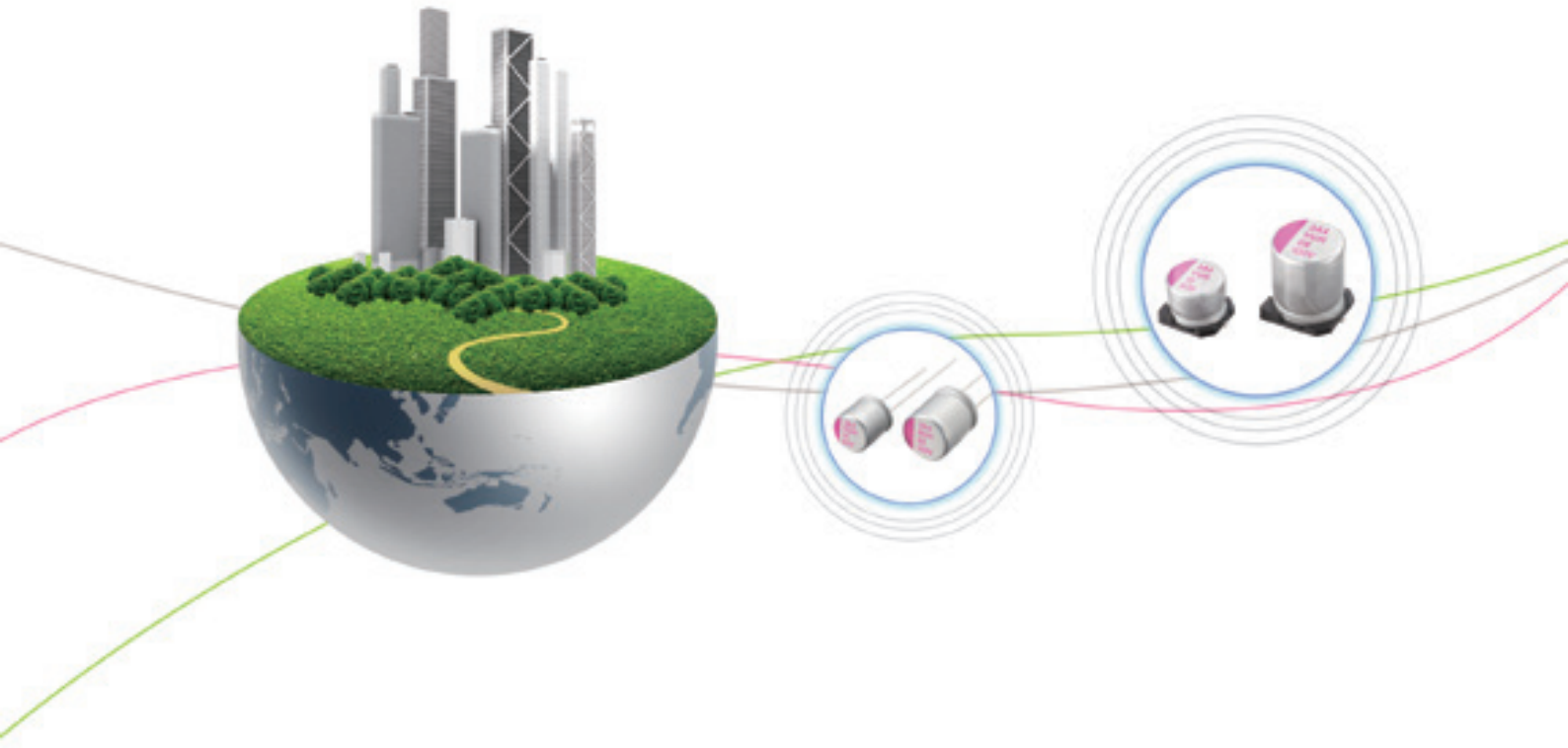
www.enesol.com

EneCap™

Conductive Polymer Aluminum Solid Capacitors

We are confident, through our accumulated experience, research and development activities, we can make major contributions to the applied electronic component industry and to the quality of life.



EneSol

Ver. 6 2016

ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 89
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EneSol is specialized in the Conductive Polymer Aluminum Solid Capacitors

EneSol Co., Ltd., headquartered in the Republic of Korea, has made remarkable growth since 2004 and became a leading manufacturer in the conductive polymer aluminum solid capacitors although mostly make efforts to on technology development, we define ourselves as a technical service company. That we focus product quality, fast responses and engineering services for higher customer satisfaction EneSol has the ability to be innovative and responsive to global business demands and requirements. Working closely with customers, we ensure their business success.

We look technical innovations and long-term customer relationship as our business objectives We learned customer's satisfaction and success are based on quality, cost and time-to market that we focus 5 major philosophies or factors for customer's competitiveness;

- Product Quality
- Fast Response
- Cost Savings
- On-time Delivery
- Field Engineering services

RoHS compliant

Pb lead-free

Br Cl Halogen Less

EneSol concerns and make efforts to achieve an environmental system that all its products are RoHS & Hologen Free compliant and its plant is ISO-9001 and 14001. EneSol is TS16949 and AEC-Q 200 certified.

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Features of EneCap

- **Very Low ESR in High Frequencies Area**
  As EneCap has lower ESR at high frequencies above 100KHz,
  it's possible to save more space and to reduce absorption of high-frequency noise.
- **Rapid Charge/Discharge**
  As Large and Instantaneous Current is consumed at high speed,
  it's possible to meet requirement of CPU and DC/DC Converter.
- **High Heat Resistance and Extremely Low Inflammability**
  EneCap excels in high-temperature characteristics and is applicable to lead-free soldering.
- **High Reliabilities**
  Guarantee more than 1,000~20,000hrs at 105~125℃.
- **No Voltage & Capacitance De-rating**

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Series Table

Type	Series	Features	Endurance	Rated Voltage Range [Vdc]	Capacitance Range [μF]	62Page
Radial	RS	Standard	105°C / 3,000hrs	2.5 to 25	6.8 to 1,500	06
	RL	Large Capacitance, Low ESR	105°C / 3,000hrs	2.5 to 16	100 to 3,500	08
	RSL	Long Life Cycle	105°C / 5,000hrs	2.5 to 25	6.8 to 1,500	10
	RLL	Large Capacitance, Low ESR Long Life Cycle	105°C / 5,000hrs	2.5 to 16	100 to 3,500	12
	RSH	High Temperature	125°C / 1,000hrs	2.5 to 25	6.8 to 1,500	14
	RLH	Large Capacitance, Low ESR High Temperature	125°C / 1,000hrs	2.5 to 16	100 to 3,500	16
	RU	Ultra Low ESR	105°C / 2,000hrs	2.5 to 6.3	470 to 1,500	18
	RHV	High Voltage, Long Life	105°C / 5,000hrs	16 to 50	10 to 1,500	20
	RUH	Ultra High Voltage	105°C / 3,000hrs	63 to 125	8.2 to 120	22
	RHH	High Voltage, High Temperature	125°C / 3,000hrs	16 to 50	5.6 to 390	24
	RHR	High Ripple Current, Long Life	105°C / 10,000hrs	2.5 to 16	100 to 3,500	26
	RHVL	High Ripple Current, High Voltage,Long Life	105°C / 10,000hrs	16 to 50	10 to 1,500	28
	RSC	Large Capacitance, Long Life	105°C / 20,000hrs	2.5 to 25	82 to 1,500	30
	RHHL	High Voltage, High Temperature,Long Life	125°C / 4,000hrs	16 to 80	22 to 1,000	32
SMD	VS	Standard	105°C / 2,000hrs	2.5 to 25	6.8 to 1,500	34
	VL	Large Capacitance, Low ESR	105°C / 2,000hrs	2.5 to 16	39 to 2,700	36
	VSL	Long Life Cycle	105°C / 5,000hrs	2.5 to 25	6.8 to 1,500	38
	VLL	Long Life Cycle	105°C / 5,000hrs	2.5 to 16	39 to 2,700	40
	VSH	High Temperature	125°C / 1,000hrs	2.5 to 25	6.8 to 1,500	42
	VLH	High Temperature	125°C / 1,000hrs	2.5 to 16	39 to 2,700	44
	VU	Ultra Low ESR	105°C / 2,000hrs	2.5 to 16	150 to 560	46
	VHV	High Voltage, Long Life	105°C / 5,000hrs	16 to 50	10 to 1,500	48
	VUH	Ultra High Voltage	105°C / 3,000hrs	63 to 125	8.2 to 120	50
	VHH	High Voltage, High Temperature	125°C / 3,000hrs	16 to 50	5.6 to 390	52
	VHR	High Ripple Current, Long Life	105°C / 10,000hrs	2.5 to 16	39 to 2,700	54
	VHVL	High Ripple Current, High Voltage, Long Life	105°C / 10,000hrs	16 to 50	10 to 1,500	56
	VSC	Large Capacitance, Long Life	105°C / 20,000hrs	4 to 16	22 to 560	58
	VHHL	High Voltage, High Temperature, Long Life	125°C / 4,000hrs	16 to 80	22 to 1,000	60

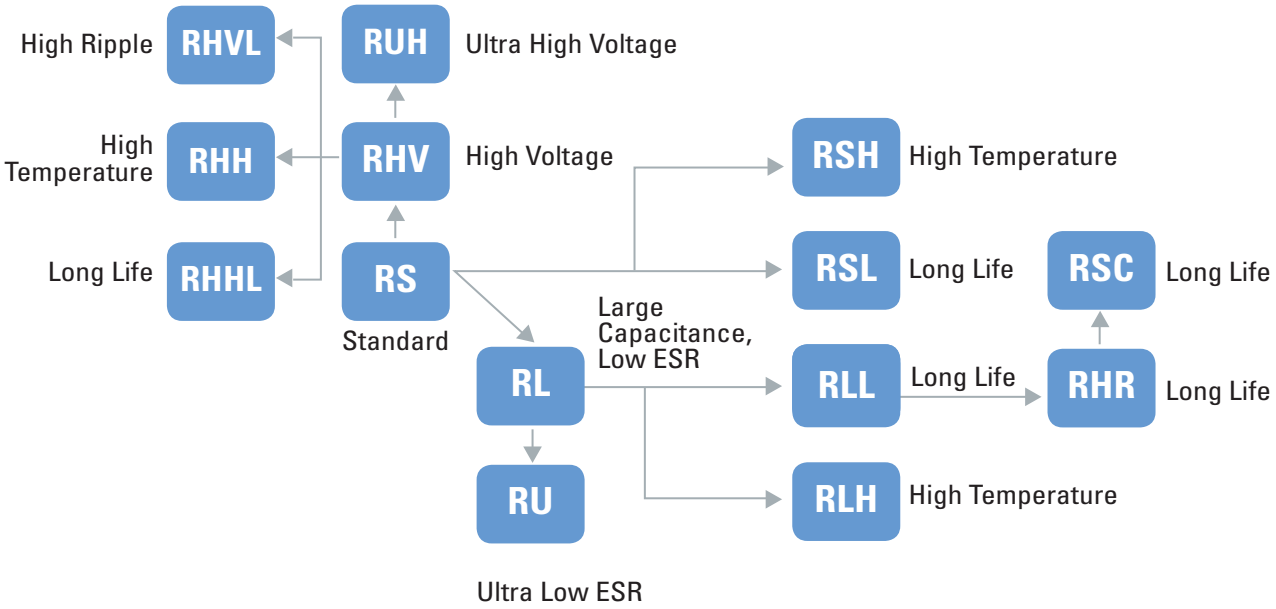
Part Numbering System

Example : VHV series, 16V / 180μF, 6.3Φ x 5.9L

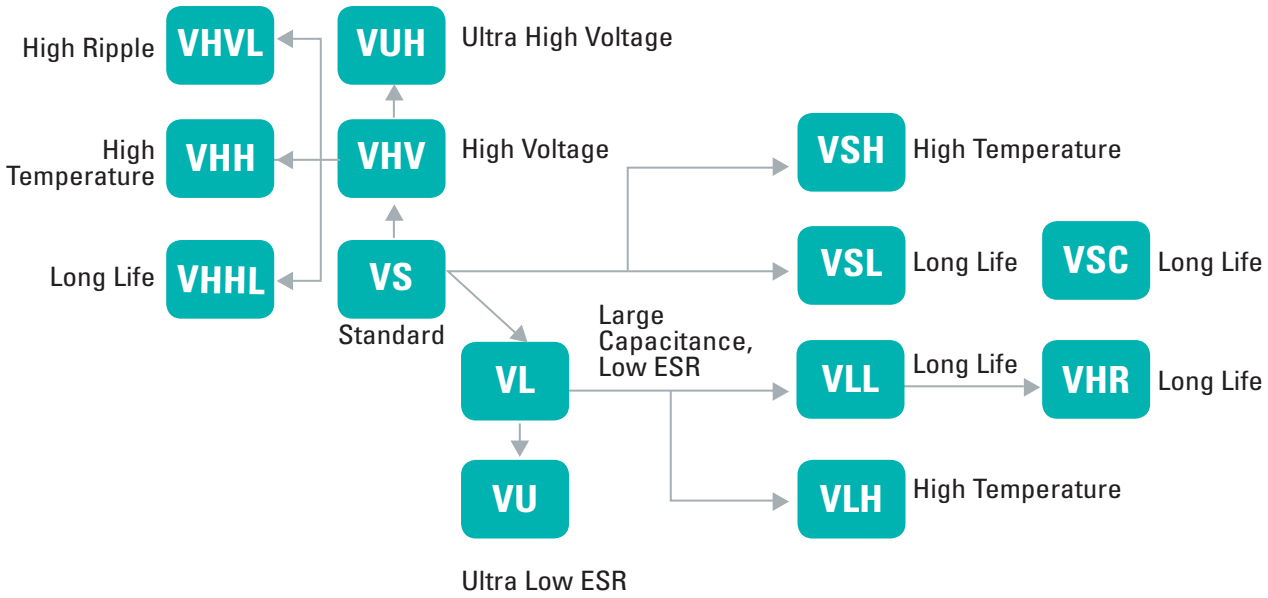
16		V		HV		180	M		C		6	
Rated Voltage [V]		Type		Series		Rated Capacitance[μF]	Capacitance Tolerance[%]		Diameter [mm]		Length [mm]	
2	2.5V	R	Radial	S	Standard		K	±10%	A	4.0	6	5.9
4	4V	V	SMD	L	Large Capacitance, Low ESR		M	±20%	B	5.0	6	6.0
6	6.3V			SL	Long Life				C	6.3	7	6.9
10	10V			LL	Large Capacitance, Low ESR, Long Life				D	8.0	7	7.0
16	16V			SH	High Temperature				E	10.0	8	7.9
20	20V			LH	Large Capacitance, Low ESR, High Temperature						8	8.0
25	25V			U	Ultra Low ESR						9	9.0
32	32V			HV	High Voltage						10	9.9
35	35V			UH	Ultra High Voltage						11	11.5
50	50V			HH	High Reliability, High Voltage, High Temperature						12	11.9
63	63V			HR	High Ripple Current, Long Life						12	12.6
80	80V			HVL	High Ripple Current, High Voltage, Long Life							
100	100V			SC	Large Capacitance, Long Life							
125	125V			HHL	High Voltage, High Temperature, Long Life							

System Diagram

[Radial (Dip) Type]



[SMD Type]



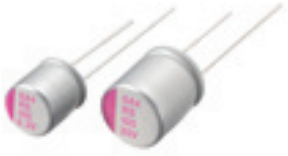
* Automotive product, please contact us.

RS

Radial Lead Type

series

- Standard
- Low ESR, High ripple current
- Load life of 3,000h at 105°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	6.8 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 3,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

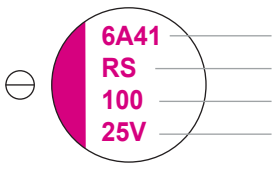
**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C*

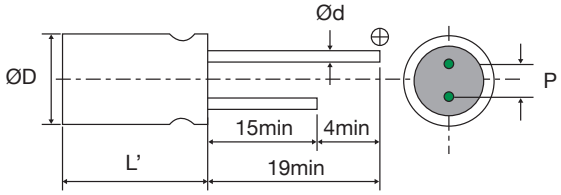
SIZE LIST

(unit: mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)	20 (23.0)	25 (28.7)
6.8							6.3 x 6
10							8 x 7
22						6.3 x 6	10 x 8
33						8 x 7	8 x 11.5
39					6.3 x 6		
47					6.3 x 6	8 x 7	
56				6.3 x 6		10 x 8	10 x 11.5
68						10 x 8	
82			6.3 x 6		8 x 7		
100		6.3 x 6	6.3 x 6		8 x 7	10 x 8 8 x 11.5	8 x 11.5
120				8 x 7			
150		6.3 x 6	8 x 7	8 x 7	10 x 8	10 x 11.5	10 x 11.5
180					8 x 11.5		
220		8 x 7	8 x 7				
270				10 x 8			
330		8 x 7	10 x 8	8 x 11.5	10 x 11.5		
470		10 x 8	8 x 11.5		10 x 11.5		
560		8 x 11.5		10 x 11.5			
680	8 x 11.5	10 x 8					
820			10 x 11.5				
1000			10 x 11.5				
1200		10 x 11.5					
1500	10 x 11.5						

MARKING AND DIMENSIONS





(unit: mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
6.3 x 6	6.3	6.0	L max.	2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
10 x 8	10.0	8.0		5.0	0.60
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.60
10 x 11.5	10.0	11.5		5.0	0.60

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Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

