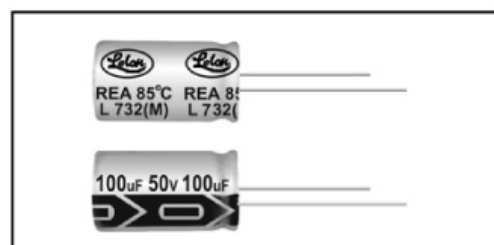


Features

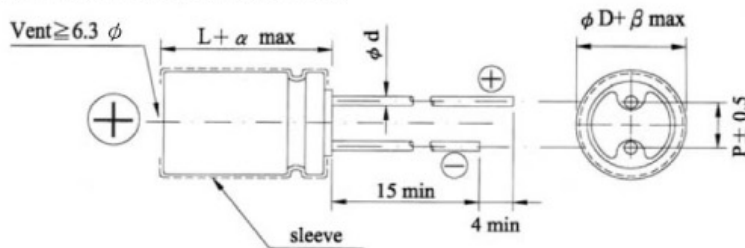
- 85°C, 2,000 ~ 3,000 hours assured
- Standard series for general purpose
- RoHS Compliance



SPECIFICATIONS

Items	Performance																																																																					
Operating Temperature Range	-40℃ ~ +85℃																																																																					
Capacitance Tolerance	±20% (at 120Hz, 20℃)																																																																					
Leakage Current (at 20℃)	<table><tr><td>Rated voltage</td><td>≤ 100V</td><td colspan="2">> 100V</td></tr><tr><td>Time</td><td>after 2 minutes</td><td colspan="2">after 5 minutes</td></tr><tr><td>Leakage Current</td><td>I = 0.01CV or 3 (μ A) whichever is greater</td><td>CV ≤ 1,000 I = 0.03CV+15(μ A)</td><td>CV > 1,000 I = 0.02CV+25(μ A)</td></tr></table> Where, C = rated capacitance in μ F V = rated DC working voltage in V	Rated voltage	≤ 100V	> 100V		Time	after 2 minutes	after 5 minutes		Leakage Current	I = 0.01CV or 3 (μ A) whichever is greater	CV ≤ 1,000 I = 0.03CV+15(μ A)	CV > 1,000 I = 0.02CV+25(μ A)																																																									
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Dissipation Factor (Tan δ at 120 Hz, 20℃)	<table><tr><td>Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td>Tan δ (max)</td><td>0.23</td><td>0.20</td><td>0.16</td><td>0.14</td><td>0.12</td><td>0.10</td><td>0.09</td><td>0.08</td><td>0.12</td><td>0.14</td><td>0.17</td><td>0.20</td><td>0.25</td><td>0.25</td></tr></table> When the capacitance exceeds 1,000 μ F, 0.02 shall be added every 1,000 μ F increase.	Rated Voltage	6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	Tan δ (max)	0.23	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.12	0.14	0.17	0.20	0.25	0.25																																							
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Low Temperature Characteristics (at 120Hz)	Impedance ratio shall not exceed the values given in the table below. <table><tr><td colspan="2">Rated Voltage</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td><td>63</td><td>100</td><td>160</td><td>200</td><td>250</td><td>350</td><td>400</td><td>450</td></tr><tr><td rowspan="4">Impedance Ratio</td><td>Z(-25℃)</td><td>φ D < 16</td><td>6</td><td>4</td><td>3</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td rowspan="2">3</td><td rowspan="2">6</td><td rowspan="2">8</td><td rowspan="2">12</td><td rowspan="2">14</td><td rowspan="2">16</td></tr><tr><td>/Z(+20℃)</td><td>φ D ≥ 16</td><td>8</td><td>6</td><td>4</td><td>4</td><td>3</td><td>3</td><td>3</td><td>3</td></tr><tr><td>Z(-40℃)</td><td>φ D < 16</td><td>10</td><td>8</td><td>6</td><td>6</td><td>4</td><td>3</td><td>3</td><td>3</td><td rowspan="2">4</td><td rowspan="2">8</td><td rowspan="2">10</td><td rowspan="2">16</td><td rowspan="2">18</td><td rowspan="2">20</td></tr><tr><td>/Z(+20℃)</td><td>φ D ≥ 16</td><td>18</td><td>16</td><td>12</td><td>10</td><td>8</td><td>8</td><td>6</td><td>6</td></tr></table>	Rated Voltage		6.3	10	16	25	35	50	63	100	160	200	250	350	400	450	Impedance Ratio	Z(-25℃)	φ D < 16	6	4	3	3	2	2	2	2	3	6	8	12	14	16	/Z(+20℃)	φ D ≥ 16	8	6	4	4	3	3	3	3	Z(-40℃)	φ D < 16	10	8	6	6	4	3	3	3	4	8	10	16	18	20	/Z(+20℃)	φ D ≥ 16	18	16	12	10	8	8	6	6
