

Chip Type

GREEN
CAP

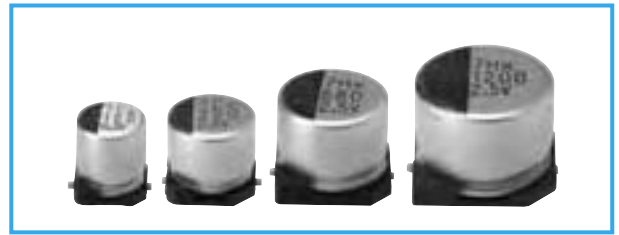
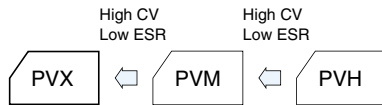
SMD

Low
ESR

105°C
2000hours

Anti-
cleaning
solvent

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



Marking color : Black print

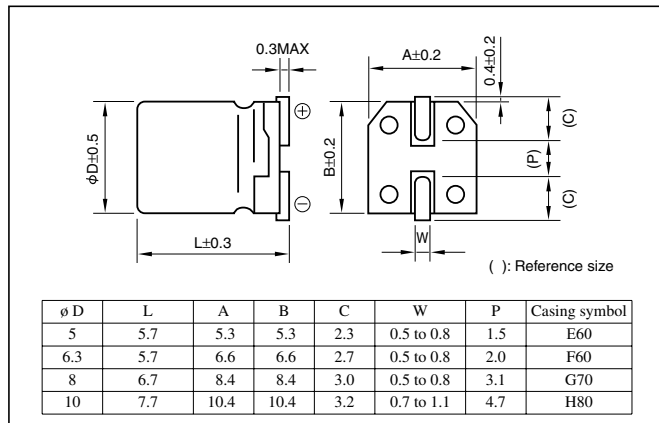
Specifications

Item	Performance										
Category temperature range (°C)	-55 to +105										
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)										
Leakage current (μA) *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 (120Hz)										
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
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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
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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 <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		
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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 tare	1% 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



- Land pattern size are described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Part numbering system (example: 4V150μF)					
PVX	4	V	151	M	E60
Series code	Rated voltage symbol	Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Taping symbol

Standard Ratings

Rated capacitance(μF)	Item	2.5			4			6.3			10		
		Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current
		ø DxL(mm)	(mΩ)	(mA _{rms})	ø DxL(mm)	(mΩ)	(mA _{rms})	ø DxL(mm)	(mΩ)	(mA _{rms})	ø DxL(mm)	(mΩ)	(mA _{rms})
100		—	—	—	—	—	—	5x5.7	15	3100	5x5.7	15	3100
120		—	—	—	—	—	—	—	—	—	6.3x5.7	15	3200
150		5x5.7	10	3800	5x5.7	10	3800	5x5.7	15	3100	—	—	—
220		5x5.7	10	3800	5x5.7	10	3800	6.3x5.7	9	4000	8x6.7	10	3800
270		5x5.7	10	3800	—	—	—	—	—	—	—	—	—
330		—	—	—	6.3x5.7	9	4000	—	—	—	8x6.7	10	3800
390		6.3x5.7	9	4000	—	—	—	8x6.7	8	4300	—	—	—
470		—	—	—	8x6.7	8	4300	8x6.7	8	4300	10x7.7	10	4000
560		8x6.7	8	4300	8x6.7	8	4300	—	—	—	—	—	—
680		8x6.7	8	4300	10x7.7	8	4600	—	—	—	—	—	—
820		—	—	—	—	—	—	10x7.7	8	4600	—	—	—
1000		10x7.7	8	4600	10x7.7	8	4600	—	—	—	—	—	—
1200		10x7.7	8	4600	—	—	—	—	—	—	—	—	—

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
Electrolyte

Chip Type

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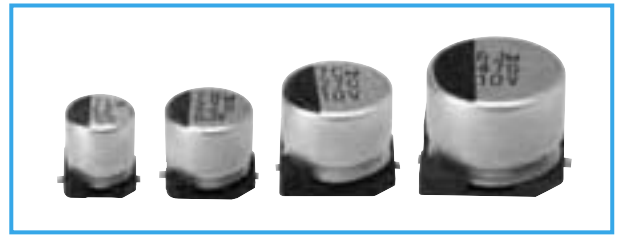
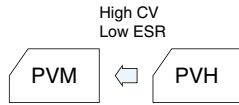
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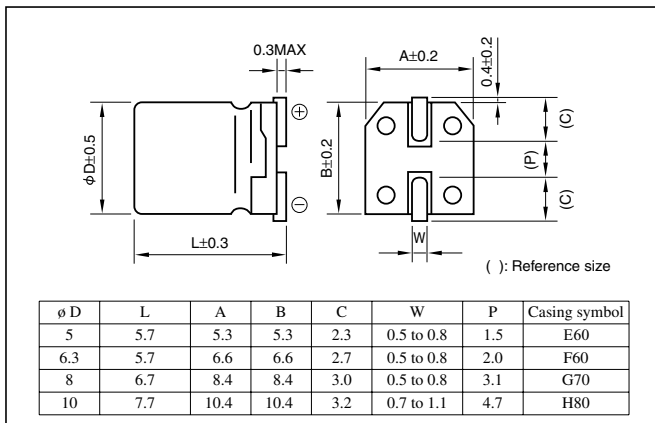
Specifications

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 (120Hz)										
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
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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 <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		
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E.S.R. change	150% or less of the initial specified value										
Failure rate	1% 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



- Land pattern size are described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Part numbering system (example: 4V150μF)					
PVM	—	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			10			16		
	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current
	Rated capacitance(μF) φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)
33	—	—	—	—	—	—	—	—	—	—	—	—	5x5.7	35	2070
39	—	—	—	—	—	—	—	—	—	—	—	—	5x5.7	35	2070
47	—	—	—	—	—	—	—	—	—	5x5.7	28	2310	—	—	—
56	—	—	—	—	—	—	—	—	—	5x5.7	28	2310	—	—	—
68	—	—	—	—	—	—	—	—	—	5x5.7	28	2310	6.3x5.7	28	2340
100	—	—	—	5x5.7	22	2610	5x5.7	24	2500	—	—	—	8x6.7	24	3010
120	—	—	—	—	—	—	5x5.7	24	2500	6.3x5.7	25	2530	8x6.7	24	3010
150	—	—	—	5x5.7	22	2610	—	—	—	—	—	—	—	—	—
180	5x5.7	21	2670	—	—	—	—	—	—	—	—	—	—	—	—
220	—	—	—	—	—	—	6.3x5.7	15	3160	8x6.7	21	3220	10x7.7	22	3450
270	—	—	—	6.3x5.7	15	3160	—	—	—	8x6.7	21	3220	—	—	—
330	—	—	—	6.3x5.7	15	3160	8x6.7	14	3950	—	—	—	—	—	—
390	6.3x5.7	15	3160	—	—	—	8x6.7	14	3950	—	—	—	—	—	—
470	—	—	—	8x7.7	14	3950	—	—	—	10x7.7	19	3800	—	—	—
560	8x6.7	13	3600	8x6.7	14	3950	—	—	—	—	—	—	—	—	—
680	8x6.7	13	3600	—	—	—	—	—	—	—	—	—	—	—	—
820	—	—	—	—	—	—	10x7.7	14	4300	—	—	—	—	—	—
1000	—	—	—	10x7.7	14	4300	—	—	—	—	—	—	—	—	—
1200	10x7.7	13	4450	—	—	—	—	—	—	—	—	—	—	—	—

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

Aluminum Electrolytic Capacitors
With Conductive Polymer Solid
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- Super low E.S.R. and high ripple current are realized.
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PVH

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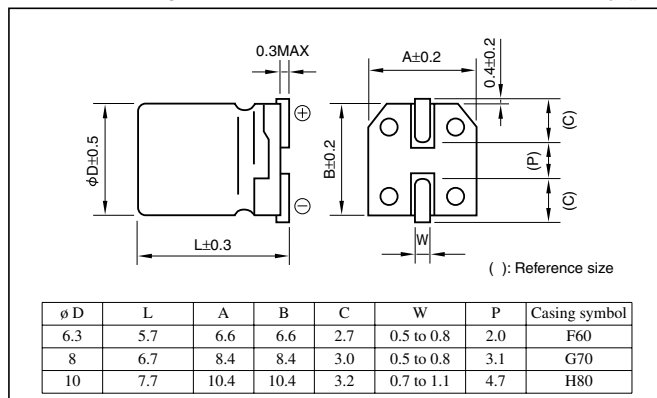
Specifications

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
	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-55°C / Z+20°C : 1.50 (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	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	
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	E.S.R. change	200% or less of the initial specified value	
Failure tare	1% 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 Z — □
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol

- Land pattern size are described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Standard Ratings