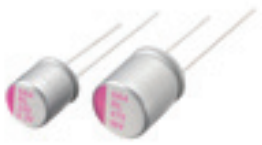
Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	680	8 x 11.5	13	4520	0.10	340	2RS680MD11
	1500	10 x 11.5	13	5440	0.10	750	2RS1500ME11
4	100	6.3 x 6	40	1810	0.10	200	4RS100MC6
	150	6.3 x 6	40	1810	0.10	300	4RS150MC6
	220	8 x 7	35	2560	0.10	440	4RS220MD7
	330	8 x 7	35	2560	0.10	660	4RS330MD7
	470	10 x 8	25	3700	0.10	376	4RS470ME8
	560	8 x 11.5	13	4520	0.10	448	4RS560MD11
	680	10 x 8	25	3700	0.10	544	4RS680ME8
	1200	10 x 11.5	13	5440	0.10	960	4RS1200ME11
6.3	82	6.3 x 6	45	1700	0.10	258	6RS82MC6
	100	6.3 x 6	40	1810	0.10	315	6RS100MC6
	150	8 x 7	35	2560	0.10	472	6RS150MD7
	220	8 x 7	35	2560	0.10	693	6RS220MD7
	330	10 x 8	25	3700	0.10	416	6RS330ME8
	470	8 x 11.5	15	4210	0.10	592	6RS470MD11
	820	10 x 11.5	12	5440	0.10	1033	6RS820ME11
	1000	10 x 11.5	12	5440	0.10	1260	6RS1000ME11
10	56	6.3 x 6	45	1700	0.10	280	10RS56MC6
	120	8 x 7	35	2560	0.10	600	10RS120MD7
	150	8 x 7	35	2560	0.10	750	10RS150MD7
	270	10 x 8	25	3700	0.10	540	10RS270ME8
	330	8 x 11.5	17	3950	0.10	660	10RS330MD11
	560	10 x 11.5	13	5230	0.10	1120	10RS560ME11
16	39	6.3 x 6	50	1620	0.10	312	16RS39MC6
	47	6.3 x 6	50	1620	0.10	376	16RS47MC6
	82	8 x 7	40	2120	0.10	656	16RS82MD7
	100	8 x 7	40	2120	0.10	800	16RS100MD7
	150	10 x 8	30	3020	0.10	480	16RS150ME8
	180	8 x 11.5	20	3640	0.10	576	16RS180MD11
	330	10 x 11.5	16	4720	0.10	1056	16RS330ME11
	470	10 x 11.5	16	4720	0.10	1504	16RS470ME11
20	22	6.3 x 6	60	1450	0.10	220	20RS22MC6
	33	8 x 7	45	1890	0.10	330	20RS33MD7
	47	8 x 7	45	1890	0.10	470	20RS47MD7
	56	10 x 8	40	2400	0.10	224	20RS56ME8
	68	10 x 8	40	2400	0.10	272	20RS68ME8
	100	10 x 8	35	2570	0.10	400	20RS100ME8
	100	8 x 11.5	24	3320	0.10	400	20RS100MD11
	150	10 x 11.5	20	4320	0.10	600	20RS150ME11
25	6.8	6.3 x 6	80	1200	0.10	170	25RS6R8MC6
	10	8 x 7	60	1500	0.10	250	25RS10MD7
	22	10 x 8	50	2000	0.10	275	25RS22ME8
	33	8 x 11.5	30	2980	0.10	413	25RS33MD11
	56	10 x 11.5	28	3800	0.10	700	25RS56ME11
	100	8 x 11.5	30	3320	0.10	500	25RS100MD11
	150	10 x 11.5	25	4320	0.10	750	25RS150ME11

RL

Radial Lead Type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 3,000h at 105°C



Halogen Less

RoHS compliant

Pb lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	100 to 3,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 3,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

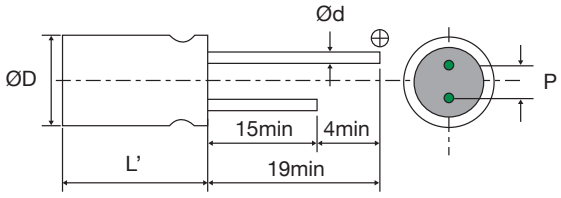
In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
100					6.3 x 6 6.3 x 9
150				6.3 x 6	8 x 7
180					8 x 9 8 x 11.5
220	5 x 9		6.3 x 6		8 x 7
270				8 x 7	8 x 9 8 x 11.5
330	5 x 9 6.3 x 9				8 x 9 8 x 11.5
470	5 x 9		6.3 x 9 8 x 9 8 x 11.5		10 x 11.5
560	5 x 9 6.3 x 9 8 x 9	6.3 x 9 8 x 9 8 x 11.5	6.3 x 9 8 x 9		
680		8 x 11.5	10 x 11.5		
820	6.3 x 9 8 x 7 8 x 9 8 x 11.5	10 x 11.5	8 x 9 8 x 11.5		
1000	8 x 9	8 x 9 10 x 11.5		8 x 15	
1200		8 x 9			
1500	8 x 9		10 x 11.5		
2700	10 x 11.5				
3500	10 x 11.5				

MARKING AND DIMENSIONS



(unit : mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
5 x 9	5.0	9.0	L max.	2.0	0.6
6.3 x 6	6.3	6.0		2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
6.3 x 9	6.3	9.0		2.5	0.6
8 x 9	8.0	9.0		3.5	0.6
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.6
10 x 11.5	10.0	11.5		5.0	0.6

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STANDARD RATINGS

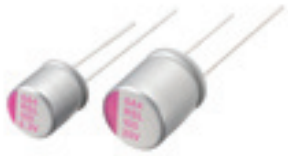
Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	220	5 x 9	7	4180	0.10	500	2RL220MB9
	330	5 x 9	7	4180	0.10	500	2RL330MB9
	330	6.3 x 9	7	5600	0.10	500	2RL330MC9
	470	5 x 9	7	4180	0.10	500	2RL470MB9
	560	5 x 9	7	4180	0.10	500	2RL560MB9
	560	6.3 x 9	7	5600	0.10	500	2RL560MC9
	560	8 x 9	7	6100	0.10	500	2RL560MD9
	820	6.3 x 9	7	5600	0.10	500	2RL820MC9
	820	8 x 7	8	5300	0.10	500	2RL820MD7
	820	8 x 9	7	6100	0.10	500	2RL820MD9
	820	8 x11.5	7	6100	0.10	500	2RL820MD11
	1000	8 x 9	7	6100	0.10	500	2RL1000MD9
	1500	8 x 9	7	6100	0.10	750	2RL1500MD9
	2700	10 x 11.5	10	5560	0.10	1350	2RL2700ME11
	3500	10 x 11.5	10	5560	0.10	1750	2RL3500ME11
4	560	6.3 x 9	7	5600	0.10	500	4RL560MC9
	560	8 x 9	7	6100	0.10	500	4RL560MD9
	560	8 x 11.5	7	6100	0.10	500	4RL560MD11
	680	8 x 11.5	7	6100	0.10	544	4RL680MD11
	820	10 x 11.5	7	6640	0.10	656	4RL820ME11
	1000	8 x 9	7	6100	0.10	800	4RL1000MD9
	1000	10 x 11.5	7	6640	0.10	800	4RL1000ME11
	1200	8 x 9	7	6100	0.10	960	4RL1200MD9
6.3	220	6.3 x 6	18	2980	0.10	277	6RL220MC6
	470	6.3 x 9	7	5600	0.10	592	6RL470MC9
	470	8 x 9	7	5700	0.10	592	6RL470MD9
	470	8 x 11.5	7	5700	0.10	592	6RL470MD11
	560	6.3 x 9	7	5600	0.10	705	6RL560MC9
	560	8 x 9	7	5700	0.10	705	6RL560MD9
	680	10 x 11.5	7	6640	0.10	857	6RL680ME11
	820	8 x 9	7	5700	0.10	1033	6RL820MD9
	820	8 x 11.5	7	5700	0.10	1033	6RL820MD11
	1500	10 x 11.5	10	5560	0.10	1890	6RL1500ME11
10	150	6.3 x 6	26	2400	0.10	300	10RL150MC6
	270	8 x 7	22	3220	0.10	500	10RL270MD7
	1000	8 x 11.5	10	6100	0.10	2000	10RL1000MD11
16	100	6.3 x 6	24	2490	0.10	320	16RL100MC6
	100	6.3 x 9	10	4680	0.10	500	16RL100MC9
	150	8 x 7	22	3220	0.10	500	16RL150MD7
	180	8 x 9	10	5000	0.10	576	16RL180MD9
	180	8 x 11.5	16	4360	0.10	576	16RL180MD11
	220	8 x 7	13	4150	0.10	500	16RL220MD7
	270	8 x 9	10	5000	0.10	864	16RL270MD9
	270	8 x 11.5	11	5000	0.10	864	16RL270MD11
	330	8 x 9	11	4520	0.10	1056	16RL330MD9
	330	8 x 11.5	11	5000	0.10	1056	16RL330MD11
	470	10 x11.5	10	6100	0.10	1504	16RL470ME11

RSL

Radial Lead Type

series

- Low ESR, High ripple current
- Load life of 5,000h at 105°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	6.8 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 5,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

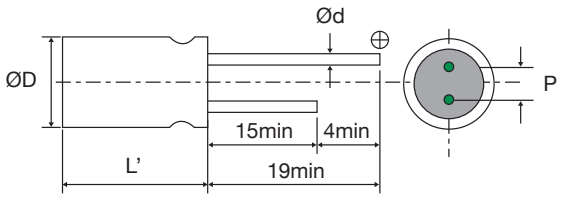
In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)	20 (23.0)	25 (28.7)
6.8							6.3 x 6
10							8 x 7
22						6.3 x 6	10 x 8
33						8 x 7	8 x 11.5
39					6.3 x 6		
47					6.3 x 6	8 x 7	
56				6.3 x 6		10 x 8	10 x 11.5
68						10 x 8	
82			6.3 x 6		8 x 7		
100		6.3 x 6	6.3 x 6		8 x 7	10 x 8 8 x 11.5	8 x 11.5
120				8 x 7			
150		6.3 x 6	8 x 7	8 x 7	10 x 8	10 x 11.5	10 x 11.5
180					8 x 11.5		
220		8 x 7	8 x 7				
270				10 x 8			
330		8 x 7	10 x 8	8 x 11.5	10 x 11.5		
470		10 x 8	8 x 11.5		10 x 11.5		
560		8 x 11.5		10 x 11.5			
680	8 x 11.5	10 x 8					
820			10 x 11.5				
1000			10 x 11.5				
1200		10 x 11.5					
1500	10 x 1.5						

MARKING AND DIMENSIONS



(unit : mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
6.3 x 6	6.3	6.0		2.5	0.45
8 x 7	8.0	7.0	L max.	3.5	0.45
10 x 8	10.0	8.0		5.0	0.60
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.60
10 x 11.5	10.0	11.5		5.0	0.60

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Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	680	8 x 11.5	13	4520	0.10	340	2RSL680MD11
	1500	10 x 11.5	13	5440	0.10	750	2RSL1500ME11
4	100	6.3 x 6	40	1810	0.10	200	4RSL100MC6
	150	6.3 x 6	40	1810	0.10	300	4RSL150MC6
	220	8 x 7	35	2560	0.10	440	4RSL220MD7
	330	8 x 7	35	2560	0.10	660	4RSL330MD7
	470	10 x 8	25	3700	0.10	376	4RSL470ME8
	560	8 x 11.5	13	4520	0.10	448	4RSL560MD11
	680	10 x 8	25	3700	0.10	544	4RSL680ME8
	1200	10 x 11.5	13	5440	0.10	960	4RSL1200ME11
6.3	82	6.3 x 6	45	1700	0.10	258	6RSL82MC6
	100	6.3 x 6	40	1810	0.10	315	6RSL100MC6
	150	8 x 7	35	2560	0.10	472	6RSL150MD7
	220	8 x 7	35	2560	0.10	693	6RSL220MD7
	330	10 x 8	25	3700	0.10	416	6RSL330ME8
	470	8 x 11.5	15	4210	0.10	592	6RSL470MD11
	820	10 x 11.5	12	5440	0.10	1033	6RSL820ME11
	1000	10 x 11.5	12	5440	0.10	1260	6RSL1000ME11
10	56	6.3 x 6	45	1700	0.10	280	10RSL56MC6
	120	8 x 7	35	2560	0.10	600	10RSL120MD7
	150	8 x 7	35	2560	0.10	750	10RSL150MD7
	270	10 x 8	25	3700	0.10	540	10RSL270ME8
	330	8 x 11.5	17	3950	0.10	660	10RSL330MD11
	560	10 x 11.5	13	5230	0.10	1120	10RSL560ME11
16	39	6.3 x 6	50	1620	0.10	312	16RSL39MC6
	47	6.3 x 6	50	1620	0.10	376	16RSL47MC6
	82	8 x 7	40	2120	0.10	656	16RSL82MD7
	100	8 x 7	40	2120	0.10	800	16RSL100MD7
	150	10 x 8	30	3020	0.10	480	16RSL150ME8
	180	8 x 11.5	20	3640	0.10	576	16RSL180MD11
	330	10 x 11.5	16	4720	0.10	1056	16RSL330ME11
	470	10 x 11.5	16	4720	0.10	1504	16RSL470ME11
20	22	6.3 x 6	60	1450	0.10	220	20RSL22MC6
	33	8 x 7	45	1890	0.10	330	20RSL33MD7
	47	8 x 7	45	1890	0.10	470	20RSL47MD7
	56	10 x 8	40	2400	0.10	224	20RSL56ME8
	68	10 x 8	40	2400	0.10	272	20RSL68ME8
	100	10 x 8	35	2570	0.10	400	20RSL100ME8
	100	8 x 11.5	24	3320	0.10	400	20RSL100MD11
	150	10 x 11.5	20	4320	0.10	600	20RSL150ME11
25	6.8	6.3 x 6	80	1200	0.10	170	25RSL6R8MC6
	10	8 x 7	60	1500	0.10	250	25RSL10MD7
	22	10 x 8	50	2000	0.10	275	25RSL22ME8
	33	8 x 11.5	30	2980	0.10	413	25RSL33MD11
	56	10 x 11.5	28	3800	0.10	700	25RSL56ME11
	100	8 x 11.5	30	3320	0.10	500	25RSL100MD11
	150	10 x 11.5	25	4320	0.10	750	25RSL150ME11

RLL

Radial Lead Type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 5,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	100 to 3,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 5,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

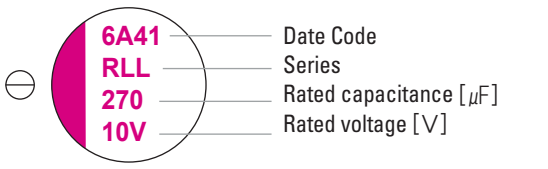
**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C*

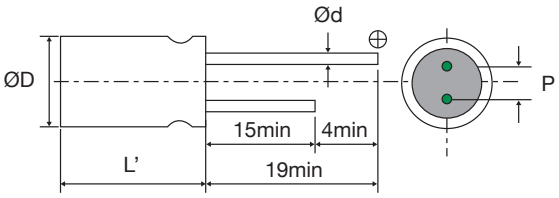
SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
100					6.3 x 6 6.3 x 9
150				6.3 x 6	8 x 7
180					8 x 9 8 x 11.5
220	5 x 9		6.3 x 6		8 x 7
270				8 x 7	8 x 9 8 x 11.5
330	5 x 9 6.3 x 9				8 x 9 8 x 11.5
470	5 x 9		6.3 x 9 8 x 9 8 x 11.5		10 x 11.5
560	5 x 9 6.3 x 9 8 x 9	6.3 x 9 8 x 9 8 x 11.5	6.3 x 9 8 x 9		
680		8 x 11.5	10 x 11.5		
820	6.3 x 9 8 x 7 8 x 9 8 x 11.5	10 x 11.5	8 x 9 8 x 11.5		
1000	8 x 9	8 x 9 10 x 11.5			
1200		8 x 9			
1500	8 x 9		10 x 11.5		
2700	10 x 11.5				
3500	10 x 11.5				

MARKING AND DIMENSIONS





(unit : mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
5 x 9	5.0	9.0	L max.	2.0	0.6
6.3 x 6	6.3	6.0		2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
6.3 x 9	6.3	9.0		2.5	0.6
8 x 9	8.0	9.0		3.5	0.6
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.6
10 x 11.5	10.0	11.5		5.0	0.6

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	220	5 x 9	7	4180	0.10	500	2RLL220MB9
	330	5 x 9	7	4180	0.10	500	2RLL330MB9
	330	6.3 x 9	7	5600	0.10	500	2RLL330MC9
	470	5 x 9	7	4180	0.10	500	2RLL470MB9
	560	5 x 9	7	4180	0.10	500	2RLL560MB9
	560	6.3 x 9	7	5600	0.10	500	2RLL560MC9
	560	8 x 9	7	6100	0.10	500	2RLL560MD9
	820	6.3 x 9	7	5600	0.10	500	2RLL820MC9
	820	8 x 7	8	5300	0.10	500	2RLL820MD7
	820	8 x 9	7	6100	0.10	500	2RLL820MD9
	820	8 x11.5	7	6100	0.10	500	2RLL820MD11
	1000	8 x 9	7	6100	0.10	500	2RLL1000MD9
	1500	8 x 9	7	6100	0.10	750	2RLL1500MD9
	2700	10 x 11.5	10	5560	0.10	1350	2RLL2700ME11
	3500	10 x 11.5	10	5560	0.10	1750	2RLL3500ME11
4	560	6.3 x 9	7	5600	0.10	500	4RLL560MC9
	560	8 x 9	7	6100	0.10	500	4RLL560MD9
	560	8 x 11.5	7	6100	0.10	500	4RLL560MD11
	680	8 x 11.5	7	6100	0.10	544	4RLL680MD11
	820	10 x 11.5	7	6640	0.10	656	4RLL820ME11
	1000	8 x 9	7	6100	0.10	800	4RLL1000MD9
	1000	10 x 11.5	7	6640	0.10	800	4RLL1000ME11
	1200	8 x 9	7	6100	0.10	960	4RLL1200MD9
6.3	220	6.3 x 6	18	2980	0.10	277	6RLL220MC6
	470	6.3 x 9	7	5600	0.10	592	6RLL470MC9
	470	8 x 9	7	5700	0.10	592	6RLL470MD9
	470	8 x 11.5	7	5700	0.10	592	6RLL470MD11
	560	6.3 x 9	7	5600	0.10	705	6RLL560MC9
	560	8 x 9	7	5700	0.10	705	6RLL560MD9
	680	10 x 11.5	7	6640	0.10	857	6RLL680ME11
	820	8 x 9	7	5700	0.10	1033	6RLL820MD9
	820	8 x 11.5	7	5700	0.10	1033	6RLL820MD11
	1500	10 x 11.5	10	5560	0.10	1890	6RLL1500ME11
10	150	6.3 x 6	26	2400	0.10	300	10RLL150MC6
	270	8 x 7	22	3220	0.10	500	10RLL270MC7
16	100	6.3 x 6	24	2490	0.10	320	16RLL100MC6
	100	6.3 x 9	10	4680	0.10	500	16RLL100MC9
	150	8 x 7	22	3220	0.10	500	16RLL150MD7
	180	8 x 9	10	5000	0.10	576	16RLL180MD9
	180	8 x 11.5	16	4360	0.10	576	16RLL180MD11
	220	8 x 7	13	4150	0.10	500	16RLL220MD7
	270	8 x 9	10	5000	0.10	864	16RLL270MD9
	270	8 x 11.5	11	5000	0.10	864	16RLL270MD11
	330	8 x 9	11	4520	0.10	1056	16RLL330MD9
	330	8 x 11.5	11	5000	0.10	1056	16RLL330MD11
	470	10 x11.5	10	6100	0.10	1504	16RLL470ME11