Rated Voltage		6.3	10	16	25	35	50	63	100	160	200	250	350	400	450																																																							
Impedance Ratio	Z(-25℃)	φ D < 16	6	4	3	3	2	2	2	2	3	6	8	12	14	16																																																						
	/Z(+20℃)	φ D ≥ 16	8	6	4	4	3	3	3	3																																																												
	Z(-40℃)	φ D < 16	10	8	6	6	4	3	3	3	4	8	10	16	18	20																																																						
	/Z(+20℃)	φ D ≥ 16	18	16	12	10	8	8	6	6																																																												
Load Life Test	<table><tr><td>Test Time</td><td>2,000 hrs (3,000 hrs for φ D ≥ 10mm)</td></tr><tr><td>Capacitance Change</td><td>With in ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage applied with rated ripple current for 2,000/3,000 hrs at 85℃.	Test Time	2,000 hrs (3,000 hrs for φ D ≥ 10mm)	Capacitance Change	With in ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																																													
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Shelf Life Test	<table><tr><td>Test Time</td><td>1,000 hrs</td></tr><tr><td>Capacitance Change</td><td>With in ±20% of initial value</td></tr><tr><td>Dissipation Factor</td><td>Less than 200% of specified value</td></tr><tr><td>Leakage Current</td><td>Within specified value</td></tr></table> * The above specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hrs at 85℃ without voltage applied. The rated voltage shall be applied to the capacitors before the measurements for 160 ~ 450V(Refer to JIS C 5101-4 4.1).	Test Time	1,000 hrs	Capacitance Change	With in ±20% of initial value	Dissipation Factor	Less than 200% of specified value	Leakage Current	Within specified value																																																													
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Ripple Current & Frequency Multipliers	<table><tr><td>Freq. (Hz)</td><td>60 (50)</td><td>120</td><td>500</td><td>1K</td><td>10K up</td></tr><tr><td>Cap. (μ F)</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>Under 100</td><td>0.70</td><td>1.00</td><td>1.30</td><td>1.40</td><td>1.50</td></tr><tr><td>100 < C ≤ 1000</td><td>0.75</td><td>1.00</td><td>1.20</td><td>1.30</td><td>1.35</td></tr><tr><td>1000 up above</td><td>0.80</td><td>1.00</td><td>1.10</td><td>1.12</td><td>1.15</td></tr></table>	Freq. (Hz)	60 (50)	120	500	1K	10K up	Cap. (μ F)						Under 100	0.70	1.00	1.30	1.40	1.50	100 < C ≤ 1000	0.75	1.00	1.20	1.30	1.35	1000 up above	0.80	1.00	1.10	1.12	1.15																																							
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DIAGRAM OF DIMENSIONS