Rated voltage(V)	Item	2.5			4			6.3			10			16			20			25		
		Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current
Rated capacitance(μF)		φ DxL(mm)	(mΩ)	(mA _{rms})	φ DxL(mm)	(mΩ)	(mA _{rms})	φ DxL(mm)	(mΩ)	(mA _{rms})	φ DxL(mm)	(mΩ)	(mA _{rms})	φ DxL(mm)	(mΩ)	(mA _{rms})	φ DxL(mm)	(mΩ)	(mA _{rms})	φ DxL(mm)	(mΩ)	(mA _{rms})
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.3x5.7	65	1500
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.3x5.7	50	1650	8x6.7	50	1800
33	—	—	—	—	—	—	—	—	—	—	—	—	—	6.3x5.7	37	2050	—	—	—	—	—	—
39	—	—	—	—	—	—	—	—	—	—	—	—	—	6.3x5.7	37	2050	8x6.7	45	2000	10x7.7	45	2100
47	—	—	—	—	—	—	—	—	—	—	6.3x5.7	31	2250	—	—	—	8x6.7	45	2000	—	—	—
56	—	—	—	—	—	—	—	—	—	—	6.3x5.7	31	2250	—	—	—	—	—	—	—	—	—
68	—	—	—	—	—	—	—	6.3x5.7	27	2400	—	—	—	—	—	—	—	—	—	—	—	—
82	—	—	—	—	—	—	—	6.3x5.7	27	2400	—	—	—	8x6.7	30	2700	10x7.7	40	2500	—	—	—
100	—	—	—	—	6.3x5.7	26	2450	6.3x5.7	27	2400	—	—	—	—	—	—	—	—	—	—	—	—
120	—	—	—	—	—	—	—	6.3x5.7	27	2400	8x6.7	27	2800	—	—	—	—	—	—	—	—	—
150	—	—	—	—	6.3x5.7	26	2450	8x6.7	25	3020	8x6.7	27	2800	10x7.7	26	3430	—	—	—	—	—	—
180	—	—	—	—	—	—	—	—	—	—	—	—	—	10x7.7	26	3430	—	—	—	—	—	—
220	6.3x5.7	25	2500	—	8x6.7	25	3020	8x6.7	25	3020	—	—	—	—	—	—	—	—	—	—	—	—
270	—	—	—	—	—	—	—	—	—	—	10x7.7	24	3770	—	—	—	—	—	—	—	—	—
330	—	—	—	—	8x6.7	25	3020	10x7.7	20	4130	10x7.7	24	3770	—	—	—	—	—	—	—	—	—
470	—	—	—	—	10x7.7	20	4130	10x7.7	20	4130	—	—	—	—	—	—	—	—	—	—	—	—
560	8x6.7	23	3100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
680	—	—	—	—	10x7.7	20	4130	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	10x7.7	19	4240	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

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- Use materials are selected carefully, the high quality is realized.



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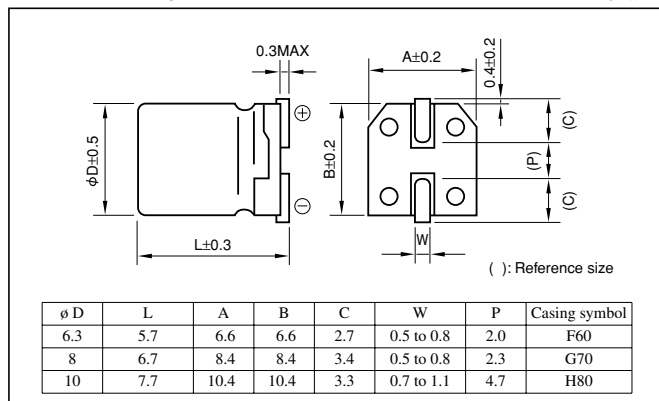
Specifications

Item	Performance		
Category temperature range (°C)	-55 to +105		
Tolerance at rated capacitance (%)	±20 (20°C, 120Hz)		
Leakage current (μA) *Note	Rated voltage (V)	4 to 20	25
	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-55°C / Z+20°C : 1.50 (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	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	
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- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Part numbering system (example: 4V150μF)					
PVO	—	4	V	151	M F60 — □
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol Casing symbol Taping symbol

Standard Ratings

Rated voltage(V) Item	4			6.3			10			16			30			25		
	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current	Case	E.S.R.	Rated ripple current
Rated capacitance(μF)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)	φ DxL(mm)	(mΩ)	(mAmps)
6.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6.3x5.7	75	1250
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x6.7	55	1570
22	—	—	—	—	—	—	—	—	—	—	—	—	6.3x5.7	70	1320	10x7.7	45	2200
27	—	—	—	—	—	—	—	—	—	6.3x5.7	65	1390	6.3x5.7	70	1320	—	—	—
33	—	—	—	—	—	—	—	—	—	6.3x5.7	65	1390	8x6.7	50	1800	—	—	—
39	—	—	—	—	—	—	—	—	—	6.3x5.7	65	1390	8x6.7	50	1800	—	—	—
47	—	—	—	—	—	—	6.3x5.7	55	1510	8x6.7	50	1800	8x6.7	50	1800	—	—	—
56	—	—	—	6.3x5.7	50	1620	6.3x5.7	55	1510	8x6.7	45	1890	10x7.7	40	2400	—	—	—
82	6.3x5.7	50	1620	6.3x5.7	50	1620	8x6.7	40	2120	8x6.7	45	1890	10x7.7	40	2400	—	—	—
100	6.3x5.7	50	1620	6.3x5.7	50	1620	8x6.7	40	2120	10x7.7	35	2670	—	—	—	—	—	—
150	6.3x5.7	50	1620	8x6.7	35	2560	10x7.7	30	3020	10x7.7	35	2670	—	—	—	—	—	—
220	8x6.7	35	2560	10x7.7	25	3700	10x7.7	30	3020	—	—	—	—	—	—	—	—	—
330	8x6.7	35	2560	10x7.7	25	3700	—	—	—	—	—	—	—	—	—	—	—	—
470	10x7.7	25	3700	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

■ 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 or 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.

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 pre-

vent 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 device 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

NOTE

Design, Specifications are subject to change without notice.
Ask factory for technical specifications before purchase and/or 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 28 to 29 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 210,501,540,545N,Diabond DN83K,DA3288,Bond G103

Coating materials: Taffy TF1159,HumiSeal 1B66,1A27NS

■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:

NOTE

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

- (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, sulfuric 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.

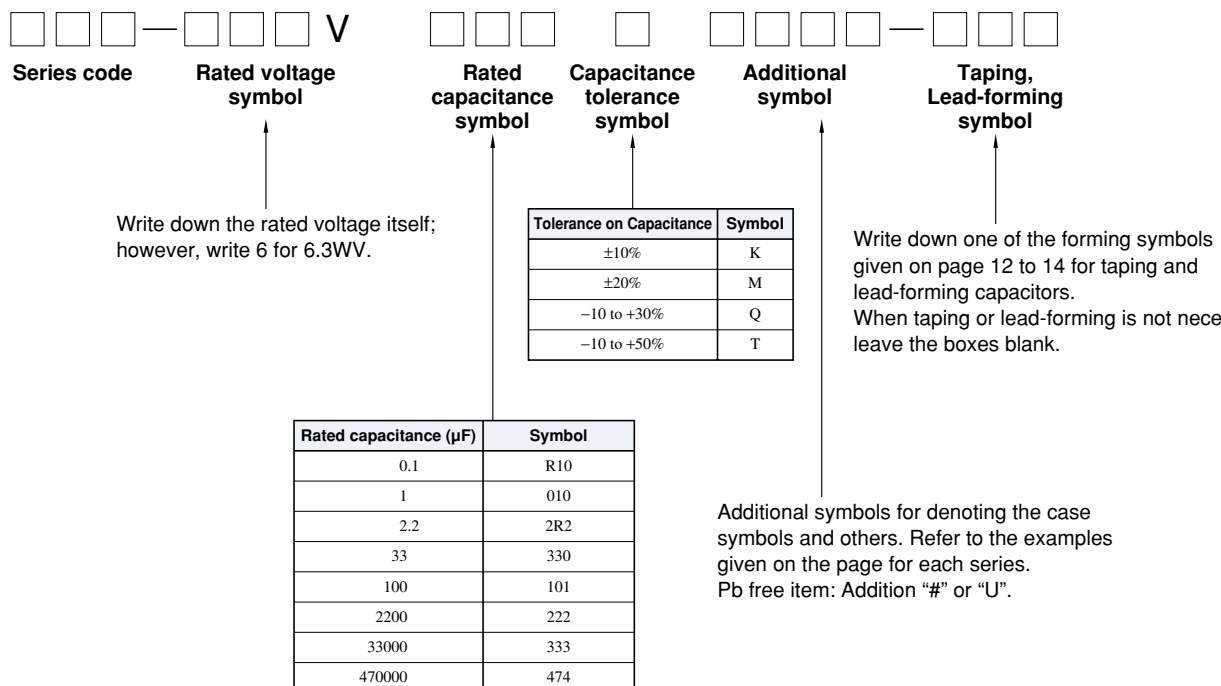
- Punch a hole or crush the capacitors (to prevent explosion) before incineration at approved facility.
- If they are not to be incinerated, bring them to a professional industrial waste disposal company.

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-2367B "Guideline of notabilia for fixed aluminum electrolytic capacitors for use in electronic equipment")

■ Product Symbol System for Aluminum Electrolytic Capacitors



■ Recommended soldering conditions

● Standard type (Lead free)

(1) Methods

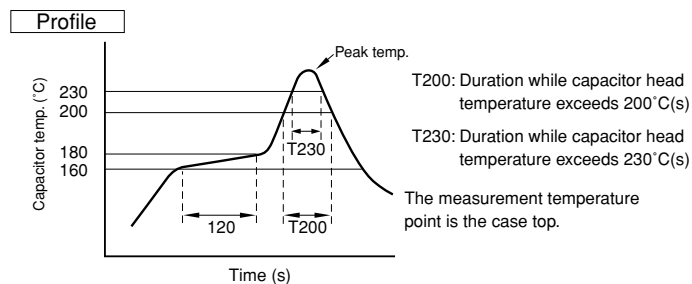
See the following

Methods	Reflow soldering	Soldering iron	Flow soldering
Advisability	○	○	×

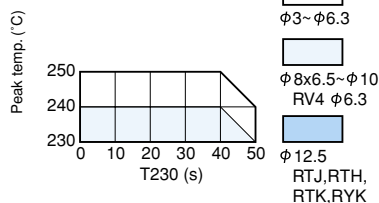
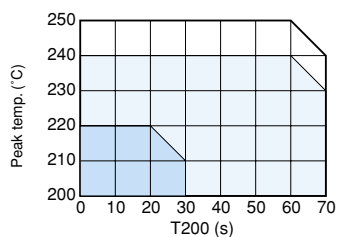
(2) Soldering iron conditions

Iron tip temperature shall be $400^{\circ}\text{C} \pm 5^{\circ}\text{C}$ within the duration of 3^{+1}_0 seconds.