RSH

Radial Lead Type

series

- Higher temperature endurance guaranteed than RS series
- Low ESR, High ripple current
- Load life of 1,000h at 125°C

Halogen Less

RoHS compliant

Pb lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	6.8 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	125°C, 1,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

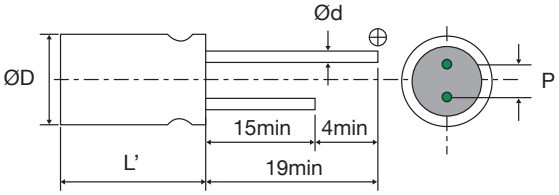
In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)	20 (23.0)	25 (28.7)
6.8							6.3 x 6
10							8 x 7
22						6.3 x 6	10 x 8
33						8 x 7	8 x 11.5
39					6.3 x 6		
47					6.3 x 6	8 x 7	
56				6.3 x 6		10 x 8	10 x 11.5
68						10 x 8	
82			6.3 x 6		8 x 7		
100		6.3 x 6	6.3 x 6		8 x 7	10 x 8 8 x 11.5	8 x 11.5
120				8 x 7			
150		6.3 x 6	8 x 7	8 x 7	10 x 8	10 x 11.5	10 x 11.5
180					8 x 11.5		
220		8 x 7	8 x 7				
270				10 x 8			
330		8 x 7	10 x 8	8 x 11.5	10 x 11.5		
470		10 x 8	8 x 11.5		10 x 11.5		
560		8 x 11.5		10 x 11.5			
680	8 x 11.5	10 x 8					
820			10 x 11.5				
1000			10 x 11.5				
1200		10 x 11.5					
1500	10 x 11.5						

MARKING AND DIMENSIONS



(unit : mm)

Size	ΦD±0.5	L	L'	P±0.5	Φd
6.3 x 6	6.3	6.0		2.5	0.45
8 x 7	8.0	7.0	L max.	3.5	0.45
10 x 8	10.0	8.0		5.0	0.60
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.60
10 x 11.5	10.0	11.5		5.0	0.60

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz) [mArms]		Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
				-55 to +105°C	+105 to +125°C			
2.5	680	8 x 11.5	13	4520	1430	0.10	340	2RSH680MD11
	1500	10 x 11.5	13	5440	1721	0.10	750	2RSH1500ME11
4	100	6.3 x 6	40	1810	572	0.10	200	4RSH100MC6
	150	6.3 x 6	40	1810	572	0.10	300	4RSH150MC6
	220	8 x 7	35	2560	810	0.10	440	4RSH220MD7
	330	8 x 7	35	2560	810	0.10	660	4RSH330MD7
	470	10 x 8	25	3700	1170	0.10	376	4RSH470ME8
	560	8 x 11.5	13	4520	1430	0.10	448	4RSH560MD11
	680	10 x 8	25	3700	1170	0.10	544	4RSH680ME8
	1200	10 x 11.5	13	5440	1721	0.10	960	4RSH1200ME11
6.3	82	6.3 x 6	45	1700	537	0.10	258	6RSH82MC6
	100	6.3 x 6	40	1810	572	0.10	315	6RSH100MC6
	150	8 x 7	35	2560	810	0.10	472	6RSH150MD7
	220	8 x 7	35	2560	810	0.10	693	6RSH220MD7
	330	10 x 8	25	3700	1170	0.10	416	6RSH330ME8
	470	8 x 11.5	15	4210	1332	0.10	592	6RSH470MD11
	820	10 x 11.5	12	5440	1721	0.10	1033	6RSH820ME11
	1000	10 x 11.5	12	5440	1721	0.10	1260	6RSH1000ME11
10	56	6.3 x 6	45	1700	537	0.10	280	10RSH56MC6
	120	8 x 7	35	2560	810	0.10	600	10RSH120MD7
	150	8 x 7	35	2560	810	0.10	750	10RSH150MD7
	270	10 x 8	25	3700	1170	0.10	540	10RSH270ME8
	330	8 x 11.5	17	3950	1250	0.10	660	10RSH330MD11
	560	10 x 11.5	13	5230	1655	0.10	1120	10RSH560ME11
16	39	6.3 x 6	50	1620	512	0.10	312	16RSH39MC6
	47	6.3 x 6	50	1620	512	0.10	376	16RSH47MC6
	82	8 x 7	40	2120	670	0.10	656	16RSH82MD7
	100	8 x 7	40	2120	670	0.10	800	16RSH100MD7
	150	10 x 8	30	3020	955	0.10	480	16RSH150ME8
	180	8 x 11.5	20	3640	1151	0.10	576	16RSH180MD11
	330	10 x 11.5	16	4720	1493	0.10	1056	16RSH330ME11
	470	10 x 11.5	16	4720	1493	0.10	1504	16RSH470ME11
20	22	6.3 x 6	60	1450	458	0.10	220	20RSH22MC6
	33	8 x 7	45	1890	598	0.10	330	20RSH33MD7
	47	8 x 7	45	1890	598	0.10	470	20RSH47MD7
	56	10 x 8	40	2400	759	0.10	224	20RSH56ME8
	68	10 x 8	40	2400	759	0.10	272	20RSH68ME8
	100	10 x 8	35	2570	810	0.10	400	20RSH100ME8
	100	8 x 11.5	24	3320	1050	0.10	400	20RSH100MD11
	150	10 x 11.5	20	4320	1367	0.10	600	20RSH150ME11
25	6.8	6.3 x 6	80	1200	377	0.10	170	25RSH6R8MC6
	10	8 x 7	60	1500	471	0.10	250	25RSH10MD7
	22	10 x 8	50	2000	632	0.10	275	25RSH22ME8
	33	8 x 11.5	30	2980	943	0.10	413	25RSH33MD11
	56	10 x 11.5	28	3800	1202	0.10	700	25RSH56ME11
	100	8 x 11.5	30	3320	1050	0.10	500	25RSH100MD11
	150	10 x 11.5	25	4320	1367	0.10	750	25RSH150ME11

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RLH

Radial Lead Type

series

- Higher temperature endurance guaranteed than RL series
- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 1,000h at 125°C

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	100 to 3,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	125°C, 1,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

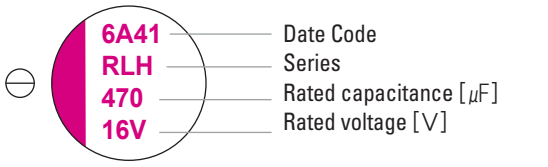
**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C*

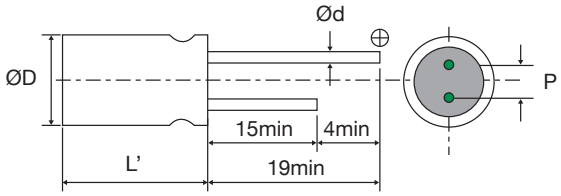
SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
100					6.3 x 6 6.3 x 9
150				6.3 x 6	8 x 7
180					8 x 9 8 x 11.5
220	5 x 9		6.3 x 6		8 x 7
270				8 x 7	8 x 9 8 x 11.5
330	5 x 9 6.3 x 9				8 x 9 8 x 11.5
470	5 x 9		6.3 x 9 8 x 9 8 x 11.5		10 x 11.5
560	5 x 9 6.3 x 9 8 x 9	6.3 x 9 8 x 9 8 x 11.5	6.3 x 9 8 x 9		
680		8 x 11.5	10 x 11.5		
820	6.3 x 9 8 x 7 8 x 9 8 x 11.5	10 x 11.5	8 x 9 8 x 11.5		
1000	8 x 9	8 x 9 10 x 11.5			
1200		8 x 9			
1500	8 x 9		10 x 11.5		
2700	10 x 11.5				
3500	10 x 11.5				

MARKING AND DIMENSIONS





(unit : mm)

Size	ØD±0.5	L	L'	P±0.5	Ød
5 x 9	5.0	9.0	L max.	2.0	0.6
6.3 x 6	6.3	6.0		2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
6.3 x 9	6.3	9.0		2.5	0.6
8 x 9	8.0	9.0		3.5	0.6
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.6
10 x 11.5	10.0	11.5		5.0	0.6

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Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz)[mArms]		Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
				-55 to +105°C	+105 to +125°C			
2.5	220	5 x 9	7	4180	1323	0.10	500	2RLH220MB9
	330	5 x 9	7	4180	1323	0.10	500	2RLH330MB9
	330	6.3 x 9	7	5600	1772	0.10	500	2RLH330MC9
	470	5 x 9	7	4180	1323	0.10	500	2RLH470MB9
	560	5 x 9	7	4180	1323	0.10	500	2RLH560MB9
	560	6.3 x 9	7	5600	1772	0.10	500	2RLH560MC9
	560	8 x 9	7	6100	1930	0.10	500	2RLH560MD9
	820	6.3 x 9	7	5600	1772	0.10	500	2RLH820MC9
	820	8 x 7	8	5300	1677	0.10	500	2RLH820MD7
	820	8 x 9	7	6100	1930	0.10	500	2RLH820MD9
	820	8 x11.5	7	6100	1930	0.10	500	2RLH820MD11
	1000	8 x 9	7	6100	1930	0.10	500	2RLH1000MD9
	1500	8 x 9	7	6100	1930	0.10	750	2RLH1500MD9
	2700	10 x 11.5	10	5560	1759	0.10	1350	2RLH2700ME11
	3500	10 x 11.5	10	5560	1759	0.10	1750	2RLH3500ME11
4	560	6.3 x 9	7	5600	1772	0.10	500	4RLH560MC9
	560	8 x 9	7	6100	1930	0.10	500	4RLH560MD9
	560	8 x 11.5	7	6100	1930	0.10	500	4RLH560MD11
	680	8 x 11.5	7	6100	1930	0.10	544	4RLH680MD11
	820	10 x 11.5	7	6640	2101	0.10	656	4RLH820ME11
	1000	8 x 9	7	6100	1930	0.10	800	4RLH1000MD9
	1000	10 x 11.5	7	6640	2101	0.10	800	4RLH1000ME11
	1200	8 x 9	7	6100	1930	0.10	960	4RLH1200MD9
6.3	220	6.3 x 6	18	2980	943	0.10	277	6RLH220MC6
	470	6.3 x 9	7	5600	1772	0.10	592	6RLH470MC9
	470	8 x 9	7	5700	1803	0.10	592	6RLH470MD9
	470	8 x 11.5	7	5700	1803	0.10	592	6RLH470MD11
	560	6.3 x 9	7	5600	1772	0.10	705	6RLH560MC9
	560	8 x 9	7	5700	1803	0.10	705	6RLH560MD9
	680	10 x 11.5	7	6640	2101	0.10	857	6RLH680ME11
	820	8 x 9	7	5700	1803	0.10	1033	6RLH820MD9
	820	8 x 11.5	7	5700	1803	0.10	1033	6RLH820MD11
	1500	10 x 11.5	10	5560	1759	0.10	1890	6RLH1500ME11
10	150	6.3 x 6	26	2400	759	0.10	300	10RLH150MC6
	270	8 x 7	22	3220	1019	0.10	500	10RLH270MD7
16	100	6.3 x 6	24	2490	788	0.10	100	16RLH100MC6
	100	6.3 x 9	10	4680	1481	0.10	100	16RLH100MC9
	150	8 x 7	22	3220	1019	0.10	150	16RLH150MD7
	180	8 x 9	10	5000	1582	0.10	180	16RLH180MD9
	180	8 x 11.5	16	4360	1380	0.10	180	16RLH180MD11
	220	8 x 7	13	4150	1313	0.10	220	16RLH220MD7
	270	8 x 9	10	5000	1582	0.10	270	16RLH270MD9
	270	8 x 11.5	11	5000	1582	0.10	270	16RLH270MD11
	330	8 x 9	11	4520	1430	0.10	330	16RLH330MD9
	330	8 x 11.5	11	5000	1582	0.10	330	16RLH330MD11
	470	10 x11.5	10	6100	1930	0.10	470	16RLH470ME11

RU

Radial Lead Type

series

- Lower ESR than RL series
- Ultra Low ESR, High ripple current
- Load life of 2,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 6.3Vdc	
Capacitance range	470 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 2,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

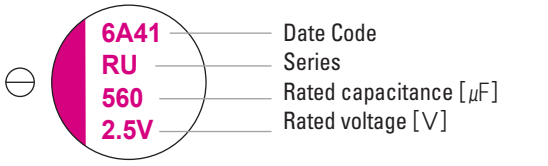
SIZE LIST

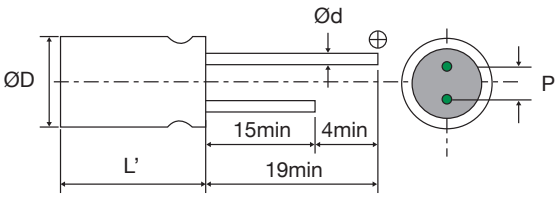
(unit: mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)
470			8 x 11.5
560	8 x 9	8 x 9 8 x 11.5	
680		8 x 11.5	10 x 11.5
820	8 x 9 8 x 11.5	10 x 11.5	10 x 11.5
1000	10 x 11.5		
1200		10 x 11.5	
1500	10 x 11.5		

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS





(unit: mm)

Size	ØD±0.5	L	L'	P±0.5	Ød
8 x 9	8.0	9.0	L max.	3.5	0.6
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.6
10 x 11.5	10.0	11.5		5.0	0.6

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	560	8 x 9	5	6300	0.10	500	2RU560MD9
	820	8 x 9	5	6300	0.10	500	2RU820MD9
	820	8 x 11.5	5	6600	0.10	500	2RU820MD11
	1000	10 x 11.5	5	7100	0.10	500	2RU1000ME11
	1500	10 x 11.5	5	7300	0.10	750	2RU1500ME11
4	560	8 x 9	5	6300	0.10	500	4RU560MD9
	560	8 x 11.5	5	6300	0.10	500	4RU560MD11
	680	8 x 11.5	5	6500	0.10	544	4RU680MD11
	820	10 x 11.5	5	7000	0.10	656	4RU820ME11
	1200	10 x 11.5	5	7200	0.10	960	4RU1200ME11
6.3	470	8 x 11.5	5	6400	0.10	592	6RU470MD11
	680	10 x 11.5	5	6700	0.10	857	6RU680ME11
	820	10 x 11.5	5	6800	0.10	1033	6RU820ME11

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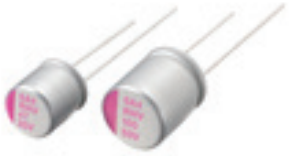
RHV

Radial Lead Type

series

- High Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 5,000h at 105°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	16 to 50Vdc	
Capacitance range	10 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 5,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

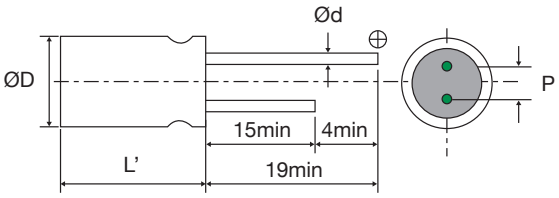
**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C*

SIZE LIST

(unit : mm)

μF \ RV(SV)	16 (18.4)	20 (23)	25 (28.7)	32 (36.8)	35 (40.2)	50 (57.5)
10						6.3 x 6
18						8 x 7
22				6.3 x 6	6.3 x 6	8 x 7
39					8 x 7	8 x 11.5
47			6.3 x 6		8 x 7	8 x 11.5
56			6.3 x 6			8 x 11.5
68				8 x 7	8 x 7	10 x 11.5
82			8 x 7		8 x 11.5	
100			8 x 7			10 x 11.5
120		6.3 x 6		8 x 11.5	10 x 11.5	
150	6.3 x 6				10 x 11.5	
180	6.3 x 6	8 x 7	8 x 11.5			
220		8 x 11.5	8 x 11.5	10 x 11.5	10 x 11.5	10 x 11.5
270	8 x 7					
330			10 x 11.5			
390		8 x 11.5	10 x 11.5			
470						
560	8 x 11.5	10 x 11.5				
1000	10 x 11.5					
1500	10 x 11.5					

MARKING AND DIMENSIONS



(unit: mm)

Size	ØD±0.5	L	L'	P±0.5	Ød
6.3 x 6	6.3	6.0	L max.	2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.60
10 x 11.5	10.0	11.5		5.0	0.60

