
330	6.3×11.5	F3	225	8×12	G3	310
470	8×12	G3	323	10×12.5	H3	429
1000	10×12.5	H3	500	10×16	H4	610
2200	10×20	H5	710	12.5×25	I6	1180
				16×20	J5	1230
				18×16	K4	1200
3300	12.5×25	I6	1200	16×25	J6	1440
				16×20	K5	1400
4700	16×25	J6	1500	16×25	J6	1570
				18×20	K5	1530
				16×25	J6	1600
6800	16×25	J6	1600	16×35.5	J8	1850
				18×20	K5	1560
10000	16×35.5	J8	1930	18×40	K9	2000
				18×40	K9	2210

(Note) Rated ripple current : 105°C, 120Hz.

Miniature Bipolar Capacitors for Audio

GREEN CAP For audio

- The newly developed audio use foil and special electrolyte makes clear and far-carrying sound a reality.
- All lead wires are copper clad steel.

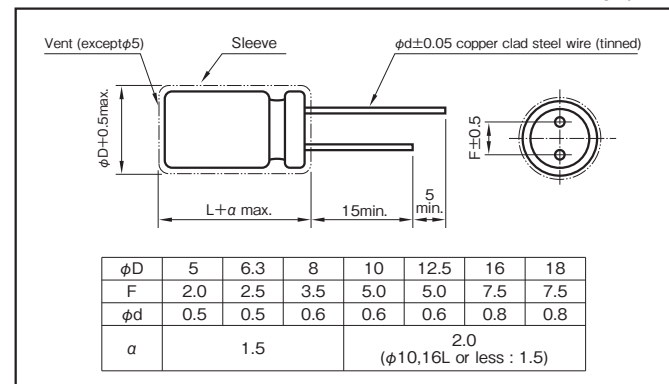


Marking color : Gold print on a black sleeve

Specifications

Item	Performance									
Category temperature range (°C)	-40 to +85									
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)									
Leakage current (µA)	Less than 0.01CV or 4 whichever is larger (after 2 minutes) C : Rated capacitance (µF); V : Rated voltage (V) (20°C)									
Tangent of loss angle (tanδ)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	
	tanδ (max.)	0.24	0.20	0.16	0.15	0.14	0.12	0.10	0.09	
0.02 is added to every 1000µF increase over 1000µF. (20°C, 120Hz)										
Characteristics at high and low temperature	Rated voltage (V)	6.3	10	16	25	35	50	63	100	
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	2	2	2	2	2	2
0.5 for -25°C, 1 for -40°C are added to every 1000µF increase over 1000µF. (120Hz)										
Endurance (85°C) (Applied ripple current)	Test time	250h × 8								
	Leakage current	The initial specified value or less								
	Percentage of capacitance change	Within ±20% of initial value								
	Tangent of the loss angle	150% or less of the initial specified value								
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)									

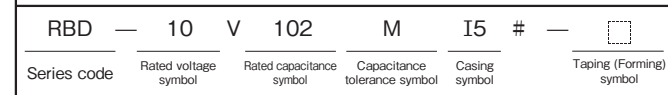
Outline Drawing



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Rated voltage (V)				
6.3 to 16	0.8	1	1.1	1.2
25 to 35	0.8	1	1.5	1.7
50 to 100	0.8	1	1.6	1.9

Part numbering system (example : 10V1000µF)



Case symbol

Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol	Case φD×L (mm)	Casing Symbol
5×11	E3	10×12.5	H3	12.5×20	I5	16×31.5	J7
6.3×11	F3	10×16	H4	12.5×25	I6	16×35.5	J8
8×11.5	G3	10×20	H5	16×25	J6	18×35.5	K8
				18×40			K9

Standard Ratings

Rated capacitance (µF)	Item	6.3		10		16		25		35		50		63		100	
		Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)	Case φD×L (mm)	Rated ripple current (mA rms)
0.47																	
1																	
2.2																	
3.3																	
4.7																	
10						5×11	39	5×11	40	5×11	42	5×11	45	6.3×11	57	8×11.5	70
22				5×11	52	5×11	58	5×11	60	6.3×11	71	6.3×11	77	8×11.5	89	10×16	136
33		5×11	58	5×11	63	5×11	71	6.3×11	84	6.3×11	87	8×11.5	111	10×12.5	144	10×20	181
47		5×11	69	5×11	75	6.3×11	97	6.3×11	100	8×11.5	122	10×12.5	157	10×16	188	12.5×20	248
100		6.3×11	115	6.3×11	126	8×11.5	167	10×12.5	204	10×12.5	212	10×20	273	12.5×20	343	16×25	458
220		8×11.5	202	8×11.5	221	10×12.5	294	10×16	332	10×20	375	12.5×25	506	16×25	645	18×35.5	837
330		8×11.5	247	10×12.5	322	10×16	394	10×20	444	12.5×20	526	12.5×25	620				
470		10×12.5	350	10×16	420	10×20	513	12.5×20	607	12.5×25	685	16×25	861				
1000		10×20	611	12.5×20	767	12.5×25	935	16×25	1120	16×31.5	1270						
2200		12.5×25	1090	16×25	1380	16×31.5	1660										
3300		16×25	1490	16×31.5	1760												
4700		16×31.5	1880	18×35.5	2280												

(Note) Rated ripple current : 85°C, 120Hz

Power Supply Smoothing Use, Standard Capacitors

GREEN CAP

For audio

- Best suited as power supply filters for sound quality priority audio equipment.
- Printed circuit board terminal snap-in type.



Marking color : Gold print on a black sleeve

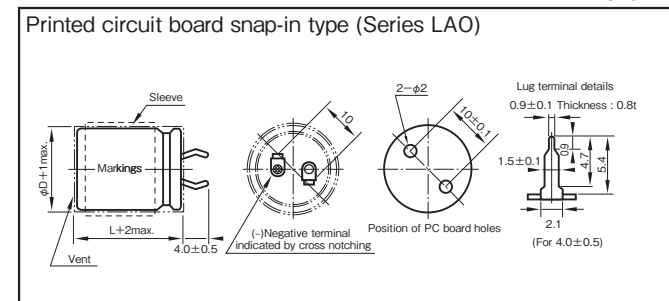


Specifications

Item	Performance				
Category temperature range (°C)	-40 to +85				
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)				
Leakage current (µA)	Less than 0.03CV or 5mA whichever is smaller (after 5 minutes) C : Rated capacitance (µF), V : Rated voltage (V) (20°C)				
Tangent of loss angle (tanδ)	Rated voltage (V)	16	25	35	50 to 100
	tanδ (max.)	0.40	0.40	0.35	0.30
Characteristics at high and low temperature	Rated voltage (V)	16 to 35	50 to 100		
	Impedance ratio (max.)	Z-25°C/Z+20°C	4	3	
Endurance (85°C) (Applied ripple current)	Test time	1000 hours			
	Leakage current	The initial specified value or less			
	Percentage of capacitance change	Within ±20% of initial value			
	Tangent of the loss angle	150% or less of the initial specified value			
Shelf life (85°C)	Test time : 1000 hours. Other have same as endurance. Voltage application treatment				
Applicable standards	JIS C5101-1, -4 1998 (IEC 60384-1 1992, -4 1985)				

Outline Drawing

Unit : mm



Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50	120	1k	10k	20k
Rated voltage (V)					
50 or less	0.95	1	1.10	1.15	1.15
63 to 100	0.95	1	1.16	1.30	1.33

Part numbering system (example : 63V6800µF)

LAO	—	63	V	682	M	S57	PX #	B
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol		Optional symbol

Standard Ratings

Case φD×L (mm)	Item Casing symbol	16		25		35		50		63		80		100	
		Rated capacitance	Rated ripple current	Rated capacitance	Rated ripple current	Rated capacitance	Rated ripple current	Rated capacitance	Rated ripple current	Rated capacitance	Rated ripple current	Rated capacitance	Rated ripple current	Rated capacitance	Rated ripple current
		(μF)	(Arms)	(μF)	(Arms)	(μF)	(Arms)	(μF)	(Arms)	(μF)	(Arms)	(μF)	(Arms)	(μF)	(Arms)
22×20	S21	3300	1.2	—	—	—	—	—	—	—	—	—	—	—	—
22×25	S22	4700	1.5	2200	1.0	1500	0.8	1000	0.8	680	0.7	—	—	—	—
22×30	S23	—	—	3300	1.3	2200	1.3	1500	1.1	1000	0.9	680	0.7	—	—
22×35	S24	6800	2.0	4700	1.7	3300	1.7	—	—	1500	1.2	1000	1.0	680	0.8
22×40	S25	—	—	—	—	—	—	2200	1.5	—	—	—	—	—	—
22×45	S26	10000	2.7	6800	2.2	4700	2.3	—	—	2200	1.6	—	—	—	—
22×50	S27	—	—	—	—	—	—	3300	2.0	—	—	1500	1.3	1000	1.2
25×25	S32	—	—	3300	1.7	2200	1.7	1500	1.4	1000	1.2	680	1.0	—	—
25×30	S33	6800	2.5	4700	2.1	3300	2.2	2200	1.8	1500	1.5	1000	1.2	680	1.1
25×35	S34	10000	3.2	—	—	—	—	—	—	—	—	—	—	—	—
25×40	S35	—	—	6800	2.7	4700	2.8	3300	2.3	2200	1.9	1500	1.6	1000	1.4
25×45	S36	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25×50	S37	—	—	10000	3.0	6800	2.6	4700	2.4	3300	2.0	2200	2.0	1500	1.8
30×25	S42	6800	2.6	4700	2.2	3300	2.3	2200	1.9	1500	1.6	1000	1.3	680	1.1
30×30	S43	10000	3.3	6800	2.7	4700	2.8	3300	2.4	2200	1.9	1500	1.6	1000	1.4
30×35	S44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30×40	S45	—	—	10000	3.1	6800	2.7	4700	2.4	3300	2.1	2200	2.1	1500	1.8
30×45	S46	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30×50	S47	—	—	—	—	10000	3.4	6800	3.1	4700	2.6	3300	2.2	2200	1.8
35×25	S52	10000	3.4	6800	2.8	4700	2.9	3300	2.4	2200	2.0	1500	1.7	1000	1.5
35×30	S53	—	—	10000	3.1	6800	2.7	4700	2.5	3300	2.1	2200	2.1	1500	1.8
35×35	S54	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35×40	S55	—	—	—	—	10000	3.5	6800	3.1	4700	2.6	3300	2.2	2200	1.8
35×45	S56	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35×50	S57	—	—	—	—	—	—	—	—	6800	3.3	4700	2.7	—	—

(Note) Rated ripple current : 85°C, 120Hz.

Aluminum Electrolytic Capacitors
for Audio

1 General Description of Aluminum Electrolytic Capacitors

1-1 The Principle of Capacitor

The principle of capacitor can be presented by the principle drawing as in Fig.1-1.

When a voltage is applied between the metal electrodes placed opposite on both surfaces of a dielectric, electric charge can be stored proportional to the voltage.

$$Q = C \cdot V$$

Q : Quantity of electricity (C)

V : Voltage (V)

C : Capacitance (F)

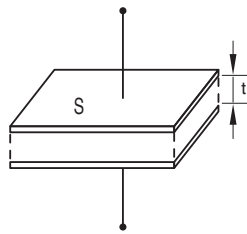


Fig.1-1

C, called the capacitance of capacitor, is expressed by the following expression with the electrode area $S[m^2]$, the electrode spacing $t[m]$ and the dielectric constant of dielectric “ ϵ ”:

$$C[F] = \epsilon_0 \cdot \epsilon \cdot \frac{S}{t}$$

ϵ_0 : Dielectric constant in vacuum ($=8.85 \times 10^{-12} F/m$)

The dielectric constant of an aluminum oxide film is 7 to 8. Larger capacitances can be obtained by enlarging the electrode area S or reducing t .

Table 1-1 shows the dielectric constants of typical dielectrics used in the capacitor. In many cases, capacitor names are determined by the dielectric material used, for example, aluminum electrolytic capacitor, tantalum capacitor, etc.

Table 1

Dielectric	Dielectric Constant	Dielectric	Dielectric Constant
Aluminum oxide film	7 to 8	Porcelain (ceramic)	10 to 120
Mylar	3.2	Polystyrene	2.5
Mica	6 to 8	Tantalum oxide film	10 to 20

Although the aluminum electrolytic capacitor is small, it has a large capacitance. It is because the electrode area is roughened by electrochemical etching, enlarging the electrode area and also because the dielectric is very thin.

The schematic cross section of the aluminum electrolytic capacitor is as in Fig.1-2.

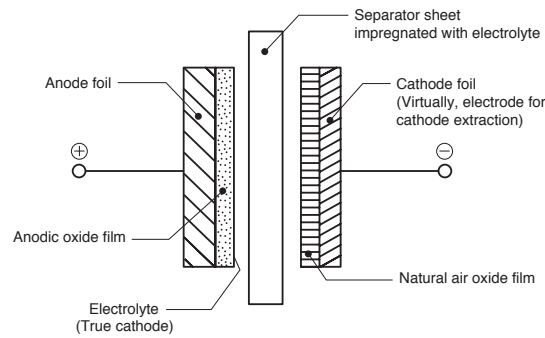
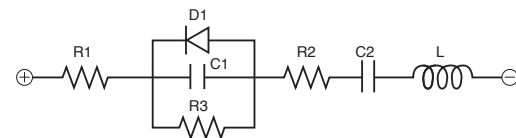


Fig.1-2

1-2 Equivalent Circuit of the Capacitor

The electrical equivalent circuit of the aluminum electrolytic capacitor is as presented in the following figure.



R1 : Resistance of terminal and electrode

R2 : Resistances of anodic oxide film and electrolyte

R3 : Insulation resistance because of defective anodic oxide film

D1 : Oxide semiconductor of anode foil

C1 : Capacity of anode foil

C2 : Capacity of cathode foil

L : Inductance caused by terminals, electrodes, etc.

2 About the Life of an Aluminum Electrolytic Capacitor

2-1 Estimation of life with minimal ripple current (negligible).

Generally, the life of an aluminum electrolytic capacitor is closely related with its ambient temperature and the life will be approximately the same as the one obtained by Arrhenius' equation.

$$L = L_0 \times 2^{\left(\frac{T_0 - T}{10}\right)} \dots\dots\dots(1)$$

Where L : Life at temperature T
 L_0 : Life at temperature T_0

The effects to the life by derating of the applied voltage etc. are neglected because they are small compared to that by the temperature.

2-2 Estimation of life considering the ripple current.

The ripple current affects the life of a capacitor because the internal loss (ESR) generates heat. The generated heat will be :

$$P = I^2R \dots\dots\dots(2)$$

Where I : Ripple current (Arms)
R : ESR (Ω)

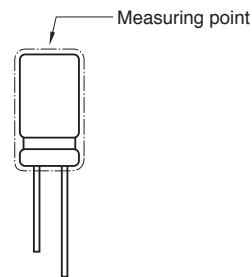
With increase in the temperature of the capacitor:

$$\Delta T = \frac{I^2 \cdot R}{A \cdot H} \dots\dots\dots(3)$$

Where ΔT : Temperature increase in the capacitor core(deg.)

I : Ripple current (Arms)
R : ESR (Ω)
A : Surface area of the capacitor (cm²)
H : Radiation coefficient (Approx. 1.5 ~2.0 × 10⁻³W/cm²×°C)

The above equation (3) shows that the temperature of a capacitor increases in proportion to the square of the applied ripple current and ESR, and in inverse proportion to the surface area. Therefore, the amount of the ripple current determines the heat generation, which affects the life. The value of ΔT varies depending on the capacitor types and operating conditions. The usage is generally desirable if ΔT remains less than 5°C. The measuring point for temperature increase due to ripple current is shown below ;



Test results:

(1) The life equation considering the ambient temperature and the ripple current will be :

$$L = L_d \times 2^{\left(\frac{T_0 - T}{10}\right)} \times K^{\left(\frac{-\Delta T}{10}\right)} \dots\dots\dots(4)$$

Where Ld : Life at DC operation (h)
K : Ripple acceleration factor
(K=2, within allowable ripple current)
(K=4, if exceeding allowable ripple current)
T₀: Upper category temperature (°C)
T : Operating temperature (°C)
ΔT : Temperature increase at capacitor core (deg.)

(2) The life equation based on the life with the rated ripple current applied under the maximum guaranteed temperature will be a conversion of the above equation (4), as below :

$$L = L_r \times 2^{\left(\frac{T_0 - T}{10}\right)} \times K^{\left(\frac{\Delta T_0 - \Delta T}{10}\right)} \dots\dots\dots(5)$$

Where L_r : Life at the upper category temperature with the rated ripple current (h)

ΔT₀ : Temperature increase at capacitor core, at the upper category temperature (deg.)

(3) The life equation considering the ambient temperature and the ripple current will be a conversion of the above equation (5), as below :

$$L = L_r \times 2^{\left(\frac{T_0 - T}{10}\right)} \times K^{\left\{1 - \left(\frac{I}{I_0}\right)^2\right\}} \times \frac{\Delta T_0}{10} \dots\dots\dots(6)$$

Where I₀ : Rated ripple current at the upper category temperature (Arms)

I : Applied ripple current (Arms)

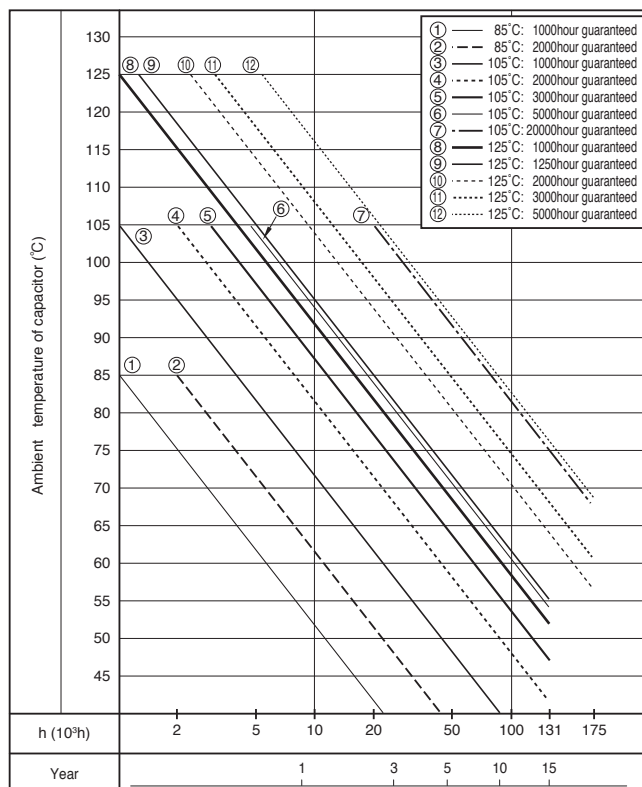
Since it is actually difficult to measure the temperature increase at the capacitor core, the following table is provided for conversion from the surface temperature increase to the core temperature increase.

Table 2-1

Case diameter	~10	12.5~16	18	22	25	30	35
Core / Surface	1.1	1.2	1.25	1.3	1.4	1.6	1.65

The life expectancy formula shall in principle be applied to the temperature range between the ambient temperature of +40°C and upper category temperature. The expected life time shall be about fifteen years at maximum as a guide in terms of deterioration of the sealant.

(Fig. 2-1 Life Expectancy Chart)

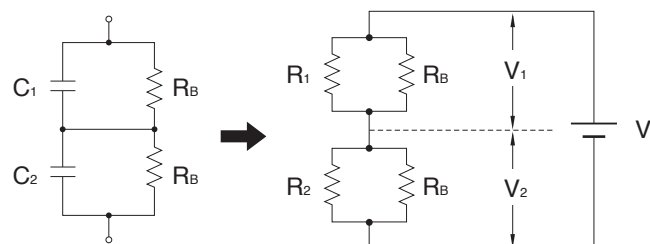


Aluminum Electrolytic Capacitors for Audio

3 To calculate Balance when connecting in series

3-1 Circuit layout

Circuit for connecting two capacitors (C1, C2) in series and equivalent circuit can be illustrated as below figure. Formula to calculate a balance resistance R_B of below figure is shown as follows.



Following are the preconditions of the circuit.

- ① V_2 shall be the rated voltage ($=V_0$). ($V_1 < V_2$)
- ② V shall be a times $V_0 \times 2$. $V=2aV_0$ ($a < 1$)
- ③ R_2 shall equal $R_1 \times b$. ($b < 1$) (1)

3-2 Formulas to calculate $[R_B]$

3-2-1 Following formula can be established from balanced condition.

$$V_1 \left[\frac{1}{R_1} + \frac{1}{R_B} \right] = V_2 \left[\frac{1}{R_2} + \frac{1}{R_B} \right] \quad (2)$$

3-2-2 Following formula can be established from preconditions.

$$V_2 \leq V_0 \quad (3)$$

$$V_1 = V - V_2 \quad (4)$$

$$= 2aV_0 - V_2 \quad (4')$$

3-2-3 Put formulas (1), (3) and (4') in formula (2).

$$(2aV_0 - V_2) \left[\frac{R_1 + R_B}{R_1 \cdot R_B} \right] = V_2 \left[\frac{bR_1 + R_B}{bR_1 \cdot R_B} \right]$$

$$2abV_0(R_1 + R_B) = V_2 \{ b(R_1 + R_B) + bR_1 + R_B \}$$

$$2ab(R_1 + R_B) \leq 2bR_1 + (1+b)R_B$$

Accordingly, balance resistance R shall be the following formula.

$$R_B \leq 2bR_1 \frac{(1-a)}{(2a-1) \cdot b-1} \quad (5)$$

3-3 Calculation Example.

Calculate the value of the balance resistance in the case of connecting two 400V 470 μ F (LC standard value : 1.88mA) capacitors in series.

$$R_1 = \frac{400(V)}{1.88(mA)} = 213(k\Omega)$$

If $a=0.8$, $400(V) \times 2 \times 0.8 = 640(V)$ as an impressed voltage.

If $b=2$, $R_2 = b R_1 = 426(k\Omega)$, $LC = 0.94(mA)$.

Balance resistance R_B will be.

$$R_B \leq 2 \times 2 \times 213(k\Omega) \frac{(1-0.8)}{(2 \times 0.8) \times 2 - 1} = 852(k\Omega)$$

4 Regarding Recovery Voltage

• After charging and then discharging the aluminum electrolytic capacitor, and further causing short-circuit to the terminals and leave them alone, the voltage between the two terminals will rise again after some interval. Voltage caused in such case is called recovery voltage. Following is the process that causes this phenomenon :

• When the voltage is impressed on a dielectric, electrical transformation will be caused inside the dielectric due to dielectric action, and electrification will occur in positive-negative opposite to the voltage impressed on the surface of the dielectric. This phenomenon is called polarization action.

• After the voltage is impressed with this polarization action, and if the terminals are discharged till the terminal voltage reaches 0 and are left open for a while, an electric potential will arise between the two terminals and thus causes recovery voltage.

• Recovery voltage comes to a peak around 10 to 20 days after the two terminals are left open, and then gradually declines. Recovery voltage has a tendency to become bigger as the component (stand-alone base type) becomes bigger.

• If the two terminals are short-circuited after the recovery voltage is generated, a spark may scare the workers working in the assembly line, and may put low-voltage driven components (CPU, memory, etc.) in danger of being destroyed. Measures to prevent this is to discharge the accumulated electric charge with resistor of about 100 to 1k Ω before using, or ship out by making the terminals in short-circuit condition by covering them with an aluminum foil at the production stage. Please consult us for adequate procedures.

5 Electrode Foil Development Technology

5-1 Corrosion inhibition of cathode foil

Inactive treatment is implemented to ensure long life by inhibiting natural corrosion of the cathode foil. Fig. 3-1 shows its effects with values of the polarization resistance inversely proportional to the corrosion rate using the AC impedance method (FRA). This indicates that the cathode foil used in the High reliability capacitors has the polarization resistance higher than that of the conventional capacitors owing to corrosion inhibition.

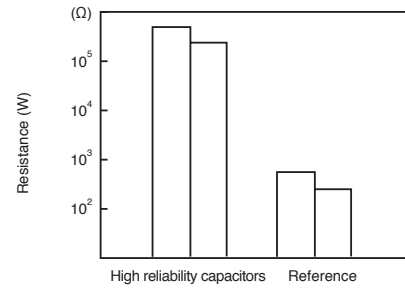


Fig. 3-1

5-2 Sealing material permeability of electrolyte

To ensure long life, a low permeable lactone solvent for the sealing material is used as the main solvent of the electrolyte of the High reliability capacitor. Fig. 3-2 shows the test results on the permeability obtained by changing the weight of the capacitors produced with different types of electrolytes at a high temperature.

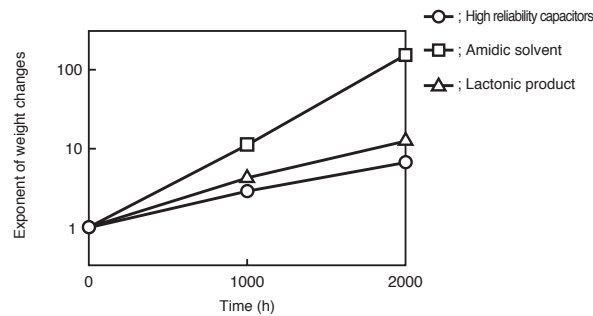


Fig. 3-2

5-3 Airtightness of sealing material

Since the electrolyte is stable for hours, the key element for capacitor's life is the sealing material. By optimizing the crosslinking density of the sealing material polymer, the sealing material of the High reliability capacitor attains its long life with electrolyte permeability less than that of the conventional capacitors.