(3) Reflow soldering conditions



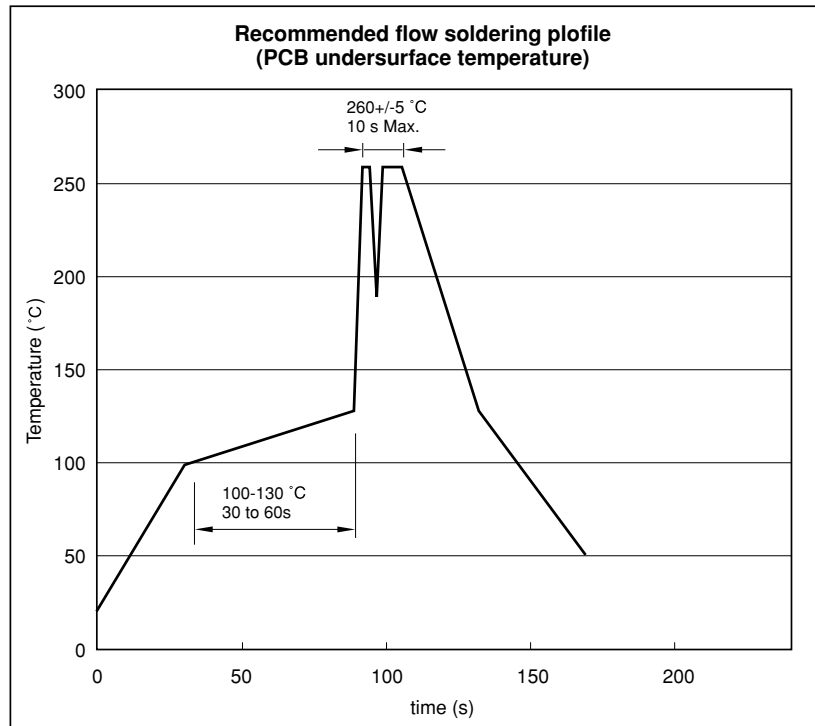
Peak temp. matrix



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.

■ Recommended soldering condition (Lead free flow soldering)

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 product specifications about other notes.

NOTE

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

Chip Type 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.

Convert to chip



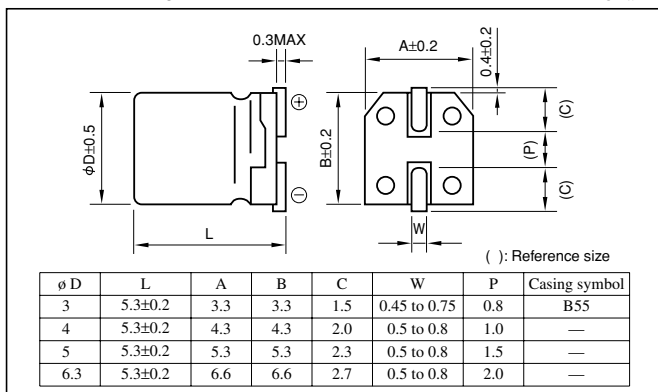
Marking color : Black print

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)		4	6.3	10	16	25	35	50
	tanδ (max.)	ø 3	0.42	0.30	0.24	0.22	0.16	0.14	0.12
		ø 4 to ø 6.3	0.42	0.28	0.24	0.20	0.14	0.12	0.10
Characteristics at high and low temperature	Rated voltage (V)		4	6.3	10	16	25	35	50
	Impedance ratio (max.)	ø 3	Z-25°C / Z+20°C	7	4	3	2	2	2
			Z-40°C / Z+20°C	17	10	8	6	4	3
		ø 4 to ø 6.3	Z-25°C / Z+20°C	7	3	3	2	2	2
			Z-40°C / Z+20°C	15	8	5	4	3	3
	Endurance (85°C) (Applied ripple current)	Test time		2000 hours (ø 3:1000 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 : 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, -18 1998 (IEC 60384-1 1992, -18 1993)								

Outline Drawing

Unit: mm



Coefficient of Frequency for Rated Ripple Current

Rated voltage(V)	Frequency(Hz)			
	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	Additional 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

- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Standard Ratings

Rated voltage (V)	4				6.3				10				16				25				35				50			
	Case	Casing	ESR	Rated ripple current	Case	Casing	ESR	Rated ripple current	Case	Casing	ESR	Rated ripple current	Case	Casing	ESR	Rated ripple current	Case	Casing	ESR	Rated ripple current	Case	Casing	ESR	Rated ripple current	Case	Casing	ESR	Rated ripple current
Rated capacitance (μF)	φ D (mm)	Symbol	Ω	mArms	φ D (mm)	Symbol	Ω	mArms	φ D (mm)	Symbol	Ω	mArms	φ D (mm)	Symbol	Ω	mArms	φ D (mm)	Symbol	Ω	mArms	φ D (mm)	Symbol	Ω	mArms	φ D (mm)	Symbol	Ω	mArms
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	4	—	40	23	3	B55	37	18	5	—	23	32	5	—	20	34	6.3	—	17	44
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

NOTE

Design, Specifications are subject to change without notice.
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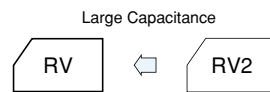
Chip Type Large Capacitance Capacitors

GREEN
CAP

SMD

Anti-
cleaning
solvent

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



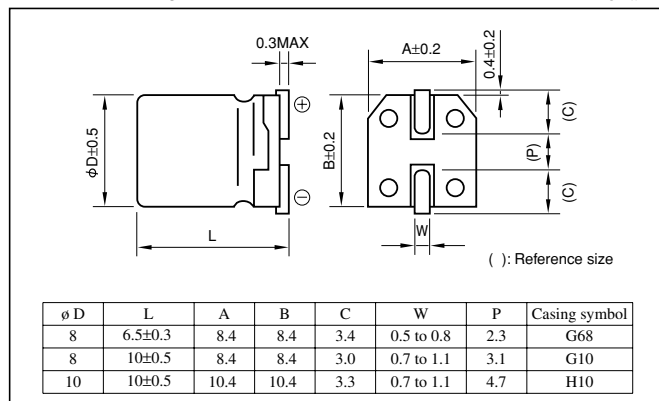
Marking color : Black print (ø8x6.5L)
White print on a brown sleeve (ø8x10L · ø10x10L)

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	(20°C,120Hz)	
Characteristics at high and low temperature											
	Impedance ratio (max.)	Rated voltage (V)	6.3	10	16	25	35	50	63	100	
		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	(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 items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1										
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)										

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	0.80	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: 10V1000μF)

RV	—	10	V	102	M	H10	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol		Taping symbol

- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Standard Ratings

Rated voltage (V)	6.3				10				16				25				35				50				63				100			
	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	8x6.5	G68	4.0	155	8x6.5	G68	3.3	155	8x6.5	G68	2.3	155	8x10	G10	2.0	252	10x10	H10	1.7	458	10x10	H10	1.7	226	—	—	—	—
220	8x6.5	G68	2.1	155	8x6.5	G68	1.8	155	8x10	G10	1.5	252	8x10	G10	1.1	252	10x10	H10	0.91	458	—	—	—	—	—	—	—	—	—	—	—	—
330	8x6.5	G68	1.4	155	8x10	G10	1.2	252	8x10	G10	1.0	252	10x10	H10	0.70	458	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
470	8x10	G10	0.99	252	10x10	H10	0.85	458	8x10	G10	0.71	252	10x10	H10	0.49	458	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	10x10	H10	0.46	458	10x10	H10	0.34	458	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

NOTE

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

Chip Type, 85°C Use, Large Capacitance Capacitors

SMD

Anti-
cleaning
solvent

- Surface mount device.
- Supplied with taping.
- Guarantees 2000 hours at 85°C.

RV
(large)

Large capacitance

RV



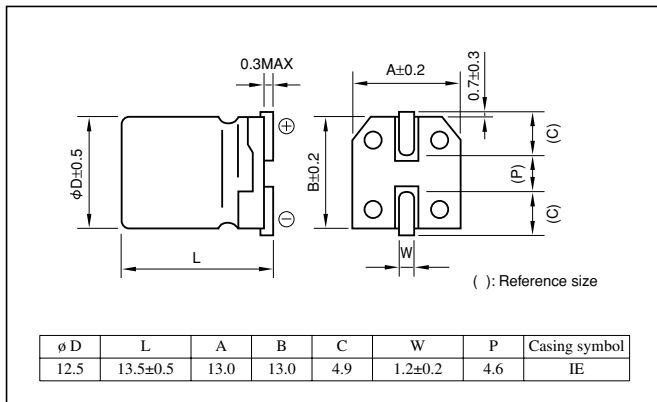
Marking color : White print on a brown sleeve

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 (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.)	0.30	0.26	0.22	0.16	0.13	0.12	0.11	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
Z-40°C / Z+20°C		8	5	4	3	3	3	3	3
	(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 items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1								
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)								

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

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 (example: 10V1500µF)

RV	—	10	V	152	M	IE	□	T	—	R5
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol			Taping symbol

Standard Ratings

Rated voltage (V)	6.3				10				16				25				35				50				63				100			
	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current
Rated capacitance (µF)	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
220	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
330	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
470	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
820	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2200	12.5x13.5	IE	0.23	651	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

NOTE

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

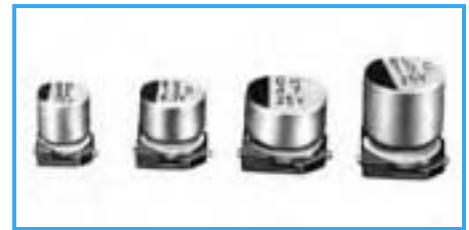
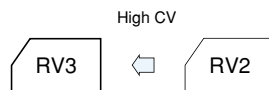
Chip Type 85°C Capacitors (height:5.5mm,8.0mm)

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.