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

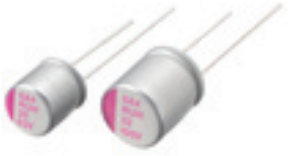
Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
16	150	6.3 x 6	30	2590	0.12	480	16RHV150MC6
	180	6.3 x 6	22	3300	0.12	576	16RHV180MC6
	270	8 x 7	22	3300	0.12	864	16RHV270MD7
	560	8 x 11.5	14	4950	0.12	1792	16RHV560MD11
	1000	10 x 11.5	12	5400	0.12	3200	16RHV1000ME11
	1500	10 x 11.5	12	5600	0.12	4800	16RHV1500ME11
20	120	6.3 x 6	25	3200	0.12	480	20RHV120MC6
	180	8 x 7	25	3200	0.12	720	20RHV180MD7
	220	8 x 11.5	24	3320	0.12	880	20RHV220MD11
	390	8 x 11.5	14	4950	0.12	1560	20RHV390MD11
	560	10 x 11.5	12	5400	0.12	2240	20RHV560ME11
25	47	6.3 x 6	30	2800	0.12	235	25RHV47MC6
	56	6.3 x 6	30	2800	0.12	280	25RHV56MC6
	82	8 x 7	28	3000	0.12	410	25RHV82MD7
	100	8 x 7	28	3000	0.12	500	25RHV100MD7
	180	8 x 11.5	16	4650	0 .12	900	25RHV180MD11
	220	8 x 11.5	16	4650	0.12	1100	25RHV220MD11
	330	10 x 11.5	14	5000	0.12	1650	25RHV330ME11
	390	10 x 11.5	14	5000	0.12	1950	25RHV390ME11
32	22	6.3 x 6	35	2700	0.12	140	32RHV22MC6
	68	8 x 7	25	3200	0.12	435	32RHV68MD7
	120	8 x 11.5	20	4000	0.12	768	32RHV120MD11
	220	10 x 11.5	18	4650	0.12	1408	32RHV220ME11
35	22	6.3 x 6	35	2600	0.12	154	35RHV22MC6
	39	8 x 7	30	2800	0.12	273	35RHV39MD7
	47	8 x 7	30	2800	0.12	329	35RHV47MD7
	68	8 x 7	28	3000	0.12	476	35RHV68MD7
	82	8 x 11.5	20	4000	0.12	574	35RHV82MD11
	120	10 x 11.5	18	4400	0.12	840	35RHV120ME11
	150	10 x 11.5	18	4400	0.12	1050	35RHV150ME11
	220	10 x 11.5	18	4650	0.12	1540	35RHV220ME11
50	10	6.3 x 6	40	2500	0.12	100	50RHV10MC6
	18	8 x 7	35	2700	0.12	180	50RHV18MD7
	22	8 x 7	35	2700	0.12	220	50RHV22MD7
	39	8 x 11.5	25	3800	0.12	390	50RHV39MD11
	47	8 x 11.5	25	3800	0.12	470	50RHV47MD11
	56	8 x 11.5	25	3800	0.12	560	50RHV56MD11
	68	10 x 11.5	20	4300	0.12	680	50RHV68ME11
	100	10 x 11.5	20	4300	0.12	1000	50RHV100ME11
	220	10 x 11.5	25	4650	0.12	2200	50RHV220ME11

RUH

Radial Lead Type

series

- Ultra-High Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 3,000h at 105°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	63 to 125Vdc	
Capacitance range	8.2 to 120μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 3,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

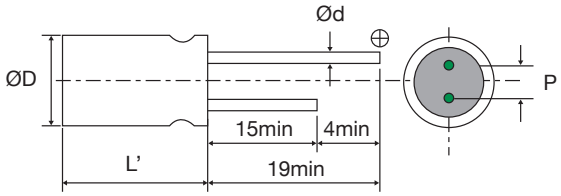
SIZE LIST

(unit : mm)

μF \ RV(SV)	63 (72.4)	80 (92)	100 (115)	125 (143)
8.2	6.3 x 6			
10	8 x 7		8 x 11.5	8 x 11.5
12		8 x 11.5		
15	8 x 7		8 x 11.5	8 x 11.5
18			10 x 11.5	
22		10 x 11.5	10 x 11.5	
27	8 x 11.5	10 x 11.5		
33	8 x 11.5			8 x 11.5
39	8 x 11.5		10 x 11.5	
47	10 x 11.5		10 x 11.5	
56	10 x 11.5			
68		10 x 11.5	10 x 11.5	
82		10 x 11.5		
120	10 x 11.5			

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS



(unit : mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
6.3 x 6	6.3	6.0	L max.	2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.60
10 x 11.5	10.0	11.5		5.0	0.60

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
63	8.2	6.3 x 6	55	1200	0.12	103	63RUH8R2MC6
	10	8 x 7	50	1400	0.12	126	63RUH10MD7
	15	8 x 7	50	1500	0.12	189	63RUH15MD7
	27	8 x 11.5	35	2800	0.12	340	63RUH27MD11
	33	8 x 11.5	30	3000	0.12	416	63RUH33MD11
	39	8 x 11.5	29	3400	0.12	491	63RUH39MD11
	47	10 x 11.5	29	3300	0.12	592	63RUH47ME11
	56	10 x 11.5	28	3400	0.12	706	63RUH56ME11
	120	10 x 11.5	25	4000	0.12	1512	63RUH120ME11
80	12	8 x 11.5	38	1900	0.12	192	80RUH12MD11
	22	10 x 11.5	35	2300	0.12	352	80RUH22ME11
	27	10 x 11.5	35	2400	0.12	432	80RUH27ME11
	68	10 x 11.5	30	3000	0.12	1088	80RUH68ME11
	82	10 x 11.5	30	3200	0.12	1312	80RUH82ME11
100	10	8 x 11.5	42	1800	0.12	200	100RUH10MD11
	15	8 x 11.5	40	2000	0.12	300	100RUH15MD11
	18	10 x 11.5	38	2200	0.12	360	100RUH18ME11
	22	10 x 11.5	38	2300	0.12	440	100RUH22ME11
	39	10 x 11.5	35	2500	0.12	780	100RUH39ME11
	47	10 x 11.5	35	2600	0.12	940	100RUH47ME11
	68	10 x 11.5	30	2800	0.12	1360	100RUH68ME11
125	10	8 x 11.5	50	1500	0.12	250	125RUH10MD11
	15	8 x 11.5	50	1800	0.12	375	125RUH15MD11
	33	10 x 11.5	40	2000	0.12	825	125RUH33ME11

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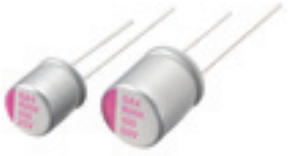
RHH

Radial Lead Type

series

- High Reliability, High Voltage, High Temperature
- Low ESR, High ripple current
- Load life of 3,000h at 125°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	16 to 50Vdc	
Capacitance range	5.6 to 390μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	125°C, 3,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C

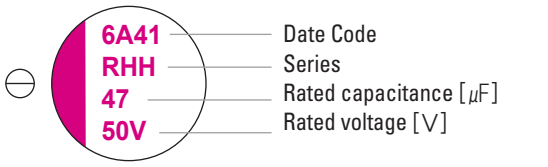
SIZE LIST

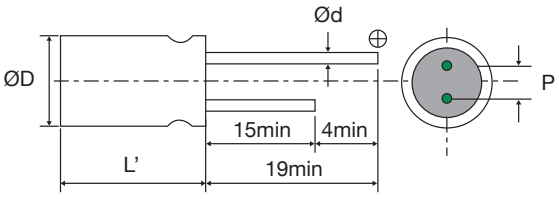
(unit: mm)

μF \ RV(SV)	16 (18.4)	20 (23)	25 (28.7)	35 (40.2)	50 (57.5)
5.6					6.3 x 6
10				6.3 x 6	8 x 7
18				8 x 7	
22			6.3 x 6		
27					8 x 11.5
33		6.3 x 6			
39			8 x 7		
47	6.3 x 6				10 x 11.5
56		8 x 7		8 x 11.5	
82	8 x 7				
100				10 x 11.5	
120			8 x 11.5		
150		8 x 11.5			
180			10 x 11.5		
220	8 x 11.5				
270		10 x 11.5			
390	10 x 11.5				

*RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS





(unit: mm)

Size	ØD±0.5	L	L'	P±0.5	Ød
6.3 x 6	6.3	6.0	L max.	2.5	0.45
8 x 7	8.0	7.0		3.5	0.45
8 x 11.5	8.0	11.5	L+1.0max.	3.5	0.60
10 x 11.5	10.0	11.5		5.0	0.60

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz)[mArms]		Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
				-55 to +105°C	+105 to +125°C			
16	47	6.3 x 6	50	1620	512	0.12	150	16RHH47MC6
	82	8 x 7	40	2120	670	0.12	262	16RHH82MD7
	220	8 x 11.5	20	3640	1151	0.12	704	16RHH220MD11
	390	10 x 11.5	16	4720	1493	0.12	1248	16RHH390ME11
20	33	6.3 x 6	60	1450	459	0.12	132	20RHH33MC6
	56	8 x 7	50	1890	598	0.12	224	20RHH56MD7
	150	8 x 11.5	28	3320	1050	0.12	600	20RHH150MD11
	270	10 x 11.5	25	4320	1367	0.12	1080	20RHH270ME11
25	22	6.3 x 6	60	1500	474	0.12	110	25RHH22MC6
	39	8 x 7	50	1835	580	0.12	195	25RHH39MD7
	120	8 x 11.5	28	2980	943	0.12	600	25RHH120MD11
	180	10 x 11.5	25	3800	1202	0.12	900	25RHH180ME11
35	10	6.3 x 6	70	1100	340	0.12	70	35RHH10MC6
	18	8 x 7	60	1300	400	0.12	126	35RHH18MD7
	56	8 x 11.5	30	2300	700	0.12	392	35RHH56MD11
	100	10 x 11.5	28	3650	1150	0.12	700	35RHH100ME11
50	5.6	6.3 x 6	70	1000	310	0.12	56	50RHH5R6MC6
	10	8 x 7	60	1200	371	0.12	100	50RHH10MD7
	27	8 x 11.5	35	2100	665	0.12	270	50RHH27MD11
	47	10 x 11.5	30	2600	825	0.12	470	50RHH47ME11

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Site Web : www.es-france.com

RHR

Radial Lead Type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 10,000h at 105°C

Halogen Less (Br Cl)

RoHS compliant

Pb lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	100 to 3,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$E_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 10,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

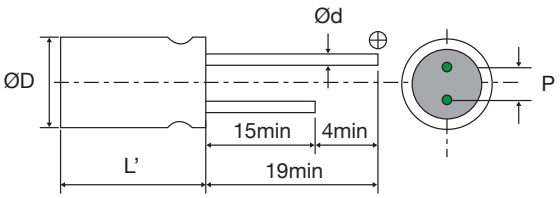
*In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
100					6.3 x 6 6.3 x 9
150				6.3 x 6	8 x 7
180					8 x 9 8 x 11.5
220	5 x 9		6.3 x 6		
270				8 x 7	8 x 9 8 x 11.5
330	5 x 9 6.3 x 9				8 x 9 8 x 11.5
470	5 x 9		6.3 x 9 8 x 9 8x11.5		10 x 11.5
560	5 x 9 6.3 x 9 8 x 9	6.3 x 9 8 x 9 8 x 11.5	6.3 x 9 8 x 9		
680		8 x 11.5	10 x 11.5		
820	6.3 x 9 8 x 7 8 x 9 8 x 11.5	10 x 11.5	8 x 9 8 x 11.5		
1000	8 x 9	8 x 9 10 x 11.5			
12000		8 x 9			
1500	8 x 9		10 x 11.5		
2700	10 x 11.5				
3500	10 x 11.5				

MARKING AND DIMENSIONS



(unit : mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
5 x 9	5.0	9.0		2.0	0.6
6.3 x 6	6.3	6.0		2.5	0.45
8 x 7	8.0	7.0	L max.	3.5	0.45
6.3 x 9	6.3	9.0		2.5	0.6
8 x 9	8.0	9.0		3.5	0.6
8 x 11.5	8.0	11.5	L + 1.0 max.	3.5	0.6
10x11.5	10.0	11.5		5.0	0.6

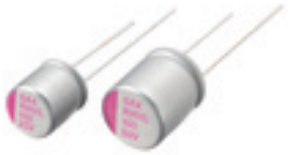
STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	220	5 x 9	7	4180	0.1	500	2RHR220MB9
	330	5 x 9	7	4180	0.1	500	2RHR330MB9
	330	6.3 x 9	7	5600	0.1	500	2RHR330MC9
	470	5 x 9	7	4180	0.1	500	2RHR470MB9
	560	5 x 9	7	4180	0.1	500	2RHR560MB9
	560	6.3 x 9	7	5600	0.1	500	2RHR560MC9
	560	8 x 9	7	6100	0.1	500	2RHR560MD9
	820	6.3 x 9	7	5600	0.1	500	2RHR820MC9
	820	8 x 7	8	5300	0.1	500	2RHR820MD7
	820	8 x 9	7	6100	0.1	500	2RHR820MD9
	820	8 x11.5	7	6100	0.1	500	2RHR820MD11
	1000	8 x 9	7	6100	0.1	500	2RHR1000MD9
	1500	8 x 9	7	6100	0.1	750	2RHR1500MD9
	2700	10 x 11.5	10	5560	0.1	1350	2RHR2700ME11
	3500	10 x 11.5	10	5560	0.1	1750	2RHR3500ME11
4	560	6.3 x 9	7	5600	0.1	500	4RHR560MC9
	560	8 x 9	7	6100	0.1	500	4RHR560MD9
	560	8 x 11.5	7	6100	0.1	500	4RHR560MD11
	680	8 x 11.5	7	6100	0.1	544	4RHR680MD11
	820	10 x 11.5	7	6640	0.1	656	4RHR820ME11
	1000	8 x 9	7	6100	0.1	800	4RHR1000MD9
	1000	10 x 11.5	7	6640	0.1	800	4RHR1000ME11
	1200	8 x 9	7	6100	0.1	960	4RHR1200MD9
6.3	220	6.3 x 6	18	2980	0.1	277	6RHR220MC6
	470	6.3 x 9	7	5600	0.1	592	6RHR470MC9
	470	8 x 9	7	5700	0.1	592	6RHR470MD9
	470	8 x 11.5	7	5700	0.1	592	6RHR470MD11
	560	6.3 x 9	7	5600	0.1	705	6RHR560MC9
	560	8 x 9	7	5700	0.1	705	6RHR560MD9
	680	10 x 11.5	7	6640	0.1	857	6RHR680ME11
	820	8 x 9	7	5700	0.1	1033	6RHR820MD9
	820	8 x 11.5	7	5700	0.1	1033	6RHR820MD11
	1500	10 x 11.5	10	5560	0.1	1890	6RHR1500ME11
10	150	6.3 x 6	26	2400	0.1	300	10RHR150MC6
	270	8 x 7	22	3220	0.1	500	10RHR270MD7
16	100	6.3 x 6	24	2490	0.1	320	16RHR100MC6
	100	6.3 x 9	10	4680	0.1	500	16RHR100MC9
	150	8 x 7	22	3220	0.1	500	16RHR150MD7
	180	8 x 9	10	5000	0.1	576	16RHR180MD9
	180	8 x 11.5	16	4360	0.1	576	16RHR180MD11
	270	8 x 9	10	5000	0.1	864	16RHR270MD9
	270	8 x 11.5	11	5000	0.1	864	16RHR270MD11
	330	8 x 9	11	4520	0.1	1056	16RHR330MD9
	330	8 x 11.5	11	5000	0.1	1056	16RHR330MD11
	470	10 x11.5	10	6100	0.1	1504	16RHR470ME11

RHVL

Radial Lead Type series

- High Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 10,000h at 105°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	16 to 50Vdc	
Capacitance range	10 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 10,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

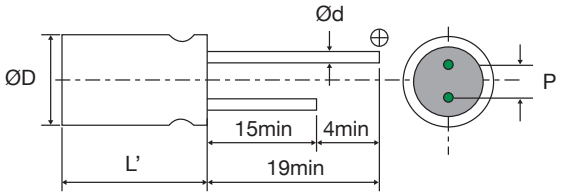
SIZE LIST

(unit: mm)

μF \ RV(SV)	16 (18.4)	20 (23)	25 (28.7)	32 (36.8)	35 (40.2)	50 (57.5)
10						6.3 x 6
18						8 x 7
22				6.3 x 6	6.3 x 6	8 x 7
39					8 x 7	8 x 11.5
47			6.3 x 6		8 x 7	8 x 11.5
56			6.3 x 6			8 x 11.5
68				8 x 7	8 x 7	10 x 11.5
82			8 x 7		8 x 11.5	
100			8 x 7			10 x 11.5
120		6.3 x 6		8 x 11.5	10 x 11.5	
150	6.3 x 6				10 x 11.5	
180	6.3 x 6	8 x 7	8 x 11.5			
220		8 x 11.5	8 x 11.5	10 x 11.5	10 x 11.5	10 x 11.5
270	8 x 7					
330			10 x 11.5			
390		8 x 11.5	10 x 11.5			
470						
560	8 x 11.5	10 x 11.5				
1000	10 x 11.5					
1500	10 x 11.5					

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS



(unit: mm)

Size	ØD±0.5	L	L'	P±0.5	Ød
6.3 x 6	6.3	6	Lmax	2.5	0.45
8 x 7	8	7		3.5	0.45
8 x 11.5	8	11.5	L+1.0max	3.5	0.6
10 x 11.5	10	11.5		5	0.6

STANDARD RATINGS

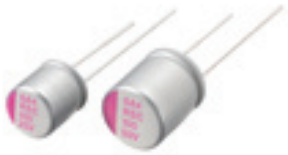
Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
16	150	6.3 x 6	30	2590	0.12	480	16RHVL150MC6
	180	6.3 x 6	22	3300	0.12	576	16RHVL180MC6
	270	8 x 7	22	3300	0.12	864	16RHVL270MD7
	560	8 x 11.5	14	4950	0.12	1792	16RHVL560MD11
	1000	10 x 11.5	12	5400	0.12	3200	16RHVL1000ME11
	1500	10 x 11.5	12	5600	0.12	4800	16RHVL1500ME11
20	120	6.3 x 6	25	3200	0.12	480	20RHVL120MC6
	180	8 x 7	25	3200	0.12	720	20RHVL180MD7
	220	8 x 11.5	24	3320	0.12	880	20RHVL220MD11
	390	8 x 11.5	14	4950	0.12	1560	20RHVL390MD11
	560	10 x 11.5	12	5400	0.12	2240	20RHVL560ME11
25	47	6.3 x 6	30	2800	0.12	235	25RHVL47MC6
	56	6.3 x 6	30	2800	0.12	280	25RHVL56MC6
	82	8 x 7	28	3000	0.12	410	25RHVL82MD7
	100	8 x 7	28	3000	0.12	500	25RHVL100MD7
	180	8 x 11.5	16	4650	0.12	900	25RHVL180MD11
	220	8 x 11.5	16	4650	0.12	1100	25RHVL220MD11
	330	10 x 11.5	14	5000	0.12	1650	25RHVL330ME11
	390	10 x 11.5	14	5000	0.12	1950	25RHVL390ME11
32	22	6.3 x 6	35	2700	0.12	140	32RHVL22MC6
	68	8 x 7	25	3200	0.12	435	32RHVL68MD7
	120	8 x 11.5	20	4000	0.12	768	32RHVL120MD11
	220	10 x 11.5	18	4650	0.12	1408	32RHVL220ME11
35	22	6.3 x 6	35	2600	0.12	154	35RHVL22MC6
	39	8 x 7	30	2800	0.12	273	35RHVL39MD7
	47	8 x 7	30	2800	0.12	329	35RHVL47MD7
	68	8 x 7	28	3000	0.12	476	35RHVL68MD7
	82	8 x 11.5	20	4000	0.12	574	35RHVL82MD11
	120	10 x 11.5	18	4400	0.12	840	35RHVL120ME11
	150	10 x 11.5	18	4400	0.12	1050	35RHVL150ME11
	220	10 x 11.5	18	4650	0.12	1540	35RHVL220ME11
50	10	6.3 x 6	40	2500	0.12	100	50RHVL10MC6
	18	8 x 7	35	2700	0.12	180	50RHVL18MD7
	22	8 x 7	35	2700	0.12	220	50RHVL22MD7
	39	8 x 11.5	25	3800	0.12	390	50RHVL39MD11
	47	8 x 11.5	25	3800	0.12	470	50RHVL47MD11
	56	8 x 11.5	25	3800	0.12	560	50RHVL56MD11
	68	10 x 11.5	20	4300	0.12	680	50RHVL68ME11
	100	10 x 11.5	20	4300	0.12	1000	50RHVL100ME11
	220	10 x 11.5	25	4650	0.12	2200	50RHVL220ME11