Fig. 3-3 shows the test results on the airtightness of the sealing material obtained by changing the weight of the capacitors at a high temperature, producing capacitors with the conventional sealing material and improved one both containing the electrolyte used in the High reliability capacitor.

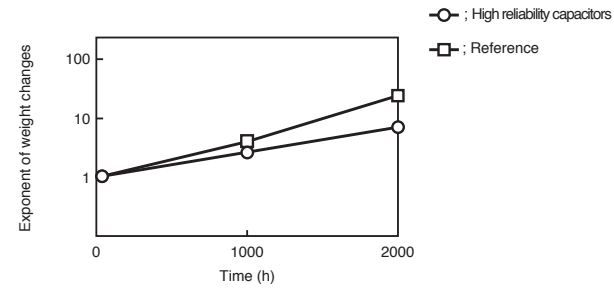


Fig. 3-3

5-4 Long-time stability of electrolyte

The electrolyte used in the High reliability capacitor is stable with low initial resistivity and small secular changes at a high temperature. Fig. 3-4 shows change in resistivity at 105°C.

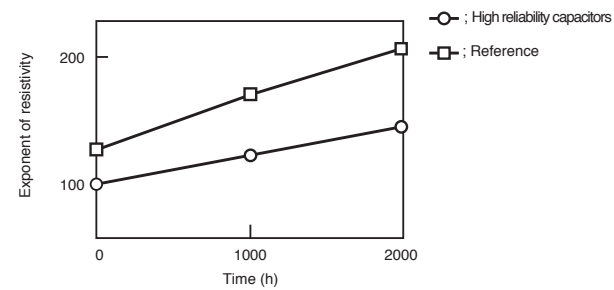


Fig. 3-4

5-5 Dielectric formation voltage and leakage current characteristics of anode foil

To increase the operating life by controlling the gas generation inside capacitor because of 1.5 to 2 times the rated voltage, while that of the previous capacitor is about 1.3 times the rated voltage.

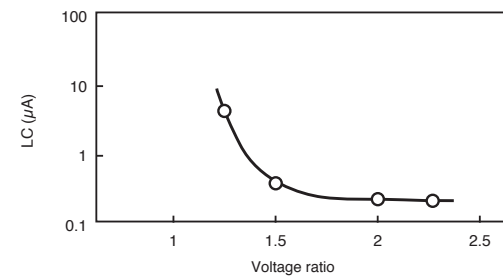


Fig. 3-5

5-6 Lowered ESR of Electrode Foil

To reduce the ESR of electrolytic capacitor, we have improved our chemical conversion technology for anode foil to develop lower ESR electrode foil compared to the conventional product as shown in Fig. 3-6

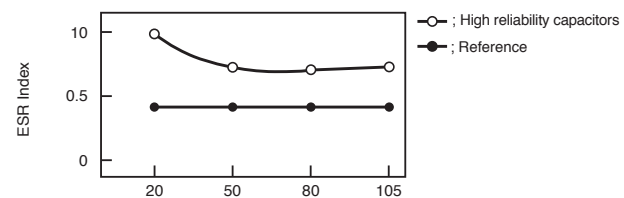


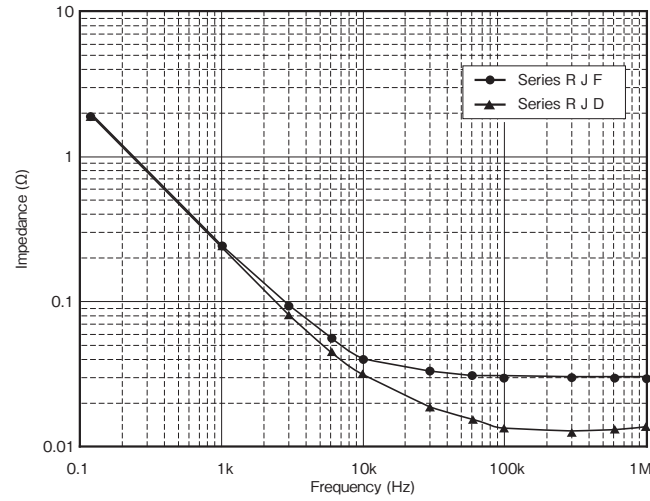
Fig. 3-6 ESR Index of Anode Foil

Aluminum Electrolytic Capacitors for Audio

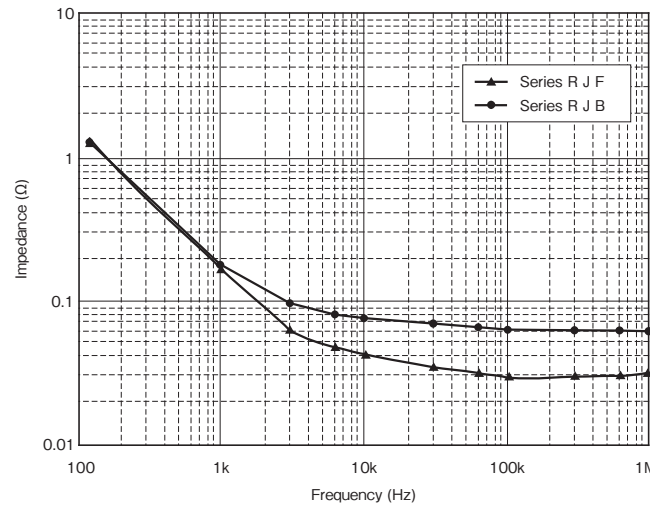
6. Electric Characteristics Data

6-1 Series RJF, RJB, RJD

Frequency characteristics at 20°C

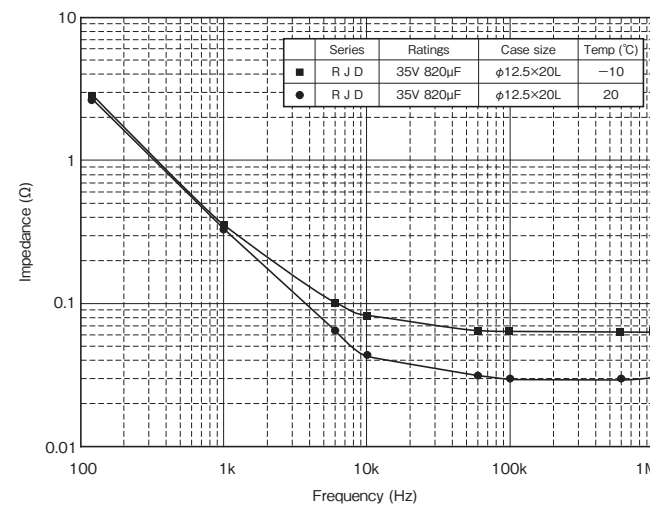


Performanse	Series	R J F	R J D
Rated Voltage		35V	35V
Capacitance		680 μ F	680 μ F
Size ($\phi \times L$)		12.5 \times 20	12.5 \times 20
Impedance Spec. (20°C, 100kHz)		0.017 Ω	0.038 Ω



Performanse	Series	R J F	R J B
Rated Voltage		10V	10V
Capacitance		1000 μ F	1000 μ F
Size ($\phi \times L$)		10 \times 16	10 \times 16
Impedance Spec. (20°C, 100kHz)		0.038 Ω	0.080 Ω

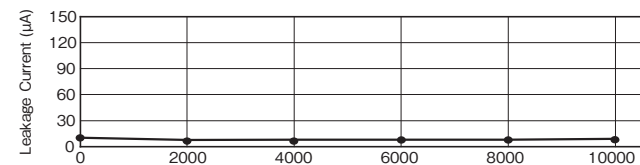
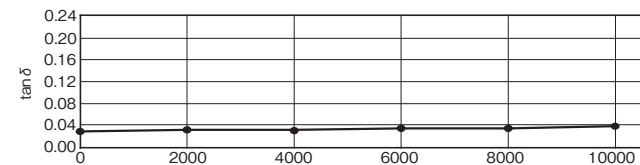
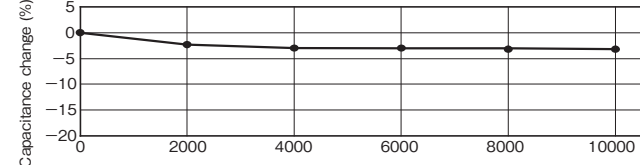
Frequency characteristics at 20°C, -10°C



Endurance (Applied ripple current) at 105°C

Series R J D

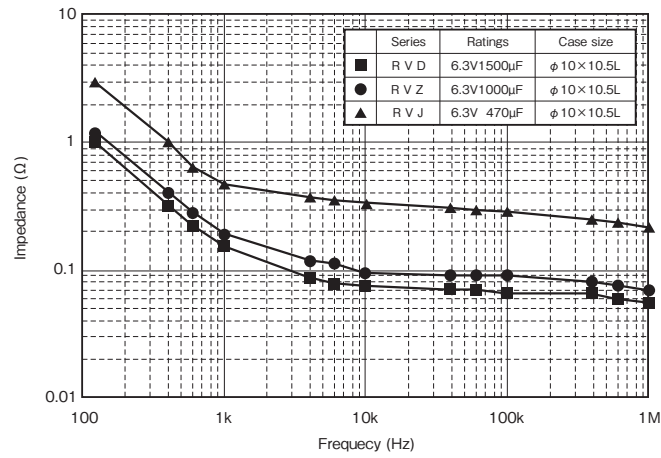
ϕ 12.5 \times 20L 35V820 μ F 1700mA_{rms} / 100kHz n=10



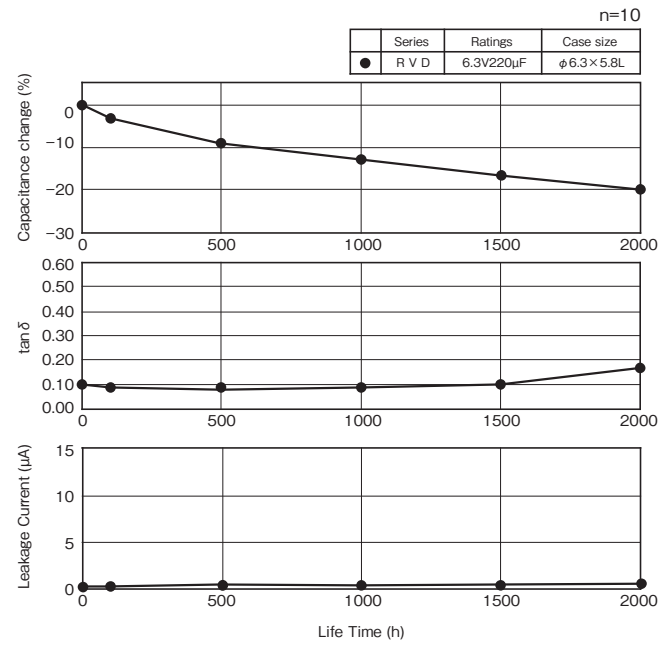
Notice : The mesurment values are not guaranteed values, but measurements.

6-2 Series RVD

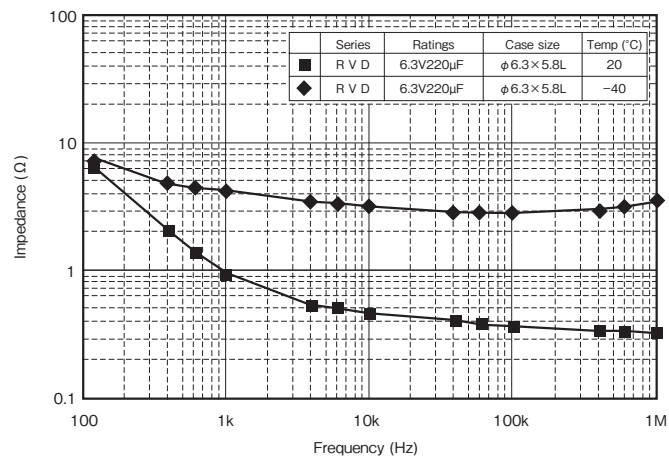
Frequency characteristics at 20°C



Endurance (Applied ripple current) at 105°C

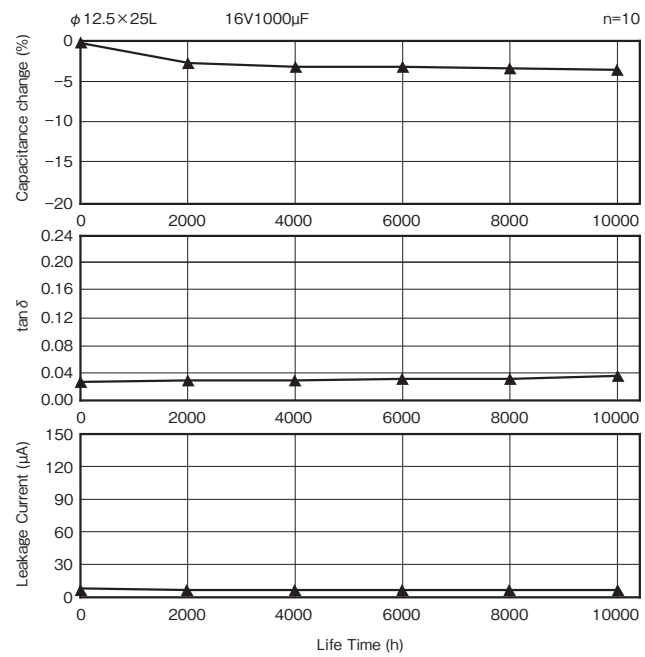


Frequency characteristics at 20°C, -40°C

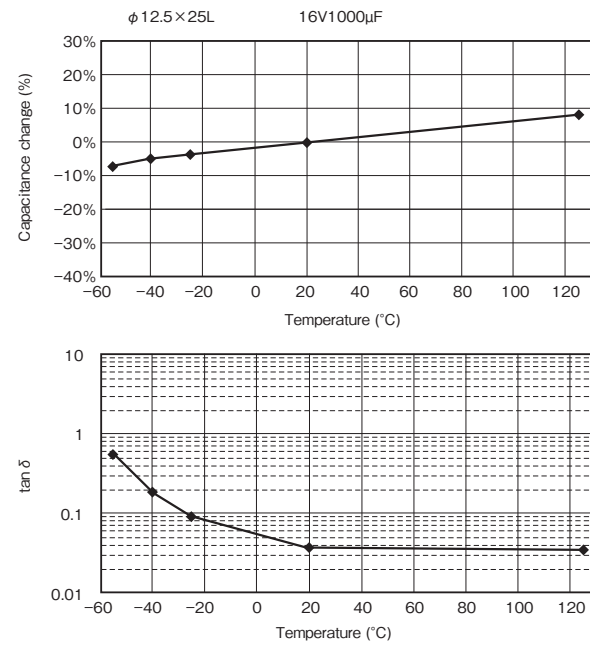


6-3 Series RKD

Endurance (Applied ripple current) at 125°C



Temperature Characteristics

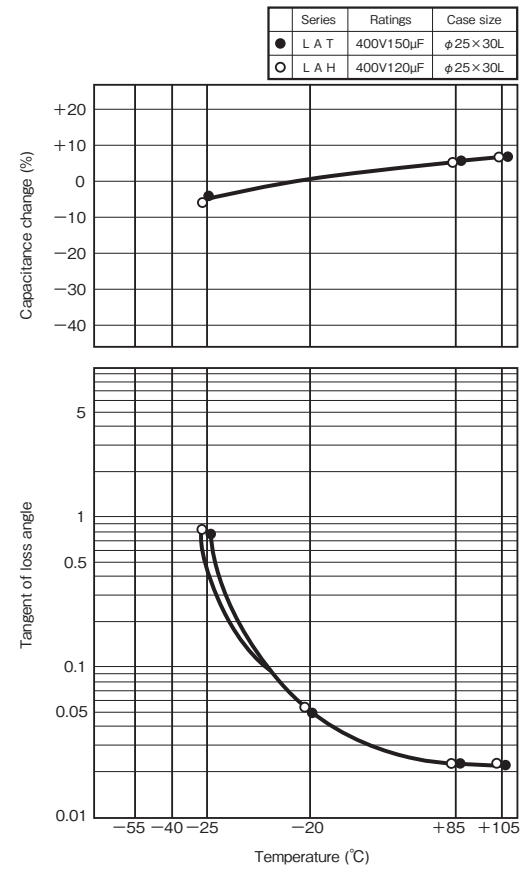
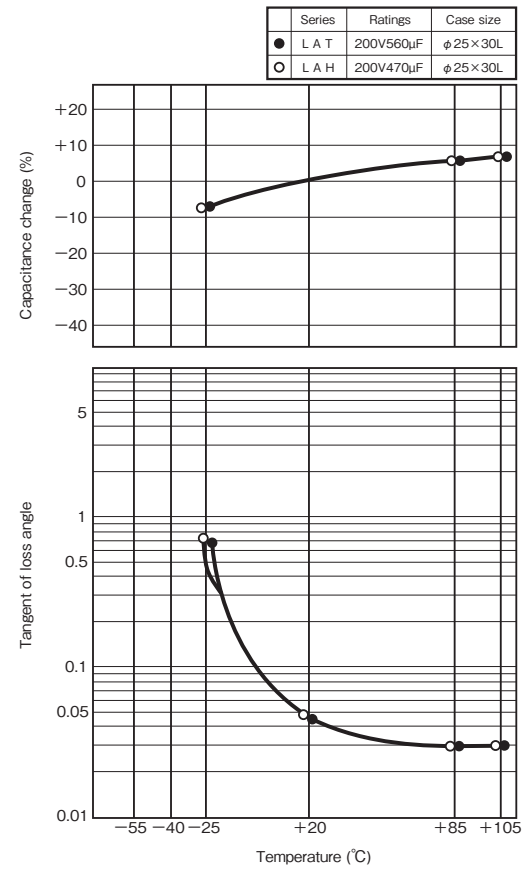


Notice : The measurement values are not guaranteed values, but measurements.

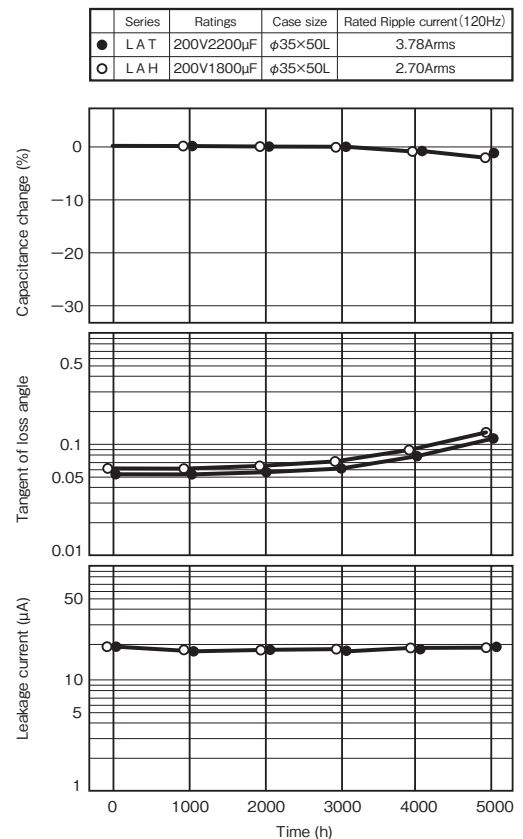
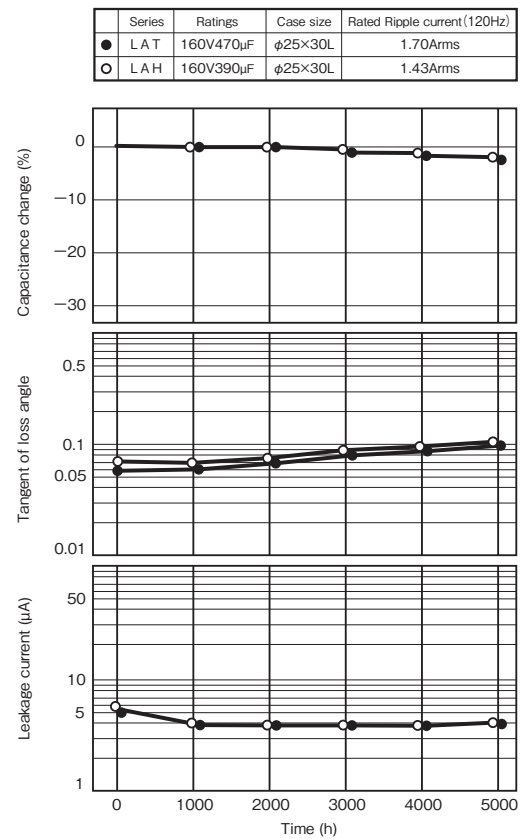
Aluminum Electrolytic Capacitors for Audio

6-4 Series LAT · LAH

Temperature characteristics, Series LAT · LAH



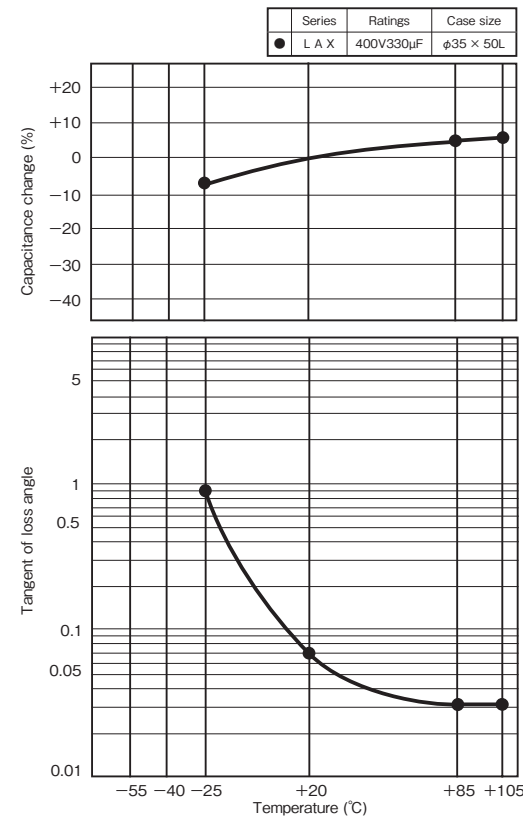
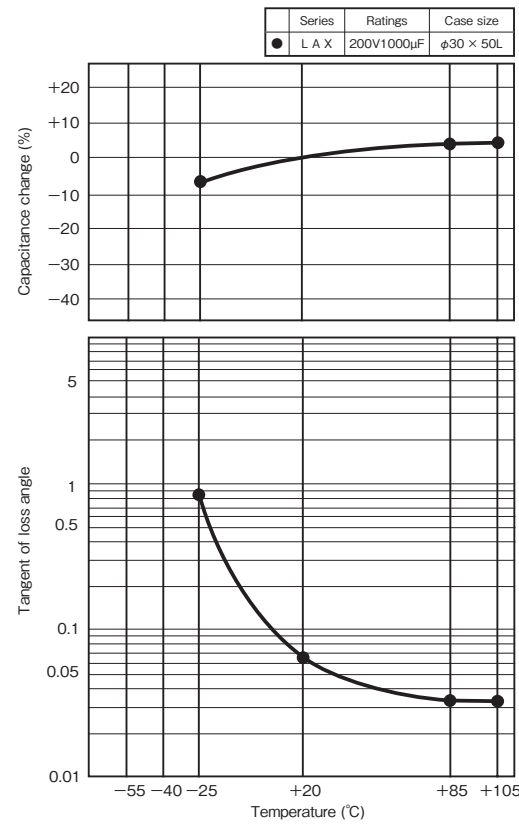
Endurance (Applied ripple current) at 105 $^{\circ}$ C of Series LAT · LAH



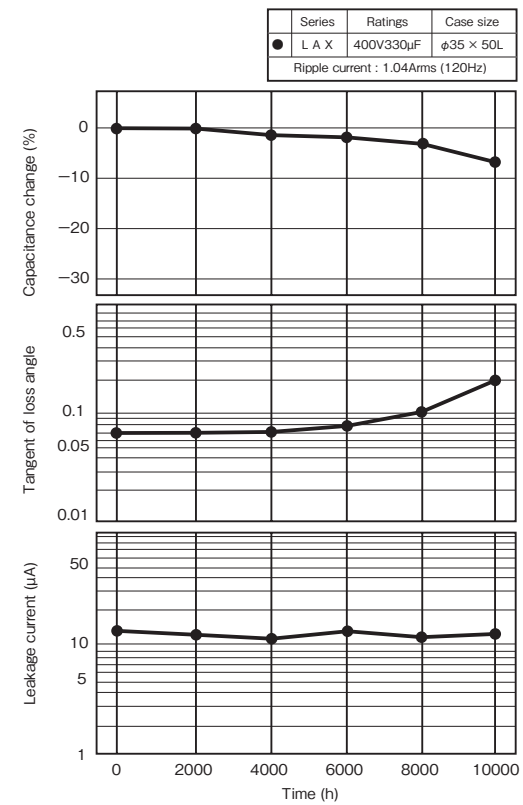
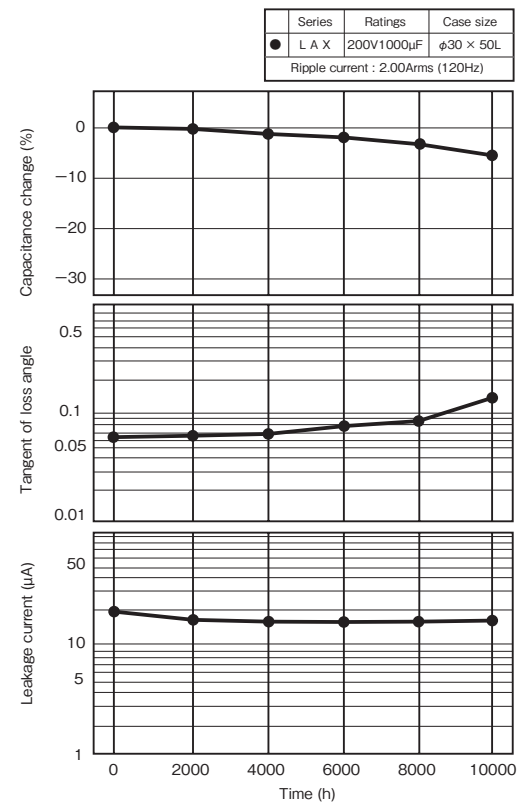
Notice : The mesurment values are not guaranteed values, but measurements.