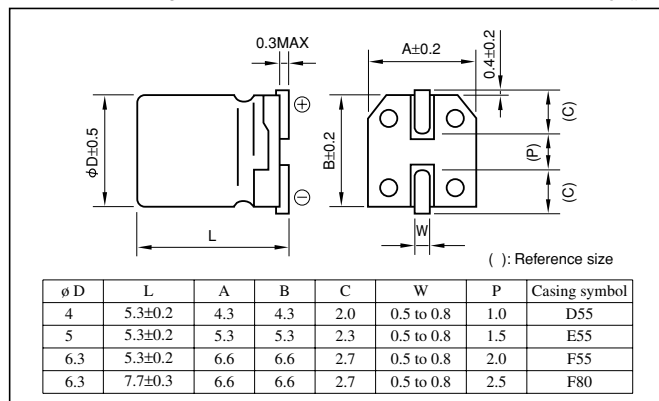
Marking color : Black print

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
(20°C, 120Hz)							
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
		Z-40°C / Z+20°C	8	8	5	5	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 ±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, -18 1998 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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	Additional symbol		Taping symbol

Standard Ratings

Rated capacitance(μF)	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
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.3	42	20
10	—	—	—	—	—	—	—	—	—	4x5.3	30	23	4x5.3	23	27	5x5.3	20	34
22	—	—	—	4x5.3	24	26	4x5.3	20	30	5x5.3	14	43	5x5.3	11	47	6.3x5.3	9.0	59
33	4x5.3	21	28	4x5.3	16	33	5x5.3	13	44	5x5.3	9.0	54	6.3x5.3	7.0	67	6.3x7.7	6.0	82
47	4x5.3	15	34	5x5.3	11	45	5x5.3	9.2	50	6.3x5.3	6.4	75	6.3x7.7	4.9	90	6.3x7.7	4.2	98
68	5x5.3	10	47	5x5.3	7.8	54	6.3x5.3	6.3	74	6.3x5.3	4.4	90	6.3x7.7	3.4	109	—	—	—
100	5x5.3	7.0	58	—	—	—	6.3x5.3	4.3	103	6.3x7.7	3.0	124	—	—	—	—	—	—
150	6.3x5.3	4.6	83	6.3x7.7	3.5	98	6.3x7.7	2.9	109	—	—	—	—	—	—	—	—	—
220	6.3x7.7	3.2	113	6.3x7.7	2.4	130	6.3x7.7	2.0	144	—	—	—	—	—	—	—	—	—
330	6.3x7.7	2.1	139	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

NOTE

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

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.

RV4

Low Profile

RV2



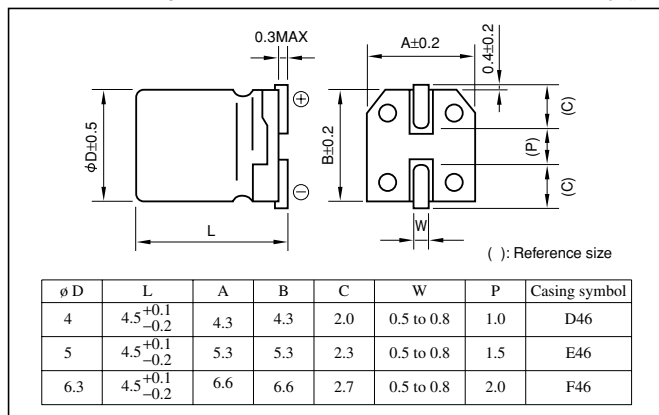
Marking color : Black print

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.)	0.30	0.24	0.19	0.16	0.14	0.12
(20°C,120Hz)							
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
		Z-40°C / Z+20°C	8	8	4	4	3
(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	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, -18 1998 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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	0.70	1	1.25	1.40
	0.1 to 3.3μF	0.50	1	1.35	1.50
	4.7 to 10μF	0.70	1	1.35	1.50

Part numbering system (example: 6.3V47μF)

RV4	—	6	V	470	M	E46	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol	Taping symbol	

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
		φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1990	3
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

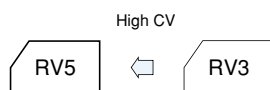
Chip Type Large Capacitance Capacitors

GREEN
CAP

SMD

Anti-
cleaning
solvent

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



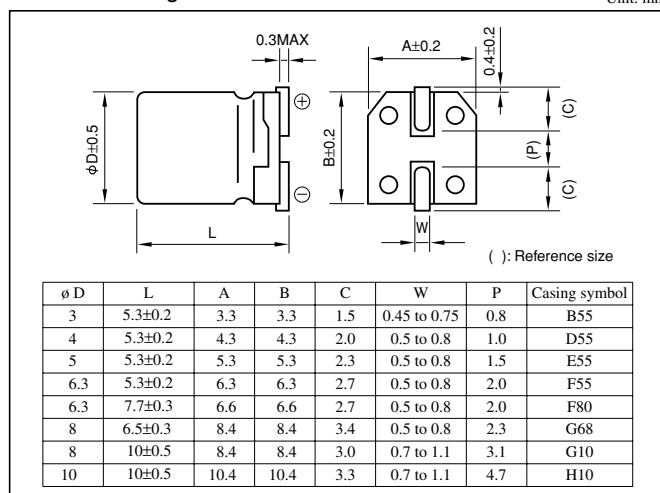
Marking color : Black print (ø3x5.3L – ø8x10L)
White print on a brown sleeve (ø10x10L)

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
	(120Hz)									
Endurance (85°C) (Applied ripple current)	Test time		2000 hours (ø 3:1000 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, -18 1998 (IEC 60384-1 1992, -18 1993)									

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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 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	Additional symbol		Taping symbol

- The standard ratings are described on the next page.

NOTE

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

Standard Ratings

Rated voltage (V)	6.3			10			16			25			35			50			63			100		
	Item			Item			Item			Item			Item			Item			Item			Item		
	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	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
Rated capacitance (μF)	φ D(mm)			φ D(mm)			φ D(mm)			φ D(mm)			φ D(mm)			φ D(mm)			φ D(mm)			φ D(mm)		
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3x5.3	B55	7	—	—	—
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3x5.3	B55	10	4x5.3	D55	12	—	—	—
4.7	—	—	—	—	—	—	—	—	—	—	—	—	3x5.3	B55	13	4x5.3	D55	18	5x5.3	E55	20	—	—	—
10	—	—	—	—	—	—	3x5.3	B55	18	3x5.3	B55	16	4x5.3	D55	24	5x5.3	E55	30	6.3x5.3	F55	32	—	—	—
22	3x5.3	B55	21	3x5.3	B55	20	—	—	—	4x5.3	D55	24	5x5.3	E55	41	6.3x5.3	F55	47	6.3x7.7	F80	60	—	—	—
																			8x6.5	G68	62			
33	—	—	—	—	—	—	4x5.3	D55	32	5x5.3	E55	47	—	—	—	8x6.5	G68	83	—	—	—	8x10	G10	94
47	4x5.3	D55	34	4x5.3	D55	33	5x5.3	E55	52	—	—	—	6.3x5.3	F55	54	6.3x7.7	F80	85	8x10	G10	139	10x10	H10	189
100	5x5.3	E55	55	5x5.3	E55	54	6.3x5.3	F55	70	6.3x7.7	F80	120	6.3x7.7	F80	120	8x10	G10	252	10x10	H10	226	—	—	—
										8x6.5	G68	118												
150	—	—	—	6.3x5.3	F55	79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
220	6.3x5.3	F55	88	6.3x7.7	F80	173	6.3x7.7	F80	162	—	—	—	8x10	G10	260	—	—	—	—	—	—	—	—	—
				8x6.5	G68	175																		
330	6.3x7.7	F80	188	—	—	—	—	—	—	8x10	G10	300	10x10	H10	360	—	—	—	—	—	—	—	—	—
	8x6.5	G68	190																					
470	—	—	—	8x10	G10	310	8x10	G10	307	10x10	H10	400	—	—	—	—	—	—	—	—	—	—	—	—
680	—	—	—	—	—	—	10x10	H10	380	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
820	8x10	G10	320	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	—	—	—	10x10	H10	454	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1500	10x10	H10	489	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(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.

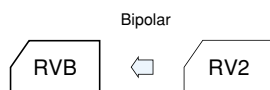
Chip Type Bipolar Capacitors (height:5.5mm)

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.



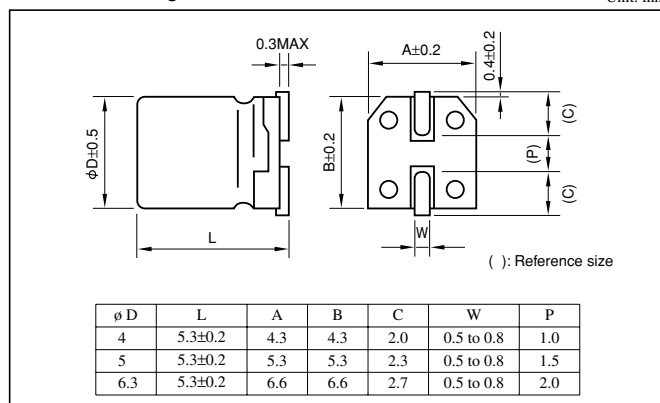
Marking color : Black print

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)		6.3	10	16	25	35	50
	tanδ (max.)	ø 4	0.35	0.30	0.25	0.25	0.25	0.25
		ø 5, 6.3	0.30	0.25	0.20	0.15	0.15	0.15
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	2
		Z-40°C / Z+20°C	8	5	4	3	3	3
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		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, -18 1998 (IEC 60384-1 1992, -18 1993)							

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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: 6.3V47μF)

RVB	—	6	V	470	M	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Additional symbol		Taping symbol

Standard Ratings

Rated capacitance(μF)	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
Item	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms	φ D(mm)	Ω	mArms
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	3320	2.3
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	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

NOTE

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

Chip Type 105°C Capacitors (height:5.5mm)

GREEN
CAP

SMD

105°C
1000hours

Anti-
cleaning
solvent

- Compatible with surface mounting for 5.5mm high capacitors.
- Supplied with carrier taping.
- Guarantees 1000 hours at 105°C.