RSC

Radial Lead Type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 20,000h at 105°C



Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	82 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 10,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

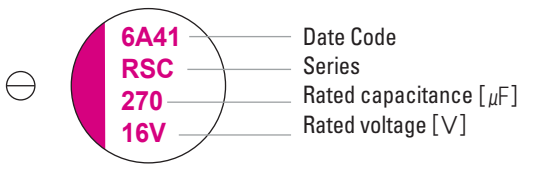
SIZE LIST

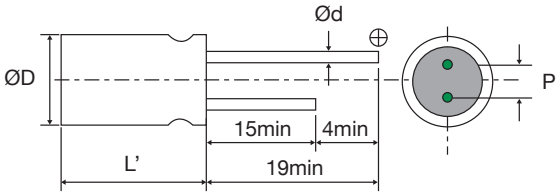
(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	16 (18.4)	20 (23)	25 (28.7)
82						6.3 x 9
100				6.3 x 6		
180					8 x 9	8 x 11.5
270				8 x 7		
330						10 x 11.5
470		6.3 x 9		10 x 11.5	10 x 11.5	
560	6.3 x 9	6.3 x 9				
680			6.3 x 9			
820	8 x 9		6.3 x 9			
1500	8 x 9					

*RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS





(unit : mm)

Size	Ø D±0.5	L	L'	P±0.5	Ø d
6.3 x 6	6.3	6	L max.	2.5	0.45
8 x 7	8	7		3.5	0.45
6.3 x 9	6.3	9		2.5	0.6
8 x 9	8	9		3.5	0.6
8 x 11.5	8	11.5	L + 1.0 max.	3.5	0.6
10x11.5	10	11.5		5	0.6

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	560	6.3 x 9	7	5600	0.1	500	2RSC560MC9
	820	8 x 9	7	5900	0.1	500	2RSC820MD9
	1500	8 x 9	7	6100	0.1	750	2RSC1500MD9
4	470	6.3 x 9	7	5600	0.1	500	4RSC470MC9
	560	6.3 x 9	7	5600	0.1	500	4RSC560MC9
6.3	680	6.3 x 9	7	4000	0.1	856	6RSC680MC9
	820	6.3 x 9	7	4700	0.1	1033	6RSC820MC9
16	100	6.3 x 6	24	2490	0.1	320	16RSC100MC6
	270	8 x 7	10	5000	0.1	864	16RSC270MD7
	470	10 x11.5	10	6100	0.1	1504	16RSC470ME11
20	180	8 x 9	18	3500	0.1	720	20RSC180MD9
	470	10 x11.5	15	5000	0.1	1880	20RSC470ME11
25	82	6.3 x 9	28	2780	0.1	410	25RSC82MC9
	180	8 x11.5	16	4650	0.1	900	25RSC180MD11
	330	10 x11.5	14	5000	0.1	1650	25RSC330ME11

RHHL

Radial Lead Type series

- High Reliability, High Voltage, High Temperature
- Low ESR, High ripple current
- Load life of 4,000h at 125°C
- Compliance with AEC-Q200

Halogen Less · RoHS compliant · lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	16 to 80Vdc	
Capacitance range	22 to 1000μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	125°C, 4,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	Flow method (260±5°C, 10s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C

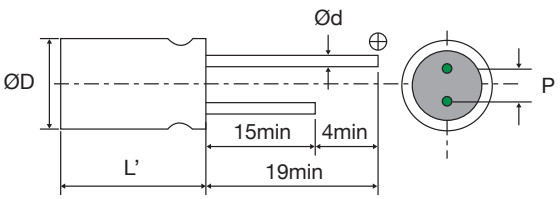
SIZE LIST

(unit : mm)

μF \ RV(SV)	16 (20)	25 (31)	35 (-43)	50 (-63)	63 (-79)	80 (-100)
22					8 x 7	
39				8 x 7		8 x 11.5
56					8 x 11.5	
68			8 x 7			10 x 11.5
100		8 x 7			10 x 11.5	
120				8 x 11.5		
180				10 x 11.5		
220	8 x 7		8 x 11.5			
270		8 x 11.5				
330			10 x 11.5			
470		10 x 11.5				
560	8 x 11.5					
680						
1000	10 x 11.5					

*RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS



(unit : mm)

Size	Φ D±0.5	L	L'	P±0.5	Φ d
8 x 7	8	7	Lmax	3.5	0.45
8 x 11.5	8	11.5	L+1.0max	3.5	0.6
10 x 11.5	10	11.5		5	0.6

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CONDUCTIVE POLYMER ALUMINUM CAPACITORS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (125°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
16	220	8 x 7	30	1500	0.1	105	16RHHL220MD7
	560	8 x 11.5	16	3800	0.1	268	16RHHL560MD11
	1000	10 x 11.5	13	4300	0.1	480	16RHHL1000ME11
25	100	8 x 7	41	1200	0.1	75	25RHHL100MD7
	270	8 x 11.5	19	3300	0.1	202	25RHHL270MD11
	470	10 x 11.5	15	4100	0.1	352	25RHHL470ME11
35	68	8 x 7	44	1200	0.1	71	35RHHL68MD7
	220	8 x 11.5	21	3300	0.1	231	35RHHL220MD11
	330	10 x 11.5	16	3900	0.1	346	35RHHL330ME11
50	39	8 x 7	45	1300	0.1	58	50RHHL39MD7
	120	8 x 11.5	25	2900	0.1	180	50RHHL120MD11
	180	10 x 11.5	19	3500	0.1	270	50RHHL180ME11
63	22	8 x 7	48	1100	0.1	42	63RHHL22MD7
	56	8 x 11.5	27	2900	0.1	105	63RHHL56MD11
	100	10 x 11.5	24	3000	0.1	189	63RHHL100ME11
80	39	8 x 11.5	35	1600	0.1	93	80RHHL39MD11
	68	10 x 11.5	28	2100	0.1	163	80RHHL68ME11

VS

Surface mount type

series

- Standard
- Low ESR, High ripple current
- Load life of 2,000h at 105°C

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	6.8 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 2 ,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

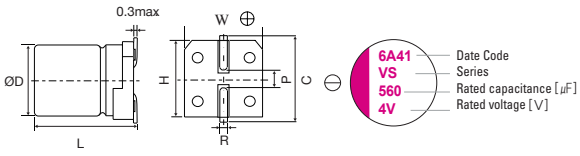
**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C*

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)	20 (23.0)	25 (28.7)
6.8							6.3 x 5.9
10						5 x 5.9	8 x 6.9
15					5 x 5.9		
22					5 x 5.9	6.3 x 5.9	10 x 7.9
27						6.3 x 5.9	
33				5 x 5.9		8 x 6.9	8 x 11.9
39		5 x 5.9			6.3 x 5.9		
47			5 x 5.9	6.3x5.9	6.3 x 5.9	8 x 6.9	
56				6.3x5.9	8 x 6.9	10 x 7.9	10 x 12.6
68		5 x 5.9				10 x 7.9	
82			6.3 x 5.9		8 x 6.9		
100			6.3 x 5.9		10 x 7.9	8 x 11.9	8 x 11.9
120			6.3 x 5.9	8 x 6.9			
150		6.3 x 5.9		8 x 6.9 10 x 7.9	10 x 7.9	10 x 12.6	10 x 12.6
180					8 x 11.9 10 x 7.9		
220	6.3 x 5.9		8 x 6.9 10 x 7.9				
270				10 x 7.9			
330		8 x 6.9	10 x 7.9	8 x 11.9 10 x 7.9	10 x 12.6		
470	8 x 6.9		8 x 11.9 10 x 7.9		10 x 12.6		
560		8 x 11.9		10 x 12.6			
680	8 x 11.9	10 x 7.9					
820			10 x 12.6				
1000			10 x 12.6				
1200		10 x 12.6					
1500	10 x 12.6						

MARKING AND DIMENSIONS

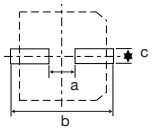


(unit : mm)

Size	Φ D±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9	5.3	5.3	6.0	0.6 to 0.8	1.4	
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1	
8 x 6.9	8.0	6.9	8.3	8.3	9.0	0.6 to 0.8	3.2	
10 x 7.9	10.0	7.9	10.3	10.3	11.0	0.6 to 0.8	4.6	
8 x 11.9	8.0	11.9	8.3	8.3	9.0	0.8 to 1.1	3.2	
10 x 12.6	10.0	12.6	10.3	10.3	11.0	0.8 to 1.1	4.6	

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
10 x 7.9	4.3	13.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

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Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	220	6.3 x 5.9	23	2390	0.10	110	2VS220MC6
	470	8 x 6.9	23	3300	0.10	235	2VS470MD7
	680	8 x 11.9	13	4520	0.10	340	2VS680MD12
	1500	10 x 12.6	12	5440	0.10	750	2VS1500ME12
4	39	5 x 5.9	70	1100	0.10	78	4VS39MB6
	68	5 x 5.9	60	1400	0.10	136	4VS68MB6
	150	6.3 x 5.9	40	1810	0.10	120	4VS150MC6
	330	8 x 6.9	35	2560	0.10	264	4VS330MD7
	560	8 x 11.9	13	4520	0.10	448	4VS560MD12
	680	10 x 7.9	25	3700	0.10	544	4VS680ME8
	1200	10 x 12.6	12	5440	0.10	960	4VS1200ME12
6.3	47	5 x 5.9	70	1100	0.10	148	6VS47MB6
	82	6.3 x 5.9	45	1700	0.10	103	6VS82MC6
	100	6.3 x 5.9	40	1810	0.10	126	6VS100MC6
	120	6.3 x 5.9	40	1810	0.10	151	6VS120MC6
	220	8 x 6.9	35	2560	0.10	277	6VS220MD7
	220	10 x 7.9	25	3700	0.10	277	6VS220ME8
	330	10 x 7.9	25	3700	0.10	416	6VS330ME8
	470	10 x 7.9	25	3700	0.10	592	6VS470ME8
	470	8 x 11.9	15	4210	0.10	592	6VS470MD12
	820	10 x 12.6	12	5440	0.10	1033	6VS820ME12
	1000	10 x 12.6	12	5440	0.10	1260	6VS1000ME12
10	33	5 x 5.9	70	1100	0.10	165	10VS33MB6
	47	6.3 x 5.9	50	1620	0.10	94	10VS47MC6
	56	6.3 x 5.9	45	1700	0.10	112	10VS56MC6
	120	8 x 6.9	35	2560	0.10	240	10VS120MD7
	150	8 x 6.9	35	2560	0.10	300	10VS150MD7
	150	10 x 7.9	30	3020	0.10	300	10VS150ME8
	270	10 x 7.9	25	3700	0.10	540	10VS270ME8
	330	8 x 11.9	17	3950	0.10	660	10VS330MD12
	330	10 x 7.9	25	3700	0.10	660	10VS330ME8
	560	10 x 12.6	13	5230	0.10	1120	10VS560ME12
16	15	5 x 5.9	120	1020	0.10	120	16VS15MB6
	22	5 x 5.9	90	1060	0.10	176	16VS22MB6
	39	6.3 x 5.9	50	1620	0.10	125	16VS39MC6
	47	6.3 x 5.9	50	1620	0.10	150	16VS47MC6
	56	8 x 6.9	45	1890	0.10	179	16VS56MD7
	82	8 x 6.9	40	2120	0.10	262	16VS82MD7
	100	10 x 7.9	35	2670	0.10	320	16VS100ME8
	150	10 x 7.9	30	3020	0.10	480	16VS150ME8
	180	8 x 11.9	20	3640	0.10	576	16VS180MD12
	180	10 x 7.9	30	3020	0.10	576	16VS180ME8
	330	10 x 12.6	16	4720	0.10	1056	16VS330ME12
	470	10 x 12.6	16	4720	0.10	1504	16VS470ME12
20	10	5 x 5.9	120	1020	0.10	100	20VS10MB6
	22	6.3 x 5.9	60	1450	0.10	88	20VS22MC6
	27	6.3 x 5.9	60	1450	0.10	108	20VS27MC6
	33	8 x 6.9	45	1890	0.10	132	20VS33MD7
	47	8 x 6.9	45	1890	0.10	188	20VS47MD7
	56	10 x 7.9	40	2400	0.10	224	20VS56ME8
	68	10 x 7.9	40	2400	0.10	272	20VS68ME8
	100	8 x 11.9	24	3320	0.10	400	20VS100MD12
	150	10 x 12.6	20	4320	0.10	600	20VS150ME12
25	6.8	6.3 x 5.9	80	1200	0.10	85	25VS6R8MC6
	10	8 x 6.9	60	1500	0.10	125	25VS10MD7
	22	10 x 7.9	50	2000	0.10	275	25VS22ME8
	33	8 x 11.9	30	2980	0.10	413	25VS33MD12
	56	10 x 12.6	28	3800	0.10	700	25VS56ME12
	100	8 x 11.9	30	3320	0.10	500	25VS100MD12
	150	10 x 12.6	25	4320	0.10	750	25VS150ME12

VL

Surface mount type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 2,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	39 to 2,700μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 2,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

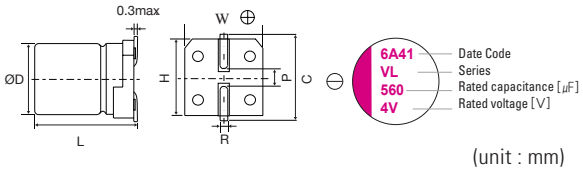
SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
39					5 x 5.9
47				5 x 5.9	
68				5 x 5.9	6.3 x 5.9
82					6.3 x 5.9
100			5 x 5.9		6.3 x 5.9
120			5 x 5.9	6.3 x 5.9	8 x 6.9
150		5 x 5.9		6.3 x 5.9	8 x 6.9
180	5 x 5.9				
220			6.3 x 5.9		
270				8 x 6.9	8 x 11.9
330		6.3 x 5.9	6.3 x 5.9		8 x 11.9
390	6.3 x 5.9		8 x 6.9		
560	6.3 x 5.9	8 x 6.9 8 x 11.9			
680	8 x 6.9				
820	8 x 11.9		8 x 11.9		
1000	8 x 11.9				
1200		8 x 11.9			
1500	8 x 11.9	8 x 11.9			
2700	10 x 12.6				

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

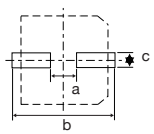
MARKING AND DIMENSIONS



(unit : mm)

Size	ØD±0.5	L +0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9	5.3	5.3	6.0	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8.0	6.9	8.3	8.3	9.0	0.6 to 0.8	3.2
8 x 11.9	8.0	11.9	8.3	8.3	9.0	0.8 to 1.1	3.2
10 x 12.6	10.0	12.6	10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB



(unit : mm)

Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

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Site Web : www.es-france.com

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	180	5 x 5.9	19	2800	0.10	300	2VL180MB6
	390	6.3 x 5.9	15	3160	0.10	300	2VL390MC6
	560	6.3 x 5.9	16	3500	0.10	300	2VL560MC6
	680	8 x 6.9	20	3370	0.10	500	2VL680MD7
	820	8 x 11.9	9	5380	0.10	500	2VL820MD12
	1000	8 x 11.9	10	5380	0.10	500	2VL1000MD12
	1500	8 x 11.9	10	5150	0.10	750	2VL1500MD12
	2700	10 x 12.6	12	5070	0.10	1350	2VL2700ME12
4	150	5 x 5.9	20	2730	0.10	300	4VL150MB6
	330	6.3 x 5.9	15	3160	0.10	300	4VL330MC6
	560	8 x 6.9	22	3220	0.10	500	4VL560MD7
	560	8 x 11.9	9	5380	0.10	500	4VL560MD12
	1200	8 x 11.9	12	4700	0.10	960	4VL1200MD12
	1500	8 x 11.9	12	4700	0.10	1200	4VL1500MD12
6.3	100	5 x 5.9	25	2150	0.10	300	6VL100MB6
	120	5 x 5.9	21	2660	0.10	300	6VL120MB6
	220	6.3 x 5.9	15	3160	0.10	300	6VL220MC6
	330	6.3 x 5.9	17	3390	0.10	415	6VL330MC6
	390	8 x 6.9	22	3220	0.10	491	6VL390MD7
	820	8 x 11.9	12	4700	0.10	1033	6VL820MD12
10	47	5 x 5.9	40	1270	0.10	300	10VL47MB6
	68	5 x 5.9	23	2540	0.10	300	10VL68MB6
	120	6.3 x 5.9	22	2600	0.10	300	10VL120MC6
	150	6.3 x 5.9	22	2600	0.10	300	10VL150MC6
	270	8 x 6.9	22	3220	0.10	500	10VL270MD7
16	39	5 x 5.9	27	2350	0.10	300	16VL39MB6
	68	6.3 x 5.9	25	2440	0.10	300	16VL68MC6
	82	6.3 x 5.9	25	2490	0.10	300	16VL82MC6
	100	6.3 x 5.9	24	2490	0.10	300	16VL100MC6
	120	8 x 6.9	27	2900	0.10	500	16VL120MD7
	150	8 x 6.9	22	3220	0.10	500	16VL150MD7
	270	8 x 11.9	16	4070	0.10	864	16VL270MD12
	330	8 x 11.9	16	4070	0.10	1056	16VL330MD12

VSL

Surface mount type

series

- Low ESR, High ripple current
- Load life of 5,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	6.8 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 5,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