6-5 Series LAX

Temperature characteristics, Series LAX



Endurance (Applied ripple current) at 105°C of Series LAX



Notice : The mesurment values are not guaranteed values, but measurements.

Aluminum Electrolytic Capacitors
for Audio

MEMO

ELNA[®]

Electric Double Layer Capacitors “DYNACAP”, “POWERCAP”

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2

■ Type List for DYNACAP

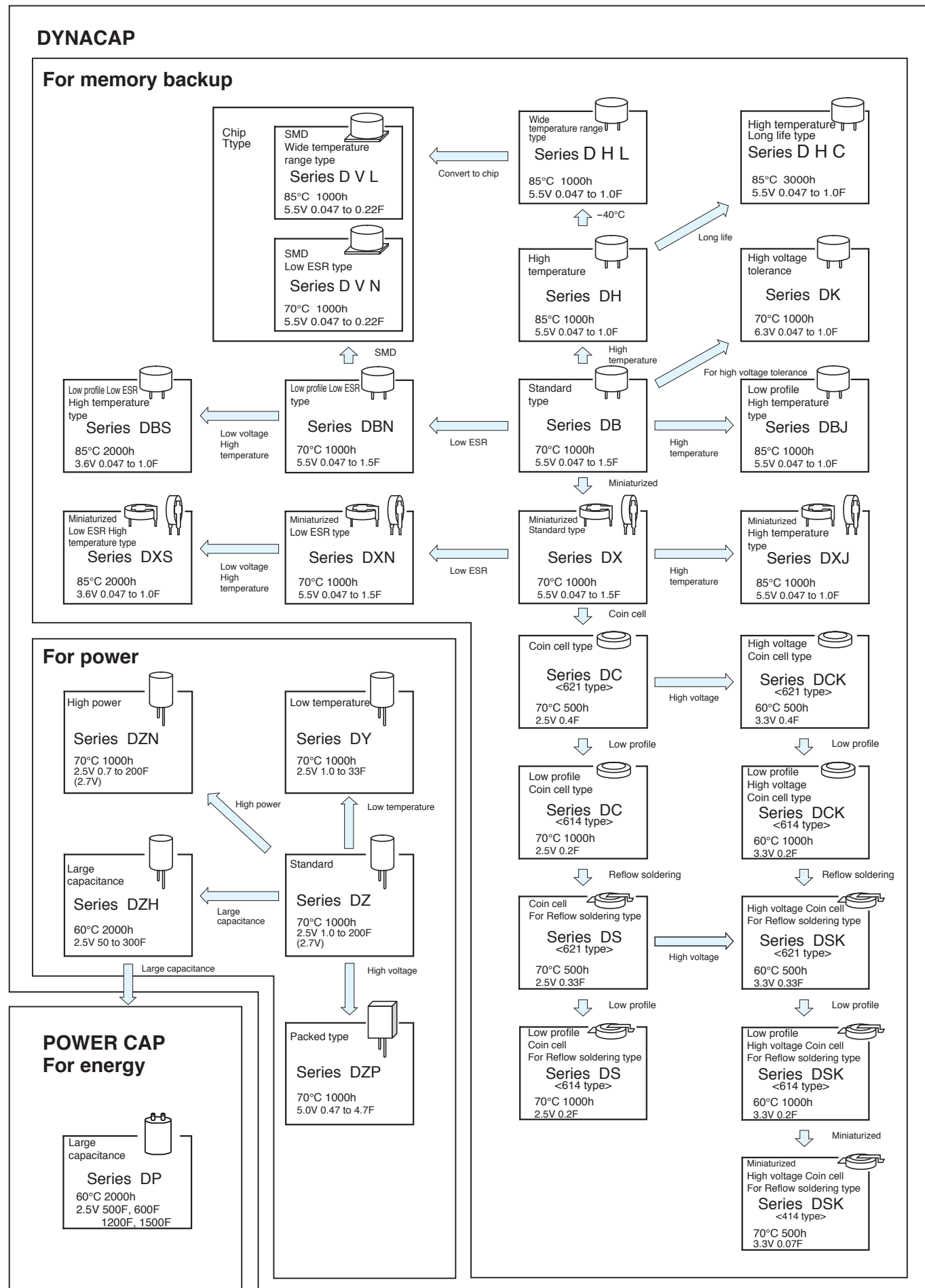
★ : New series
☆ : Upgrade

Category	Series	Category temp. range °C		Max.operating voltage V.DC	Capacitance range F	Color of sleeve	Page	Applications	Remarks	
		Max.	Min.							
For memory backup	Reflow soldering type	DVN	+70	-25	5.5	0.047 ~ 0.22	Brown	186	Ideal for backing up of RTC' s, momentary backup of a battery etc.	★
	Reflow soldering type	DVL	+85	-40	5.5	0.047 ~ 0.22	Brown	187		★
	Standard type	DB	+70	-25	5.5	0.047 ~ 1.5	Indigo	188	Ideal for backing up of CMOS IC' s, microcomputers, RAM' s, RTC' s and the like used in VIDEO' s, tuners, TV sets, telephone sets, DVD and others.	☆
	Low profile Low ESR type	DBN	+70	-25	5.5	0.047 ~ 1.0	Indigo	188		☆
	Low profile High temperature type	DBJ	+85	-10	5.5	0.047 ~ 1.0	Black	189		☆
	Low profile Low ESR High temperature type	DBS	+85	-25	3.6	0.047 ~ 1.0	Black	190		☆
	Miniaturized Standard type	DX	+70	-25	5.5	0.047 ~ 1.5	Indigo	191		☆
	Miniaturized Low ESR type	DXN	+70	-25	5.5	0.047 ~ 1.5	Indigo	192	Ideal for backing up of CMOS IC' s, microcom-puters, RAM' s, RTC' s and the like used in VIDEO' s, tuners, TV sets, telephone sets, DVD,pager units, cameras, personal wireless items and others.	☆
	Miniaturized High temperature type	DXJ	+85	-10	5.5	0.047 ~ 1.0	Black	193		☆
	Miniaturized Low ESR High temperature type	DXS	+85	-25	3.6	0.047 ~ 1.0	Black	194		☆
	High voltage tolerance type	DK	+70	-25	6.3	0.047 ~ 1.0	Indigo	195	Ideal for backing up of Li -batterybacked equipment such as cameras, VIDEO' s and telephone	
	High temperature type	DH	+85	-25	5.5	0.047 ~ 1.0	Indigo	196	Ideal for backing up of controls, electronic rice cooking jars, home bakeries and others.	
	Wide temperature range type	DHL	+85	-40	5.5	0.047 ~ 1.0	Indigo	197	Ideal for backing up of CMOS IC' s, microcomputers, RAM' s, RTC' s for smart meter, outdoor equipment, auto motive and industrial.	★
	High temperature long life type	DHC	+85	-25	5.5	0.047 ~ 1.0	Black	198		★
	Coin type	DC (614)	+70	-25	2.5	0.2	silver	199	Ideal for backing up of pager, solar watches, solar calculators, solar remote control units, camaras and the like.	
DCK (614)		+60	-10	3.3	0.2					
DC (621)		+70	-25	2.5	0.4					
DCK (621)		+60	-10	3.3	0.4					
Reflow soldering Coin type	DSK (414)	+70	-10	3.3	0.07	silver	200	Mountable on board with best suited for mainly memory and time functions as well as memory backup for PDA and DSC.		
	DS (614)	+70	-25	2.5	0.2					
	DSK (614)	+60	-10	3.3	0.2				201	
	DS (621)	+70	-25	2.5	0.33					
	DSK (621)	+60	-10	3.3	0.33					
For power	Standard type	DZ	+70	-25	2.5	1.0 ~ 200	Black	202	Ideal for power supplies of LED displays, personal wireless items, backup for power supplies, and the storage battery of solar battery.	☆
	Large capacitance type	DZH	+60	-25	2.5	50 ~ 300	Black	203		☆
	High power type	DZN	+70	-25	2.5 / 2.7	0.7 ~ 200	Blue	204 205	Ideal for actuator of moters and electromagnetic coil drives.	☆
	Low temperature type	DY	+70	-40	2.5	1.0 ~ 33	Brown	206	Ideal for power supplies of LED displays, personal wireless items, backup for power supplies, and the storage battery of solar battery.	★
	Packed type	DZP	+70	-25	5.0	0.47 ~ 4.7	Black	207		★

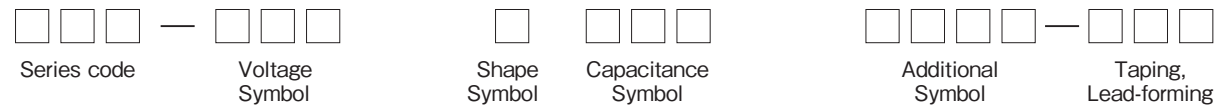
■ Type List for POWERCAP

Category	Series	Category temp. range °C		Max.operating voltage V.DC	Capacitance range F	Color of sleeve	Page	Applications	Remarks
		Max.	Min.						
For energy	Large capacitance type	DP	+60	-25	2.5	500,600 1200,1500	Black	208	Ideal for power supplies of LED displays, backup for power supplies, the storage battery of solar battery, and actuator of moters and electromagnetic coil drives.

Systematized Classification of Electric Double Layer Capacitors



■ Product Symbol System for Electric Double Layer Capacitors



Refer to the examples on the page describing a particular series.

Leave the boxes blank when no particular designation is made.

Max.operating voltage (V)	Voltage symbol
2.5	2R5
2.7	2R7
3.3	3R3
3.6	3R6
5.5	5R5
6.3	6R3

Capacitance (F)	Capacitance symbol
0.047	473
0.1	104
0.2	204
0.22	224
0.33	334
0.47	474
0.4	404
0.68	684
1	105
1.5	155
3.3	335
4.7	475
10	106
20	206
50	506
100	107
200	207
1200	128

Write down one of the forming symbols for taping and lead-forming capacitors.

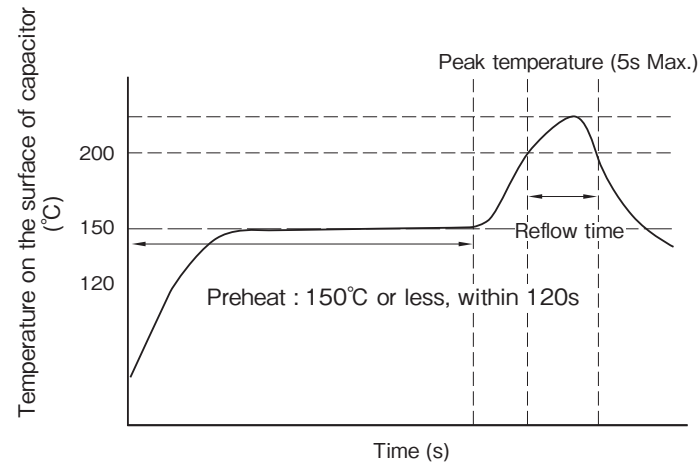
When taping or lead-forming is not necessary, leave the boxes blank.

■ Recommended soldering method (series DS, DSK, DVN, DVL)

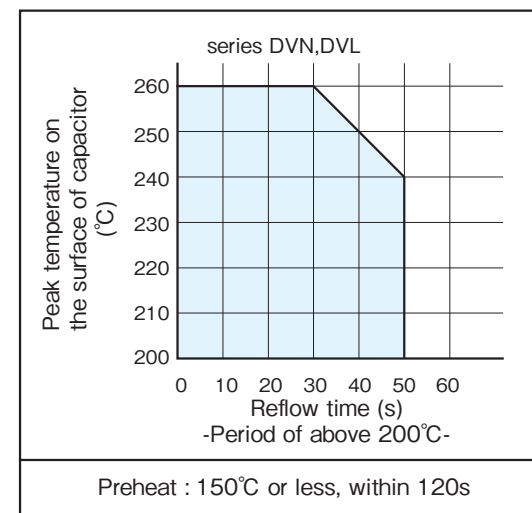
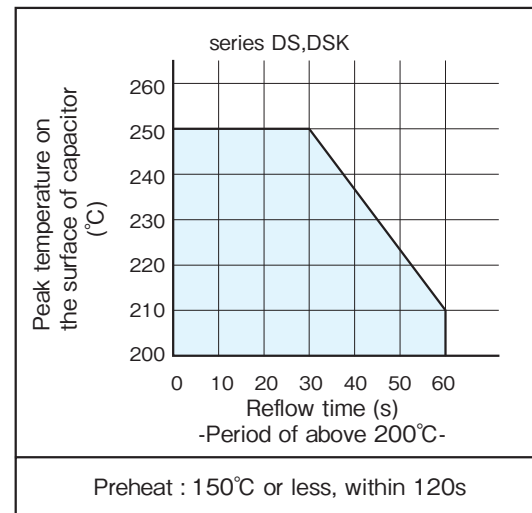
Method	Reflow soldering	Soldering iron	Flow soldering
Advisability	○	○	×

Reflow soldering conditions.

Profile



Peak temp. matrix



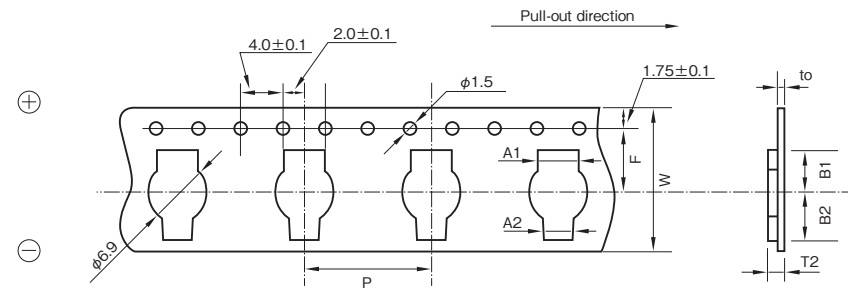
Attention : Carry out soldering work at low temperature and in the shortest time within above conditions.

Do NOT reflow solder, when cell voltage is above 0.3V.

*Please consult with us about reflow soldering conditions other than the above.

■ Taping

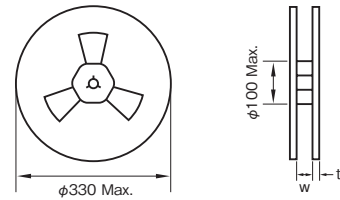
■ Carrier tape dimensions (Series DS, DSK) polarity L



(Unit : mm)

Outside size	W	P	F	A1	A2	B1	B2	T2	to	φD
φ6.8×1.4 to 2.1L	24±0.2	12.0	11.5	4.4	3.4	5.9	6.5	3.2	0.3	6.9
φ4.8×1.4L (Terminal shaped : HL)	16±0.2	8.0	7.5	2.4	3.6	5.0	5.1	2.45	0.3	4.9
φ4.8×1.4L (Terminal shaped : HR)	↑	↑	↑	3.6	2.4	5.1	5.0	↑	↑	↑

■ Reel dimensions



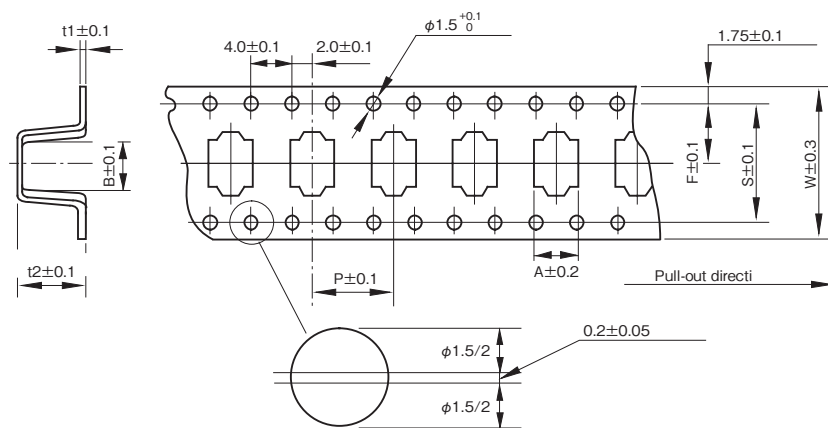
(Unit : mm)

Outside size	W	t
φ6.8×1.4 to 2.1L	26	3
φ4.8×1.4L	18	3

■ Packing quantity

Outside size	Quantity
φ6.8×2.1L	1500PCS.
φ6.8×1.4L	1500PCS. to 2000PCS.
φ4.8×1.4L	2000PCS.

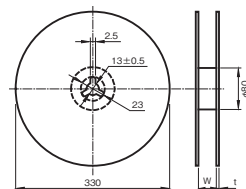
■ Carrier tape dimensions (Series DVN, DVL) polarity R



(Unit : mm)

Outside size	W	A	B	P	t2	F	t1	S
φ12.5×10.5L	32	13.4	13.4	24	11	14.2	0.5	28.4
φ12.5× 8.5L	32	13.4	13.4	24	9.5	14.2	0.5	28.4

■ Reel dimensions



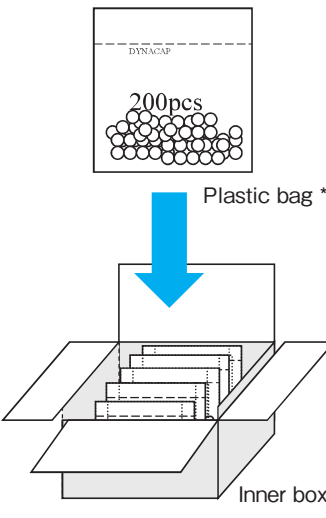
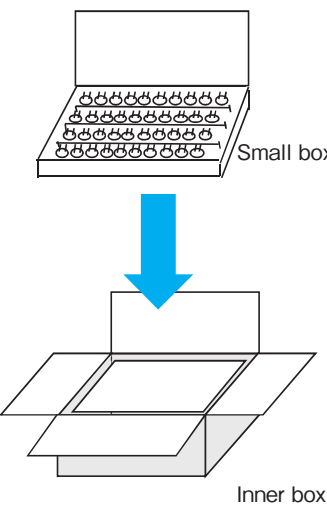
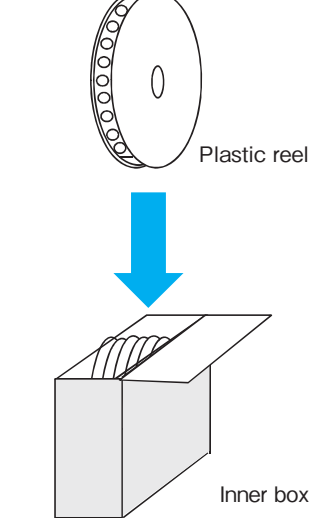
(Unit : mm)

Outside size	W	t
φ12.5×10.5L	34	3
φ12.5× 8.5L	34	3

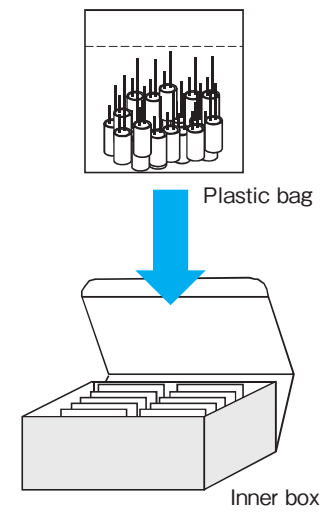
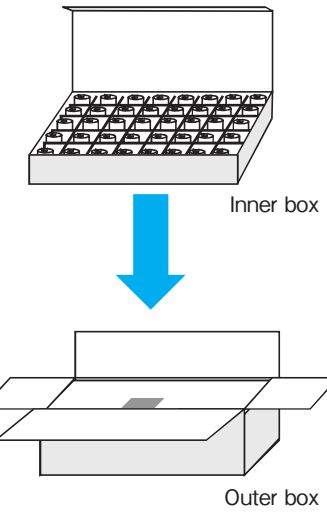
■ Packing quantity

Outside size	Quantity
φ12.5×10.5L	250pcs.
φ12.5× 8.5L	300pcs.

■ Standard packing specification of Coin cell type

Series	<ul style="list-style-type: none"> • DC, DCK (614, 621) • DX, DXJ, DXN, DXS • DB, DBN, DBJ, DBS, DK, DH, DHL, DHC (φ13.5) 	<ul style="list-style-type: none"> • DB, DBN, DBJ, DBS, DK • DH, DHL, DHC (φ21.5) 	<ul style="list-style-type: none"> • DSK (414, 614, 621) • DVN, DVL
Packing style	 <p>200 pcs Plastic bag * Inner box</p> <p>* DC, DCK : Vacuum packing</p>	 <p>Small box Inner box</p>	 <p>Plastic reel Inner box</p>

■ Standard packing specification of large type

Series	<ul style="list-style-type: none"> • DY, DZ, DZN, DZH (φ6.3 to φ18) • DZP 	<ul style="list-style-type: none"> • DY, DZ, DZN, DZH, DP (φ22 or more)
Packing style	 <p>Plastic bag Inner box</p>	 <p>Inner box Outer box</p>

Please inquire for details.

Cautions for Using Electric Double Layer Capacitor (DYNACAP , POWERCAP)

■ Usage

1. Electric double layer capacitors (EDLC) use a conductive organic electrolyte.

The use at excessive mounting temperature or exceeding the upper category temperature can cause the electrolyte to leak. Especially, coin and multilayer coin types for the memory backup excluding the DZ, DZH, DZN and DP series use a low elastic plastic as the sealant in the cell construction like coin batteries; therefore, avoid using such capacitors in the vicinity of automotive equipment with steep temperature change, and heating element such as motor, relay, transformer, power IC, etc. because of the risk of leakage of electrolyte.

2. Since EDLC is polarized, do not apply a reversed voltage.

EDLC is polarized. If a reversed voltage is applied for a long time, the leakage current will increase abruptly, which may cause a decrease in the capacity, an increase in the internal resistance, and causing leakage or damage to the product in some cases.

3. Do not apply any voltage higher than the operating maximum voltage (this means the surge voltage in the case of short-time charge).

If an overvoltage is applied to the product, the leakage current will increase abruptly and the product will become overheated, which may cause a decrease in the capacity, an increase in the internal resistance, and causing leakage or damage to the product in some cases.

4. Do not use smoothing a power supply (for absorbing its ripple).

Since the internal resistance of EDLC is high, the product will be overheated if it is used for smoothing a power supply (for absorbing its ripple), which may cause a decrease in the capacity, an increase in the internal resistance, and causing leakage or damage to the product in some cases.

5. Do not use in a circuit where quick charge and discharge are repeated Very often.

In a circuit where quick charge and discharge are repeated very often, the product will become overheated, which may cause a decrease in the capacity, an increase in the internal resistance, and causing leakage or damage to the product in some cases.

Reduce the charge and discharge currents while selecting a product with low internal resistance, and make sure that the product surface temperature does not rise.

6. EDLC life depends heavily on the ambient temperature.

① The lifetime of EDLC is seriously affected by change in ambient temperature. If the temperature is lowered by 10°C, the lifetime will be approximately doubled. Therefore, the product should be used at a temperature lower than the guaranteed maximum value for maximum life.

② If the capacitor is used at a temperature exceeding its maximum guaranteed temperature, not only is its life shortened, but increased vapor

pressure of electrolyte or electrochemical reactions may increase the internal pressure, and causing leakage or damage to the product in some cases.

7. Note that a voltage drop in EDLC occurs during backup.

In a case where discharge current is large, or a large current flows instantaneously, an electric double layer capacitor may not operate at the start of discharge because of a large voltage drop (IR drop) caused by the product with the DC internal resistance.

Please consult us for a large discharge current (in the case of other series except DZ, DZH, DZN and DP series: when larger than $1 \text{ (mA)} = 100 \text{ (F)}$) as the internal resistance varies by each series (Recommendation discharge current: less than 1 mA/F at 20°C)

8. Do not use the product in an ambient atmosphere containing waterdrops (condensation) or toxic gases.

Although EDLC is sealed, water droplets or toxic gases may do degradation characteristics, a leakage and corrode the lead wires and the case, which may cause a breaking of the wires.

Avoid abrupt temperature changes, which may cause water droplets, resulting in product deterioration and electrolyte leakage.

9. Contact us before connecting the products in series.

A series connection will cause imbalance in the voltage, charged to the capacitors and an overvoltage may be charged to one or more them. This may cause a decrease in the capacity, an increase in the internal resistance and causing leakage or damage to the product in some cases. When using series connection for several capacitors, please derate the applied voltage from the operating maximum voltage or use balancing circuits (bleeder resistor, etc.) to compensate for the imbalance in the applied voltage for each capacitor. Moreover, please ensure the arrangement does not cause temperature fluctuation between capacitors.

10. About vibration.

A terminal blank, a terminal bend, and a crease may occur by adding too much vibration to a capacitor.

Moreover, depending on the case, an EDLC may do degradation of the characteristic, breakage, and a leakage.

When you become too much vibration, please contact us.