RVS

High temperature

RV2



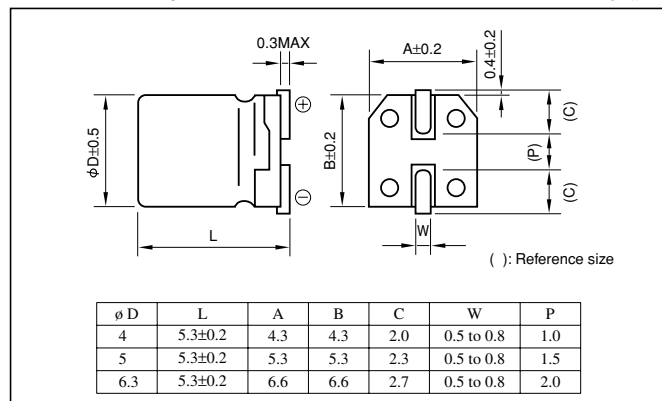
Marking color : Black print

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
(20°C,120Hz)							
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
		Z-40°C / Z+20°C	8	5	4	3	3
(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 items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1						
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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: 16V47μF)

RVS	—	16	V	470	M	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Additional symbol		Taping symbol

Standard Ratings

Rated capacitance(μF)	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
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1990	2
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	905	3
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	603	4
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	424	5
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	199	7
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	91	10
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	60	12
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	42	17
10	—	—	—	4	43	15	4	36	16	5	27	21	4	46	14	5	91	10
22	4	23	21	5	20	25	5	17	28	6.3	12	36	6.3	10	50	—	—	—
33	5	15	30	5	13	31	6.3	11	40	6.3	8.0	44	—	—	—	—	—	—
47	5	11	36	6.3	9.2	43	6.3	7.8	47	—	—	—	—	—	—	—	—	—
100	6.3	5.0	61	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

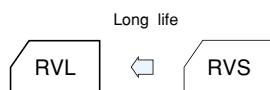
Chip Type 105°C Capacitors (height:6.0mm)

GREEN
CAP

SMD

105°C
2000hoursAnti-
cleaning
solvent

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



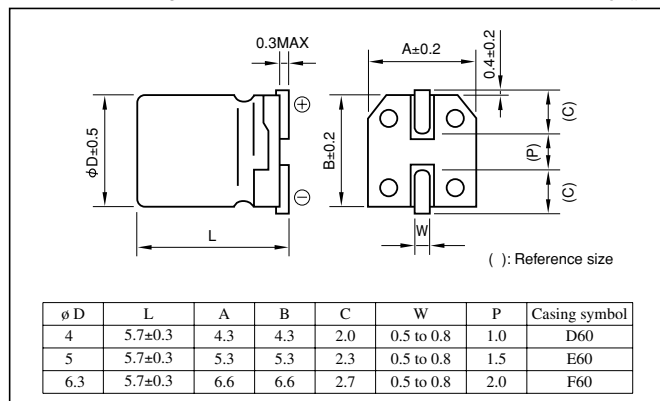
Marking color : Black print

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	(20°C,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	5	4	3	3
Endurance (105°C) (Applied ripple current)	(120Hz)						
	Test time	2000 hours					
	Leakage current	The initial specified value or less					
	Percentage of capacitance change	Within ±30% of initial value					
Shelf life (105°C)	Tangent of the loss angle	300% or less of the initial specified value					
	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, -18 1998 (IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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	1.15	1.25
	25 · 35	0.8	1	1.25	1.40
	0.1 to 3.3μF	0.5	1	1.35	1.50
	4.7 to 10μF	0.7	1	1.35	1.50

Part numbering system (example: 16V470M F60 □ U □)

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

Standard Ratings

Rated capacitance(μF)	Item	Rated voltage(V)			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			
		ø D(mm)	Ω	mArms	ø D(mm)	Ω	mArms	ø D(mm)	Ω	mArms	ø D(mm)	Ω	mArms	ø D(mm)	Ω	mArms	ø D(mm)	Ω	mArms			
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	2321	4			
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	1055	5			
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	703	6			
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	494	7			
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	232	12			
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	105	19			
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	70	22			
4.7	—	—	—	—	—	—	—	—	—	—	4	63	21	4	53	23	5	49	29			
10	—	—	—	—	—	—	4	40	27	5	30	36	5	25	39	6.3	23	47	—			
22	—	—	—	—	—	—	5	18	46	6.3	14	62	6.3	11	65	—	—	—	—			
33	—	—	—	—	—	—	6.3	12	66	6.3	9.0	76	—	—	—	—	—	—	—			
47	—	—	—	—	6.3	9.9	74	6.3	8.5	78	—	—	—	—	—	—	—	—	—			
100	6.3	5.3	99	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			

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

NOTE

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

Chip Type, 105°C Use, Large Capacitance Capacitors

GREEN
CAP

SMD

105°C
2000hoursAnti-
cleaning
solvent

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

RVJ

High temperature

RV



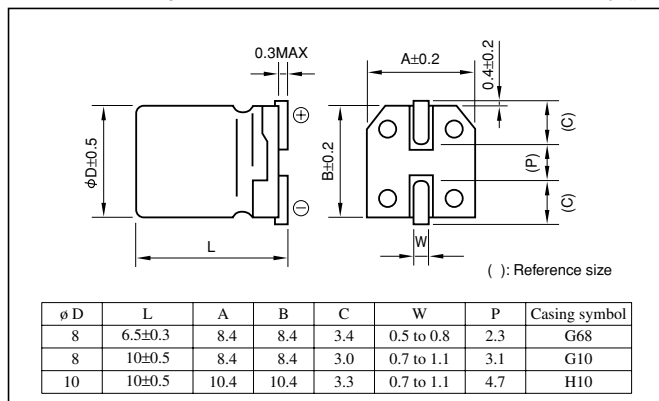
Marking color : Black print (ø8x6.5L)
White print on a brown sleeve (ø8x10L · ø10x10L)

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	63	100
	tanδ (max.)		0.30	0.24	0.22	0.16	0.13	0.12	0.11	0.10
	(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	5	4	3	3	3	3	3
(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; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1									
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)									

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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 to 63	0.80	1	1.35	1.50
100	0.70	1	1.35	1.50

Part numbering system (example: 16V470μF)

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

Standard Ratings

Rated voltage (V)	6.3				10				16				25				35				50				63				100				
	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	
	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	
Item																																	
Rated capacitance (μF)																																	
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
220	8x10	G10	2.3	178	8x10	G10	2.0	178	10x10	H10	1.7	324	10x10	H10	1.2	324	10x10	H10	0.98	324	—	—	—	—	—	—	—	—	—	—	—	—	—
330	8x10	G10	1.5	178	10x10	H10	1.3	324	10x10	H10	1.1	324	10x10	H10	0.80	324	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
470	10x10	H10	1.0	324	10x10	H10	0.92	324	10x10	H10	0.78	324	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	10x10	H10	0.50	324	10x10	H10	0.40	324	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Chip Type, 105°C Use, Large Capacitance Capacitors

SMD

105°C
5000hoursAnti-
cleaning
solvent

- Surface mount device.
- Supplied with taping.
- Guarantees 5000 hours at 105°C.

RVJ
(large)

High temperature

RV
(large)

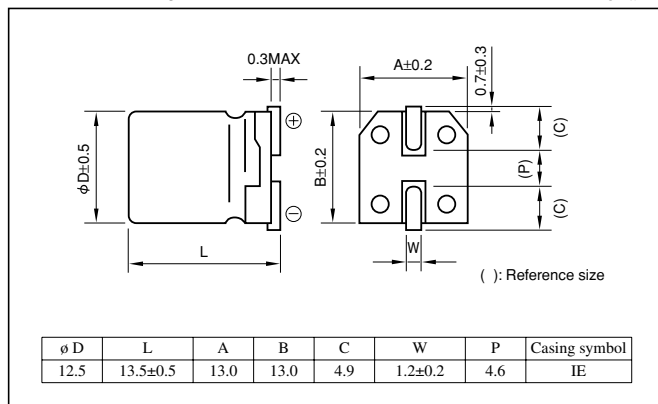
Marking color : White print on a brown sleeve

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 (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.)		0.30	0.26	0.22	0.16	0.13	0.12	0.11	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	2
		Z-40°C / Z+20°C	8	5	4	3	3	3	3	3
(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; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1									
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)									

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

Frequency(Hz)	120	1k	10k	100k
Rated capacitance(μF)				
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 (example: 10V1000μF)

RVJ	—	10	V	102	M	IE	□	T	—	R5
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol			Taping symbol

Standard Ratings

Rated voltage (V)	6.3				10				16				25				35				50				63				100			
	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms	Case	Casing symbol	Imp. Ω	Rated ripple current mArms
Rated capacitance (μF)	φ D(mm)				φ D(mm)				φ D(mm)				φ D(mm)				φ D(mm)				φ D(mm)				φ D(mm)				φ D(mm)			
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
220	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
330	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
470	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1000	12.5x13.5	IE	0.105	747	12.5x13.5	IE	0.105	747	12.5x13.5	IE	0.105	747	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 105°C, 100kHz ; Impedance(Imp.) : 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, Low Impedance Capacitors

GREEN
CAP

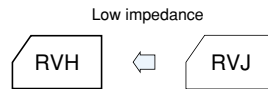
SMD

Low
Impedance

105°C
2000hours

Anti-
cleaning
solvent

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



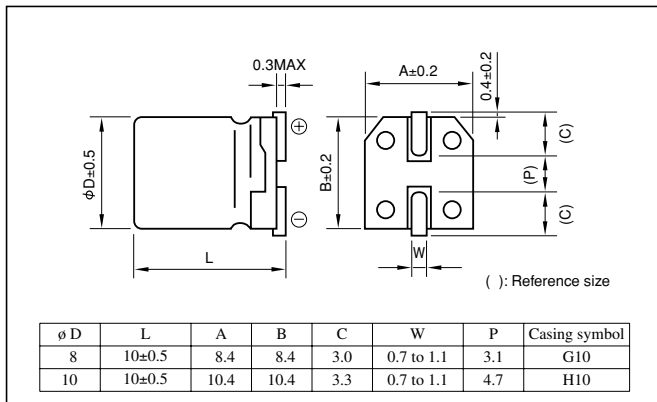
Marking color : White print on a brown sleeve

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)	6.3	10	16	25	35
	tanδ (max.)	0.30	0.26	0.22	0.16	0.13
(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-40°C / Z+20°C	8	5	4	3
(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; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1					
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)					

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Coefficient	0.64	0.8	0.93	1

Part numbering system (example: 16V330μF)

RVH	—	16	V	331	M	H10	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol		Taping symbol

Standard Ratings

Item	6.3				10				16				25				35			
	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	0.45	369
100	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	0.45	369	10x10	H10	0.25	553
220	—	—	—	—	8x10	G10	0.45	369	—	—	—	—	10x10	H10	0.25	553	—	—	—	—
330	8x10	G10	0.45	369	—	—	—	—	10x10	H10	0.25	553	—	—	—	—	—	—	—	—
470	—	—	—	—	10x10	H10	0.25	553	—	—	—	—	—	—	—	—	—	—	—	—

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

Chip Type, 105°C Use, Long Life Capacitors

GREEN
CAP

SMD

105°C
3000hoursAnti-
cleaning
solvent

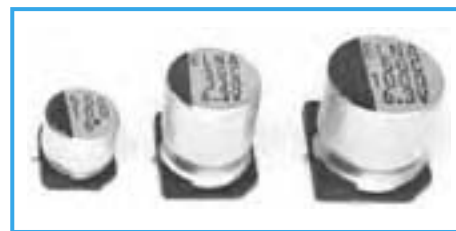
- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 3000 hours at 105°C.
(10L:5000 hours).