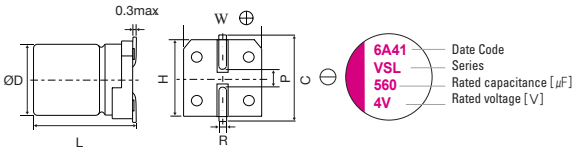
In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)	20 (23.0)	25 (28.7)
6.8							6.3 x 5.9
10						5 x 5.9	8 x 6.9
15					5 x 5.9		
22					5 x 5.9	6.3 x 5.9	10 x 7.9
27						6.3 x 5.9	
33				5 x 5.9		8 x 6.9	8 x 11.9
39		5 x 5.9			6.3 x 5.9		
47			5 x 5.9	6.3x5.9	6.3 x 5.9	8 x 6.9	
56				6.3x5.9	8 x 6.9	10 x 7.9	10 x 12.6
68		5 x 5.9				10 x 7.9	
82			6.3 x 5.9		8 x 6.9		
100			6.3 x 5.9		10 x 7.9	8 x 11.9	8 x 11.9
120			6.3 x 5.9	8 x 6.9			
150		6.3 x 5.9		8 x 6.9 10 x 7.9	10 x 7.9	10 x 12.6	10 x 12.6
180					8 x 11.9 10 x 7.9		
220	6.3 x 5.9		8 x 11.9 10 x 7.9				
270				10 x 7.9			
330		8 x 6.9	10 x 7.9	8 x 11.9 10 x 7.9	10 x 12.6		
470	8 x 6.9		8 x 11.9 10 x 7.9		10 x 12.6		
560		8 x 11.9		10 x 12.6			
680	8 x 11.9	10 x 7.9					
820			10 x 12.6				
1000			10 x 12.6				
1200		10 x 12.6					
1500	10 x 12.6						

MARKING AND DIMENSIONS

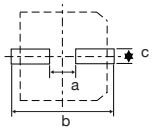


(unit : mm)

Size	ΦD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9	5.3	5.3	6.0	0.6 to 0.8	1.4	
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1	
8 x 6.9	8.0	6.9	8.3	8.3	9.0	0.6 to 0.8	3.2	
10 x 7.9	10.0	7.9	10.3	10.3	11.0	0.6 to 0.8	4.6	
8 x 11.9	8.0	11.9	8.3	8.3	9.0	0.8 to 1.1	3.2	
10 x 12.6	10.0	12.6	10.3	10.3	11.0	0.8 to 1.1	4.6	

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
10 x 7.9	4.3	13.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	220	6.3 x 5.9	23	2390	0.10	110	2VSL220MC6
	470	8 x 6.9	23	3300	0.10	235	2VSL470MD7
	680	8 x 11.9	13	4520	0.10	340	2VSL680MD12
	1500	10 x 12.6	12	5440	0.10	750	2VSL1500ME12
4	39	5 x 5.9	70	1100	0.10	78	4VSL39MB6
	68	5 x 5.9	60	1400	0.10	136	4VSL68MB6
	150	6.3 x 5.9	40	1810	0.10	120	4VSL150MC6
	330	8 x 6.9	35	2560	0.10	264	4VSL330MD7
	560	8 x 11.9	13	4520	0.10	448	4VSL560MD12
	680	10 x 7.9	25	3700	0.10	544	4VSL680ME8
	1200	10 x 12.6	12	5440	0.10	960	4VSL1200ME12
6.3	47	5 x 5.9	70	1100	0.10	148	6VSL47MB6
	82	6.3 x 5.9	45	1700	0.10	103	6VSL82MC6
	100	6.3 x 5.9	40	1810	0.10	126	6VSL100MC6
	120	6.3 x 5.9	40	1810	0.10	151	6VSL120MC6
	220	8 x 6.9	35	2560	0.10	277	6VSL220MD7
	220	10 x 7.9	25	3700	0.10	277	6VSL220ME8
	330	10 x 7.9	25	3700	0.10	416	6VSL330ME8
	470	10 x 7.9	25	3700	0.10	592	6VSL470ME8
	470	8 x 11.9	15	4210	0.10	592	6VSL470MD12
	820	10 x 12.6	12	5440	0.10	1033	6VSL820ME12
	1000	10 x 12.6	12	5440	0.10	1260	6VSL1000ME12
10	33	5 x 5.9	70	1100	0.10	165	10VSL33MB6
	47	6.3 x 5.9	50	1620	0.10	94	10VSL47MC6
	56	6.3 x 5.9	45	1700	0.10	112	10VSL56MC6
	120	8 x 6.9	35	2560	0.10	240	10VSL120MD7
	150	8 x 6.9	35	2560	0.10	300	10VSL150MD7
	150	10 x 7.9	30	3020	0.10	300	10VSL150ME8
	270	10 x 7.9	25	3700	0.10	540	10VSL270ME8
	330	8 x 11.9	17	3950	0.10	660	10VSL330MD12
	330	10 x 7.9	25	3700	0.10	660	10VSL330ME8
	560	10 x 12.6	13	5230	0.10	1120	10VSL560ME12
16	15	5 x 5.9	120	1020	0.10	120	16VSL15MB6
	22	5 x 5.9	90	1060	0.10	176	16VSL22MB6
	39	6.3 x 5.9	50	1620	0.10	125	16VSL39MC6
	47	6.3 x 5.9	50	1620	0.10	150	16VSL47MC6
	56	8 x 6.9	45	1890	0.10	179	16VSL56MD7
	82	8 x 6.9	40	2120	0.10	262	16VSL82MD7
	100	10 x 7.9	35	2670	0.10	320	16VSL100ME8
	150	10 x 7.9	30	3020	0.10	480	16VSL150ME8
	180	8 x 11.9	20	3640	0.10	576	16VSL180MD12
	180	10 x 7.9	30	3020	0.10	576	16VSL180ME8
	330	10 x 12.6	16	4720	0.10	1056	16VSL330ME12
	470	10 x 12.6	16	4720	0.10	1504	16VSL470ME12
20	10	5 x 5.9	120	1020	0.10	100	20VSL10MB6
	22	6.3 x 5.9	60	1450	0.10	88	20VSL22MC6
	27	6.3 x 5.9	60	1450	0.10	108	20VSL27MC6
	33	8 x 6.9	45	1890	0.10	132	20VSL33MD7
	47	8 x 6.9	45	1890	0.10	188	20VSL47MD7
	56	10 x 7.9	40	2400	0.10	224	20VSL56ME8
	68	10 x 7.9	40	2400	0.10	272	20VSL68ME8
	100	8 x 11.9	24	3320	0.10	400	20VSL100MD12
	150	10 x 12.6	20	4320	0.10	600	20VSL150ME12
25	6.8	6.3 x 5.9	80	1200	0.10	85	25VSL6R8MC6
	10	8 x 6.9	60	1500	0.10	125	25VSL10MD7
	22	10 x 7.9	50	2000	0.10	275	25VSL22ME8
	33	8 x 11.9	30	2980	0.10	413	25VSL33MD12
	56	10 x 12.6	28	3800	0.10	700	25VSL56ME12
	100	8 x 11.9	30	3320	0.10	500	25VSL100MD12
	150	10 x 12.6	25	4320	0.10	750	25VSL150ME12

VLL

Surface mount type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 5,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	39 to 2,700μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 5,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

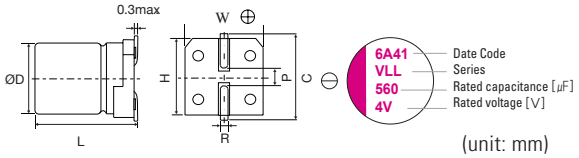
SIZE LIST

(unit: mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
39					5 x 5.9
68				5 x 5.9	6.3 x 5.9
82					6.3 x 5.9
100			5 x 5.9		6.3 x 5.9
120			5 x 5.9	6.3 x 5.9	8 x 6.9
150		5 x 5.9		6.3 x 5.9	8 x 6.9
180	5 x 5.9				
220			6.3 x 5.9		
270				8 x 6.9	8 x 11.9
330		6.3 x 5.9	6.3 x 5.9		8 x 11.9
390	6.3 x 5.9		8 x 6.9		
560	6.3 x 5.9	8 x 6.9 8 x 11.9			
680	8 x 6.9				
820	8 x 11.9		8 x 11.9		
1000	8 x 11.9				
1200		8 x 11.9			
1500	8 x 11.9	8 x 11.9			
2700	10 x 12.6				

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

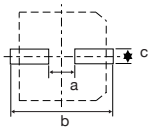
MARKING AND DIMENSIONS



(unit: mm)

Size	Ø D±0.5	L +0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9	5.3	5.3	6.0	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8.0	6.9	8.3	8.3	9.0	0.6 to 0.8	3.2
8 x 11.9	8.0	11.9	8.3	8.3	9.0	0.8 to 1.1	3.2
10 x 12.6	10.0	12.6	10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB



(unit: mm)

Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	180	5 x 5.9	19	2800	0.10	300	2VLL180MB6
	390	6.3 x 5.9	15	3160	0.10	300	2VLL390MC6
	560	6.3 x 5.9	16	3500	0.10	300	2VLL560MC6
	680	8 x 6.9	20	3370	0.10	500	2VLL680MD7
	820	8 x 11.9	9	5380	0.10	500	2VLL820MD12
	1000	8 x 11.9	10	5380	0.10	500	2VLL1000MD12
	1500	8 x 11.9	10	5150	0.10	750	2VLL1500MD12
	2700	10 x 12.6	12	5070	0.10	1350	2VLL2700ME12
4	150	5 x 5.9	20	2730	0.10	300	4VLL150MB6
	330	6.3 x 5.9	15	3160	0.10	300	4VLL330MC6
	560	8 x 6.9	22	3220	0.10	500	4VLL560MD7
	560	8 x 11.9	9	5380	0.10	500	4VLL560MD12
	1200	8 x 11.9	12	4700	0.10	960	4VLL1200MD12
	1500	8 x 11.9	12	4700	0.10	1200	4VLL1500MD12
6.3	100	5 x 5.9	25	2150	0.10	300	6VLL100MB6
	120	5 x 5.9	21	2660	0.10	300	6VLL120MB6
	220	6.3 x 5.9	15	3160	0.10	300	6VLL220MC6
	330	6.3 x 5.9	17	3390	0.10	415	6VLL330MC6
	390	8 x 6.9	22	3220	0.10	491	6VLL390MD7
	820	8 x 11.9	12	4700	0.10	1033	6VLL820MD12
10	68	5 x 5.9	23	2540	0.10	300	10VLL68MB6
	120	6.3 x 5.9	22	2600	0.10	300	10VLL120MC6
	150	6.3 x 5.9	22	2600	0.10	300	10VLL150MC6
	270	8 x 6.9	22	3220	0.10	500	10VLL270MD7
16	39	5 x 5.9	27	2350	0.10	300	16VLL39MB6
	68	6.3 x 5.9	25	2440	0.10	300	16VLL68MC6
	82	6.3 x 5.9	25	2490	0.10	300	16VLL82MC6
	100	6.3 x 5.9	24	2490	0.10	300	16VLL100MC6
	120	8 x 6.9	27	2900	0.10	500	16VLL120MD7
	150	8 x 6.9	22	3220	0.10	500	16VLL150MD7
	270	8 x 11.9	16	4070	0.10	864	16VLL270MD12
	330	8 x 11.9	16	4070	0.10	1056	16VLL330MD12

VSH

Surface mount type

series

- Higher temperature endurance guaranteed than VS series
- Low ESR, High ripple current
- Load life of 1,000h at 125°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	2.5 to 25Vdc	
Capacitance range	6.8 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	125°C, 1,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

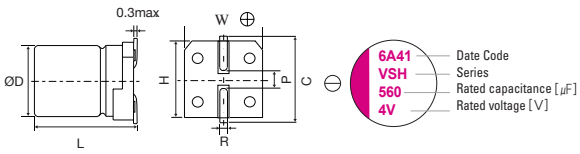
In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)	20 (23.0)	25 (28.7)
6.8							6.3 x 5.9
10						5 x 5.9	8 x 6.9
15					5 x 5.9		
22					5 x 5.9	6.3 x 5.9	10 x 7.9
27						6.3 x 5.9	
33				5 x 5.9		8 x 6.9	8 x 11.9
39		5 x 5.9			6.3 x 5.9		
47			5 x 5.9	6.3x5.9	6.3 x 5.9	8 x 6.9	
56				6.3x5.9	8 x 6.9	10 x 7.9	10 x 12.6
68		5 x 5.9				10 x 7.9	
82			6.3 x 5.9		8 x 6.9		
100			6.3 x 5.9		10 x 7.9	8 x 11.9	8 x 11.9
120			6.3 x 5.9	8 x 6.9			
150		6.3 x 5.9		8 x 6.9 10 x 7.9	10 x 7.9	10 x 12.6	10 x 12.6
180					8 x 11.9 10 x 7.9		
220	6.3 x 5.9		8 x 11.9 10 x 7.9				
270				10 x 7.9			
330		8 x 6.9	10 x 7.9	8 x 11.9 10 x 7.9	10 x 12.6		
470	8 x 6.9		8 x 11.9 10 x 7.9		10 x 12.6		
560		8 x 11.9		10 x 12.6			
680	8 x 11.9	10 x 7.9					
820			10 x 12.6				
1000			10 x 12.6				
1200		10 x 12.6					
1500	10 x 12.6						

MARKING AND DIMENSIONS

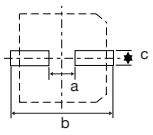


(unit : mm)

Size	ØD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9	5.3	5.3	6.0	0.6 to 0.8	1.4	
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1	
8 x 6.9	8.0	6.9	8.3	8.3	9.0	0.6 to 0.8	3.2	
10 x 7.9	10.0	7.9	10.3	10.3	11.0	0.6 to 0.8	4.6	
8 x 11.9	8.0	11.9	8.3	8.3	9.0	0.8 to 1.1	3.2	
10 x 12.6	10.0	12.6	10.3	10.3	11.0	0.8 to 1.1	4.6	

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
10 x 7.9	4.3	13.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

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Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz)[mArms]		Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
				-55 to +105°C	+105 to +125°C			
2.5	220	6.3 x 5.9	23	2390	756	0.10	110	2VSH220MC6
	470	8 x 6.9	23	3300	1044	0.10	235	2VSH470MD7
	680	8 x 11.9	13	4520	1430	0.10	340	2VSH680MD12
	1500	10 x 12.6	12	5440	1721	0.10	750	2VSH1500ME12
4	39	5 x 5.9	70	1100	348	0.10	78	4VSH39MB6
	68	5 x 5.9	60	1400	443	0.10	136	4VSH68MB6
	150	6.3 x 5.9	40	1810	572	0.10	120	4VSH150MC6
	330	8 x 6.9	35	2560	810	0.10	264	4VSH330MD7
	560	8 x 11.9	13	4520	1430	0.10	448	4VSH560MD12
	680	10 x 7.9	25	3700	1170	0.10	544	4VSH680ME8
	1200	10 x 12.6	12	5440	1721	0.10	960	4VSH1200ME12
6.3	47	5 x 5.9	70	1100	348	0.10	148	6VSH47MB6
	82	6.3 x 5.9	45	1700	537	0.10	103	6VSH82MC6
	100	6.3 x 5.9	40	1810	572	0.10	126	6VSH100MC6
	120	6.3 x 5.9	40	1810	572	0.10	151	6VSH120MC6
	220	8 x 6.9	35	2560	810	0.10	277	6VSH220MD7
	220	10 x 7.9	25	3700	1170	0.10	277	6VSH220ME8
	330	10 x 7.9	25	3700	1170	0.10	416	6VSH330ME8
	470	10 x 7.9	25	3700	1170	0.10	592	6VSH470ME
	470	8 x 11.9	15	4210	1332	0.10	592	6VSH470MD12
	820	10 x 12.6	12	5440	1721	0.10	1033	6VSH820ME12
	1000	10 x 12.6	12	5440	1721	0.10	1260	6VSH1000ME12
10	33	5 x 5.9	70	1100	348	0.10	165	10VSH33MB6
	47	6.3 x 5.9	50	1620	512	0.10	94	10VSH47MC6
	56	6.3 x 5.9	45	1700	537	0.10	112	10VSH56MC6
	120	8 x 6.9	35	2560	810	0.10	240	10VSH120MD7
	150	8 x 6.9	35	2560	810	0.10	300	10VSH150MD7
	150	10 x 7.9	30	3020	955	0.10	300	10VSH150ME8
	270	10 x 7.9	25	3700	1170	0.10	540	10VSH270ME8
	330	8 x 11.9	17	3950	1250	0.10	660	10VSH330MD12
	330	10 x 7.9	25	3700	1170	0.10	660	10VSH330ME8
	560	10 x 12.6	13	5230	1655	0.10	1120	10VSH560ME12
16	15	5 x 5.9	120	1020	322	0.10	120	16VSH15MB6
	22	5 x 5.9	90	1060	335	0.10	176	16VSH22MB6
	39	6.3 x 5.9	50	1620	512	0.10	125	16VSH39MC6
	47	6.3 x 5.9	50	1620	512	0.10	150	16VSH47MC6
	56	8 x 6.9	45	1890	598	0.10	179	16VSH56MD7
	82	8 x 6.9	40	2120	670	0.10	262	16VSH82MD7
	100	10 x 7.9	35	2670	845	0.10	320	16VSH100ME8
	150	10 x 7.9	30	3020	955	0.10	480	16VSH150ME8
	180	8 x 11.9	20	3640	1151	0.10	576	16VSH180MD12
	180	10 x 7.9	30	3020	955	0.10	576	16VSH180ME8
	330	10 x 12.6	16	4720	1493	0.10	1056	16VSH330ME12
	470	10 x 12.6	16	4720	1493	0.10	1504	16VSH470ME12
20	10	5 x 5.9	120	1020	322	0.10	100	20VSH10MB6
	22	6.3 x 5.9	60	1450	458	0.10	88	20VSH22MC6
	27	6.3 x 5.9	60	1450	458	0.10	108	20VSH27MC6
	33	8 x 6.9	45	1890	598	0.10	132	20VSH33MD7
	47	8 x 6.9	45	1890	598	0.10	188	20VSH47MD7
	56	10 x 7.9	40	2400	759	0.10	224	20VSH56ME8
	68	10 x 7.9	40	2400	759	0.10	272	20VSH68ME8
	100	8 x 11.9	24	3320	1050	0.10	400	20VSH100MD12
	150	10 x 12.6	20	4320	1367	0.10	600	20VSH150ME12
25	6.8	6.3 x 5.9	80	1200	377	0.10	85	25VSH6R8MC6
	10	8 x 6.9	60	1500	471	0.10	125	25VSH10MD7
	22	10 x 7.9	50	2000	632	0.10	275	25VSH22ME8
	33	8 x 11.9	30	2980	943	0.10	413	25VSH33MD12
	56	10 x 12.6	28	3800	1202	0.10	700	25VSH56ME12
	100	8 x 11.9	30	3320	1050	0.10	500	25VSH100MD12
	150	10 x 12.6	25	3800	1367	0.10	750	25VSH150ME12