11. When used on a double sided printed circuit board, do not overlap the wiring patterns on the mounted part.

A short circuit may be created by certain wiring conditions. Should the electrolyte leaks, the circuit pattern may cause a short circuit, resulting in tracking or migration.

12. Do not keep in high temperature and high humidity atmospheres.

① Avoid high temperature or high humidity or direct rays when storing capacitors.

②Keep the product in a place where the temperature is 5°C~30°C and the humidity is lower than 60%. Avoid an abrupt temperature change, which may cause condensation or deterioration of the product or liquid leakage.

③Do not store EDLC at a place where there is a possibility that they may get water, salt or oil spill.

④Do not store EDLC at place where the air contains dense hazardous gas (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine ammonia, etc.).

⑤Do not store EDLC at a place where it gets ultraviolet ray or radioactive ray.

13. Capacitors fitted with a relief valve

①The relief valve is provided with a valve function with part of the case made thin to avoid explosion by increased internal pressure when the capacitor is under abnormal load such as overvoltage or reverse voltage. After activation of the relief valve, the capacitor must be replaced as it does not restore.

②For the capacitors with a case relief valve, provide a void on the top of the relief valve so as not to hamper its activation. Make a void of 2 mm or more for the product of $\phi 18$ or less in diameter, and a void of 3 mm or more for the product of $\phi 20$ to $\phi 35$ mm in diameter on the top.

14. Use at a high altitude

The use of capacitors at high altitudes such as on an airplane causes a large difference between the internal pressure of the capacitors and the atmospheric pressure.

However, there is no problem in use under atmospheric pressure up to about an altitude of 10,000 meters.

If the condition is severe like space, please contact us.

■ Mounting

1. Do not overheat when soldered.

Depending on the type and size of the board, the product may be subjected to overheat, leading to loss of airtightness. This may greatly shorten the product life or cause liquid leakage.

In case of a 1.6mm-thick and single side printed board, for example, keep the following soldering conditions: temperature lower than 260°C, time shorter than 5 seconds.

When a board thinner than 1.6 mm or multi-layer printed board is used, contact us.

In the case of hand soldering, the iron tip temperature is lower than 360°C, time is shorter than 3 seconds.

The coin types and multilayer coin types excluding the DZ and reflow-compatible coin types use polypropylene as the packing material for sealing and therefore susceptible to excessive heat. Note that the component body temperature shall be controlled so as not to exceed 90°C including preheating.

2. When soldering the capacitor to the wiring board, do not attach the body of the capacitor to the circuit board.

If the body of the capacitor is attached directly to the circuit board, the flux or solder can blow through the through holes in the circuit board, negatively impacting the capacitor.

Moreover, the heat influence at the time of soldering can be reduced by floating the body.

3. Contact us when cleaning is necessary after soldering.

Certain types of solvents are not compatible and may cause damage.

4. Contact us when the product is attached by adhesive bonding.

Certain types of adhesives are not compatible. Paste bond partially between the product and the board so that the product will not adhere completely to the board.

Do not raise the temperature over the guaranteed value while the bond is hardening.

5. Heating conditions of adhesive curing oven

During heating of the adhesive curing oven, application of excessive heat may significantly shorten the product life or cause liquid leakage. Control the body temperature so as not to exceed 90°C during work while setting the allowable atmospheric temperature below 110°C, and allowable heating time within 30 seconds.

For the heating conditions deviating from the above, consult with us providing your temperature profile conditions.

6. Be careful not to apply an excessive force to the capacitor body, terminals or lead wires.

①Mount the capacitor while making sure that the terminal spacing of the capacitor and the spacing of the holes in the printed wiring board are aligned.

②If the capacitor body is subjected to stress such as grabbing, falling, bend, pushing or twisting after mounted, its terminals may come off, leading to open, short or liquid leakage.

■ Other cautions

1. Emergency procedures

If the EDLC overheats or starts to smell, immediately switch off the units main power supply to stop operation.

Keep your face and hands away from the EDLC, since the temperature may be high enough to cause the EDLC to ignite and burn.

2. Periodical inspections should be established for the EDLC used in industrial appliances.

The following items should be checked:

①Appearance : Check if there is leakage.

②Electronic performance : Check the leakage current, the electrostatic, the internal resistance and other items described in the catalog or the product specifications.

3. Disposing of EDLC.

①Punch a hole or crush the EDLC (to prevent explosion) before incineration at approved facility.

②If they are not to be incinerated, bring them to a professional industrial waste disposal company.

4. Other notes.

Please refer to the following literature for anything not described in the product specifications or the catalog. (Technical Report of Japan Electronics and Information Technology Industries Association #EIAJ RCR-2370B "Guideline of notabilia for fixed electric double layer capacitors")

NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

5.5V SMD, Low Resistance

GREEN CAP 70°C

- Size : $\phi 12.5 \times 8.5$ mm, compatible with surface mounting and low ESR.
- Unlike batteries, safe and high reliability without containing active and hazardous substance.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reactions.
- Responds to temperature 260°C during the reflow peak.



Marking color : White print on a brown sleeve

Convert to chip

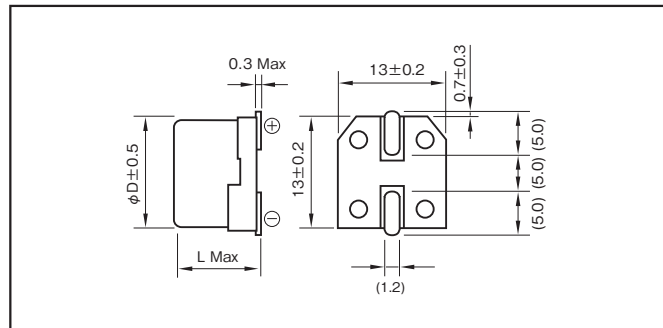


Specifications

Item	Performance	
Category temperature range (°C)	- 25 to +70	
Tolerance at rated capacitance (%)	- 20 to +80	
Internal resistance at 1 kHz	Rated Capacitance (F)	0.047 0.1 0.22
	Internal resistance (Ω)	30 30 30
Characteristics at high and low temperature	Percentage of capacitance change	Within $\pm 30\%$ of the value at 20°C
	Internal resistance	Less than five times of the value at 20°C
Endurance (70°C)	Test time	1000 hours
	Percentage of capacitance change	Within $\pm 30\%$ of the initial measured value
	Internal resistance	Less than four times of the initial specified value
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.	
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)	

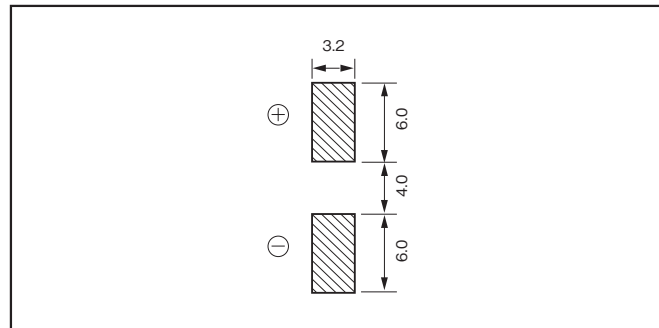
Outline Drawing

Unit : mm



Recommended land pattern size

Unit : mm



Part numbering system (example : 5.5V0.1F)

DVN	5R5	—	D	104	T	—	R5
Series code	Rated voltage symbol		Terminal code	Rated capacitance symbol			Taping symbol

Part number is refer to below table.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	$\phi D \times L$ (mm)
5.5	0.047	DVN-5R5D473T-R5	12.5×8.5
5.5	0.1	DVN-5R5D104T-R5	12.5×8.5
5.5	0.22	DVN-5R5D224T-R5	12.5×8.5

*soldering conditions are described on page 181.

5.5V SMD, Wide Temperature range

GREEN CAP 85°C



Marking color : White print on an brown sleeve

- Size : $\phi 12.5 \times 10.5$ mm, compatible with surface mounting.
- Wide temperature range (-40 to 85°C), Low ESR.
- Unlike batteries, safe and high reliability without containing active and hazardous substance.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reactions.
- Responds to temperature 260°C during the reflow peak.

Convert to chip

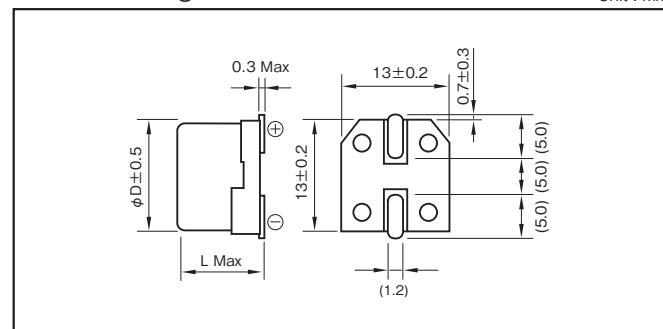


Specifications

Item	Performance
Category temperature range (°C)	- 40 to +85
Tolerance at rated capacitance (%)	- 20 to +80
Internal resistance at 1 kHz	Rated Capacitance (F)
	Internal resistance (Ω)
Characteristics at high and low temperature	Percentage of capacitance change
	Internal resistance
Endurance (85°C)	Test time
	Percentage of capacitance change
	Internal resistance
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)

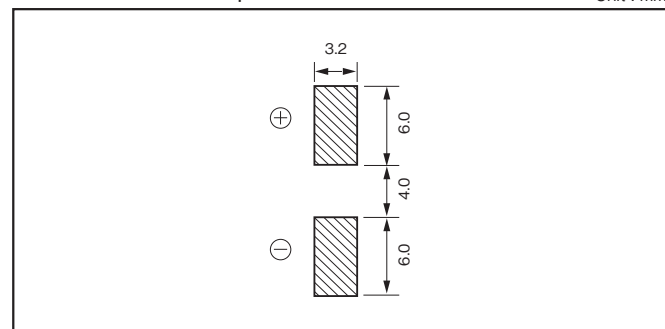
Outline Drawing

Unit : mm



Recommended land pattern size

Unit : mm



Part numbering system (example : 5.5V0.1F)

DVL	5R5	—	D	104	T	—	R5
Series code	Rated voltage symbol		Terminal code	Rated capacitance symbol			Taping symbol

Part number is refer to below table.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	$\phi D \times L$ (mm)
5.5	0.047	DVL-5R5D473T-R5	12.5×10.5
5.5	0.1	DVL-5R5D104T-R5	12.5×10.5
5.5	0.22	DVL-5R5D224T-R5	12.5×10.5

*soldering conditions are described on page 181.

Electric Double Layer Capacitors

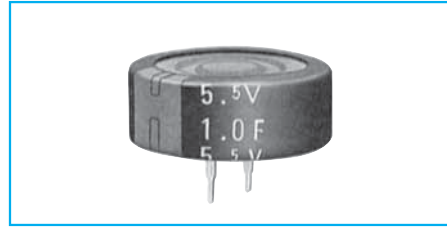
NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

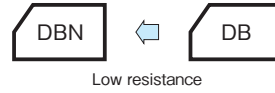
5.5V Standard Capacitors Series DB

GREEN CAP 70°C

- Small-sized, large capacity, excellent voltage holding.
- For all ratings, uniform 5mm pitch of terminal spacing.
- Wider temperature range (-25 to +70°C) than battery.
- ϕ21.5×7.5 l size can encase up to 1.5F.
- Ideal for backing up of CMOS's, IC's, microcomputers, RAM's, RTC's and the like used in Video's, tuners, TV sets, telephone sets and others.



Marking color : White print on an indigo sleeve

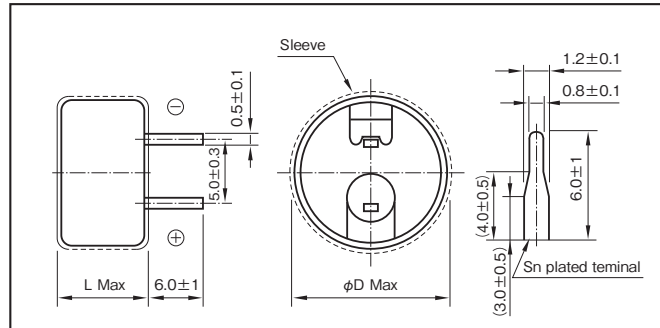


Specifications

Item	Performance								
Category temperature range (°C)	-25 to +70								
Tolerance at rated capacitance (%)	-20 to +80								
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.33	0.47	0.47	1.0	1.5
	Internal resistance (Ω)	120	75	75	75	75 (ϕ13.5)	30 (ϕ21.5)	30	30
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C							
	Internal resistance	Less than five times of the value at 20°C							
Endurance (70°C)	Test time	1000 hours							
	Percentage of capacitance change	Within ±30% of the initial measured value							
	Internal resistance	Within four times of the initial specified value							
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.								
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)								

Outline Drawing

Unit : mm



Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	ϕD×L (mm)
5.5	0.047	DB-5R5D473T	13.5×7.5
5.5	0.1	DB-5R5D104T	13.5×7.5
5.5	0.22	DB-5R5D224T	13.5×7.5
5.5	0.33	DB-5R5D334T	13.5×7.5
5.5	0.47	DB-5R5D474ST	13.5×7.5
5.5	0.47	DB-5R5D474T	21.5×8.0
5.5	1.0	DB-5R5D105T	21.5×8.0
5.5	1.5	DB-5R5D155T	21.5×8.0

Part numbering system (example : 5.5V0.1F)

DB	—	5R5	D	104	□	T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol		Additional symbol

Part number is refer to above table.

5.5V Low Resistance Series DBN

GREEN CAP 70°C

Low ESR

- Internal resistance was reduced to 85% to DB series.
- It excels in rapid charge.(It can charge and discharge with 1.5 times as much current (mA) as rated capacitance.)

Specifications

Item	Performance								
Category temperature range (°C)	-25 to +70								
Tolerance at rated capacitance (%)	-20 to +80								
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.33	0.47	0.47	1.0	1.5
	Internal resistance (Ω)	25	25	25	25	25 (ϕ13.5)	20 (ϕ21.5)	20	20
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C							
	Internal resistance	Less than five times of the value at 20°C							
Endurance (70°C)	Test time	1000 hours							
	Percentage of capacitance change	Within ±30% of the initial measured value							
	Internal resistance	Within four times of the initial specified value							
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.								
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)								

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	ϕD×L (mm)
5.5	0.047	DBN-5R5D473T	13.5×7.5
5.5	0.1	DBN-5R5D104T	13.5×7.5
5.5	0.22	DBN-5R5D224T	13.5×7.5
5.5	0.33	DBN-5R5D334T	13.5×7.5
5.5	0.47	DBN-5R5D474ST	13.5×7.5
5.5	0.47	DBN-5R5D474T	21.5×8.0
5.5	1.0	DBN-5R5D105T	21.5×8.0
5.5	1.5	DBN-5R5D155T	21.5×8.0

Part numbering system (example : 5.5V0.047F)

DBN	—	5R5	D	473	□	T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol		Additional symbol

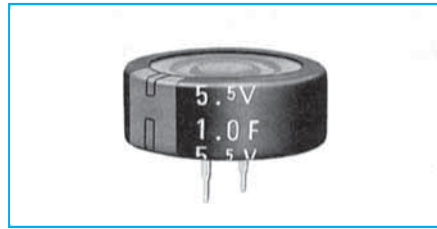
Part number is refer to left table.

NOTE

Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

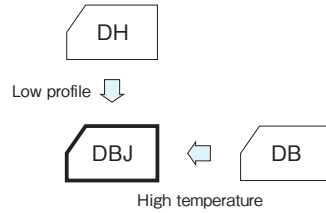
5.5V Low profile and high temperature Capacitors

GREEN CAP 85°C



Marking color : White print on a black sleeve

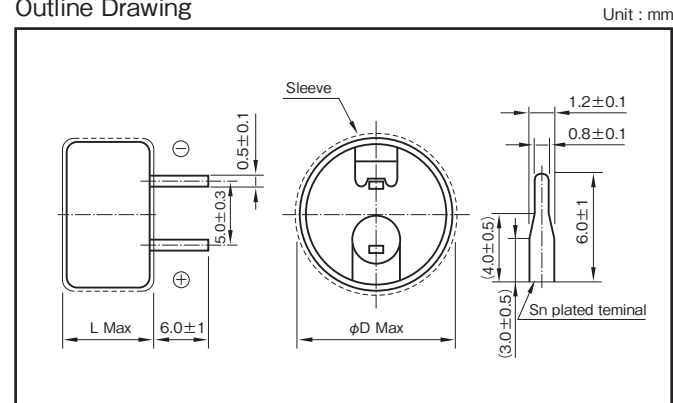
- High temperature type of series DB.
- Small-sized, large capacity, excellent voltage holding.
- For all ratings, uniform 5mm pitch of terminal spacing.
- $\phi 13.5 \times 7.5$ e size can encase up to 1F.
- Ideal for backing up of CMOS's, IC's, microcomputers, RAM's, RTC's and the like used in Video's, tuners, TV sets, telephone sets and others.



Specifications

Item	Performance
Category temperature range (°C)	-10 to +85
Tolerance at rated capacitance (%)	-20 to +80
Internal resistance at 1 kHz	Rated Capacitance (F)
	Internal resistance (Ω)
Characteristics at high and low temperature	Percentage of capacitance change
	Internal resistance
Endurance (85°C)	Test time
	Percentage of capacitance change
	Internal resistance
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)

Outline Drawing



Part numbering system (example : 5.5V0.1F)

DBJ	—	5R5	D	104	T
Series code		Max.operating voltage symbol		Rated capacitance symbol	

Part number is refer to below table.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	$\phi D \times L$ (mm)
5.5	0.047	DBJ-5R5D473T	13.5×7.5
5.5	0.1	DBJ-5R5D104T	13.5×7.5
5.5	0.22	DBJ-5R5D224T	13.5×7.5
5.5	0.33	DBJ-5R5D334T	13.5×7.5
5.5	0.47	DBJ-5R5D474T	21.5×8.0
5.5	1.0	DBJ-5R5D105T	21.5×8.0

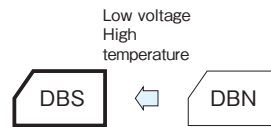
3.6V Low Profile and Low ESR High temperature

GREEN CAP 85°C

- Long life of 3.6V 2000 hours in small size low ESR.
- For all ratings, uniform 5mm pitch of terminal spacing.
- Wider temperature range (−25 to +85°C) than battery.
- ϕ13.5×7.5 ℓ size can encase up to 0.47F.
- Ideal for backing up of CMOS' s, IC' s, microcomputers, RAM' s, RTC' s and the like used in Video' s, tuners, TV sets, telephone sets and others.
- It excels in rapid charge.



Marking color : White print on a black sleeve

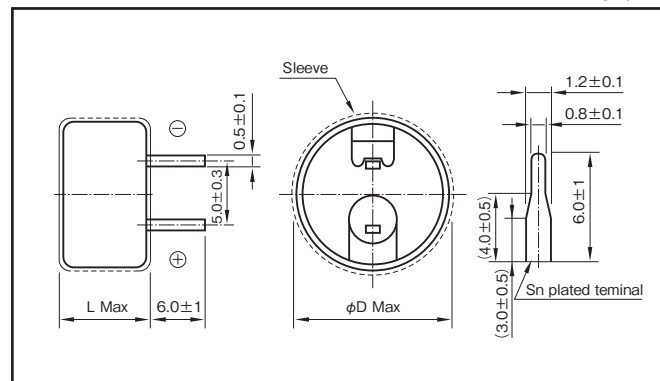


Specifications

Item	Performance
Category temperature range (°C)	−25 to +85
Tolerance at rated capacitance (%)	−20 to +80
Internal resistance at 1 kHz	Rated Capacitance (F)
	Internal resistance (Ω)
Characteristics at high and low temperature	Percentage of capacitance change
	Internal resistance
Endurance (85°C)	Test time
	Percentage of capacitance change
	Internal resistance
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)

Outline Drawing

Unit : mm



Part numbering system (example : 3.6V0.1F)				
DBS	—	3R6	D	104
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol
				Additional symbol

Part number is refer to following table.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	ϕD×L (mm)
3.6	0.047	DBS-3R6D473T	13.5×7.5
3.6	0.1	DBS-3R6D104T	13.5×7.5
3.6	0.22	DBS-3R6D224T	13.5×7.5
3.6	0.33	DBS-3R6D334T	13.5×7.5
3.6	0.47	DBS-3R6D474ST	13.5×7.5
3.6	0.47	DBS-3R6D474T	21.5×8.0
3.6	1.0	DBS-3R6D105T	21.5×8.0

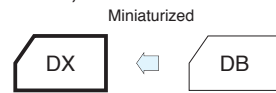
NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

5.5V Miniaturized Standard Capacitors

GREEN CAP 70°C

- Smaller and lighter than Series DB.
- 5mm tall. Max. thin profile (H-shaped).
- Miniaturized but can encase up to 0.47F in 11.5×5mm case, and 1.5F in 19.0×20.5mm case.



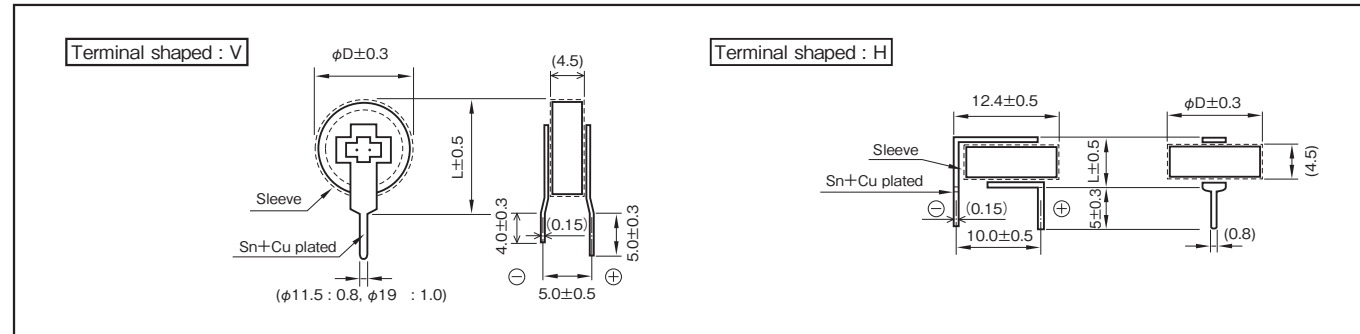
Marking color : White print on an indigo sleeve

Specifications

Item	Performance								
Category temperature range (°C)	-25 to +70								
Tolerance at rated capacitance (%)	-20 to +80								
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.33	0.47	0.47	1.0	1.5
	Internal resistance (Ω)	120	75	75	75	75 (φ11.5)	30 (φ19.0)	30	30
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C							
	Internal resistance	Less than five times of the value at 20°C							
Endurance (70°C)	Test time	1000 hours							
	Percentage of capacitance change	Within ±30% of the initial measured value							
	Internal resistance	Less than four times of the initial specified value							
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.								
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)								

Outline Drawing

Unit : mm



Part numbering system (example : 5.5V0.1F)

DX	5R5	□	104	□	U
Series code	Rated voltage symbol	Terminal code	Rated capacitance symbol	Additional symbol	

Part number is refer to below table.

Note

Do not apply external force to products or terminals as stress such as twisting, bending, pushing, or falling of such products or terminals may remove the terminals, resulting in an open/short circuit or liquid leakage. Avoid applying excessive heat to capacitors during heating of an adhesive curing oven. For details, refer to the precautions in use of DYNACAP.

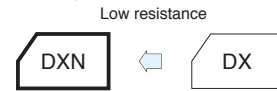
Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
5.5	0.047	DX-5R5V473U	11.5×13.0
		DX-5R5H473U	11.5× 5.0
5.5	0.1	DX-5R5V104U	11.5×13.0
		DX-5R5H104U	11.5× 5.0
5.5	0.22	DX-5R5V224U	11.5×13.0
		DX-5R5H224U	11.5× 5.0
5.5	0.33	DX-5R5V334U	11.5×13.0
		DX-5R5H334U	11.5× 5.0
5.5	0.47	DX-5R5V474SU	11.5×13.0
		DX-5R5H474SU	11.5× 5.0
		DX-5R5V474U	19.0×20.5
5.5	1.0	DX-5R5V105U	19.0×20.5
5.5	1.5	DX-5R5V155U	19.0×20.5

5.5V Miniaturized Low Resistance

GREEN CAP 70°C

- Internal resistance was reduced to 85% to DX series and this size.
- 5mm tall. Max. thin profile (H-shaped).
- Miniaturized but can encase up to 0.47F in 11.5×5mm case, and 1.5F in 19.0×20.5mm case.
- It excels in rapid charge.
- (It can charge and discharge with 1.5 times as much current (mA) as rated capacitance.)