LEAD SPACING AND DIAMETER Unit: mm

ϕD	5	6.3	8	10	12.5	16	18	22	25
P	2.0	2.5	3.5	5.0	5.0	7.5	7.5	10	12.5
ϕd	0.5		0.6			0.8		1.0	
α	1.0			1.5				2.0	
β	0.5								

DIMENSION & PERMISSIBLE RIPPLE CURRENT

Dimension: φ D × L(mm)

Ripple Current: mA/rms at 120 Hz, 85°C

μF	V. DC Contents	6.3V (0J)				10V (1A)				16V (1C)				25V (1E)			
		φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA
4.7	4R7													5×11	31		
10	100									5×11	49			5×11	54		
22	220					5×11	70			5×11	75			5×11	80		
33	330	5×11	72			5×11	84			5×11	90			5×11	97		
47	470	5×11	90			5×11	100			5×11	110			5×11	115		
100	101	5×11	130			5×11	145			6.3×11	180	5×11	160	6.3×11	190		
220	221	6.3×11	230	5×11	200	6.3×11	250	5×11	220	8×11.5	300	6.3×11	260	8×11.5	320		
330	331	8×11.5	290	6.3×11	270	8×11.5	350	6.3×11	290	8×11.5	370	6.3×11	290	10×12.5	470	8×11.5	440
470	471	8×11.5	380	6.3×11	320	8×11.5	415	6.3×11	350	10×12.5	520	8×11.5	440	10×16	620	10×12.5	545
1,000	102	8×11.5	540			10×12.5	650	8×11.5	550	10×16	785	10×12.5	635	12.5×20	1,090	10×20	955
2,200	222	10×20	1,000	10×16	845	12.5×20	1,240	10×20	1,070	12.5×20	1,295			16×25	1,660	12.5×25	1,540
3,300	332	12.5×20	1,380	10×20	1,185	12.5×20	1,420			12.5×25	1,655	12.5×20	1,370	16×31.5	2,070	16×25	1,975
4,700	472	16×25	1,880	12.5×20	1,545	16×25	1,980	12.5×25	1,780	16×31.5	2,260	16×25	2,090	16×31.5	2,420	16×25	1,825
6,800	682	16×25	2,120	12.5×25	1,880	16×25	2,220			16×31.5	2,520	16×25	2,130	18×35.5	2,880	18×31.5	2,550
10,000	103	16×25	2,330	16×20	2,000	16×35.5	2,670	16×31.5	2,370	18×31.5	2,590	16×35.5	2,450	22×40	3,440	18×40	3,080
22,000	223	18×40	3,320	18×31.5	2,780	22×40	3,790	18×40	3,370	22×40	3,900						

μF	V. DC Contents	35V (1V)				50V (1H)				63V (1J)				100V (2A)			
		φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA	φ D×L	mA	* φ D×L	mA
0.1	0R1					5×11	1.5			5×11	3			5×11	3		
0.22	R22					5×11	3.5			5×11	4.5			5×11	5.8		
0.33	R33					5×11	5			5×11	7.5			5×11	8.8		
0.47	R47					5×11	7			5×11	9.5			5×11	12		
1	010					5×11	15			5×11	17			5×11	22		
2.2	2R2					5×11	29			5×11	28			5×11	33		
3.3	3R3					5×11	35			5×11	34			5×11	40		
4.7	4R7	5×11	40			5×11	42			5×11	45			5×11	48		
10	100	5×11	58			5×11	65			5×11	70			6.3×11	80	5×11	59
22	220	5×11	87			5×11	95			6.3×11	115			8×11.5	135	6.3×11	115
33	330	6.3×11	115	5×11	108	6.3×11	136	5×11	125	8×11.5	150	6.3×11	140	10×16	195	8×11.5	145
47	470	6.3×11	145	5×11	130	6.3×11	165			8×11.5	190	6.3×11	170	10×16	255	10×12.5	235
100	101	8×11.5	240	6.3×11	210	8×11.5	260			10×12.5	320	8×11.5	245	10×20	370	10×16	325
220	221	10×12.5	420	8×11.5	385	10×16	490	10×12.5	455	10×20	565	10×16	490	12.5×25	675	12.5×20	640
330	331	10×16	570	10×12.5	490	12.5×20	635	10×16	585	12.5×20	765	10×20	710	16×25	825	16×20	695
470	471	10×16	740			12.5×20	860	10×20	755	16×25	1,050	12.5×20	900	16×31.5	1,070	16×25	910
1,000	102	12.5×20	1,145			16×25	1,530	12.5×25	1,340	16×25	1,560	16×20	1,260	22×40	2,600	18×40	2,410
2,200	222	16×31.5	1,890	16×25	1,785	18×40	2,231	16×35.5	2,075	18×40	2,385	18×31.5	1,955				
3,300	332	16×35.5	2,275	16×31.5	2,070	22×40	2,785	18×35.5	2,500	22×40	3,000	18×40	2,660				
4,700	472	18×35.5	2,700	18×31.5	2,360	25×40	3,300	22×40	3,155	25×40	3,560	22×40	2,890				

Case size in mark of "*" is downsize.