Long life

RVC

◀

RVL



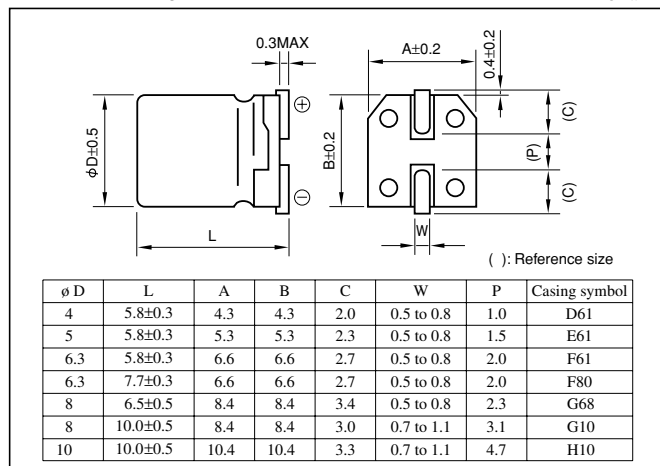
Marking color : Black print

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(mF),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
(20°C,120Hz)							
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
		Z-40°C / Z+20°C	10	7	5	3	3
(120Hz)							
Endurance (105°C)	Test time	3000 hours(10L:5000 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 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, -18 1998(IEC 60384-1 1992, -18 1993)						

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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
4.7μF to	0.7	1	1.35	1.50

Part numbering system (example: 16V47μF)

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

- The standard ratings are described on the next page.

NOTE

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

Standard Ratings

Rated voltage(V) Rated capacitance(μF) Item	6.3			10			16			25			35			50		
	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	Case	Casing symbol	Rated ripple current mArms	Case	Casing symbol	Rated ripple current mArms
	ø D(mm)			ø D(mm)			ø D(mm)			ø D(mm)			ø D(mm)			ø D(mm)		
0.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	1.0
0.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	2.6
0.33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	3.2
0.47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	5.0
1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	10
2.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	16
3.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	17
4.7	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	16	5x5.8	E61	23
10	—	—	—	—	—	—	4x5.8	D61	28	—	—	—	5x5.8	E61	28	6.3x5.8	F61	35
22	4x5.8	D61	26	—	—	—	5x5.8	E61	39	—	—	—	6.3x5.8	F61	55	6.3x7.7	F80	58
33	—	—	—	5x5.8	E61	43	—	—	—	6.3x5.8	F61	60	6.3x7.7	F80	57	8x10	G10	91
47	5x5.8	E61	46	—	—	—	6.3x5.8	F61	70	6.3x7.7	F80	65	—	—	—	8x10	G10	100
100	6.3x5.8	F61	71	—	—	—	6.3x7.7	F80	81	8x10	G10	130	—	—	—	10x10	H10	160
220	6.3x7.7	F80	101	8x10	G10	160	—	—	—	—	—	—	10x10	H10	220	—	—	—
330	8x10	G10	230	—	—	—	—	—	—	10x10	H10	238	—	—	—	—	—	—
470	—	—	—	—	—	—	10x10	H10	340	—	—	—	—	—	—	—	—	—
1000	10x10	H10	313	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Chip Type, 105°C Use, Long Life Capacitors

GREEN
CAP

SMD

Low Z

105°C
2000hoursAnti-
cleaning
solvent

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

Low Z, Long life

RVD



RVZ



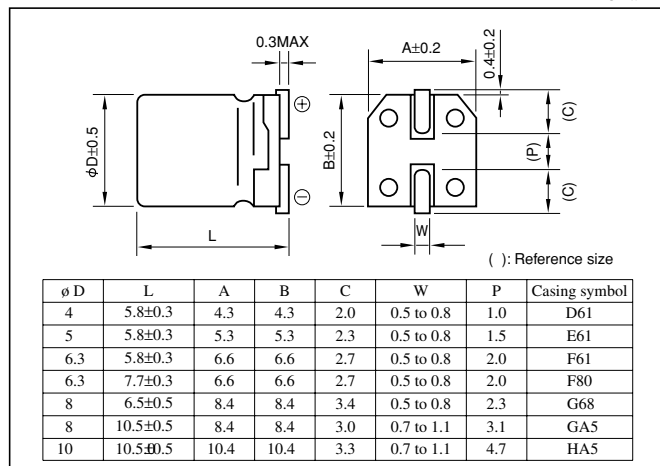
Marking color : Black print

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(mF),V:Rated voltage(V) (20°C)																																		
Tangent of loss angle (tanδ)	<table><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>0.26</td><td>0.19</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td></tr></table>							Rated voltage (V)	6.3	10	16	25	35	50	tanδ (max.)	0.26	0.19	0.16	0.14	0.12	0.10														
	Rated voltage (V)	6.3	10	16	25	35	50																												
tanδ (max.)	0.26	0.19	0.16	0.14	0.12	0.10																													
(20°C,120Hz)																																			
Characteristics at high and low temperature	<table><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="3">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></tr><tr><td>Z-40°C / Z+20°C</td><td>3</td><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td>Z-55°C / Z+20°C</td><td>8</td><td>4</td><td>4</td><td>3</td><td>3</td></tr></table>							Rated voltage (V)	6.3	10	16	25	35	50	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		
	Rated voltage (V)	6.3	10	16	25	35	50																												
	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																													
(120Hz)																																			
Endurance (105°C)	<table><tr><td>Test time</td><td colspan="6">2000 hours(10.5L:5000 hours)</td></tr><tr><td>Leakage current</td><td colspan="6">The initial specified value or less</td></tr><tr><td>Percentage of capacitance change</td><td colspan="6">Within ±30% of initial value</td></tr><tr><td>Tangent of the loss angle</td><td colspan="6">200% or less of initial specified value (10.5L:300% or less)</td></tr></table>							Test time	2000 hours(10.5L:5000 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 (10.5L:300% or less)					
	Test time	2000 hours(10.5L:5000 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 (10.5L:300% or less)																																		
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, -18 1998(IEC 60384-1 1992, -18 1993)																																		

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

Frequency(Hz)	50	120	1k	10k-100k
Rated voltage(V)				
6.3 ~ 50	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	Additional symbol		Taping symbol

- The standard ratings are described on the next page.

NOTE

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

Standard Ratings

Rated voltage (V)	Item	6.3				10				16				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	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current
		øDxL (mm)		Ω	mArms	øDxL (mm)		Ω	mArms	øDxL (mm)		Ω	mArms	øDxL (mm)		Ω	mArms	øDxL (mm)		Ω	mArms	øDxL (mm)		Ω	mArms
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.8	D61	1.35	90	4x5.8	D61	2.7	60
10	—	—	—	—	—	—	—	—	4x5.8	D61	1.35	90	4x5.8	D61	1.35	90	4x5.8	D61	1.35	90	5x5.8	E61	1.5	90	
22	4x5.8	D61	1.35	90	4x5.8	D61	1.35	90	4x5.8	D61	1.35	90	5x5.8	E61	0.70	170	5x5.8	E61	0.70	170	5x5.8	E61	0.70	170	
33	—	—	—	—	4x5.8	D61	1.35	90	—	—	—	—	5x5.8	E61	0.70	170	5x5.8	E61	0.70	170	6.3x5.8	F61	0.86	170	
47	4x5.8	D61	1.35	90	—	—	—	—	5x5.8	E61	0.70	170	6.3x5.8	F61	0.36	250	6.3x5.8	F61	0.36	250	6.3x7.7	F80	0.66	195	
100	5x5.8	E61	0.70	170	—	—	—	—	6.3x5.8	F61	0.36	250	6.3x5.8	F61	0.36	250	6.3x7.7	F80	0.30	300	8x6.5	G68	0.63	200	
220	6.3x5.8	F61	0.36	250	—	—	—	—	6.3x5.8	F61	0.36	250	8x6.5	G68	0.30	300	8x10.5	GA5	0.16	600	8x10.5	GA5	0.32	350	
330	6.3x7.7	F80	0.30	300	6.3x7.7	F80	0.30	300	8x6.5	G68	0.30	300	8x10.5	GA5	0.16	600	8x10.5	GA5	0.16	600	10x10.5	HA5	0.18	700	
470	8x10.5	GA5	0.16	600	8x10.5	GA5	0.16	600	8x10.5	GA5	0.16	600	8x10.5	GA5	0.16	600	10x10.5	HA5	0.08	850	—	—	—	—	
680	—	—	—	—	8x10.5	GA5	0.16	600	10x10.5	HA5	0.08	850	—	—	—	—	—	—	—	—	—	—	—	—	
1000	8x10.5	GA5	0.16	600	10x10.5	HA5	0.08	850	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
1500	10x10.5	HA5	0.08	850	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

(Note) Impedance : 20°C, 100kHz

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.