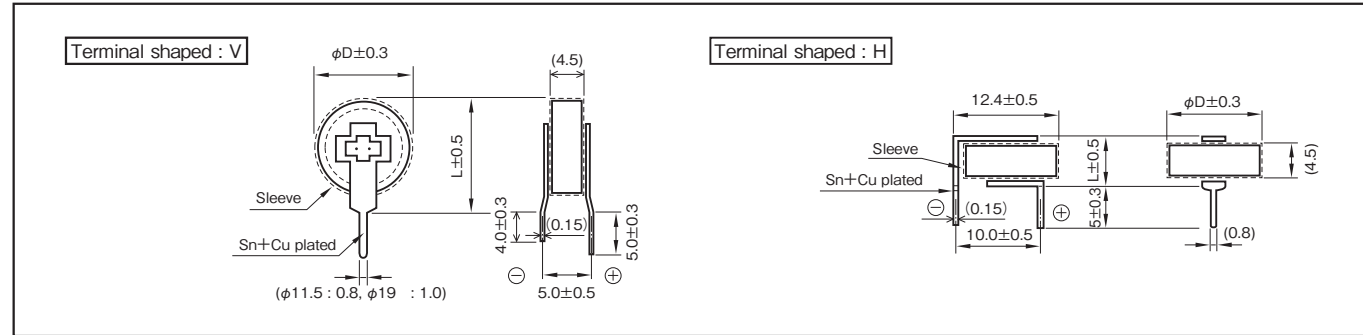
Marking color : White print on an indigo sleeve

Specifications

Item	Performance
Category temperature range (°C)	-25 to +70
Tolerance at rated capacitance (%)	-20 to +80
Internal resistance at 1 kHz	Rated capacitance (F)
	Internal resistance (Ω)
Characteristics at high and low temperature	Percentage of capacitance change
	Internal resistance
Endurance (70°C)	Test time
	Percentage of capacitance change
	Internal resistance
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.
Applicable standards	Conforms to JIS C5160-1 2009(IEC 62391-1 2006)

Outline Drawing

Unit : mm



Part numbering system (example : 5.5V0.1F)

DXN	—	5R5	□	104	□	U
Series code		Rated voltage symbol	Terminal shaped	Rated Capacitance symbol	Additional symbol	

Note

Do not apply external force to products or terminals as stress such as twisting, bending, pushing, or falling of such products or terminals may remove the terminals, resulting in an open/short circuit or liquid leakage.
Avoid applying excessive heat to capacitors during heating of an adhesive curing oven.
For details, refer to the precautions in use of DYNACAP.

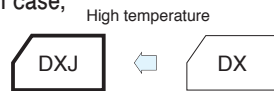
Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φ D × L (mm)
5.5	0.047	DXN-5R5V473U	11.5×13.0
		DXN-5R5H473U	11.5× 5.0
5.5	0.1	DXN-5R5V104U	11.5×13.0
		DXN-5R5H104U	11.5× 5.0
5.5	0.22	DXN-5R5V224U	11.5×13.0
		DXN-5R5H224U	11.5× 5.0
5.5	0.33	DXN-5R5V334U	11.5×13.0
		DXN-5R5H334U	11.5× 5.0
5.5	0.47	DXN-5R5V474SU	11.5×13.0
		DXN-5R5H474SU	11.5× 5.0
		DXN-5R5V474U	19.0×20.5
5.5	1.0	DXN-5R5V105U	19.0×20.5
5.5	1.5	DXN-5R5V155U	19.0×20.5

5.5V Miniaturized High temperature Capacitors

GREEN CAP 85°C

- High temperature type of Series DX.
- 5mm tall. Max. thin profile (H-shaped).
- Miniaturized but can encase up to 0.33F in 11.5×5mm case, and 1.0F in 19.0×20.5mm case.



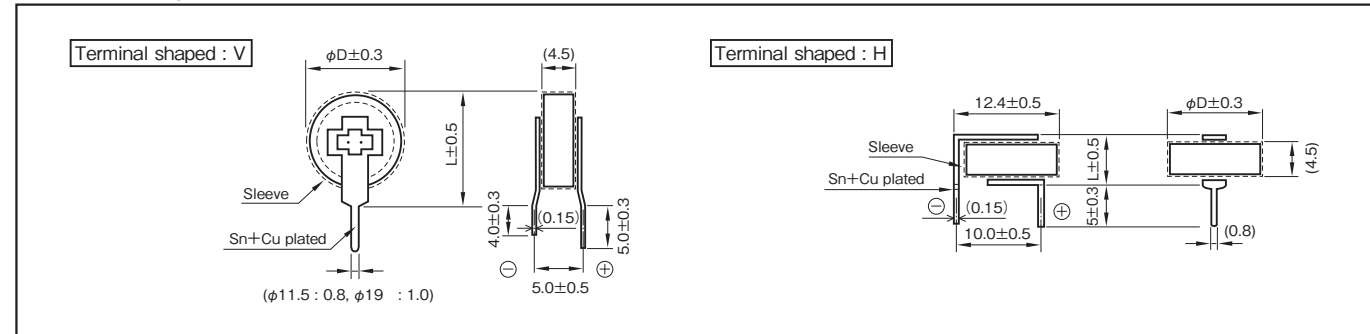
Marking color : White print on a black sleeve

Specifications

Item	Performance					
Category temperature range (°C)	-10 to +85					
Tolerance at rated capacitance (%)	-20 to +80					
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.33	1.0
	Internal resistance (Ω)	200	150	150	150	75
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C				
	Internal resistance	Within four times of the initial specified value				
Endurance (85°C)	Test time	1000 hours				
	Percentage of capacitance change	Within ±30% of the initial measured value				
	Internal resistance	Less than four times of the initial specified value				
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.					
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)					

Outline Drawing

Unit : mm



Part numbering system (example : 5.5V0.1F)

DXJ	5R5	□	104	U
Series code	Rated voltage symbol	Terminal shaped	Rated Capacitance symbol	

Note
 Do not apply external force to products or terminals as stress such as twisting, bending, pushing, or falling of such products or terminals may remove the terminals, resulting in an open/short circuit or liquid leakage.
 Avoid applying excessive heat to capacitors during heating of an adhesive curing oven. For details, refer to the precautions in use of DYNACAP.

Part number is refer to below table.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
5.5	0.047	DXJ-5R5V473U	11.5×13.0
		DXJ-5R5H473U	11.5× 5.0
5.5	0.1	DXJ-5R5V104U	11.5×13.0
		DXJ-5R5H104U	11.5× 5.0
5.5	0.22	DXJ-5R5V224U	11.5×13.0
		DXJ-5R5H224U	11.5× 5.0
5.5	0.33	DXJ-5R5V334U	11.5×13.0
		DXJ-5R5H334U	11.5× 5.0
5.5	1.0	DXJ-5R5V105U	19.0×20.5

Electric Double Layer Capacitors

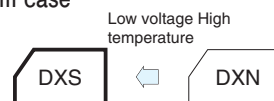
3.6V Miniaturized Low ESR High Temperature

GREEN CAP 85°C

- Long life of 3.6V 2000 hours, low ESR in DX series and this size.
- 5mm tall. Max. thin profile (H-shaped).
- Wider temperature range (-25 to +85°C) than battery.
- Miniaturized but can encase up to 0.47F in 11.5×5mm case and 1.0F in 19.0×20.5mm case.
- It excels in rapid charge.



Marking color : White print on a black sleeve

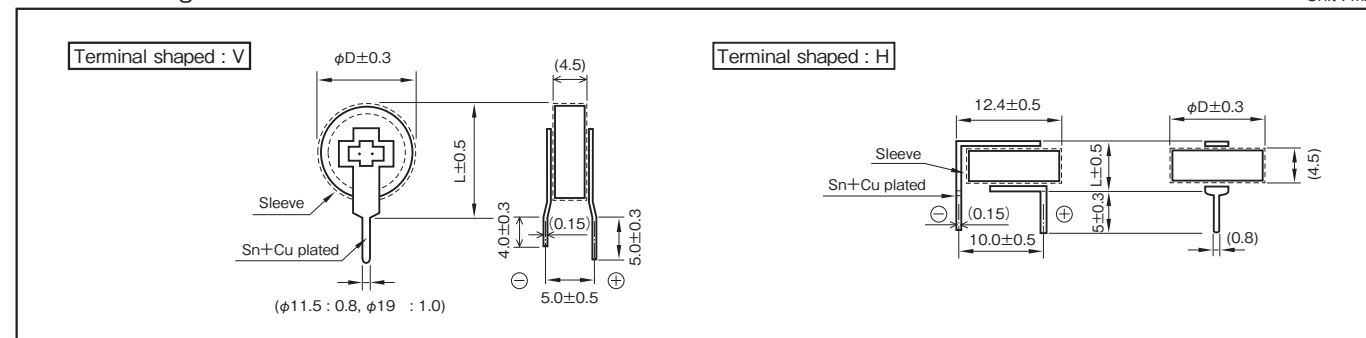


Specifications

Item	Performance							
Category temperature range (°C)	-25 to +85							
Tolerance at rated capacitance (%)	-20 to +80							
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.33	0.47	0.47	1.0
	Internal resistance (Ω)	25	25	25	25	25 (φ 11.5)	20 (φ 19.0)	20
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C						
	Internal resistance	Less than five times of the value at 20°C						
Endurance (85°C)	Test time	2000 hours (φ 11.5 0.047F : 1000 hours)						
	Percentage of capacitance change	Within ±30% of the initial measured value						
	Internal resistance	Less than four times of the initial specified value						
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.							
Applicable standards	Conforms to JIS C5160-1 2009(IEC 62391-1 2006)							

Outline Drawing

Unit : mm



Part numbering system (example : 3.6V0.1F)

DXS	—	3R6	□	104	□	U
Series code		Rated voltage symbol	Terminal shaped	Rated capacitance symbol	Additional symbol	

Part number is refer to below table.

Note

Do not apply external force to products or terminals as stress such as twisting, bending, pushing, or falling of such products or terminals may remove the terminals, resulting in an open/short circuit or liquid leakage. Avoid applying excessive heat to capacitors during heating of an adhesive curing oven. For details, refer to the precautions in use of DYNACAP.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
3.6	0.047	DXS-3R6V473U	11.5×13.0
		DXS-3R6H473U	11.5× 5.0
3.6	0.1	DXS-3R6V104U	11.5×13.0
		DXS-3R6H104U	11.5× 5.0
3.6	0.22	DXS-3R6V224U	11.5×13.0
		DXS-3R6H224U	11.5× 5.0
3.6	0.33	DXS-3R6V334U	11.5×13.0
		DXS-3R6H334U	11.5× 5.0
3.6	0.47	DXS-3R6V474SU	11.5×13.0
		DXS-3R6H474SU	11.5× 5.0
		DXS-3R6V474U	19.0×20.5
3.6	1.0	DXS-3R6V105U	19.0×20.5

NOTE

Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

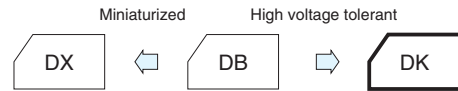
High Voltage Tolerance Capacitors

GREEN CAP 70°C

- High voltage tolerant (6.3V guaranteed) and highly reliable.
- Ideal for backing up of Li-battery-backed equipment such as cameras, video and telephone sets.



Marking color : White print on an indigo sleeve

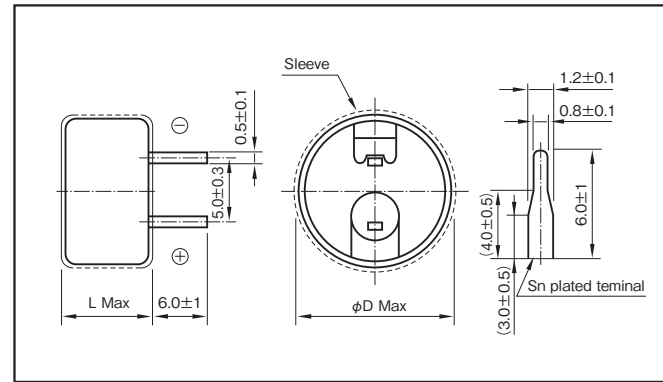


Specifications

Item	Performance					
Category temperature range (°C)	-25 to +70					
Tolerance at rated capacitance (%)	-20 to +80					
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.47	0.68	1.0
	Internal resistance (Ω)	300	200	50	50	30
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C				
	Internal resistance	less than five times of the value at 20°C				
Endurance (70°C)	Test time	1000 hours				
	Percentage of capacitance change	Within ±30% of the initial measured value				
	Internal resistance	Less than four times of the initial specified value				
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.					
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)					

Outline Drawing

Unit : mm



Part numbering system (example : 6.3V0.1F)				
DK	—	6R3	D	104 T
Series code		Max.operating voltage symbol		Rated capacitance symbol

Part number is refer to below table.

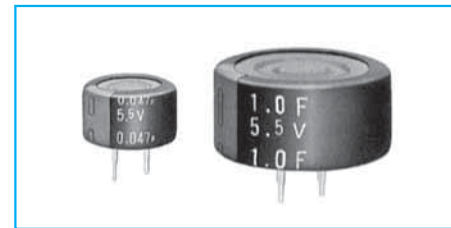
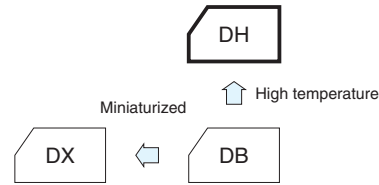
Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
6.3	0.047	DK-6R3D473T	13.5×9.5
6.3	0.1	DK-6R3D104T	13.5×9.5
6.3	0.47	DK-6R3D474T	21.5×9.5
6.3	0.68	DK-6R3D684T	21.5×9.5
6.3	1.0	DK-6R3D105T	21.5×9.5

High-Temperature Capacitors

GREEN CAP 85°C

- High temperature tolerant (−25 to +85°C) and highly reliable.
- Ideal for backing up of controls, electronic rice cooking jars, home bakeries and the like.



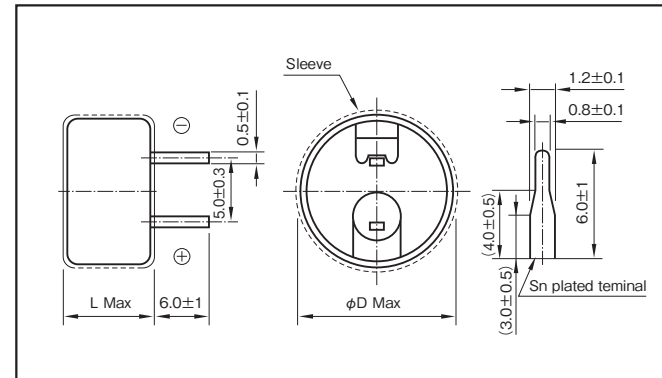
Marking color : White print on an indigo sleeve

Specifications

Item	Performance						
Category temperature range (°C)	−25 to +85						
Tolerance at rated capacitance (%)	−20 to +80						
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.47	0.68	1.0
	Internal resistance (Ω)	300	200	120	50	50	30
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C					
	Internal resistance	less than five times of the value at 20°C					
Endurance (85°C)	Test time	1000 hours					
	Percentage of capacitance change	Within ±30% of the initial measured value					
	Internal resistance	Less than four times of the initial specified value					
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.						
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)						

Outline Drawing

Unit : mm



Part numbering system (example : 5.5V0.1F)				
DH	—	5R5	D	104 T
Series code		Max. operating voltage symbol		Rated capacitance symbol

Part number is refer to below table.

Standard Ratings

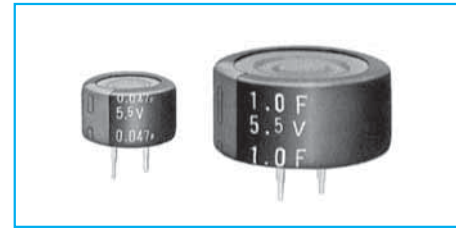
Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
5.5	0.047	DH-5R5D473T	13.5×9.5
5.5	0.1	DH-5R5D104T	13.5×9.5
5.5	0.22	DH-5R5D224T	13.5×9.5
5.5	0.47	DH-5R5D474T	21.5×9.5
5.5	0.68	DH-5R5D684T	21.5×9.5
5.5	1.0	DH-5R5D105T	21.5×9.5

5.5V Wide Temperature Range Capacitors

GREEN CAP

85°C

- It is a category temperature range larger than battery.
- $\phi 13.5$ size can encase up to 0.22F, $\phi 21.5$ size can encase up to 1.0F.
- It excels in rapid charge.
- Ideal for backing up of CMOS IC's, microcomputers, RAM's, RTC's for smart meter, outdoor equipment, auto motive and industrial.



Marking color : White print on an indigo sleeve

Wide temperature range

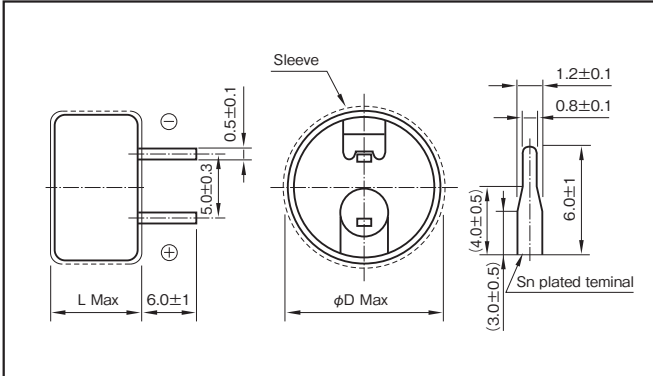


Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85	
Tolerance at rated capacitance (%)	-20 to +80	
Internal resistance at 1 kHz	Rated capacitance (F)	0.047 0.1 0.22 0.47 0.68 1.0
	Internal resistance (Ω)	40 40 40 20 20 20
Characteristics at high and low temperature	Percentage of capacitance change	Within $\pm 30\%$ of the value at 20°C
	Internal resistance	-40°C : Less than seven times of the value at 20°C 85°C : Less than five times of the value at 20°C
Endurance (85°C)	Test time	1000 hours
	Percentage of capacitance change	Within $\pm 30\%$ of the initial measured value
	Internal resistance	Less than four times of the initial specified value
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.	
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)	

Outline Drawing

Unit : mm



Part numbering system (example : 6.3V0.1F)

DHL	—	5R5	D	104	T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol	

Part number is refer to below table.

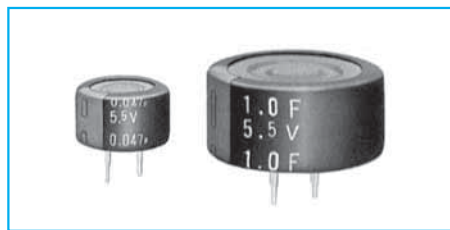
Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	$\phi D \times L$ (mm)
5.5	0.047	DHL-5R5D473T	13.5×9.5
5.5	0.1	DHL-5R5D104T	13.5×9.5
5.5	0.22	DHL-5R5D224T	13.5×9.5
5.5	0.47	DHL-5R5D474T	21.5×9.5
5.5	0.68	DHL-5R5D684T	21.5×9.5
5.5	1.0	DHL-5R5D105T	21.5×9.5

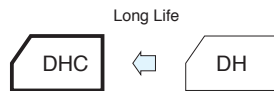
5.5V High Temperature, Long Life Capacitors

GREEN CAP 85°C

- Guarantees 3000 hours at 85°C, 5.5V (10 years at room temperature).
- It is a category temperature range larger than battery.
- It excels in rapid charge.
- Ideal for backing up of CMOS IC's, microcomputers, RAM's, RTC's for smart meter, outdoor equipment, auto motive and industrial.



Marking color : White print on a Black sleeve

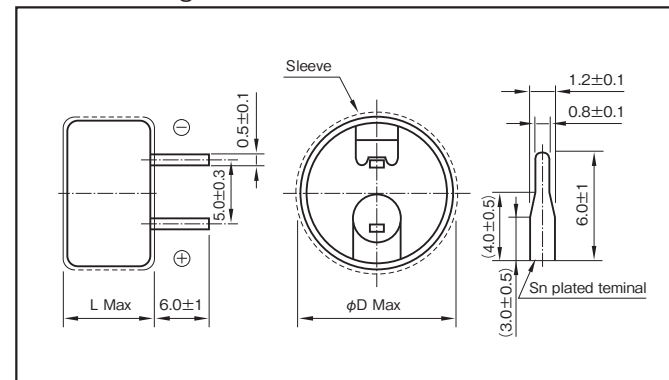


Specifications

Item	Performance							
Category temperature range (°C)	-25 to +85							
Tolerance at rated capacitance (%)	-20 to +80							
Internal resistance at 1 kHz	Rated capacitance (F)	0.047	0.1	0.22	0.47	0.68	1.0	
	Internal resistance (Ω)	300	200	120	50	50	30	
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C						
	Internal resistance	less than five times of the value at 20°C						
Endurance (85°C)	Test time	3000 hours						
	Percentage of capacitance change	Within ±30% of the initial measured value						
	Internal resistance	Less than four times of the initial specified value						
Shelf life (85°C)	Test time : 1000 hours ; Same as endurance.							
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)							

Outline Drawing

Unit : mm



Part numbering system (example : 5.5V0.1F)				
DHC	—	5R5	D	104 T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol

Part number is refer to below table.

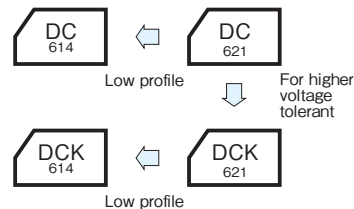
Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
5.5	0.047	DHC-5R5D473T	13.5×9.5
5.5	0.1	DHC-5R5D104T	13.5×9.5
5.5	0.22	DHC-5R5D224T	13.5×9.5
5.5	0.47	DHC-5R5D474T	21.5×9.5
5.5	0.68	DHC-5R5D684T	21.5×9.5
5.5	1.0	DHC-5R5D105T	21.5×9.5

Coin Cell Capacitors



- Unlike batteries, the number of charging / discharging cycles unlimited and rapid charging / discharging is possible.
- High reliability, Safe and unlike secondary batteries, this is pollution free devices.
- 1.8mm height 614type made lineup in the DC, DCK Series.

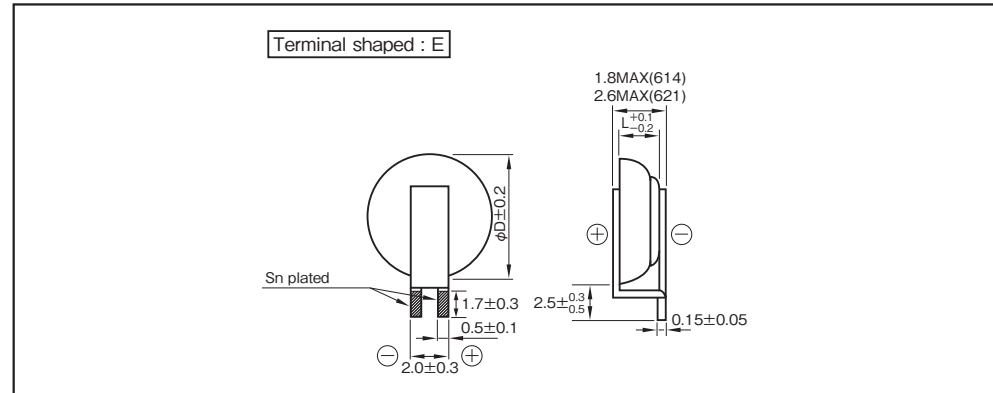


Specifications

Item	Performance					
	Series DC			Series DCK		
Series Name	Series DC			Series DCK		
Max. operating voltage (V)	2.5			3.3		
Category temperature range (°C)	-25 to +70			-10 to +60		
Tolerance at rated capacitance (%)	-20 to +80			-20 to +80		
Internal resistance (Ω) at 1 kHz	Size code	614	621	Size code	614	621
	Rated capacitance (F)	0.2	0.4	Rated capacitance (F)	0.2	0.4
	Internal resistance (Ω)	100	100	Internal resistance (Ω)	200	200
Characteristics at high and low temperature	Size code	614	621	Size code	614	621
	Rated capacitance (F)	Within ±30% of the value at 20°C	Within ±30% of the value at 20°C	Rated capacitance (F)	Within ±50% of the value at 20°C	Within ±50% of the value at 20°C
	Internal resistance (Ω)	Less than five times of the value at 20°C	Less than five times of the value at 20°C	Internal resistance (Ω)	Less than five times the initial specified value	Less than ten times of the value at 20°C
Endurance	Size code	614	621	Size code	614	621
	Test time and temp	70°C 1000 hours	70°C 500 hours	Test time and temp	60°C 1000 hours	60°C 500 hours
	Rated capacitance (F)	Within ±30% of the initial measured value	of the initial measured value	Rated capacitance (F)	Within ±30% of the initial measured value	Within ±40% of the initial measured value
	Internal resistance (Ω)	1kΩ Max.	400Ω Max.	Internal resistance (Ω)	2kΩ Max.	800Ω Max.
Shelf life	Same as endurance.			Same as endurance.		
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)					

Outline Drawing

Unit : mm



Part numbering system (example : 614,2.5V0.2F, terminal shaped : E)

DC	—	2R5	E	204	T	614	—	E
Series code		Max. operating voltage symbol		Rated capacitance symbol		Additional symbol		

Part number is refer to below table.

Part numbering system (example : 621, 3.3V0.4F, terminal shaped : E)

DCK	—	3R3	E	404	T	—	E
Series code		Max. operating voltage symbol		Rated capacitance symbol		Additional symbol	

Part number is refer to below table.

Standard Ratings

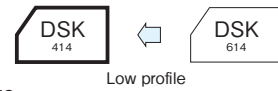
Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
2.5	0.2	DC-2R5E204T614-E	6.8×1.4
3.3	0.2	DCK-3R3E204T614-E	6.8×1.4
2.5	0.4	DC-2R5E404T-E	6.8×2.1
3.3	0.4	DCK-3R3E404T-E	6.8×2.1

Electric Double Layer Capacitors

Coin Cell Capacitors

GREEN CAP 70°C

- Reflow soldering method available.
- Unlike batteries, the number of charging / discharging cycles unlimited and rapid charging / discharging is possible.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reactions.
- $\phi 4.8 \times 1.71$ mm Max height type made lineup in the DSK series.