Dimension: $\phi D \times L(\text{mm})$

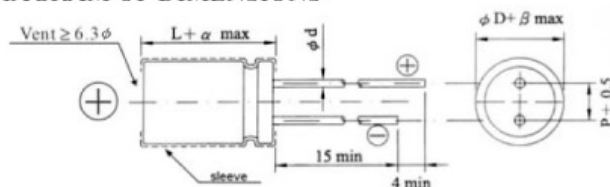
Ripple Current: mA/rms at 120 Hz, 85°C

DIMENSION & PERMISSIBLE RIPPLE CURRENT

μF	Contents	160V (2C)				200V (2D)				250V (2E)				350V (2V)			
		$\phi D \times L$	mA	* $\phi D \times L$	mA	$\phi D \times L$	mA	* $\phi D \times L$	mA	$\phi D \times L$	mA	* $\phi D \times L$	mA	$\phi D \times L$	mA	* $\phi D \times L$	mA
0.47	R47	6.3×11	15	5×11	13	6.3×11	16	5×11	14	8×11.5	21	5×11	14	8×11.5	21	6.3×11	18
1	010	6.3×11	24	5×11	20	6.3×11	25	5×11	21	8×11.5	32	5×11	21	8×11.5	32	6.3×11	27
2.2	2R2	6.3×11	34	5×11	29	6.3×11	37	5×11	29	8×11.5	49	6.3×11	42	8×11.5	49	6.3×11	42
3.3	3R3	8×11.5	50	6.3×11	43	8×11.5	54	6.3×11	46	8×11.5	60	6.3×11	46	10×12.5	70	8×11.5	60
4.7	4R7	8×11.5	60	6.3×11	51	8×11.5	64	6.3×11	50	10×16	93	8×11.5	72	10×16	93	10×12.5	80
10	100	10×12.5	104	8×11.5	75	10×12.5	112	8×11.5	81	10×16	138	10×12.5	112	10×20	150	10×16	138
22	220	10×20	189	10×16	150	10×20	204	10×16	155	12.5×20	255	10×20	220	12.5×25	282	12.5×20	255
33	330	12.5×20	270	10×20	228	12.5×20	288	10×20	210	12.5×25	348	12.5×20	310	16×25	390	12.5×25	348
47	470	12.5×25	354	12.5×20	318	12.5×25	378	12.5×20	300	16×25	468	12.5×25	420	16×31.5	474	16×20	385
100	101	16×25	582	12.5×25	510	16×35.5	678	16×25	582	16×35.5	732	16×31.5	645	18×40	685	16×31.5	645
220	221	18×35.5	900	16×31.5	792	18×35.5	1,002	18×31.5	885	22×40	1,134	18×40	985				
330	331	18×40	1,010	18×35.5	984			18×40	1,200								

μF	Contents	400V (2G)				450V (2W)			
		$\phi D \times L$	mA	* $\phi D \times L$	mA	$\phi D \times L$	mA	* $\phi D \times L$	mA
0.47	R47	8×11.5	21	5×11	15	8×11.5	21	6.3×11	18
1	010	8×11.5	32	5×11	22	8×11.5	32	6.3×11	25
2.2	2R2	10×12.5	57	6.3×11	33	10×12.5	57	8×11.5	45
3.3	3R3	10×16	78	8×11.5	40	10×16	78	10×12.5	65
4.7	4R7	10×20	103	10×12.5	80	10×20	103	10×12.5	75
10	100	12.5×20	174	10×20	140	12.5×20	174	10×20	140
22	220	12.5×25	280	12.5×20	240	16×25	354	12.5×25	300
33	330	16×25	390	16×20	340	16×31.5	435	16×20	350
47	470	16×31.5	474	16×25	445	16×35.5	510	16×31.5	460
100	101	22×40	710	18×35.5	600	22×45	750	18×40	630

Case size in mark of "*" is downsize. 500 WV specifications are available upon request.

※ Low-Profile Size
DIAGRAM OF DIMENSIONS


Unit: mm

LEAD SPACING AND DIAMETER

ϕ D	12.5	16	18
P	5.0	7.5	7.5
ϕ d	0.6	0.8	
α	1.5		
β	0.5		

DIMENSION & PERMISSIBLE RIPPLE CURRENT

μF	Contents	6.3V (0J)		10V (1A)		16V (1C)		25V (1E)		35V (1V)		50V (1H)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
470	471											12.5×16	610
1,000	102							12.5×16	830	16×16	1,010	16×20	1,160
2,200	222			12.5×16	970	16×16	1,160	16×20	1,360	18×20	1,560		
3,300	332	12.5×16	960	16×16	1,310	16×20	1,460	18×20	1,720	18×25	1,970		
4,700	472	16×16	1,410	16×20	1,560	18×20	1,770	18×25	2,070				
6,800	682	16×20	1,660	16×20	1,870	18×25	2,170						
10,000	103	18×20	2,020	18×25	2,370	16×20	2,050						

μF	Contents	160V (2C)		200V (2D)		250V (2E)		400V (2G)	
		$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA	$\phi D \times L$	mA
10	101							12.5×16	150
22	220					12.5×16	280	16×16	280
33	330	12.5×16	305	12.5×16	280	16×16	350	16×20	355
47	470	12.5×16	360	16×16	390	16×20	420	18×20	435
68	680	16×16	440	16×16	470	18×20	490		
100	101	16×20	560	16×20	520				
150	151	18×20	640	18×25	590				