VLH

Surface mount type

series

- Higher temperature endurance guaranteed than VL series
- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 1,000h at 125°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	39 to 2,700μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	125°C, 1,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C*

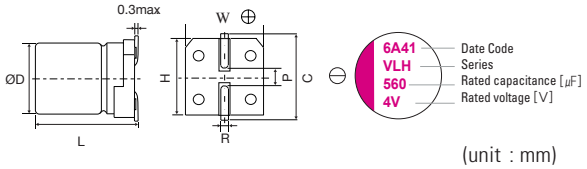
SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
39					5 x 5.9
68				5 x 5.9	6.3 x 5.9
82					6.3 x 5.9
100			5 x 5.9		6.3 x 5.9
120			5 x 5.9	6.3 x 5.9	8 x 6.9
150		5 x 5.9		6.3 x 5.9	8 x 6.9
180	5 x 5.9				
220			6.3 x 5.9		
270				8 x 6.9	8 x 11.9
330		6.3 x 5.9	6.3 x 5.9		8 x 11.9
390	6.3 x 5.9		8 x 6.9		
560	6.3 x 5.9	8 x 6.9 8 x 11.9			
680	8 x 6.9				
820	8 x 11.9		8 x 11.9		
1000	8 x 11.9				
1200		8 x 11.9			
1500	8 x 11.9	8 x 11.9			
2700	10 x 12.6				

**RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)*

MARKING AND DIMENSIONS

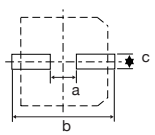


(unit : mm)

Size	ØD±0.5	L +0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9	5.3	5.3	6.0	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8.0	6.9	8.3	8.3	9.0	0.6 to 0.8	3.2
8 x 11.9	8.0	11.9	8.3	8.3	9.0	0.8 to 1.1	3.2
10 x 12.6	10.0	12.6	10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz) [mArms]		Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
				-55 to +105°C	+105 to +125°C			
2.5	180	5 x 5.9	19	2800	886	0.10	300	2VLH180MB6
	390	6.3 x 5.9	15	3160	1000	0.10	300	2VLH390MC6
	560	6.3 x 5.9	16	3500	1107	0.10	300	2VLH560MC6
	680	8 x 6.9	20	3370	1066	0.10	500	2VLH680MD7
	820	8 x 11.9	9	5380	1702	0.10	500	2VLH820MD12
	1000	8 x 11.9	10	5380	1702	0.10	500	2VLH1000MD12
	1500	8 x 11.9	10	5150	1630	0.10	750	2VLH1500MD12
	2700	10 x 12.6	12	5070	1604	0.10	1350	2VLH2700ME12
4	150	5 x 5.9	20	2730	864	0.10	300	4VLH150MB6
	330	6.3 x 5.9	15	3160	1000	0.10	300	4VLH330MC6
	560	8 x 6.9	22	3220	1019	0.10	500	4VLH560MD7
	560	8 x 11.9	9	5380	1702	0.10	500	4VLH560MD12
	1200	8 x 11.9	12	4700	1487	0.10	960	4VLH1200MD12
	1500	8 x 11.9	12	4700	1487	0.10	1200	4VLH1500MD12
6.3	100	5 x 5.9	25	2150	680	0.10	300	6VLH100MB6
	120	5 x 5.9	21	2660	841	0.10	300	6VLH120MB6
	220	6.3 x 5.9	15	3160	1000	0.10	300	6VLH220MC6
	330	6.3 x 5.9	17	3390	1073	0.10	415	6VLH330MC6
	390	8 x 6.9	22	3220	1019	0.10	491	6VLH390MD7
	820	8 x 11.9	12	4700	1487	0.10	1033	6VLH820MD12
10	68	5 x 5.9	23	2540	804	0.10	300	10VLH68MB6
	120	6.3 x 5.9	22	2600	823	0.10	300	10VLH120MC6
	150	6.3 x 5.9	22	2600	823	0.10	300	10VLH150MC6
	270	8 x 6.9	22	3220	1019	0.10	500	10VLH270MD7
16	39	5 x 5.9	27	2350	743	0.10	300	16VLH39MB6
	68	6.3 x 5.9	25	2440	772	0.10	300	16VLH68MC6
	82	6.3 x 5.9	25	2490	788	0.10	300	16VLH82MC6
	100	6.3 x 5.9	24	2490	788	0.10	300	16VLH100MC6
	120	8 x 6.9	27	2900	917	0.10	500	16VLH120MD7
	150	8 x 6.9	22	3220	1019	0.10	500	16VLH150MD7
	270	8 x 11.9	16	4070	1288	0.10	864	16VLH270MD12
	330	8 x 11.9	16	4070	1288	0.10	1056	16VLH330MD12

VU

Surface mount type

series

- Lower ESR than VL series
- High ripple current
- Load life of 2,000h at 105°C

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	150 to 560µF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 2,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

**In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C*

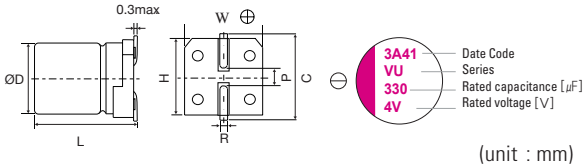
DIMENSIONS

(unit : mm)

µF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	16 (18.4)
150			5 x 5.9	
180			5 x 5.9	6.3 x 9.9
220			6.3 x 5.9	
270	5 x 5.9			
330	5 x 5.9	6.3 x 5.9		
390	5 x 5.9 6.3 x 5.9			
470				10 x 12.6
560	6.3 x 5.9			

**RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)*

MARKING AND SIZE LIST

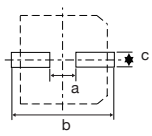


(unit : mm)

Size	Φ D±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9		5.3	5.3	6.0	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9		6.6	6.6	7.3	0.6 to 0.8	2.1
6.3 x 9.9	6.3	9.9		6.6	6.6	7.3	0.6 to 0.8	2.1
10 x 12.6	10.0	12.6		10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
6.3 x 9.9	2.1	9.1	1.6
10 x 12.6	4.3	13.1	1.9

ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 89
Fax. 01 47 01 16 22
e-mail : comp@es-france.com
Site Web : www.es-france.com

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	270	5.0 x 5.9	10	3860	0.12	500	2VU270MB6
	330	5.0 x 5.9	10	3860	0.12	500	2VU330MB6
	390	5.0 x 5.9	10	3860	0.12	700	2VU390MB6
	390	6.3 x 5.9	10	3900	0.12	500	2VU390MC6
	560	6.3 x 5.9	10	3900	0.12	500	2VU560MC6
4	330	6.3 x 5.9	10	3900	0.12	500	4VU330MC6
6.3	150	5.0 x 5.9	12	3520	0.12	500	6VU150MB6
	180	5.0 x 5.9	15	3150	0.12	500	6VU180MB6
	220	6.3 x 5.9	10	3900	0.12	500	6VU220MC6
16	180	6.3 x 9.9	11	4460	0.12	576	16VU180MC10
	470	10 x 12.6	10	6100	0.12	1504	16VU470ME12

ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches
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Site Web : www.es-france.com

VHV

Surface mount type

series

- High Rated Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 5,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	16 to 50Vdc	
Capacitance range	10 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 5,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

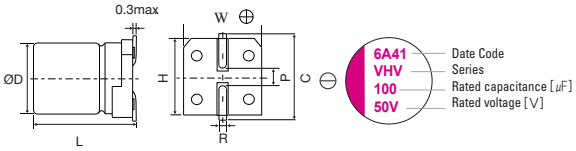
DIMENSIONS

(unit : mm)

μF \ RV(SV)	16 (18.4)	20 (23)	25 (28.7)	32 (36.8)	35 (40.2)	50 (57.5)
10						6.3 x 5.9
18						8 x 6.9
22				6.3 x 5.9	6.3 x 5.9	8 x 6.9
27			5 x 5.9			
33						
39					8 x 6.9	8 x 11.9
47			6.3 x 5.9		8 x 6.9	8 x 11.9
56		5 x 5.9	6.3 x 5.9			8 x 11.9
68				8 x 6.9		10 x 12.6
82	5 x 5.9		8 x 6.9		8 x 11.9	
100			8 x 6.9			10 x 12.6
120		6.3 x 5.9		8 x 11.9	10 x 12.6	
150					10 x 12.6	
180	6.3 x 5.9	8 x 6.9	8 x 11.9		10 x 12.6	
220				10 x 12.6		
270	8 x 6.9					
330			10 x 12.6			
390		8 x 11.9				
560	8 x 11.9	10 x 12.6				
1000	10 x 12.6					
1500	10 x 12.6					

*RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

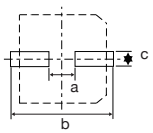
MARKING AND SIZE LIST



(unit : mm)

Size	Φ D±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5.0	5.9		5.3	5.3	6.0	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9		6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8.0	6.9		8.3	8.3	9.0	0.6 to 0.8	3.2
8 x 11.9	8.0	11.9		8.3	8.3	9.0	0.8 to 1.1	3.2
10 x 12.6	10.0	12.6		10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB



(unit : mm)

Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
16	82	5x5.9	27	3000	0.12	262	16VHV82MB6
	180	6.3x5.9	22	3300	0.12	576	16VHV180MC6
	270	8 x6.9	22	3300	0.12	864	16VHV270MD7
	560	8x11.9	14	4950	0.12	1792	16VHV560MD12
	1000	10x12.6	12	5400	0.12	3200	16VHV1000ME12
	1500	10x12.6	12	5400	0.12	4800	16VHV1500ME12
20	56	5x5.9	30	2800	0.12	224	20VHV56MB6
	120	6.3x5.9	25	3200	0.12	480	20VHV120MC6
	180	8 x6.9	25	3200	0.12	720	20VHV180MD7
	390	8x11.9	14	4950	0.12	1560	20VHV390MD12
	560	10x12.6	12	5400	0.12	2240	20VHV560ME12
25	27	5x5.9	40	2450	0.12	135	25VHV27MB6
	47	6.3x5.9	30	2800	0.12	235	25VHV47MC6
	56	6.3x5.9	30	2800	0.12	280	25VHV56MC6
	82	8 x6.9	28	3000	0.12	410	25VHV82MD7
	100	8 x6.9	25	3200	0.12	500	25VHV100MD7
	180	8 x11.9	16	4650	0.12	900	25VHV180MD12
	330	10x12.6	14	5000	0.12	1650	25VHV330ME12
32	22	6.3 x 5.9	35	2700	0.12	141	32VHV22MC6
	68	8 x 6.9	25	3200	0.12	435	32VHV68MD7
	120	8 x 11.9	20	4000	0.12	768	32VHV120MD12
	220	10 x 12.6	18	4650	0.12	1408	32VHV220ME12
35	22	6.3 x 5.9	35	2600	0.12	154	35VHV22MC6
	39	8 x 6.9	30	2800	0.12	273	35VHV39MD7
	47	8 x 6.9	30	2800	0.12	329	35VHV47MD7
	82	8 x 11.9	20	4000	0.12	574	35VHV82MD12
	120	10x12.6	18	4400	0.12	840	35VHV120ME12
	150	10x12.6	18	4400	0.12	1050	35VHV150ME12
	180	10x12.6	18	4400	0.12	1260	35VHV180ME12
50	10	6.3 x 5.9	40	2500	0.12	100	50VHV10MC6
	18	8 x 6.9	35	2700	0.12	180	50VHV18MD7
	22	8 x 6.9	35	2700	0.12	220	50VHV22MD7
	39	8 x 11.9	25	3800	0.12	390	50VHV39MD12
	47	8 x 11.9	25	3800	0.12	470	50VHV47MD12
	56	8 x 11.9	25	3800	0.12	560	50VHV56MD12
	68	10 x 12.6	20	4300	0.12	680	50VHV68ME12
	100	10 x 12.6	20	4300	0.12	1000	50VHV100ME12

VUH

Surface mount type

series

- Ultra-High Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 3,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	63 to 125 Vdc	
Capacitance range	8.2 to 120μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 3,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

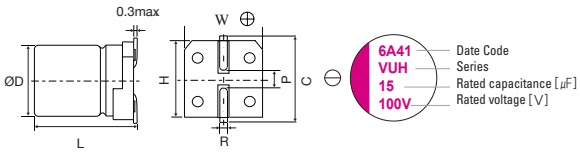
DIMENSIONS

(unit : mm)

μF \ RV(SV)	63 (72.4)	80 (92)	100 (115)	125 (143)
8.2	6.3 x 5.9			
10	8 x 6.9		8 x 11.9	8 x 11.5
12		8 x 11.9		
15	8 x 6.9		8 x 11.9	8 x 11.5
18			10 x 12.6	
22		10 x 12.6	10 x 12.6	
27	8 x 11.9	10 x 12.6		
33	8 x 11.9			10 x 11.5
39	8 x 11.9		10 x 12.6	
47	10 x 12.6		10 x 12.6	
56	10 x 12.6			
68		10 x 12.6	10 x 12.6	
82		10 x 12.6		
120	10 x 12.6			

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND SIZE LIST

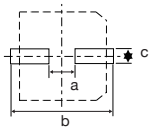


(unit : mm)

Size	ØD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
6.3 x 5.9	6.3	5.9		6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8.0	6.9		8.3	8.3	9.0	0.6 to 0.8	3.2
8 x 11.9	8.0	11.9		8.3	8.3	9.0	0.8 to 1.1	3.2
10 x 12.6	10.0	12.6		10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
63	8.2	6.3 x 5.9	55	1200	0.12	103	63VUH8R2MC6
	10	8 x 6.9	50	1400	0.12	126	63VUH10MD7
	15	8 x 6.9	50	1500	0.12	189	63VUH15MD7
	27	8 x 11.9	35	2800	0.12	340	63VUH27MD12
	33	8 x 11.9	30	3000	0.12	416	63VUH33MD12
	39	8 x 11.9	29	3400	0.12	491	63VUH39MD12
	47	10 x 12.6	29	3300	0.12	592	63VUH47ME12
	56	10 x 12.6	28	3400	0.12	706	63VUH56ME12
	120	10 x 12.6	25	4000	0.12	1512	63VUH120ME12
80	12	8 x 11.9	38	1900	0.12	192	80VUH12MD12
	22	10 x 12.6	35	2300	0.12	352	80VUH22ME12
	27	10 x 12.6	35	2400	0.12	432	80VUH27ME12
	68	10 x 12.6	30	3000	0.12	1088	80VUH68ME12
	82	10 x 12.6	30	3200	0.12	1312	80VUH82ME12
100	10	8 x 11.9	42	1800	0.12	200	100VUH10MD12
	15	8 x 11.9	40	2000	0.12	300	100VUH15MD12
	18	10 x 12.6	38	2200	0.12	360	100VUH18ME12
	22	10 x 12.6	38	2300	0.12	440	100VUH22ME12
	39	10 x 12.6	35	2500	0.12	780	100VUH39ME12
	47	10 x 12.6	35	2600	0.12	940	100VUH47ME12
	68	10 x 12.6	30	2800	0.12	1360	100VUH68ME12
125	10	8 x 11.9	50	1500	0.12	250	125VUH10MD12
	15	8 x 11.9	50	1800	0.12	375	125VUH15MD12
	33	10 x 12.6	40	2000	0.12	825	125VUH33MD12

VHH

Surface mount type

series

- High Reliability,High Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 3,000h at 125°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	16 to 50Vdc	
Capacitance range	5.6 to 390μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	125°C, 3,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C

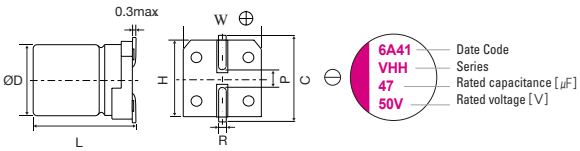
DIMENSIONS

(unit : mm)

μF \ RV(SV)	16 (18.4)	20 (23)	25 (28.7)	35 (40.2)	50 (57.5)
5.6					6.3 x 5.9
10				6.3 x 5.9	8 x 6.9
18				8 x 6.9	
22			6.3 x 5.9		
27					8 x 11.9
33		6.3 x 5.9			
39			8 x 6.9		
47	6.3 x 5.9				10 x 12.6
56		8 x 6.9		8 x 11.9	
82	8 x 6.9				
100				10 x 12.6	
120			8 x 11.9		
150		8 x 11.9			
180			10 x 12.6		
220	8 x 11.9				
270		10 x 12.6			
330			10 x 12.6		
390	10 x 12.6				

*RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND SIZE LIST

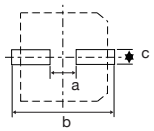


(unit : mm)