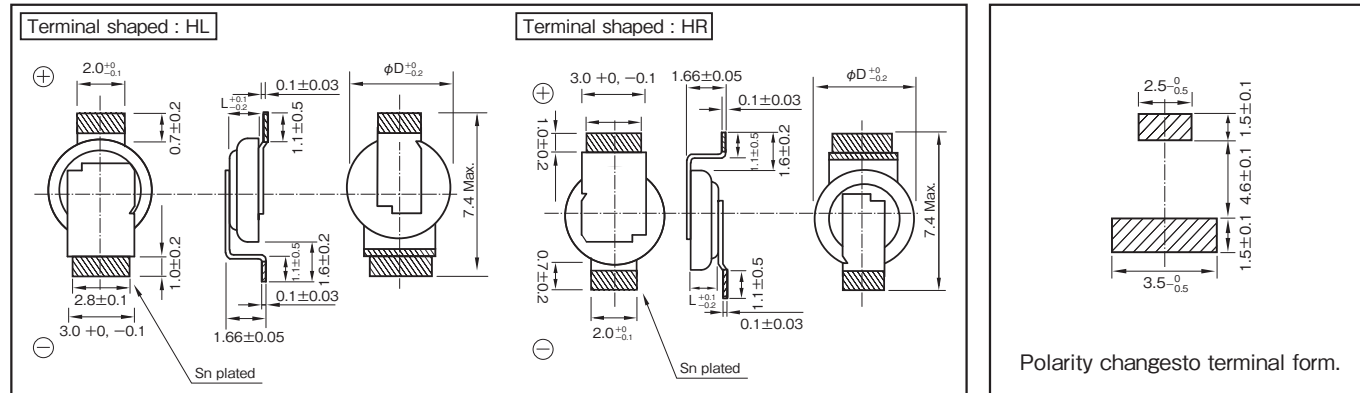
Specifications

Item	Performance	
Series Name	DSK series	
Max. operating voltage (V)	3.3	
Category temperature range (°C)	-10 to +70	
Tolerance at rated capacitance (%)	-20 to +80	
Rated Capacitance (F)	0.07	
Internal resistance (Ω) at 1 kHz	100	
Characteristics at high and low temperature	Percentage of capacitance change	Within $\pm 50\%$ of the value at 20°C
	Internal resistance	Within ten times the initial specified value
Endurance	Test temperature	70°C
	Test time	500 hours
	Percentage of capacitance change	Within $\pm 30\%$ of the initial measured value
	Internal resistance	5k Ω or less
Shelf life	Test time : 500 hours ; Same as endurance.	
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)	

Outline Drawing

Unit : mm

Recommended land pattern size Unit : mm



*Please consult with us about other terminal form

Part numbering system (3.3V0.07F, terminal shaped : HL)

DSK	—	3R3	H	703	T414	—	HL	L
Series code		Max. operating voltage symbol		Rated capacitance symbol	Additional symbol		Terminal shaped	Taping

Standard Ratings

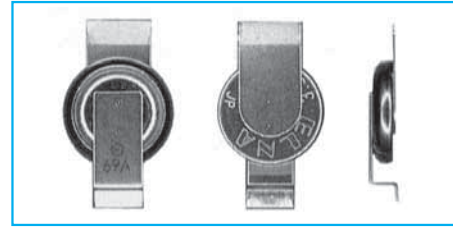
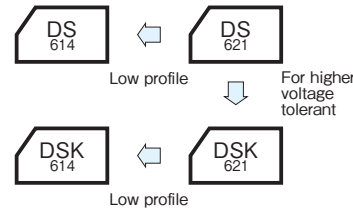
Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	$\phi D \times L$ (mm)
3.3	0.07	DSK-3R3H703T414-HLL	4.8×1.4
		DSK-3R3H703T414-HRL	

*Reflow soldering condition : 181 page.

Coin Cell Capacitors



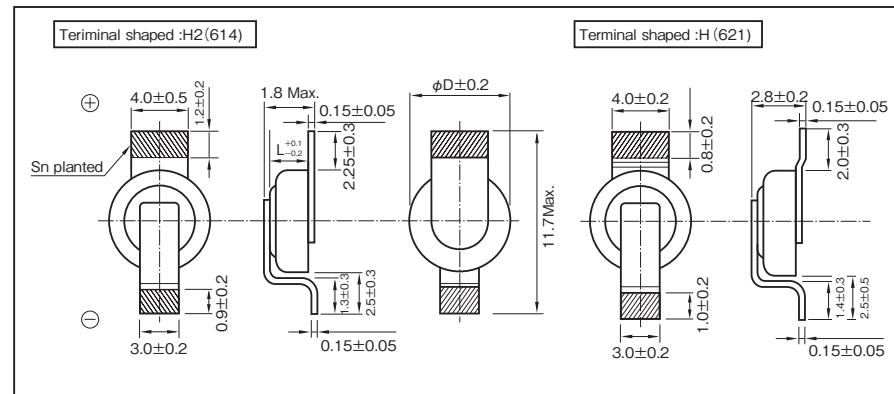
- Reflow soldering method available.
- Unlike batteries, the number of charging/ discharging cycles unlimited and rapid charging/ discharging is possible.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reactions.
- 1.8mm height type 614 made lineup in the DS, DSK series.



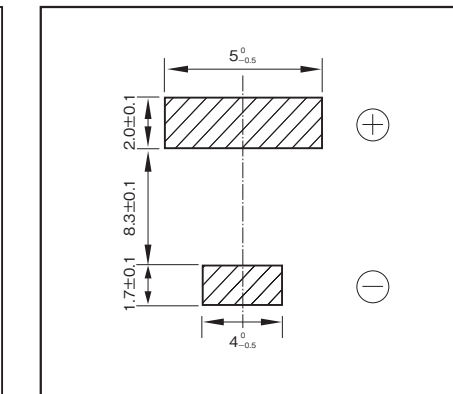
Specifications

Item	Performance					
Series Name	Series DS			Series DSK		
Max.operating voltage (V)	2.5			3.3		
Category temperature range (°C)	-25 to +70			-10 to +60		
Tolerance at rated capacitance (%)	-20 to +80			-20 to +80		
Internal resistance (Ω) at 1 kHz	Size code	614	621	Size code	614	621
	Rated capacitance (F)	0.2	0.33	Rated capacitance (F)	0.2	0.33
	Internal resistance (Ω)	100	100	Internal resistance (Ω)	200	200
Characteristics at high and low temperature	Size code	614	621	Size code	614	621
	Rated capacitance (F)	Within ±30% of the value at 20°C	Within ±30% of the value at 20°C	Rated capacitance (F)	Within ±50% of the value at 20°C	Within ±50% of the value at 20°C
	Internal resistance (Ω)	Less than five times of the value at 20°C	Less than five times of the value at 20°C	Internal resistance (Ω)	Less than five times the initial specified value	Less than five times of the value at 20°C
Endurance	Size code	614	621	Size code	614	621
	Test time and temp.	70°C 1000 hours	70°C 500 hours	Test time and temp.	60°C 1000 hours	60°C 500 hours
	Rated capacitance (F)	Within ±30% of the initial measured value	Within ±30% of the initial measured value	Rated capacitance (F)	Within ±30% of the initial measured value	Within ±30% of the initial measured value
Internal resistance (Ω)	1kΩ Max.		400Ω Max.	2kΩ Max.		800Ω Max.
	Same as endurance.			Same as endurance.		
Shelf life	Same as endurance.			Same as endurance.		
Applicable standards	Conforms to JIS C5160-1 2009(IEC 62391-1 2006)					

Outline Drawing



Recommended land pattern size



※Please consult with us about other terminal form.

Part numbering system (2.5V0.2F, terminal shaped:H2)

DS	—	2R5	H	204	T614	—	H2	L
Series code	Max.operating voltage symbol	Rated capacitance symbol	Additional symbol	Terminal shaped	Taping			

Part number is refer to below table.

Part numbering system (example:621, 3.3V0.33F, terminal shaped:H)

DSK	—	3R3	H	334	T	—	H	L
Series code	Max.operating voltage symbol	Rated capacitance symbol	Additional symbol	Terminal shaped	Taping			

Part number is refer to below table.

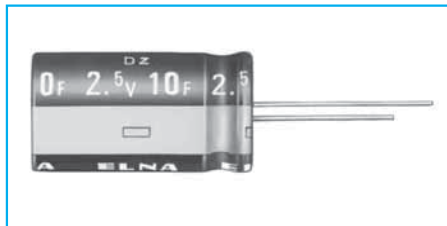
Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)
2.5	0.20	DS-2R5H204T614-H2L	6.8×1.4
3.3	0.20	DSK-3R3H204T614-H2L	6.8×1.4
2.5	0.33	DS-2R5H334T-HL	6.8×2.1
3.3	0.33	DSK-3R3H334T-HL	6.8×2.1

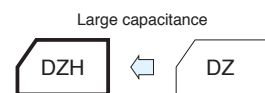
* Reflow soldering condition : 181 page.

Standard, Large capacitance type Capacitors

GREEN CAP 60°C / 70°C 2.5V / 2.7V



- Pollution-Free ; with no pollutants such as Cd or Pb.
- Unlike batteries ; excellent charge and discharge characteristics with no chemical reactions



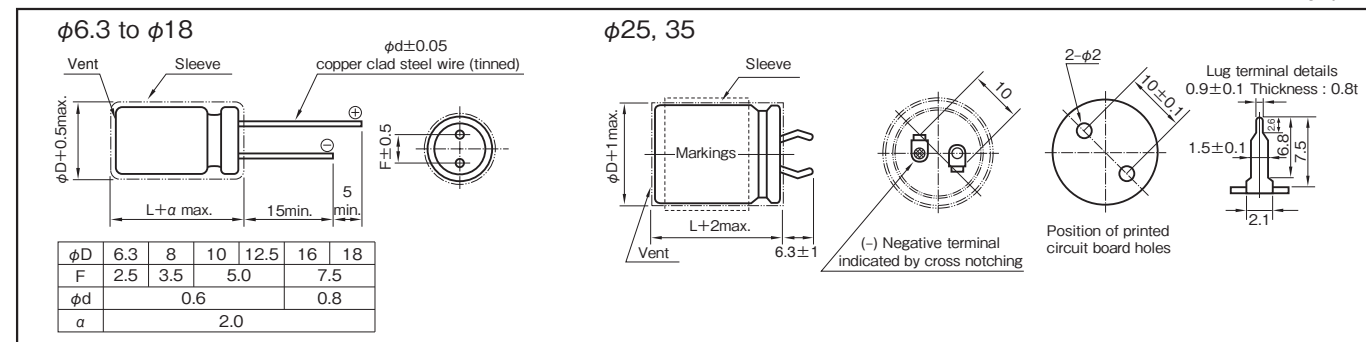
Marking color : White print on a black sleeve

Specifications

Item	Performance	
	Series DZ	Series DZH
Series name	Series DZ	Series DZH
Category temperature range (°C)	-25 to +70	-25 to +60
Tolerance at rated capacitance (%)	-20 to +80	-20 to +80
Internal resistance at 1kHz	Refer to the following page	
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C
	Internal resistance	Less than five times of the value at 20°C
Endurance	Test temperature	70°C
	Test time	1000 hours
	Percentage of capacitance change	Within ±30% of the initial measured value
	Internal resistance	Less than four times of the initial specified value
Shelf life	Same as endurance	
	Same as endurance	
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)	

Outline Drawing

Unit : mm



Part numbering system (example : 2.5V10F)

DZ	—	2R5	D	106	(H8)	T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol	Casing symbol	

Part number is refer to the following page.

Standard Ratings (Series DZ 2.5V)

Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	φD×L (mm)	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
2.5	0.9	0.1	DZ-2R5D904F4T	6.3×14.0	1.0	400
2.5	1.0	0.1	DZ-2R5D105G3T	8.0×12.0	1.0	200
2.5	1.0	0.1	DZ-2R5D105G4T	8.0×15.0	1.0	200
2.5	1.0	0.1	DZ-2R5D105T	8.0×22.0	1.0	150
2.5	2.7	0.2	DZ-2R5D275G5T	8.0×22.0	0.5	150
2.5	3.3	0.2	DZ-2R5D335H5T	10.0×20.0	0.3	70
2.5	3.3	0.2	DZ-2R5D335T	12.5×23.0	0.3	70
2.5	4.7	0.3	DZ-2R5D475H5T	10.0×20.0	0.2	80
2.5	4.7	0.3	DZ-2R5D475T	12.5×31.5	0.2	40
2.5	6.8	0.4	DZ-2R5D685H7T	10.0×30.0	0.2	50
2.5	10	0.5	DZ-2R5D106H8T	10.0×35.0	0.2	40
2.5	10	0.5	DZ-2R5D106Z7T	12.5×31.5	0.2	40
2.5	10	0.5	DZ-2R5D106T	18.0×35.0	0.2	30
2.5	15	0.7	DZ-2R5D156J5T	16.0×20.0	0.2	35
2.5	20	0.8	DZ-2R5D206K8T	18.0×35.0	0.2	30
2.5	20	0.8	DZ-2R5D206T	18.0×40.0	0.2	30
2.5	22	0.8	DZ-2R5D226J6T	16.0×25.0	0.2	30
2.5	30	0.8	DZ-2R5D306K9T	18.0×40.0	0.2	30
2.5	33	0.8	DZ-2R5D336J8T	16.0×35.5	0.2	30
2.5	50	1.0	DZ-2R5D506T	25.0×40.0	0.08	20
2.5	100	1.0	DZ-2R5D107S37T	25.0×50.0	0.08	15
2.5	100	1.0	DZ-2R5D107T	35.0×50.0	0.08	15
2.5	200	2.0	DZ-2R5D207S57T	35.0×50.0	0.08	15

We tailor packaged product in series and parallel arrangements according to voltage and capacitance as required.

Standard Ratings (Series DZ 2.7V)

Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	φD×L (mm)	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
2.7	0.9	0.2	DZ-2R7D904F4T	6.3×14.0	1.0	400
2.7	1.0	0.2	DZ-2R7D105G3T	8.0×12.0	1.0	200
2.7	1.0	0.2	DZ-2R7D105G4T	8.0×15.0	1.0	200
2.7	1.0	0.2	DZ-2R7D105G5T	8.0×22.0	1.0	150
2.7	2.7	0.3	DZ-2R7D275G5T	8.0×22.0	0.5	150
2.7	3.3	0.3	DZ-2R7D335H5T	10.0×20.0	0.3	100
2.7	3.3	0.3	DZ-2R7D335Z6T	12.5×23.0	0.3	70
2.7	4.7	0.4	DZ-2R7D475H5T	10.0×20.0	0.2	80
2.7	4.7	0.4	DZ-2R7D475Z7T	12.5×31.5	0.2	40
2.7	6.8	0.5	DZ-2R7D685H7T	10.0×30.0	0.2	50
2.7	10	0.6	DZ-2R7D106H8T	10.0×35.0	0.2	40
2.7	10	0.6	DZ-2R7D106Z7T	12.5×31.5	0.2	40
2.7	10	0.6	DZ-2R7D106K8T	18.0×35.0	0.2	30
2.7	15	0.8	DZ-2R7D156J6T	16.0×25.0	0.2	35
2.7	20	1.0	DZ-2R7D206K8T	18.0×35.0	0.2	30
2.7	20	1.0	DZ-2R7D206K9T	18.0×40.0	0.2	30
2.7	22	1.0	DZ-2R7D226J7T	16.0×31.5	0.2	30
2.7	30	1.0	DZ-2R7D306K9T	18.0×40.0	0.2	30
2.7	33	1.0	DZ-2R7D336J9T	16.0×40.0	0.2	30

We tailor packaged product in series and parallel arrangements according to voltage and capacitance as required.

Standard Ratings (Series DZH 2.5V)

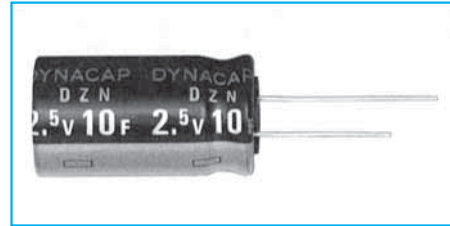
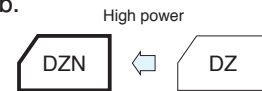
Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	φD×L (mm)	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
2.5	50	1.0	DZH-2R5D506K9T	18.0×40.0	0.08	30
2.5	100	2.0	DZH-2R5D107S35T	25.0×40.0	0.08	20
2.5	300	5.0	DZH-2R5D307S57T	35.0×50.0	0.08	15

We tailor packaged product in series and parallel arrangements according to voltage and capacitance as required.

High power type Capacitors

GREEN CAP 70°C Low ESR 2.5V / 2.7V

- Low internal resistance allows boosting charge and heavy-current discharge. (ampere level)
- Pollution-Free ; with no pollutants such as Cd or Pb.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reaction



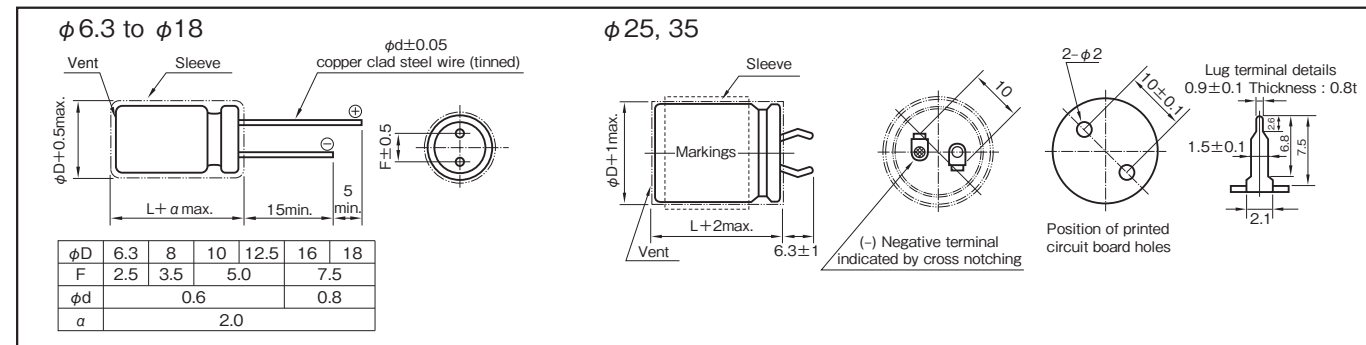
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Specifications

Item	Performance	
Category temperature range (°C)	-25 to +70	
Tolerance at rated capacitance (%)	-20 to +80	
Internal resistance at 1 kHz	Refer to the following page	
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C
	Internal resistance	Less than five times of the value at 20°C
Endurance (70°C)	Test time	1000 hours
	Percentage of capacitance change	Within ±30% of the initial measured value
	Internal resistance	Less than four times of the initial specified value
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.	
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)	

Outline Drawing

Unit : mm



Part numbering system (example : 2.5V10F)					
DZN	—	2R5	D	106	(H8) T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol	Casing symbol

Part number is refer to the following page.

Standard Ratings (Series DZ 2.5V)

Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	φD×L (mm)	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
2.5	0.7	0.1	DZN-2R5D704G4T	8.0×15.0	0.4	200
2.5	0.9	0.1	DZN-2R5D904F4T	6.3×14.0	0.4	300
2.5	1.0	0.1	DZN-2R5D105G3T	8.0×12.0	0.3	150
2.5	1.0	0.1	DZN-2R5D105G4T	8.0×15.0	0.3	150
2.5	1.0	0.1	DZN-2R5D105T	8.0×22.0	0.3	120
2.5	2.7	0.2	DZN-2R5D275G5T	8.0×22.0	0.3	120
2.5	3.3	0.2	DZN-2R5D335H5T	10.0×20.0	0.2	60
2.5	3.3	0.2	DZN-2R5D335T	12.5×23.0	0.2	60
2.5	4.7	0.3	DZN-2R5D475H5T	10.0×20.0	0.1	70
2.5	4.7	0.3	DZN-2R5D475T	12.5×31.5	0.1	35
2.5	6.8	0.4	DZN-2R5D685H7T	10.0×30.0	0.1	40
2.5	10	0.5	DZN-2R5D106H8T	10.0×35.0	0.1	35
2.5	10	0.5	DZN-2R5D106Z8T	12.5×36.5	0.1	30
2.5	10	0.5	DZN-2R5D106T	18.0×35.0	0.1	25
2.5	15	0.7	DZN-2R5D156J5T	16.0×20.0	0.1	30
2.5	20	0.8	DZN-2R5D206K8T	18.0×35.0	0.1	25
2.5	20	0.8	DZN-2R5D206T	18.0×40.0	0.1	20
2.5	22	0.8	DZN-2R5D226J6T	16.0×25.0	0.1	25
2.5	30	0.8	DZN-2R5D306K9T	18.0×40.0	0.1	25
2.5	33	0.8	DZN-2R5D336J8T	16.0×35.5	0.1	25
2.5	50	1.0	DZN-2R5D506T	25.0×40.0	0.03	15
2.5	100	1.0	DZN-2R5D107S37T	25.0×50.0	0.03	15
2.5	100	1.0	DZN-2R5D107T	35.0×50.0	0.03	8
2.5	200	2.0	DZN-2R5D207S57T	35.0×50.0	0.03	8

We tailor packaged product in series and parallel arrangements according to voltage and capacitance as required.

Standard Ratings (Series DZ 2.7V)

Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	φD×L (mm)	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
2.7	0.7	0.2	DZN-2R7D704G4T	8.0×15.0	0.4	200
2.7	0.9	0.2	DZN-2R7D904F4T	6.3×14.0	0.4	300
2.7	1.0	0.2	DZN-2R7D105G3T	8.0×12.0	0.3	150
2.7	1.0	0.2	DZN-2R7D105G4T	8.0×15.0	0.3	150
2.7	1.0	0.2	DZN-2R7D105G5T	8.0×22.0	0.3	120
2.7	2.7	0.3	DZN-2R7D275G5T	8.0×22.0	0.3	120
2.7	3.3	0.3	DZN-2R7D335H5T	10.0×20.0	0.2	90
2.7	3.3	0.3	DZN-2R7D335Z6T	12.5×23.0	0.2	60
2.7	4.7	0.4	DZN-2R7D475H5T	10.0×20.0	0.1	70
2.7	4.7	0.4	DZN-2R7D475Z7T	12.5×31.5	0.1	35
2.7	6.8	0.5	DZN-2R7D685H7T	10.0×30.0	0.1	40
2.7	10	0.6	DZN-2R7D106H8T	10.0×35.0	0.1	35
2.7	10	0.6	DZN-2R7D106Z8T	12.5×36.5	0.1	30
2.7	10	0.6	DZN-2R7D106K8T	18.0×35.0	0.1	25
2.7	15	0.8	DZN-2R7D156J6T	16.0×25.0	0.1	40
2.7	20	1.0	DZN-2R7D206K8T	18.0×35.0	0.1	25
2.7	20	1.0	DZN-2R7D206K9T	18.0×40.0	0.1	25
2.7	22	1.0	DZN-2R7D226J7T	16.0×31.5	0.1	25
2.7	30	1.0	DZN-2R7D306K9T	18.0×40.0	0.1	25
2.7	33	1.0	DZN-2R7D336J9T	16.0×40.0	0.1	25

We tailor packaged product in series and parallel arrangements according to voltage and capacitance as required.

For Low Temperature Type Capacitors

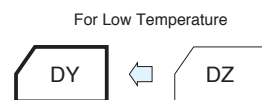
GREEN CAP

70°C

2.5V

For -40°C

- For Low Temperature (-40°C).
- Pollution-Free ; with no pollutants such as Cd or Pb.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reaction.



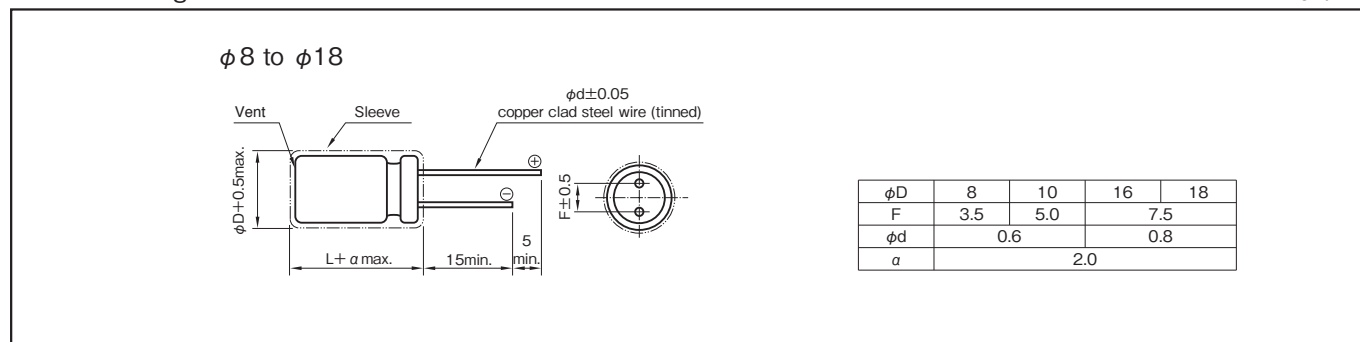
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Specifications

Item	Performance		
Category temperature range (°C)	-40 to +70		
Tolerance at rated capacitance (%)	-20 to +80		
Internal resistance at 1 kHz	Refer to the Standard Ratings		
Characteristics at high and low temperature	Percentage of capacitance change	-20 to +70°C	Within ±30% of the value at 20°C
		-40 to <-25°C	Within ±50% of the value at 20°C
	Internal resistance	-20 to +70°C	Less than five times of the value at 20°C
		-40 to <-25°C	Less than ten times of the value at 20°C
Endurance (70°C)	Test time	1000 hours	
	Percentage of capacitance change	Within ±30% of initial value	
	Internal resistance	Less than four times of the initial specified value	
Shelf life (70°C)	Test time : 1000 hours ; Same as endurance.		
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)		

Outline Drawing

Unit : mm



Part numbering system (example : 2.5V10F)

DY	—	2R5	D	106	H8	T
Series code		Rated voltage symbol	Terminal code	Rated capacitance symbol	Casing symbol	

Part number is refer to the following table.

Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	φD×L (mm)	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
2.5	1.0	0.1	DY-2R5D105G3T	8.0×12.0	1.0	200
2.5	1.0	0.1	DY-2R5D105G4T	8.0×15.0	1.0	200
2.5	2.7	0.2	DY-2R5D275G5T	8.0×22.0	0.5	120
2.5	3.3	0.2	DY-2R5D335H5T	10.0×20.0	0.3	60
2.5	4.7	0.3	DY-2R5D475H5T	10.0×20.0	0.2	70
2.5	6.8	0.4	DY-2R5D685H7T	10.0×30.0	0.2	40
2.5	10	0.5	DY-2R5D106H8T	10.0×35.0	0.2	35
2.5	15	0.7	DY-2R5D156J5T	16.0×20.0	0.2	30
2.5	20	0.8	DY-2R5D206K8T	18.0×35.0	0.2	25
2.5	22	0.8	DY-2R5D226J6T	16.0×25.0	0.2	25
2.5	30	0.8	DY-2R5D306K9T	18.0×40.0	0.2	25
2.5	33	0.8	DY-2R5D336J8T	16.0×35.5	0.2	25

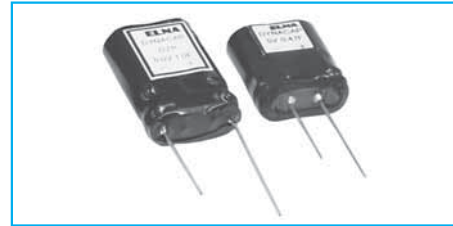
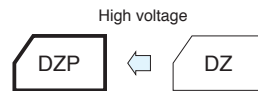
Packed Type

GREEN CAP

70°C

5.0V

- High-voltage capacitor which connected DZ in series.
- Pollution-Free ; with no pollutants such as Cd or Pb.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reaction.



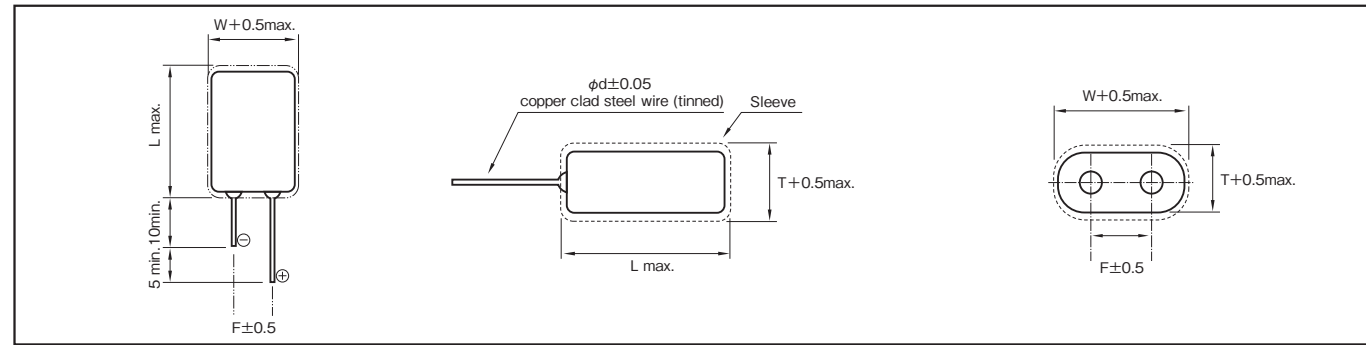
Marking color : White print on a brown sleeve

Specifications

Item	Performance	
Category temperature range (°C)	-25 to +70	
Tolerance at rated capacitance (%)	-20 to +80	
Internal resistance at 1 kHz	Refer to the Standard Ratings	
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of the value at 20°C
	Internal resistance	Less than five times of the value at 20°C
Endurance (70°C)	Test time	1000 hours
	Percentage of capacitance change	Within ±30% of initial value
	Internal resistance	Less than four times of the initial specified value
Shelf life (70°C)	Same as endurance.	
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)	

Outline Drawing

Unit : mm



Part numbering system (example : 5.0V0.47F)					
DZP	5	V	474	G3	TS1
Series code	Rated voltage symbol	Terminal code	Rated capacitance symbol	Casing symbol	Additional code

Part number is refer to the following table.

Standard Ratings

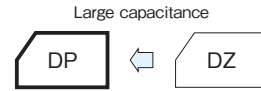
Max. operating voltage (V)	Rated capacitance (F)	Max. Leakage Current (mA) after 24h	ELNA Parts No.	T×W×L (mm)	φd	F	Internal resistance (Ω max.) at 1kHz	Internal resistance (mΩ) at 1kHz (measurement value)
5.0	0.47	0.2	DZP-5V474G3TS1A	8.5×17.0×16.0	0.6	5.1	2.0	600
			DZP-5V474G3TS1B			12.1		
5.0	1.0	0.3	DZP-5V105G5STS1A	8.5×17.0×24.0	0.6	5.1	1.0	250
			DZP-5V105G5STS1B			12.1		
5.0	1.5	0.4	DZP-5V155G5STS1A	8.5×17.0×24.0	0.6	5.1	1.0	250
			DZP-5V155G5STS1B			12.1		
5.0	3.3	0.8	DZP-5V335H7TS1A	10.5×21.0×34.0	0.6	5.5	0.4	100
			DZP-5V335H7TS1B			15.5		
5.0	4.7	1.0	DZP-5V475H8TS1A	10.5×21.0×39.0	0.6	5.5	0.4	80
			DZP-5V475H8TS1B			15.5		

Electric Double Layer Capacitors

Large capacitance, High energy type Capacitors

GREEN CAP 60°C

- Most suitable for energy storage with large capacitance.
- Terminals arranged in the same orientation provide easy connection.
- Unlike batteries, safe and high reliability without containing active and hazardous substances.
- Unlike batteries, excellent charge and discharge characteristics with no chemical reactions.



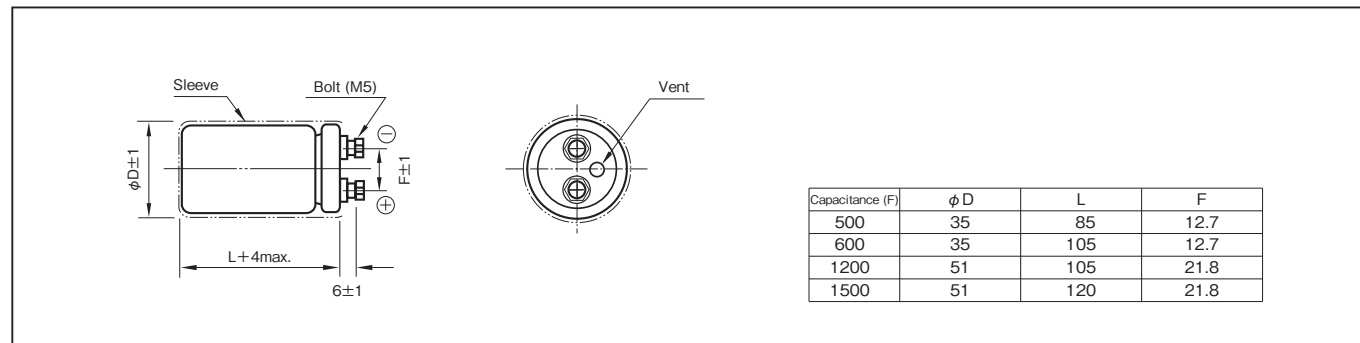
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Specifications

Item	Performance				
Category temperature range (°C)	-25 to +60				
Tolerance at rated capacitance (%)	-20 to +20				
Internal resistance at 1 kHz	Rated capacitance (F)	500	600	1200	1500
	Internal resistance (mΩ)	12	10	10	10
Characteristics at high and low temperature	Percentage of capacitance change	Within ±30% of value at 20°C			
	Internal resistance	Less than five times of the value at 20°C			
Endurance (60°C)	Test time	2000 hours			
	Percentage of capacitance change	Within ±30% of the initial measured value			
	Internal resistance	Less than four times of the initial specified value			
Shelf life (60°C)	Test time : 2000 hours ; Same as endurance.				
Applicable standards	Conforms to JIS C5160-1 2009 (IEC 62391-1 2006)				

Outline Drawing

Unit : mm



Standard Ratings

Max. operating voltage (V)	Rated capacitance (F)	ELNA Parts No.	φD×L (mm)	* Internal resistance (mΩ) at 1kHz (measurement value)
2.5	500	DP-2R5D507A85	35.0× 85.0	4.0
2.5	600	DP-2R5D607AA5	35.0×105.0	3.2
2.5	1200	DP-2R5D128CA5	51.0×105.0	3.0
2.5	1500	DP-2R5D158CC0	51.0×120.0	3.0

* Internal resistance are not guaranteed values, but measurement value.
We tailor packaged product in series and parallel arrangements according to voltage and capacitance as required.

Part numbering system (example : 2.5V600F)

DP	—	2R5	D	607	AA5
Series code		Max.operating voltage symbol	Rated capacitance symbol		Casing symbol

1 Description of Electric Double Layer Capacitor

1-1 Basic Concepts

Generally capacitors are constructed with a dielectric placed between opposed electrodes, functioning as capacitors by accumulating charges in the dielectric material. Aluminum electrolytic and tantalum electrolytic capacitors, for example, use an aluminum oxide film and a tantalum oxide film as the dielectric, respectively.

On the other hand, Electric Double Layer Capacitors have no visible dielectric in a general sense but utilize the state referred to as the electric double layer, which is developed naturally on the interface between substances, as the function of dielectric.

1-2 Operating Principle

The Electric Double Layer represents the state in which positive and negative charges exist at a very short distance on the boundary where contact occurs between two different substances (e.g. solid and liquid). By externally applying a voltage below a certain voltage to the boundary, higher charges can be accumulated. Accordingly, charge and discharge of electric double layer capacitors utilize adsorption and desorption of ions to the ionic adsorption layer (Electric Double Layer) formed on the electrode surface of the activated carbon used for electrodes.

Applying DC voltage externally across the electrodes of the Electric Double Layer allows almost no passage of current up to a certain voltage, exhibiting a condition like insulation.

However, the application of voltages exceeding the certain voltage causes electrolysis to occur in the electrolyte, resulting in abrupt passage of current.

This voltage determines the resistance of voltage of an Electric Double Layer Capacitor. We use an organic electrolyte and its standard electrolysis occurs at the voltage of about 2.5 to 3V.

1-3 Advantages and Disadvantages of Electric Double Layer Capacitor

[Advantages]

- (1) Small size and capacitance in farads (F) available by utilizing the activated carbon electrode with a large surface area
- (2) No special charging circuit and constrains during discharge are required.
- (3) No effect on the life through overcharging and overdischarging
- (4) Environmentally clean energy

[Disadvantage]

- (1) The life is limited due to the use of electrolyte.
- (2) Series connection is required when used with a low resistance of voltage at a high voltage.
- (3) Cannot be used in AC circuits due to high internal resistance unlike aluminum electrolytic capacitors.

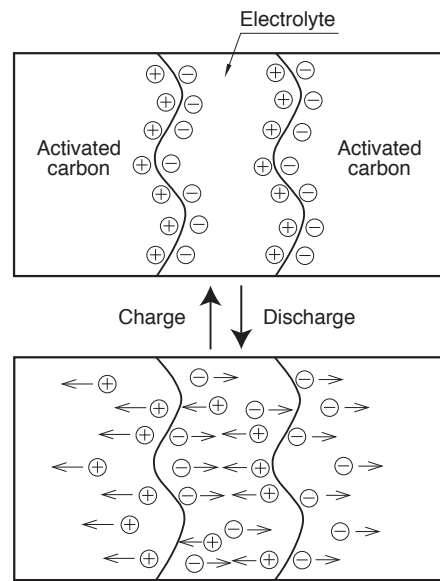


Fig.1 Schematic of Principle of Electric Double Layer Capacitor

1-4 Construction of DYNACAP

The series which consists of coin cells is similar to that of coin-type batteries as shown in Fig.2. DYNACAP contains a single cell or two to three cells stacked in series.

Since these series have a large electrode-to-electrode distance and a small electrode area exhibiting a large internal resistance, they are suitable for the memory backup application that involves microcurrent discharge.

The cylindrical cell construction as seen in the DZ and DZN series has the construction similar to that of aluminum electrolytic capacitors as shown in Fig.3.

These series have a small electrode-to-electrode distance, allowing a large electrode area because of the winding structure. This decreases the internal resistance, which is primary suitable for applications requiring high-power such as motor drive and LED lighting that need high currents.

2 Description of Life Expectancy

Generally, the life of Electric Double Layer Capacitors is largely affected by the ambient temperature.

The expected life is approximated by the equation as shown below:

$$L = L_0 \times 2 \left(\frac{T_0 - T}{10} \right)$$

Where,

L : Expected lifetime at temperature T

L₀ : Lifetime at temperature T₀

T : Expected working temperature

T₀ : Upper category temperature

Note that the above equation does not cover charge and discharge. In the case of charge and discharge, heat generation occurs inside a capacitor; the temperature rise by this heat generation must also be considered.

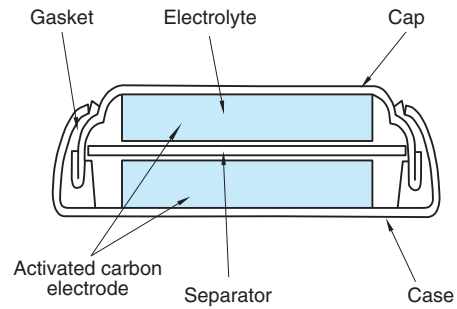


Fig.2 Example of Basic Construction of Coin Cell

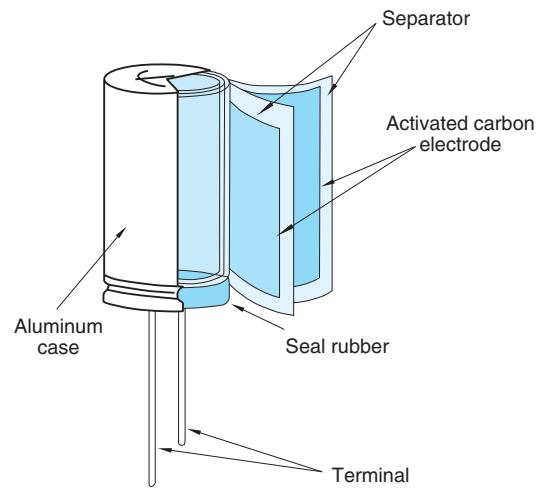


Fig.3 Example of Basic Construction of Cylindrical Cell

3 Calculation Method of Discharge Time

3-1 Approximating the Discharge Time of Basic Constant Current Discharge

The discharge time at the constant current of a capacitor can be calculated by the following equation.

$$t = (C \times \Delta V) / I$$

Where,

- t : Discharge time (sec.)
- C : Capacitor capacitance (F)
- ΔV : Working voltage range (V)
- I : Discharge current (A)

As an example, we calculate the discharge time when a capacitor of the DB series 5.5V 1F is charged with 5V and discharged to 3V at a constant current of 1 mA. Since the working voltage range ΔV is 2V from 5 – 3V, $t = (1F \times 2V) / 0.001A$ from the above equation, and the discharge time can be calculated as 2,000 seconds (about 33 minutes). Note that the actual discharge time may be different because this equation does not cover the effect of the self-discharge and the IR drop by internal resistance described below.

3-2 Effect of Self-discharge at Microcurrents

When backup is made by discharge with a micro-current below some μA especially for the memory backup application and the like, the discharge time must be determined while taking into account the self-discharge as shown in Fig.4.

The value closer to the actual discharge curve is obtained by adding the voltage drop through the self-discharge determined from the voltage retention characteristic test to the discharge curve given by calculation.

Note that the value of self-discharge varies by the charge time, charging current and an ambient temperature.

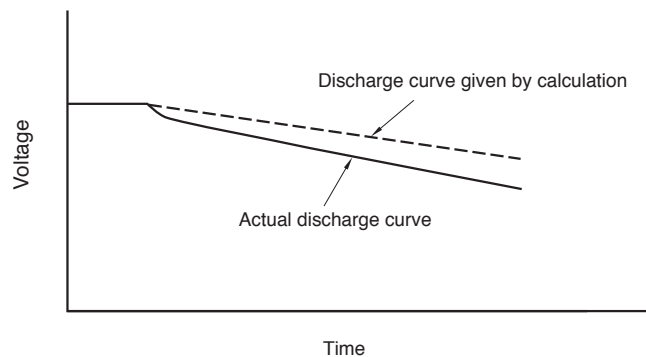


Fig.4 Example of Discharge Curve involving Self-Discharge

3-3 Effect of IR Drop at Large Currents

When a large Current discharge and a capacitor with a high internal resistance are used, the effect of IR drop by the product of the internal resistance and the current must be considered as shown in Fig.5.

When a large current is required in a very short time, or a large instantaneous current flows at the start of discharge, the voltage drop indicated with ΔV1 counts. However, when the discharge continues as it is, the discharge curve indicates in a manner showing a slow diffusion and then keeps a constant straight line.

We also make calculation including ΔV2 of the intersection extending from the initial discharge and the discharge straight line section including the diffusion curve when indicating the DC internal resistance.

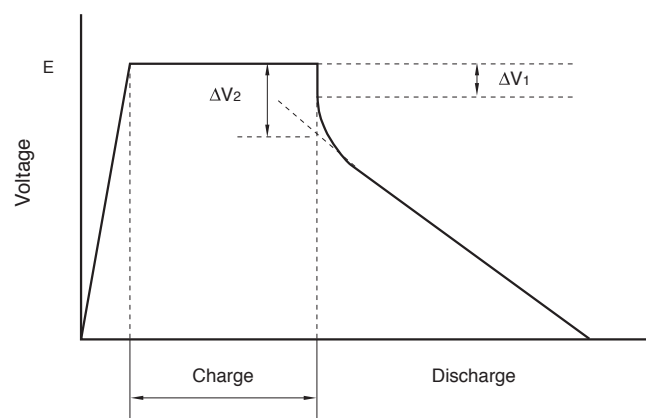


Fig.5 Example of Discharge Curve involving IR Drop

Due to IR drop, the shape of the discharge curve varies by the internal resistance and ambient temperature for each series.

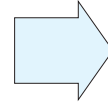
4 Series-parallel connection packaged products.

Electric Double Layer Capacitors have a low operating voltage per cell.

To deal with this, ELNA is ready to offer series packaging for high operating voltages to meet to various needs.

Please consult with us on optimization and design.

Packaged item



Example of packaged item

In case of a low voltage (up to about 24 V) for the DZ and DZN series with relatively low capacitance, we are preparing simple packaged products.

No full-scale voltage equalization circuit has been equipped yet, but comparatively low cost and flexible layout can be realized.

5 Moisture-proof provision

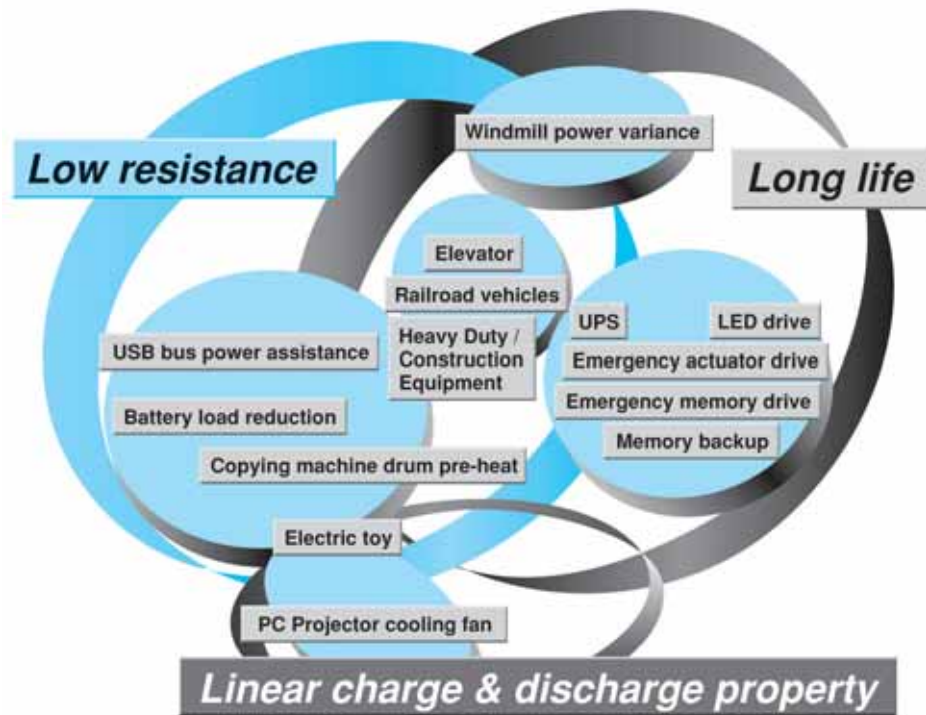
If a electric double layer capacitor is used in a heat-and-high-humidity environment, the characteristic will deteriorate.

We can improve the durability in heat-and-high-humidity environment by coating of special resin.

Please consult about resin coating.

6 Applications

Features & Benefits of Electric Double Layer Capacitor



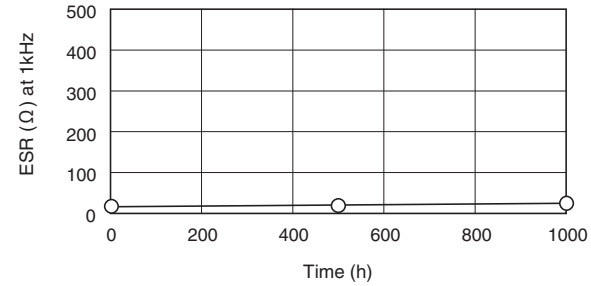
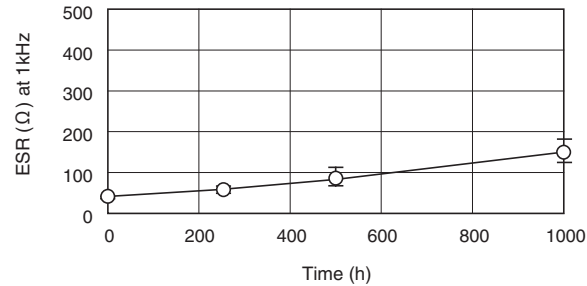
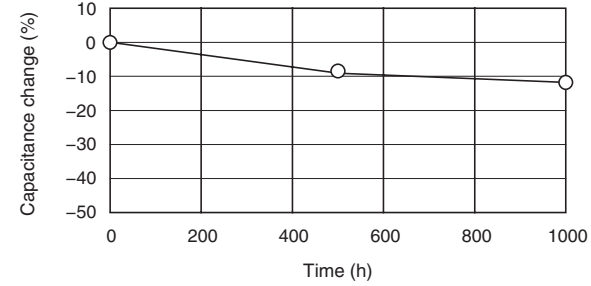
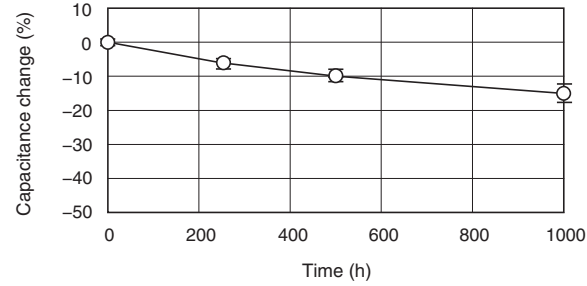
7 Electric Characteristics Data

7-1 Coin type for memory back-up

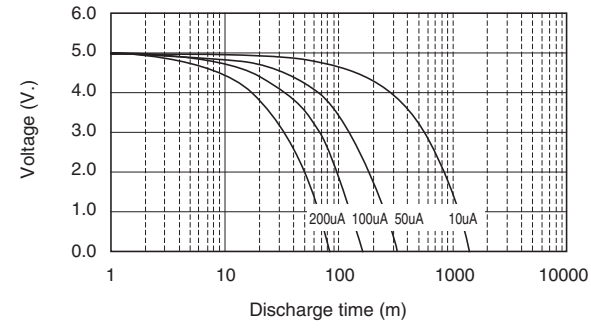
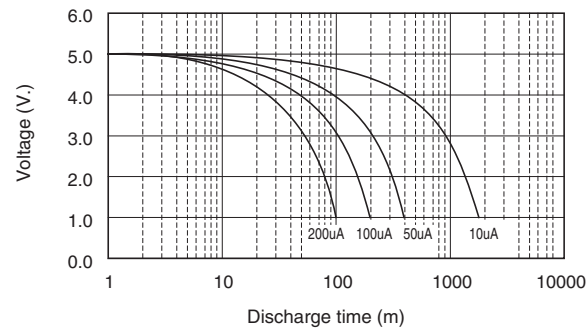
DYNACAP Series DXJ
5.5V 0.33F/DXJ-5R5H334 φ11.5×5L (mm)

DYNACAP Series DHL
5.5V 0.22F/DHL-5R5D224T φ13.5×9.5L (mm)