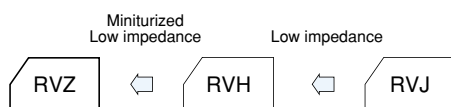
Chip Type, 105°C Use, Low Impedance Capacitors

GREEN
CAP

SMD

Low
Impedance105°C
2000hoursAnti-
cleaning
solvent

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



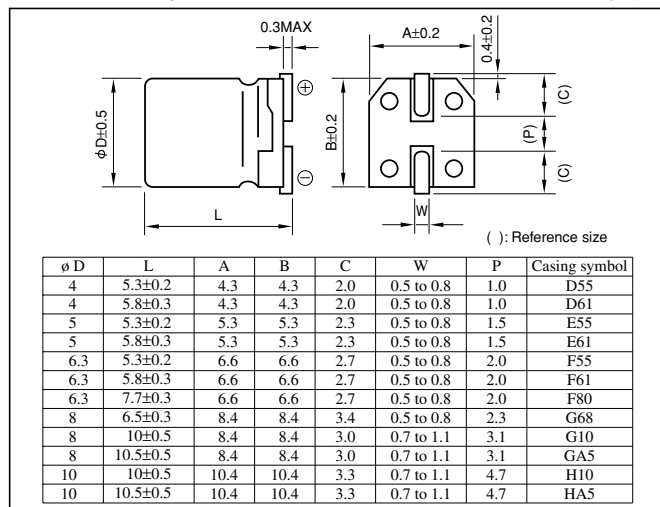
Marking color : Black print (ø4x5.3L – ø8x6.5L)
White print on a brown sleeve (ø8x10L · ø10x10L)

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
(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
(120Hz)						
Endurance (105°C) (Applied ripple current)	Test time	2000 hours (8x6.5 or less: 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				
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, -18 1998 (IEC 60384-1 1992, -18 1993)					

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

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

Part numbering system (example: 6.3V1500μF)

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

- The standard ratings are described on the next page.

NOTE

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

Standard Ratings

Rated voltage (V)	Item	6.3				10				16				25				35			
		Case	Casing	Impedance	Rated ripple	Case	Casing	Impedance	Rated ripple	Case	Casing	Impedance	Rated ripple	Case	Casing	Impedance	Rated ripple	Case	Casing	Impedance	Rated ripple
		ø D(mm)	symbol	Ω	mArms	ø D(mm)	symbol	Ω	mArms	ø D(mm)	symbol	Ω	mArms	ø D(mm)	symbol	Ω	mArms	ø D(mm)	symbol	Ω	mArms
4.7	—	—	—	—	—	—	—	—	—	—	—	—	—	4x5.3	D55	3.20	65	4x5.3	D55	3.20	65
10	—	—	—	—	—	4x5.3	D55	3.20	65	4x5.3	D55	3.20	65	4x5.8	D61	1.80	80	5x5.3	E55	1.50	110
														5x5.3	E55	1.50	110	5x5.8	E61	0.76	150
15	—	—	—	—	—	—	—	—	—	4x5.8	D61	1.80	80	5x5.8	E61	0.76	150	5x5.8	E61	0.76	150
22	—	4x5.3	D55	3.20	65	4x5.8	D61	1.80	80	5x5.3	E55	1.50	110	5x5.8	E61	0.76	150	5x5.8	E61	0.76	150
		4x5.8	D61	1.80	80	5x5.3	E55	1.50	110	5x5.8	E61	0.76	150	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170
33	—	5x5.3	E55	1.50	110	5x5.3	E55	1.50	110	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170
		5x5.8	E61	0.76	150	5x5.8	E61	0.76	150	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230
47	—	5x5.3	E55	1.50	110	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170	6.3x5.8	F61	0.44	230
		5x5.8	E61	0.76	150	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x7.7	F80	0.34	280
68	—	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	8x6.5	G68	0.34	280
																		6.3x7.7	F80	0.34	280
100	—	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170	6.3x5.3	F55	0.85	170	6.3x7.7	F80	0.34	280	8x10	G10	0.20	450
		6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	8x6.5	G68	0.34	280	8x10.5	GA5	0.17	450
		6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x7.7	F80	0.34	280	8x10	G10	0.20	450	8x10.5	GA5	0.17	450
150	—	6.3x5.8	F61	0.44	230	6.3x5.8	F61	0.44	230	6.3x7.7	F80	0.34	280	8x10	G10	0.20	450	10x10	H10	0.10	670
220	—	6.3x5.8	F61	0.44	230	6.3x7.7	F80	0.34	280	6.3x7.7	F80	0.34	280	8x10.5	GA5	0.17	450	8x10.5	GA5	0.17	450
		6.3x7.7	F80	0.34	280	8x6.5	G68	0.34	280	8x10	G10	0.20	450	10x10	H10	0.10	670	10x10	H10	0.10	670
		6.3x7.7	F80	0.34	280	8x10	G10	0.20	450	8x10.5	GA5	0.17	450	8x10.5	GA5	0.17	450	10x10.5	HA5	0.09	670
330	—	8x6.5	G68	0.34	200	10x10	H10	0.10	670	10x10	H10	0.10	670	10x10	H10	0.10	670	10x10.5	HA5	0.09	670
		8x10	G10	0.20	450	10x10	H10	0.10	670	10x10	H10	0.10	670	10x10	H10	0.10	670				
		8x10.5	GA5	0.17	450	10x10.5	GA5	0.17	450	10x10.5	GA5	0.17	450	10x10.5	HA5	0.09	670				
470	—	8x10.5	GA5	0.17	450	10x10.5	GA5	0.17	450	10x10.5	GA5	0.17	450	10x10.5	HA5	0.09	670	—	—	—	—
		10x10	H10	0.10	670	10x10	H10	0.10	670	10x10	H10	0.10	670	—	—	—	—	—	—	—	—
680	—	8x10.5	GA5	0.17	450	10x10.5	HA5	0.09	670	10x10.5	HA5	0.09	670	—	—	—	—	—	—	—	—
1000	—	8x10.5	GA5	0.17	450	10x10.5	HA5	0.09	670	—	—	—	—	—	—	—	—	—	—	—	—
		10x10	H10	0.10	670																
1500	—	10x10.5	HA5	0.09	670	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

Chip Type 125°C Capacitors

GREEN
CAP

SMD

125°C
1250hours105°C
5000hoursAnti-
cleaning
solvent

- Compatible with surface mounting.
- Supplied with carrier taping.
- Guarantees 1250 hours at 125°C.
(ø8 : 1000 hours)
- Guarantees 5000 hours at 105°C.
(ø8 : 4000 hours)

RVK

High temperature

RVJ



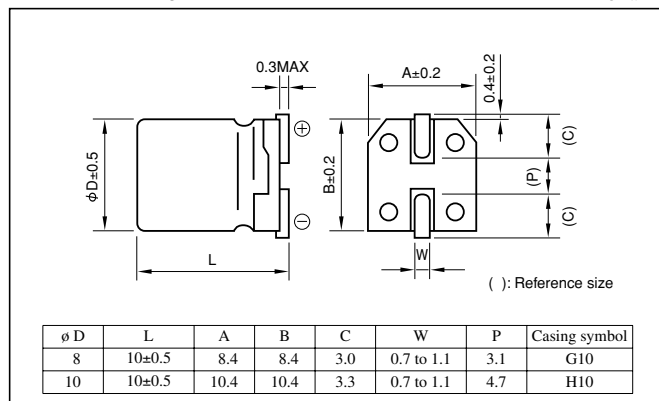
Marking color : Gold print on a brown sleeve

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	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		ø10 : 1250h, ø8 : 1000h			ø10 : 5000h, ø8 : 4000h		
	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, -18 1998 (IEC 60384-1 1992, -18 1993)							

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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

Part numbering system (example: 16V220μF)

RVK	—	16	V	221	M	H10	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol		Taping symbol

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)	φ D(mm)	Ω	Ω	mArms	φ D(mm)	Ω	Ω	mArms	φ D(mm)	Ω	Ω	mArms	φ D(mm)	Ω	Ω	mArms	φ D(mm)	Ω	Ω	mArms	φ D(mm)	Ω	Ω	mArms
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	32	0.80	38	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	32	0.65	45	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	14	0.80	38	8x10	14	1.00	33
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10x10	14	0.65	48	10x10	14	0.67	48
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	10	0.80	40	—	—	—	—
220	8x10	2.1	0.68	60	10x10	2.0	0.55	107	—	—	—	—	—	—	—	—	10x10	10	0.60	58	—	—	—	—
330	10x10	1.4	0.55	111	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

NOTE

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

RVK(Large) VERTICAL CHIP TYPE ALUMINUM ELECTROLYTIC CAPACITORS ELNA®

Chip Type, 125°C Use, Large Capacitance Capacitors

SMD

125°C
5000hours

Anti-
cleaning
solvent

- Surface mount device.
- Supplied with taping.
- Guarantees 5000 hours at 125°C.