Size	ΦD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
6.3 x 5.9	6.3	5.9		6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8.0	6.9		8.3	8.3	9.0	0.6 to 0.8	3.2
8 x 11.9	8.0	11.9		8.3	8.3	9.0	0.8 to 1.1	3.2
10 x 12.6	10.0	12.6		10.3	10.3	11.0	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (100kHz)[mArms]		Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
				-55 to +105°C	+105 to +125°C			
16	47	6.3 x 5.9	50	1620	512	0.12	150	16VHH47MC6
	82	8 x 6.9	40	2120	670	0.12	262	16VHH82MD7
	220	8 x 11.9	20	3640	1151	0.12	704	16VHH220MD12
	390	10 x 12.6	16	4720	1493	0.12	1248	16VHH390ME12
20	33	6.3 x 5.9	60	1450	459	0.12	132	20VHH33MC6
	56	8 x 6.9	50	1890	598	0.12	224	20VHH56MD7
	150	8 x 11.9	28	3320	1050	0.12	600	20VHH150MD12
	270	10 x 12.6	25	4320	1367	0.12	1080	20VHH270ME12
25	22	6.3 x 5.9	60	1500	474	0.12	110	25VHH22MC6
	39	8 x 6.9	50	1835	580	0.12	195	25VHH39MD7
	120	8 x 11.9	28	2980	943	0.12	600	25VHH120MD12
	180	10 x 12.6	25	3800	1202	0.12	900	25VHH180ME12
	330	10 x 12.6	25	3800	1210	0.12	1650	25VHH330ME12
35	10	6.3 x 5.9	70	1100	340	0.12	70	35VHH10MC6
	18	8 x 6.9	60	1300	400	0.12	126	35VHH18MD7
	56	8 x 11.9	30	2300	700	0.12	392	35VHH56MD12
	100	10 x 12.6	28	3650	1150	0.12	700	35VHH100ME12
50	5.6	6.3 x 5.9	70	1000	310	0.12	56	50VHH5R6MC6
	10	8 x 6.9	60	1200	371	0.12	100	50VHH10MD7
	27	8 x 11.9	35	2100	665	0.12	270	50VHH27MD12
	47	10 x 12.6	30	2600	825	0.12	470	50VHH47ME12

VHR

Surface mount type

series

- Super low ESR, High ripple current
- Large capacitance, Small size
- Load life of 10,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	2.5 to 16Vdc	
Capacitance range	39 to 2,700μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	105°C, 10 ,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

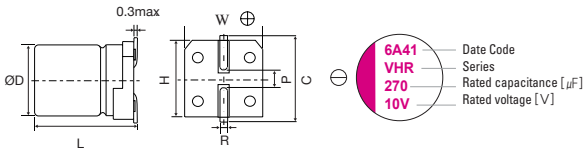
In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

SIZE LIST

(unit : mm)

μF \ RV(SV)	2.5 (3.3)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
39					5 x 5.9
68				5 x 5.9	6.3 x 5.9
82					6.3 x 5.9
100			5 x 5.9		6.3 x 5.9
120			5 x 5.9	6.3 x 5.9	8 x 6.9
150		5 x 5.9		6.3 x 5.9	8 x 6.9
180	5 x 5.9				
220			6.3 x 5.9		
270				8 x 6.9	8 x 11.9
330		6.3 x 5.9	6.3 x 5.9		8 x 11.9
390	6.3 x 5.9		8 x 6.9		
560	6.3 x 5.9	8 x 6.9 8 x 11.9			
680	8 x 6.9				
820	8 x 11.9		8 x 11.9		
1000	8 x 11.9				
1200		8 x 11.9			
1500	8 x 11.9	8 x 11.9			
2700	10 x 12.6				

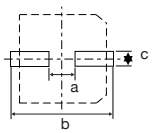
MARKING AND DIMENSIONS



(unit : mm)

Size	Φ D±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5	5.9		5.3	5.3	6	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9		6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8	6.9		8.3	8.3	9	0.6 to 0.8	3.2
8 x 11.9	8	11.9		8.3	8.3	9	0.8 to 1.1	3.2
10 x 12.6	10	12.6		10.3	10.3	11	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB



(unit : mm)

Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
2.5	180	5 x 5.9	19	2800	0.1	300	2VHR180MB6
	390	6.3 x 5.9	15	3160	0.1	300	2VHR390MC6
	560	6.3 x 5.9	16	3500	0.1	300	2VHR560MC6
	680	8 x 6.9	20	3370	0.1	500	2VHR680MD7
	820	8 x 11.9	9	5380	0.1	500	2VHR820MD12
	1000	8 x 11.9	10	5380	0.1	500	2VHR1000MD12
	1500	8 x 11.9	10	5150	0.1	750	2VHR1500MD12
	2700	10 x 12.6	12	5070	0.1	1350	2VHR2700ME12
4	150	5 x 5.9	20	2730	0.1	300	4VHR150MB6
	330	6.3 x 5.9	15	3160	0.1	300	4VHR330MC6
	560	8 x 6.9	22	3220	0.1	500	4VHR560MD7
	560	8 x 11.9	9	5380	0.1	500	4VHR560MD12
	1200	8 x 11.9	12	4700	0.1	960	4VHR1200MD12
	1500	8 x 11.9	12	4700	0.1	1200	4VHR1500MD12
6.3	100	5 x 5.9	25	2150	0.1	300	6VHR100MB6
	120	5 x 5.9	21	2660	0.1	300	6VHR120MB6
	220	6.3 x 5.9	15	3160	0.1	300	6VHR220MC6
	330	6.3 x 5.9	17	3390	0.1	415	6VHR330MC6
	390	8 x 6.9	22	3220	0.1	491	6VHR390MD7
	820	8 x 11.9	12	4700	0.1	1033	6VHR820MD12
10	68	5 x 5.9	23	2540	0.1	300	10VHR68MB6
	120	6.3 x 5.9	22	2600	0.1	300	10VHR120MC6
	150	6.3 x 5.9	22	2600	0.1	300	10VHR150MC6
	270	8 x 6.9	22	3220	0.1	500	10VHR270MD7
16	39	5 x 5.9	27	2350	0.1	300	16VHR39MB6
	68	6.3 x 5.9	25	2440	0.1	300	16VHR68MC6
	82	6.3 x 5.9	25	2490	0.1	300	16VHR82MC6
	100	6.3 x 5.9	24	2490	0.1	300	16VHR100MC6
	120	8 x 6.9	27	2900	0.1	500	16VHR120MD7
	150	8 x 6.9	22	3220	0.1	500	16VHR150MD7
	270	8 x 11.9	16	4070	0.1	864	16VHR270MD12
	330	8 x 11.9	16	4070	0.1	1056	16VHR330MD12

VHVL

Surface mount type

series

- High Rated Voltage, High Capacitance
- Low ESR, High ripple current
- Load life of 10,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	16 to 50Vdc	
Capacitance range	10 to 1,500μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 10 ,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

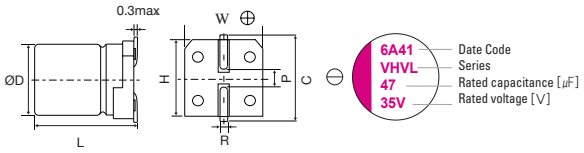
DIMENSIONS

(unit : mm)

μF \ RV(SV)	16 (18.4)	20 (23)	25 (28.7)	32 (36.8)	35 (40.2)	50 (57.5)
10						6.3 x 5.9
18						8 x 6.9
22				6.3 x 5.9	6.3 x 5.9	8 x 6.9
27			5 x 5.9			
39					8 x 6.9	8 x 11.9
47			6.3 x 5.9		8 x 6.9	8 x 11.9
56		5 x 5.9	6.3 x 5.9			8 x 11.9
68				8 x 6.9		10 x 12.6
82	5 x 5.9		8 x 6.9		8 x 11.9	
100			8 x 6.9			10 x 12.6
120		6.3 x 5.9		8 x 11.9	10 x 12.6	
150					10 x 12.6	
180	6.3 x 5.9	8 x 6.9	8 x 11.9		10 x 12.6	
220				10 x 12.6		
270	8 x 6.9					
330			10 x 12.6			
390		8 x 11.9				
560	8 x 11.9	10 x 12.6				
1000	10 x 12.6					
1500	10 x 12.6					

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS

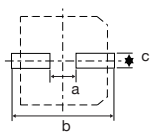


(unit : mm)

Size	ØD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5	5.9	5.3	5.3	6	0.6 to 0.8	1.4	
6.3 x 5.9	6.3	5.9	6.6	6.6	7.3	0.6 to 0.8	2.1	
8 x 6.9	8	6.9	8.3	8.3	9	0.6 to 0.8	3.2	
8 x 11.9	8	11.9	8.3	8.3	9	0.8 to 1.1	3.2	
10 x 12.6	10	12.6	10.3	10.3	11	0.8 to 1.1	4.6	

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
16	82	5x5.9	27	3000	0.12	262	16VHVL82MB6
	180	6.3x5.9	22	3300	0.12	576	16VHVL180MC6
	270	8 x6.9	22	3300	0.12	864	16VHVL270MD7
	560	8x11.9	14	4950	0.12	1792	16VHVL560MD12
	1000	10x12.6	12	5400	0.12	3200	16VHVL1000ME12
	1500	10x12.6	12	5400	0.12	4800	16VHVL1500ME12
20	56	5x5.9	30	2800	0.12	224	20VHVL56MB6
	120	6.3x5.9	25	3200	0.12	480	20VHVL120MC6
	180	8 x6.9	25	3200	0.12	720	20VHVL180MD7
	390	8x11.9	14	4950	0.12	1560	20VHVL390MD12
	560	10x12.6	12	5400	0.12	2240	20VHVL560ME12
25	27	5x5.9	40	2450	0.12	135	25VHVL27MB6
	47	6.3x5.9	30	2800	0.12	235	25VHVL47MC6
	56	6.3x5.9	30	2800	0.12	280	25VHVL56MC6
	82	8 x6.9	28	3000	0.12	410	25VHVL82MD7
	100	8 x6.9	25	3200	0.12	500	25VHVL100MD7
	180	8 x11.9	16	4650	0.12	900	25VHVL180MD12
	330	10x12.6	14	5000	0.12	1650	25VHVL330ME12
32	22	6.3 x 5.9	35	2700	0.12	141	32VHVL22MC6
	68	8 x 6.9	25	3200	0.12	435	32VHVL68MD7
	120	8 x 11.9	20	4000	0.12	768	32VHVL120MD12
	220	10 x 12.6	18	4650	0.12	1408	32VHVL220ME12
35	22	6.3 x 5.9	35	2600	0.12	154	35VHVL22MC6
	39	8 x 6.9	30	2800	0.12	273	35VHVL39MD7
	47	8 x 6.9	30	2800	0.12	329	35VHVL47MD7
	82	8 x 11.9	20	4000	0.12	574	35VHVL82MD12
	120	10x12.6	18	4400	0.12	840	35VHVL120ME12
	150	10x12.6	18	4400	0.12	1050	35VHVL150ME12
	180	10x12.6	18	4400	0.12	1260	35VHVL180ME12
50	10	6.3 x 5.9	40	2500	0.12	100	50VHVL10MC6
	18	8 x 6.9	35	2700	0.12	180	50VHVL18MD7
	22	8 x 6.9	35	2700	0.12	220	50VHVL22MD7
	39	8 x 11.9	25	3800	0.12	390	50VHVL39MD12
	47	8 x 11.9	25	3800	0.12	470	50VHVL47MD12
	56	8 x 11.9	25	3800	0.12	560	50VHVL56MD12
	68	10 x 12.6	20	4300	0.12	680	50VHVL68ME12
	100	10 x 12.6	20	4300	0.12	1000	50VHVL100ME12

VSC

Surface mount type

series

- Super low ESR, High ripple current
- Load life of 20,000h at 105°C

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +105°C	
Rated voltage range	4 to 16Vdc	
Capacitance range	22 to 560μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+105°C}/Z_{+20°C} \le 1.25$, $Z_{-55°C}/Z_{+20°C} \le 1.25$ at 100kHz	
Endurance	105°C, 10 ,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 105°C

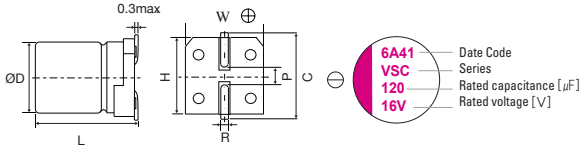
SIZE LIST

(unit : mm)

μF \ RV(SV)	4 (5.2)	6.3 (8.2)	10 (11.5)	16 (18.4)
22				5 x 5.9
33			5 x 5.9	
39				6.3 x 5.9
47		5 x 5.9		
82				8 x 6.9
100		5 x 5.9		
120			6.3 x 5.9	8 x 6.9
220		6.3 x 5.9		
560	8 x 6.9			

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS

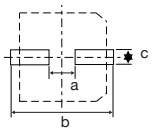


(unit : mm)

Size	ØD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
5 x 5.9	5	5.9		5.3	5.3	6	0.6 to 0.8	1.4
6.3 x 5.9	6.3	5.9		6.6	6.6	7.3	0.6 to 0.8	2.1
8 x 6.9	8	6.9		8.3	8.3	9	0.6 to 0.8	3.2

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
5 x 5.9	1.4	7.4	1.6
6.3 x 5.9	2.1	9.1	1.6
8 x 6.9	2.8	11.1	1.9

ES France - Département Composants & Modules
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Conductive Polymer Aluminum Capacitors

STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (105°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
4	560	8 x 6.9	22	3220	0.1	500	4VSC560MD7
6.3	47	5 x 5.9	30	1970	0.1	300	6VSC47MB6
	100	5 x 5.9	25	2150	0.1	300	6VSC100MB6
	220	6.3 x 5.9	22	2570	0.1	300	6VSC220MC6
10	33	5 x 5.9	50	1100	0.1	300	10VSC33MB6
	120	6.3 x 5.9	27	2320	0.1	300	10VSC120MC6
16	22	5 x 5.9	50	1060	0.1	300	16VSC22MB6
	39	6.3 x 5.9	37	2050	0.1	300	16VSC39MC6
	82	8 x 6.9	30	2760	0.1	300	16VSC82MD7
	120	8 x 6.9	27	2900	0.1	500	16VSC120MD7

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VHHL

Surface mount type

series

- High Reliability, High Voltage, High Temperature
- Low ESR, High ripple current
- Load life of 4,000h at 125°C
- Compliance with AEC-Q200

Halogen Less

RoHS compliant

lead-free

SPECIFICATIONS

Items	Characteristics	
Temperature range	-55 to +125°C	
Rated voltage range	16 to 80Vdc	
Capacitance range	22 to 1000μF	
Capacitance tolerance	±20% [M] (at 20°C, 120Hz)	
Tangent of loss angle	Less than or equal to the value of Standard Ratings (at 20°C, 120Hz)	
Leakage current	Less than or equal to the value of Standard Ratings (at 20°C, after 2 minutes)	
ESR	Less than or equal to the value of Standard Ratings	
Characteristics of impedance	$Z_{+125°C}/Z_{+20°C} \leq 1.25$, $Z_{-55°C}/Z_{+20°C} \leq 1.25$ at 100kHz	
Endurance	125°C, 4,000 hrs at rated voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Damp Heat (Steady State)	60°C , 90 to 95% RH , 1,000 hrs , No-applied Voltage	
	Appearance	No significant damage
	Capacitance change	Within±20% of the initial value
	Tangent of loss angle (tanδ)	≤150% of the initial specified value
	ESR(mΩ)	≤150% of the initial specified value
	Leakage current	≤The initial specified value
Resistance to soldering heat	VPS (230°C , 75s)	
	Appearance	No significant damage
	Capacitance change	Within±10% of the initial value
	Tangent of loss angle (tanδ)	≤130% of the initial specified value
	ESR(mΩ)	≤130% of the initial specified value
	Leakage current	≤The initial specified value

In case of some problems for measured values, measure after applying rated voltage for 120 minutes at 125°C

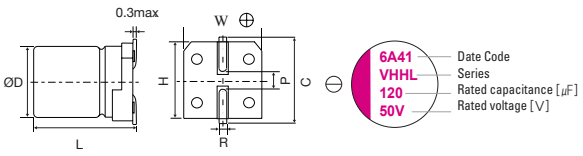
DIMENSIONS

(unit : mm)

μF \ RV(SV)	16 (20)	25 (31)	35 (43)	50 (63)	63 (79)	80 (100)
22					8 x 6.9	
39				8 x 6.9		8 x 11.9
56					8 x 11.9	
68			8 x 6.9			10 x 12.6
100		8 x 6.9			10 x 12.6	
120				8 x 11.9		
180				10 x 12.6		
220	8 x 6.9		8 x 11.9			
270		8 x 11.9				
330			10 x 12.6			
470		10 x 12.6				
560	8 x 11.9					
680						
1000	10 x 12.6					

RV : Rated Voltage [V] SV : Surge Voltage [V] (at room temperature)

MARKING AND DIMENSIONS

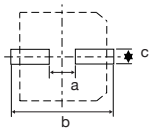


(unit : mm)

Size	ØD±0.5	L	+0.1 -0.4	W±0.2	H±0.2	C±0.2	R	P±0.2
8 x 6.9	8	6.9		8.3	8.3	9	0.6 to 0.8	3.2
8 x 11.9	8	11.9		8.3	8.3	9	0.8 to 1.1	3.2
10 x 12.6	10	12.6		10.3	10.3	11	0.8 to 1.1	4.6

RECOMMENDED LAND PATTERN DIMENSION OF PCB

(unit : mm)



Size	a	b	c
8 x 6.9	2.8	11.1	1.9
8 x 11.9	2.8	11.1	1.9
10 x 12.6	4.3	13.1	1.9

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STANDARD RATINGS

Rated Voltage [Vdc]	Rated Capacitance [µF]	Size ΦD x L [mm]	ESR (20°C, 100kHz) [mΩ] [max.]	Rated Ripple Current (125°C, 100kHz) [mArms]	Tangent of Loss Angel [max.]	Leakage Current [µA, max.]	Part Number
16	220	8 x 6.9	30	1500	0.1	105	16VHHL220MD7
	560	8 x 11.9	16	3800	0.1	268	16VHHL560MD12
	1000	10 x 12.6	13	4300	0.1	480	16VHHL1000ME12
25	100	8 x 6.9	41	1200	0.1	75	25VHHL100MD7
	270	8 x 11.9	19	3300	0.1	202	25VHHL270MD12
	470	10 x 12.6	15	4100	0.1	352	25VHHL470ME12
35	68	8 x 6.9	44	1200	0.1	71	35VHHL68MD7
	220	8 x 11.9	21	3300	0.1	231	35VHHL220MD12
	330	10 x 12.6	16	3900	0.1	346	35VHHL330ME12
50	39	8 x 6.9	45	1300	0.1	58	50VHHL39MD7
	120	8 x 11.9	25	2900	0.1	180	50VHHL120MD12
	180	10 x 12.6	19	3500	0.1	270	50VHHL180ME12
63	22	8 x 6.9	48	1100	0.1	42	63VHHL22MD7
	56	8 x 11.9	27	2900	0.1	105	63VHHL56MD12
	100	10 x 12.6	24	3000	0.1	189	63VHHL100ME12
80	39	8 x 11.9	35	1600	0.1	93	80VHHL39MD12
	68	10 x 12.6	28	2100	0.1	163	80VHHL68ME12

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