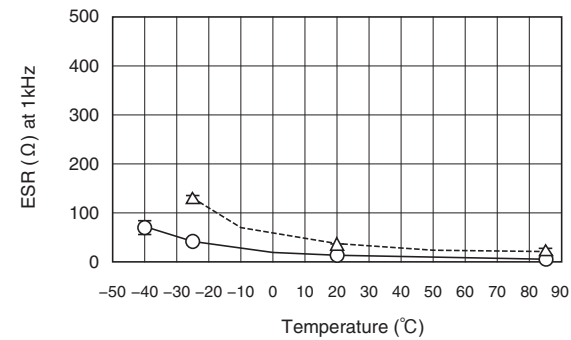
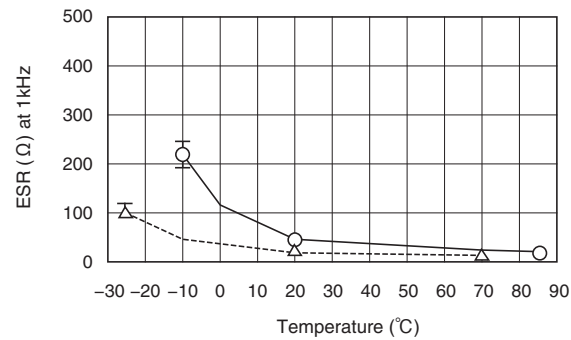
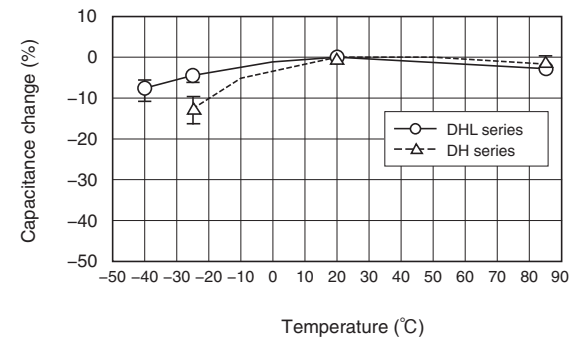
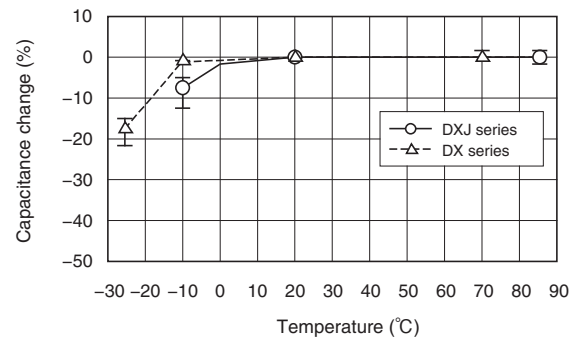
■ Endurance (85°C 5.5V.DC)



■ Discharge characteristics



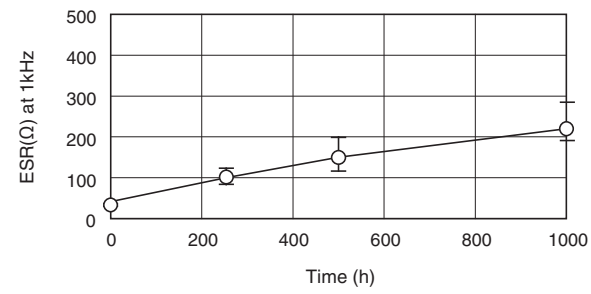
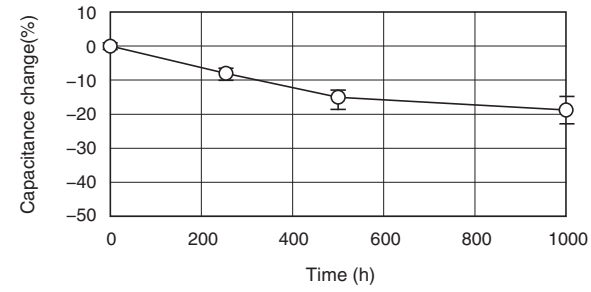
■ Characteristics at high and low temperature



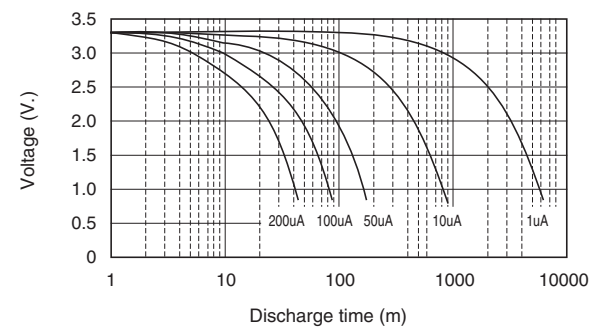
NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

DYNACAP Series DZK
3.3V 0.22F/DSK-3R3H224 $\phi 6.8 \times 2.1L$ (mm)

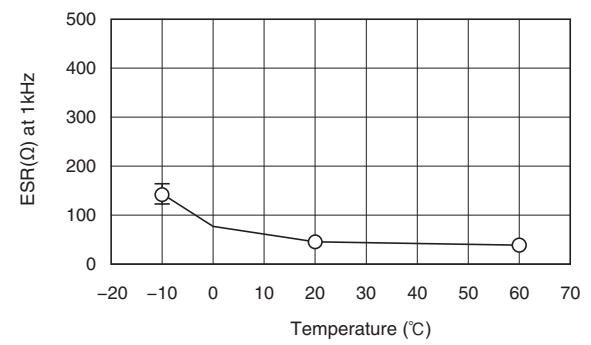
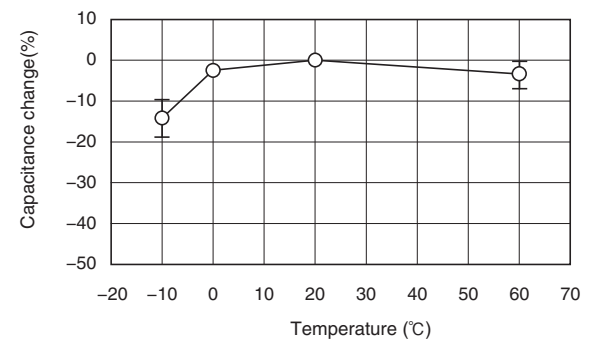
■ Endurance (60°C 3.3V.DC)



■ Discharge characteristics



■ Characteristics at high and low temperature



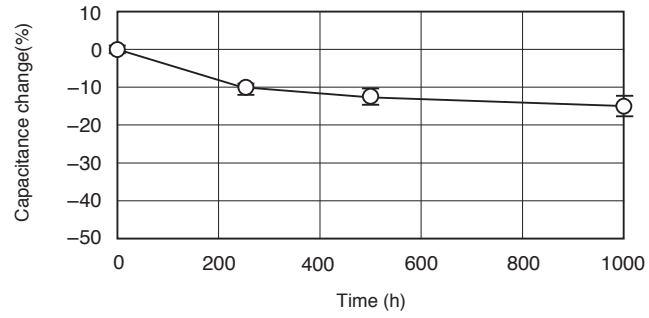
NOTE
Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or use.

7-2 Cylindrical type for power

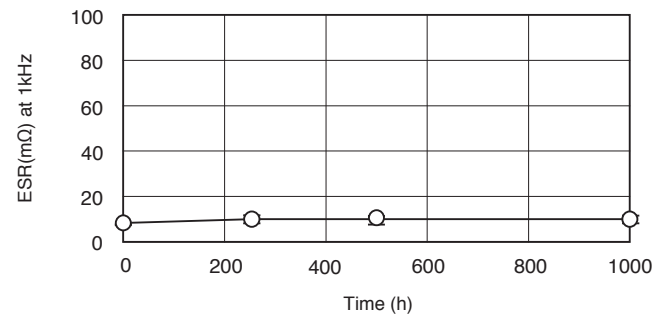
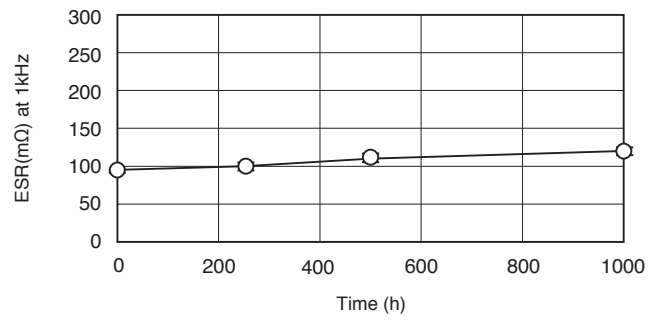
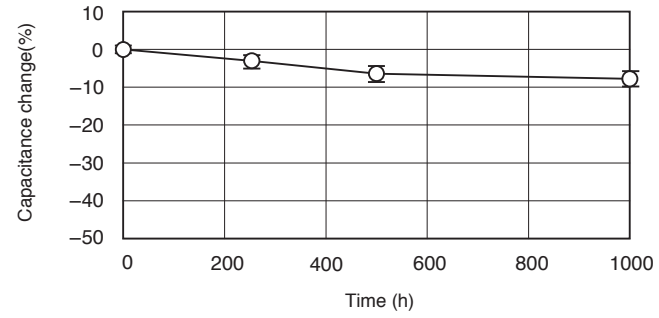
DYNACAP Series DZN
2.5V 1F/DZN-2R5D105T $\phi 8 \times 22L$ (mm)

DYNACAP Series DZN
2.5V 100F/DZN-2R5D107T $\phi 35 \times 50L$ (mm)

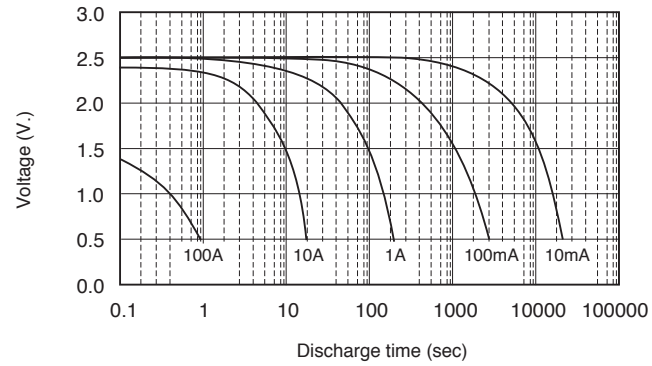
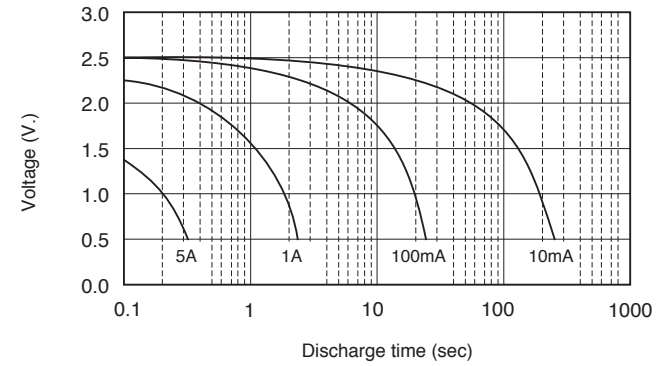
■ Endurance (70°C 2.5V.DC)



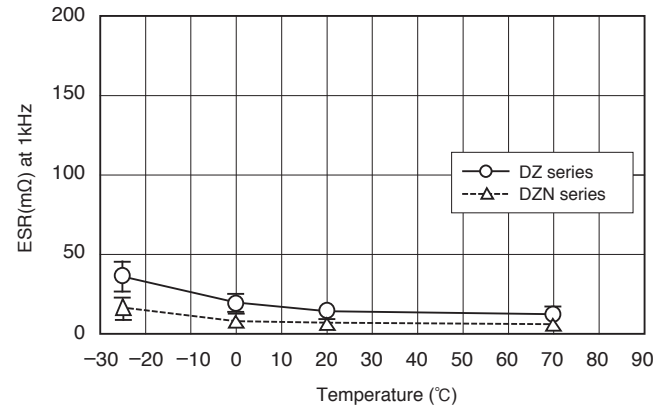
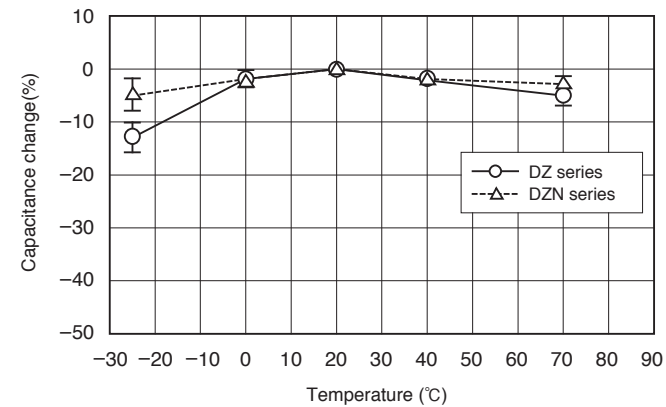
■ Endurance (70°C 2.5V.DC)



■ Discharge characteristics



■ Characteristics at high and low temperature



Electric Double Layer Capacitors

For DC-Link circuits 85°C DC-LINK

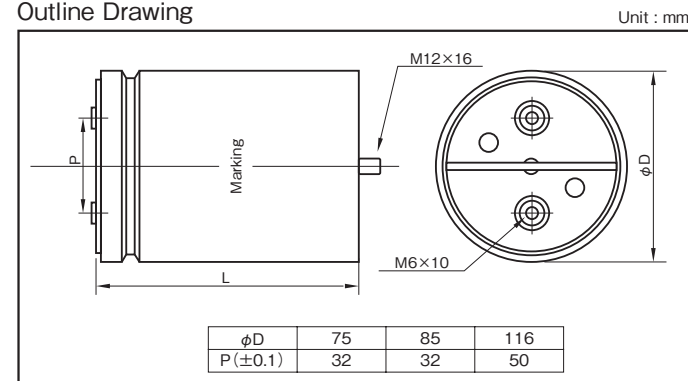
- Used in DC-Link circuits, can replace electrolytic capacitor.
- PP film design, good temperature characteristics, stable capacity, low ESR, high ripple current handing capabilities, low Ls, long life.
- Aluminum case, filled with fire-retardant resin.
- Self-healing property.
- Used in Inverters of wind power and solar power, HEV or EV, welders, elevators, Motor Driver systems.



Specifications

Item	Performance	
Category temperature range (°C)	-40 to +85 (at Hotspot in capacitor)	
Tolerance at rated capacitance (%)	±10 (20°C, 50 to 120Hz)	
Over Voltage	Rated voltage × 1.1	30% of on-load-duration
	Rated voltage × 1.15	30 min/day
	Rated voltage × 1.2	5 min/day
	Rated voltage × 1.3	1 min/day
	Rated voltage × 1.5	30 ms every time, 100ms/day
Dielectric Dissipation Factor	2×10 ⁻⁴ or less	
Life Expectancy	100000 hours (at Hotspot in capacitor = 70°C)	
Failure Rate	50Fit	
Withstanding DC Voltage	Between Terminals	Rated voltage × 1.5 10s
	Between Terminals and Case	3000 VAC 10s (20°C, 50Hz)
Insulation Resistance	5000MΩ·µF or less (20°C, 100V DC, 1min)	
Reference Standard	IEC 61071	

Outline Drawing

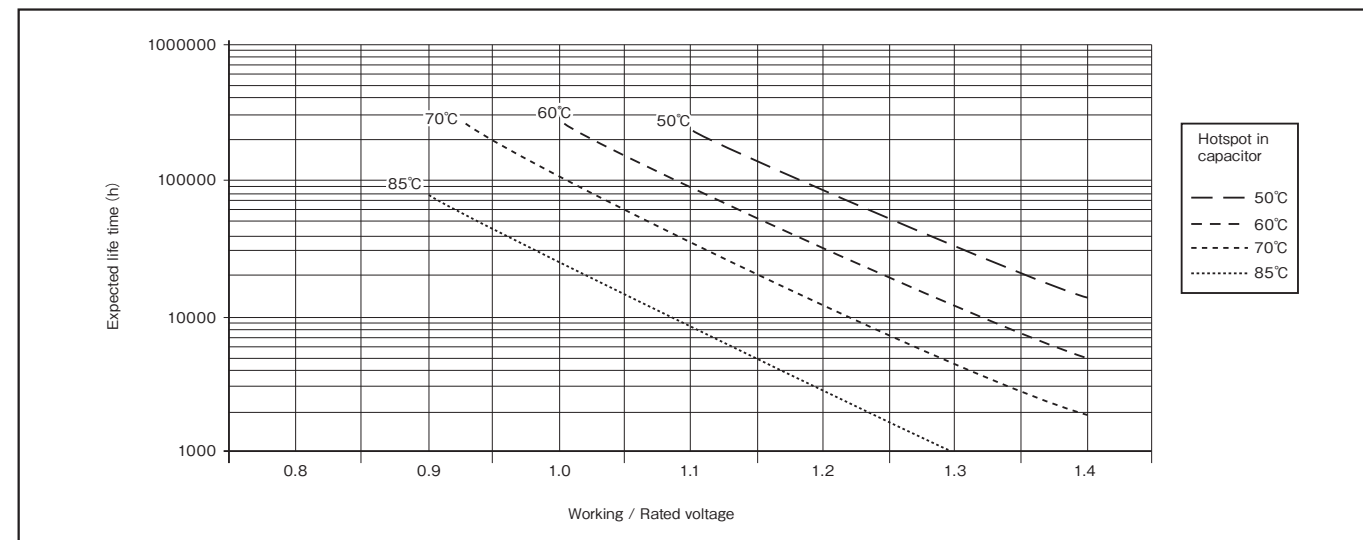


Part numbering system (1100V420µF)

NYD	—	1100	V	421	K	FD6	6BB
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol

Cautions

1. Please do not exceed the specified current.
2. Please confirm voltage waveform and do not exceed the specified voltage.
3. The expected life time changes under the effect of the applied voltage and the inside temperature of the capacitor. Please refer to the following figure.



Certifications of Quality Management System (as of Sep. 2012)

Factory	Applicable Standard	Certification Number	Item	Applicable Organization
ELNA CO., LTD. SHIRAKAWA Tech. (Japan)	ISO 9001	JP05/060268	Aluminum electrolytic capacitors Electric double layer capacitors	SGS
ELNA TOHOKU CO., LTD. AOMORI Factory (Japan)				
TANIN ELNA CO., LTD. (Thailand)	ISO/TS 16949	IATF0089622 44 111 060686	Aluminum electrolytic capacitors Electric double layer capacitors	TÜV
	ISO 9001	04100 1999 0506	Aluminum electrolytic capacitors Electric double layer capacitors	TÜV
ELNA-SONIC SDN. BHD. (Malaysia)	ISO/TS 16949	IATF0110000 SGS MY04/0675	Aluminum electrolytic capacitors	SGS
	ISO 9001	SG02/20012	Aluminum electrolytic capacitors	SGS

Certifications of Environmental Management System (as of Sep. 2012)

Factory	Applicable Standard	Certification Number	Applicable Organization
ELNA TOHOKU CO., LTD. AOMORI Factory (Japan)	ISO 14001	JQA-EM2918	Japan Quality Assurance (JQA)
TANIN ELNA CO., LTD. (Thailand)	ISO 14001	04104 1999 0506E5	TÜV
ELNA-SONIC SDN. BHD. (Malaysia)	ISO 14001	SG03/60718	SGS

Standard Ratings

Rated voltage (V)	Rated capacitance (μF)	Case (mm)		Casing symbol	Maximum current (Arms)	Thermal resistance (K/W)	Maximum peak current (A)	Series resistance (mΩ)	Self-inductance (nH)	ELNA Parts No.
		φD	L							
880	220	85	70	F70	50	5.6	2640	1.9	60	NYD-880V221KF706BB
	260	75	95	E95	45	5.6	2600	2.8	80	NYD-880V261KE956BB
	350	85	95	F95	50	5.1	3500	2.4	60	NYD-880V351KF956BB
	440	116	70	H70	65	5.8	5280	1.5	60	NYD-880V441KH706BB
	480	85	120	FC0	55	4.7	3840	2.8	60	NYD-880V481KFC06BB
	550	85	136	FD6	50	4.6	3850	3.0	60	NYD-880V551KFD66BB
	700	116	95	H95	70	5.4	7000	1.7	60	NYD-880V701KH956BB
	750	85	173	FH3	55	4.3	6750	3.7	60	NYD-880V751KFH36BB
	970	116	120	HC0	75	5.0	5820	1.9	60	NYD-880V971KHC06BB
	1100	116	132	HD2	75	4.9	6600	2.0	60	NYD-880V112KHD26BB
	1500	116	173	HH3	80	3.4	13500	2.4	60	NYD-880V152KHH36BB
	1100	100	75	70	E70	35	6.0	1200	2.5	80
140		85	70	F70	45	5.6	1680	2.1	60	NYD-1100V141KF706BB
170		75	95	E95	40	5.6	1700	3.2	80	NYD-1100V171KE956BB
230		75	120	EC0	40	4.7	1840	4.1	80	NYD-1100V231KEC06BB
260		75	136	ED6	40	4.6	2080	4.4	80	NYD-1100V261KED66BB
280		116	70	H70	60	5.8	2800	1.6	60	NYD-1100V281KH706BB
350		75	173	EH3	40	4.2	3500	5.6	80	NYD-1100V351KEH36BB
420		85	136	FD6	55	4.6	3200	2.2	60	NYD-1100V421KFD66BB
450		116	95	H95	65	5.4	4500	1.9	60	NYD-1100V451KH956BB
480		85	173	FH3	50	4.3	4800	4.3	60	NYD-1100V481KFH36BB
610		116	120	HC0	70	5.0	5490	2.2	60	NYD-1100V611KHC06BB
700		116	132	HD2	70	4.9	6300	2.3	60	NYD-1100V701KHD26BB
940		116	173	HH3	70	3.4	9400	1.6	60	NYD-1100V941KHH36BB
1100	116	230	HNO	80	2.7	11000	1.5	100	NYD-1100V112KHN06BB	
1320	70	75	70	E70	35	6.0	1050	2.8	80	NYD-1320V700KE706BB
	110	75	95	E95	35	5.6	1540	3.8	80	NYD-1320V111KE956BB
	160	75	120	EC0	40	4.7	1600	4.6	80	NYD-1320V161KEC06BB
	180	75	136	ED6	40	4.6	1800	5.1	80	NYD-1320V181KED66BB
	220	85	120	FC0	45	4.7	2200	3.6	60	NYD-1320V221KFC06BB
	260	85	136	FD6	45	4.6	2600	3.9	60	NYD-1320V261KFD66BB
	310	116	95	H95	65	5.4	3720	2.0	60	NYD-1320V311KH956BB
	340	85	173	FH3	50	4.3	4080	4.9	60	NYD-1320V341KFH36BB
	420	116	120	HC0	65	5.0	4200	2.4	60	NYD-1320V421KHC06BB
	480	116	132	HD2	70	4.9	4800	2.6	60	NYD-1320V481KHD26BB
	660	116	173	HH3	70	3.4	7920	3.1	60	NYD-1320V661KHH36BB

Please read the following warning and cautions !!

The Electronic components shown in this catalog are designed and produced mainly for such general purpose electronic equipment as audio and visual equipment, home appliances, office equipment and information processing and communication equipment.

If you wish to use these components in medical equipment, transportation equipment, (automotive, train, ships, etc), aircraft, spacecraft, security systems or other equipment that requires high security application, you are required to confirm application through your own testing and own judgment.

Regardless of a component intended use, if high safety application is required, it is recommended that you shall establish a protective or redundant circuit and shall conduct own evaluation test.

It is highly recommended that you shall follow our "Cautions for using"

Also it is recommended that you shall obtain technical specifications from Elna Co., Ltd to ensure that the component is suitable for your intended use.

It is not our responsibility for any kind of problems without technical specifications.

Specifications and dimensions shown in this catalog are subject to change without prior notice.

ELECTRONIC COMPONENTS

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<http://www.elna.co.jp/>

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SHIRAKAWA OFFICE	9-32 Aza-sugiyama, Oaza-yone, Nishigo-mura, Nishishirakawa-gun, Fukushima, 961-8031 Japan	TEL. +81-248-48-1654 FAX. +81-248-25-5614

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ELNA (SHANGHAI) CO.,LTD. Room 6203, Rui Jin Hotel Business Center 118 Rui Jin 2 Road, Shanghai, China Post Code 200020	TEL. +86-21-64452269 FAX.+86-21-64452271
ELNA BANGKOK SALES OFFICE 88.90. Chalermphrakiat Rama 9 Road, Nongborn, Pravct, Bangkok 10250, Thailand	TEL. +66-2-3985333 FAX.+66-2-3985337
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ELNA-SONIC SDN.BHD. 2473, Tingkat Perusahaan 6, Free Trade Zone, Prai Industrial Estate, 13600 Prai, Penang, Malaysia.	TEL. +60-4-3992916 FAX.+60-4-3992925 Sales office TEL. +60-4-3985369
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2013 / 2014E HIGH QUALITY CAPACITORS



 <p>CAUTION Observe the following to ensure safe operation.</p>	<p>1. The models and specification values contained in this catalog are for reference purposes only. During actual use or when placing an order, please request "drawings" and make your purchase or use the purchased product based on those drawings.</p> <p>2. In order to ensure that products are used correctly and safely, always make sure to read the cautions for using prior to using the product.</p>
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<p>NOTE</p>	<p>1. Since the contents contained are subject to changes in specifications, dimensions and so forth without notice due to modification, please confirm the contents when placing an order. If any of the matters described here are unclear, please inquire at one of our nearby sales offices.</p> <p>2. The contents of this catalog are valid as of December 2012.</p>
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