RVK
(large)

High temperature

RVJ
(large)



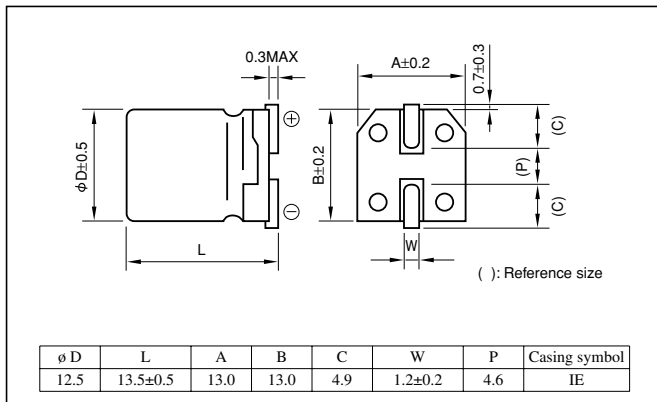
Marking color : White print on a brown sleeve

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 (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.)		0.26	0.22	0.16	0.13	0.12	0.11
	0.02 is added to each 1000μF (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	2	2	2	2	2
		Z-40°C / Z+20°C	5	4	3	3	3	3
(120Hz)								
Endurance (125°C) (Applied ripple current)	Test time		5000 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 (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, -18 1998 (IEC 60384-1 1992, -18 1993)							

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

Frequency(Hz)	120	1k	10k	100k
Rated capacitance(μF)				
100	0.40	0.75	0.90	1
220 to 330	0.50	0.85	0.95	1
470	0.60	0.88	0.96	1

Part numbering system (example: 10V470μF)

RVJ	—	10	V	471	M	IE	□	T	—	R5
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol			Taping symbol

Standard Ratings

Rated voltage (V)	10				16				25				35				50				63			
	Case	Casing symbol	Imp.	Rated ripple current	Case	Casing symbol	Imp.	Rated ripple current	Case	Casing symbol	Imp.	Rated ripple current	Case	Casing symbol	Imp.	Rated ripple current	Case	Casing symbol	Imp.	Rated ripple current	Case	Casing symbol	Imp.	Rated ripple current
Rated capacitance (μF)	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms
100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.5x13.5	IE	0.136	509	12.5x13.5	IE	0.176	447
220	—	—	—	—	—	—	—	—	—	—	—	—	12.5x13.5	IE	0.105	579	—	—	—	—	—	—	—	—
330	—	—	—	—	—	—	—	—	12.5x13.5	IE	0.105	579	—	—	—	—	—	—	—	—	—	—	—	—
470	12.5x13.5	IE	0.105	579	12.5x13.5	IE	0.105	579	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Note) Rated ripple current : 125°C, 100kHz ; Impedance(Imp.) : 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, Large Capacitance Capacitors

SMD

Vibration
Resistance105°C
2000hoursAnti-
cleaning
solvent

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

RTJ

Vibration resistance

RVJ



Marking color : White print on a brown sleeve

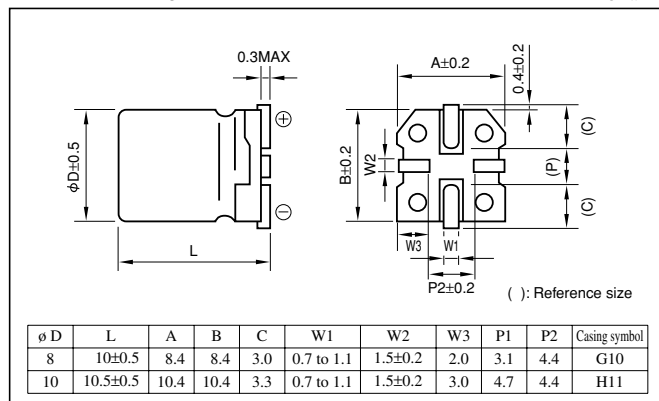
Specifications

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)	6.3	10	16	25	35	50	63	100	(20°C,120Hz)
	tanδ (max.)	0.30	0.26	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	(120Hz)
	Impedance ratio (max.)	Z-25°C / Z+20°C	4	3	2	2	2	2	2	
		Z-40°C / Z+20°C	8	5	4	3	3	3	3	
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; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5101-1									
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)									

Chip type
Aluminum Electrolytic Capacitors

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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 to 63	0.80	1	1.35	1.50
100	0.70	1	1.35	1.50

Part numbering system (example: 25V220μF)

RTJ	—	25	V	221	M	H11	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol		Taping symbol

Standard Ratings

Rated voltage (V)	6.3				10				16				25				35				50				63				100							
	Item	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current	Case	Casing symbol	ESR	Rated ripple current			
		φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms	φ D(mm)		Ω	mArms			
Rated capacitance (μF)																																				
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	16.6	67			
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	8.3	99	10x10.5	H11	7.5	133
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	4.6	178	8x10	G10	6.0	178	10x10.5	H11	5.5	160	—	—	—	—	—		
100	—	—	—	—	—	—	—	—	—	8x10	G10	3.6	178	8x10	G10	2.7	178	10x10.5	H11	2.2	324	10x10.5	H11	2.0	324	—	—	—	—	—	—	—	—	—	—	
220	8x10	G10	2.3	178	8x10	G10	2.0	178	10x10.5	H11	1.7	324	10x10.5	H11	1.2	324	10x10.5	H11	0.98	324	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
330	8x10	G10	1.5	178	10x10.5	H11	1.3	324	10x10.5	H11	1.1	324	10x10.5	H11	0.80	324	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
470	10x10.5	H11	1.0	324	10x10.5	H11	0.92	324	10x10.5	H11	0.78	324	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	

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

NOTE

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

Chip Type, 105°C Use, Low Impedance Capacitors

SMD

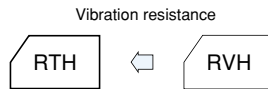
Vibration
Resistance

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.



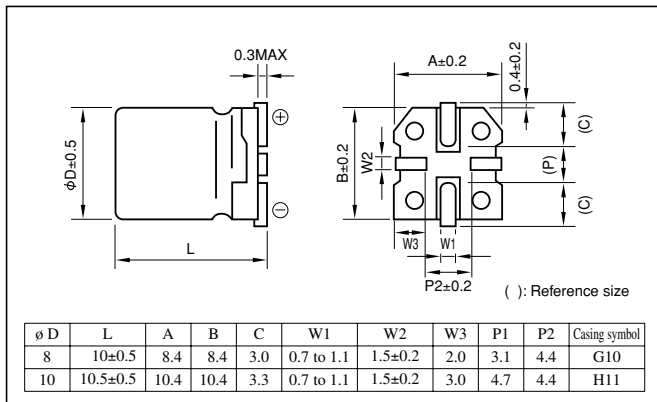
Marking color : White print on a brown sleeve

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)	6.3	10	16	25	35
	tanδ (max.)	0.30	0.26	0.22	0.16	0.13
(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-40°C / Z+20°C	8	5	4	3
(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; other items are the same as those for the endurance. Voltage application treatment : According to JIS C5102					
Applicable standards	JIS C5101-1, -18 1998 (IEC 60384-1 1992, -18 1993)					

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

Coefficient of Frequency for Rated Ripple Current

Frequency (Hz)	50 · 60	120	1k	10k · 100k
Coefficient	0.64	0.8	0.93	1

Part numbering system (example: 25V100μF)

RTH	—	25	V	101	M	G10	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol		Taping symbol

Standard Ratings

Item	6.3				10				16				25				35			
	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current	Case	Casing symbol	Impedance	Rated ripple current
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	0.45	369
100	—	—	—	—	—	—	—	—	—	—	—	—	8x10	G10	0.45	369	10x10.5	H11	0.25	553
220	—	—	—	—	8x10	G10	0.45	369	—	—	—	—	10x10.5	H11	0.25	553	—	—	—	—
330	8x10	G10	0.45	369	—	—	—	—	10x10.5	H11	0.25	553	—	—	—	—	—	—	—	—
470	—	—	—	—	10x10.5	H11	0.25	553	—	—	—	—	—	—	—	—	—	—	—	—

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

Chip Type 125°C Capacitors

SMD

Vibration
Resistance125°C
1250hours105°C
5000hoursAnti-
cleaning
solvent

- Compatible with surface mounting.
- For Vibration resistance.
- Supplied with carrier taping.
- Guarantees 1250 hours at 125°C.
(ø8 : 1000 hours)
- Guarantees 5000 hours at 105°C.
(ø8 : 4000 hours)

RTK

Vibration resistance

RVK



Marking color : Gold print on a brown sleeve

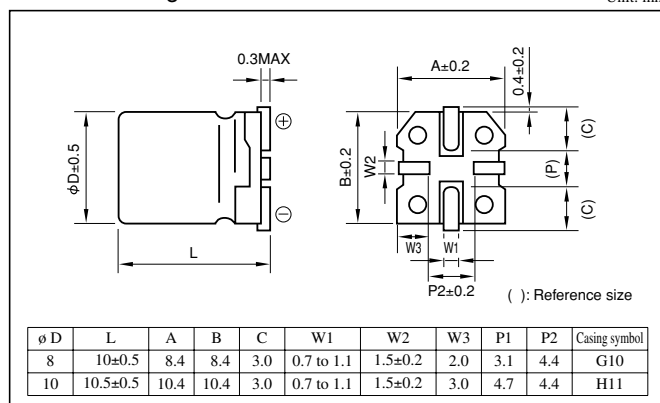
Specifications

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	
Characteristics at high and low temperature	(20°C,120Hz)							
	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
Endurance (Applied ripple current)	(120Hz)							
	Test temp.	125°C			105°C			
	Test time	ø10 : 1250h, ø8 : 1000h			ø10 : 5000h, ø8 : 4000h			
	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, -18 1998 (IEC 60384-1 1992, -18 1993)						

Chip type
Aluminum Electrolytic Capacitors

Outline Drawing

Unit: mm



- Land pattern size is described on page 10.
- The taping specifications are described on page 11.
- Soldering conditions are described on page 32.

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

Part numbering system (example: 16V220μF)

RTK	—	16	V	221	M	H11	□	U	□
Series code		Rated voltage symbol		Rated capacitance symbol	Capacitance tolerance symbol	Casing symbol	Additional symbol		Taping symbol

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)	ø D(mm)	Ω	Ω	mArms	ø D(mm)	Ω	Ω	mArms	ø D(mm)	Ω	Ω	mArms	ø D(mm)	Ω	Ω	mArms	ø D(mm)	Ω	Ω	mArms	ø D(mm)	Ω	Ω	mArms
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	32	0.80	38	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10x10.5	32	0.65	45	—	—	—	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8x10	14	0.80	38	8x10	14	1.00	33
47	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10x10.5	14	0.65	48	10x10.5	14	0.67	48
100	—	—	—	—	—	—	—	—	—	—	—	—	8x10	7.1	0.68	55	8x10	10	0.80	40	—	—	—	—
220	8x10	2.1	0.68	60	10x10.5	2.0	0.55	107	—	—	—	—	10x10.5	3.3	0.55	102	—	—	—	—	—	—	—	—
330	10x10.5	1.4	0.55	111	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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

NOTE

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