



# Aluminum Electrolytic Capacitors **LL** Series

## Features

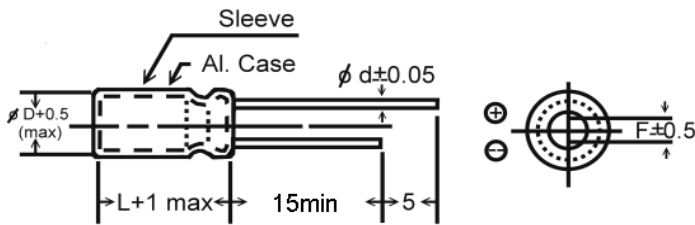
- Low Leakage Current

## Specification

Items	Performance																								
Capacitance Tolerance	±20 % (at 120Hz, 25 °C)																								
Rated Voltage Range	10 to 63 VDC																								
Capacitance Range	0.1 to 1000 uF																								
Operating Temperature Range	-40 to + 105°C																								
Leakage Current (at 25°C)	$I \leq 0.002 CV$ or 0.4 (uA), whichever is greater.																								
	After 3 minutes application of working voltage. I= Leakage current (uA), C= Rated capacitance (uF), V= Rated voltage (V)																								
Dissipation Factor (Tan $\delta$ at 120Hz, 25°C)	<table border="1"> <thead> <tr> <th>Rate Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>Tan <math>\delta</math> (max)</td> <td>0.2</td> <td>0.17</td> <td>0.15</td> <td>0.12</td> <td>0.1</td> <td>0.10</td> </tr> </tbody> </table>	Rate Voltage	10	16	25	35	50	63	Tan $\delta$ (max)	0.2	0.17	0.15	0.12	0.1	0.10										
	Rate Voltage	10	16	25	35	50	63																		
Tan $\delta$ (max)	0.2	0.17	0.15	0.12	0.1	0.10																			
For capacitance > 1000uF, add 0.02 per 1000uF increase.																									
Low Temperature characteristics (at 120Hz)	Impedance ration max.																								
	<table border="1"> <thead> <tr> <th>Rate Voltage</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> </tr> </thead> <tbody> <tr> <td>-25°C/25°C</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>-40°C/25°C</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> <td>3</td> </tr> </tbody> </table>	Rate Voltage	10	16	25	35	50	63	-25°C/25°C	3	2	2	2	2	2	-40°C/25°C	8	6	4	3	3	3			
	Rate Voltage	10	16	25	35	50	63																		
-25°C/25°C	3	2	2	2	2	2																			
-40°C/25°C	8	6	4	3	3	3																			
Load Life	After 1000 hours application of W.V. at 105°C. the capacitor shall meet the following limits.																								
	Capacitance change : $\leq \pm 25\%$ of initial value																								
	Dissipation factor : $\leq 200\%$ of initial specified value																								
	Leakage Current : $\leq$ Initial specified value																								
Shelf Life	After storage for 500 hours at 105°C, with no voltage applied and being stabilixed at + 25°C, Capacitor shall meet the limit specified in load life.																								
Ripple Current & Frequency Multipliers	<table border="1"> <thead> <tr> <th>Freq.(Hz)</th> <th>60 (50)</th> <th>120</th> <th>500</th> <th>1K</th> <th>10Kup</th> </tr> </thead> <tbody> <tr> <td>Under 100</td> <td>0.75</td> <td>1.00</td> <td>1.35</td> <td>1.50</td> <td>2.00</td> </tr> <tr> <td>100 to 1000</td> <td>0.83</td> <td>1.00</td> <td>1.23</td> <td>1.32</td> <td>1.50</td> </tr> <tr> <td>1000 up above</td> <td>0.90</td> <td>1.00</td> <td>1.12</td> <td>1.10</td> <td>1.15</td> </tr> </tbody> </table>	Freq.(Hz)	60 (50)	120	500	1K	10Kup	Under 100	0.75	1.00	1.35	1.50	2.00	100 to 1000	0.83	1.00	1.23	1.32	1.50	1000 up above	0.90	1.00	1.12	1.10	1.15
	Freq.(Hz)	60 (50)	120	500	1K	10Kup																			
	Under 100	0.75	1.00	1.35	1.50	2.00																			
	100 to 1000	0.83	1.00	1.23	1.32	1.50																			
1000 up above	0.90	1.00	1.12	1.10	1.15																				
Ripple Current & Temperature Multipliers	<table border="1"> <thead> <tr> <th>Temperature (°C)</th> <th>85</th> <th>105</th> </tr> </thead> <tbody> <tr> <td>Multiplier</td> <td>1.40</td> <td>1.00</td> </tr> </tbody> </table>	Temperature (°C)	85	105	Multiplier	1.40	1.00																		
	Temperature (°C)	85	105																						
Multiplier	1.40	1.00																							

# Aluminum Electrolytic Capacitors

LL Series



D	5	6.3	8	10	13
F	2.0	2.5	3.5	5.0	
d	0.5			0.6	

Dimension :  $\phi D \times L$  (mm)

Ripple Current : mA/rms at 120Hz, 105°C

## DIMENSION & PERMISSIBLE RIPPLE CURRENT

VDC uF	10V		16V		25V		35V		50V		63V	
	$\phi D \times L$	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
0.1- 0.47									5x11.5	1	5x11.5	1
1									5x11.5	9	5x11.5	9
2.2									5x11.5	15	5x11.5	16
3.3									5x11.5	24	5x11.5	26
4.7									5x11.5	26	5x11.5	28
10					5x11.5	30	5x11.5	35	5x11.5	40	6.3x11	48
22					5x11.5	50	5x11.5	50	5x11.5	60	6.3x11	70
33			5x11.5	55	5x11.5	60	5x11.5	68	6.3x11	85	8x11	95
47	5x11.5	65	5x11.5	90	6.3x11	95	6.3x11	95	6.3x11	100	8x11	120
100	5x11.5	95	6.3x11	115	6.3x11	120	8x11	160	8x11	165	10x16	210
220	6.3x11	165	8x11	200	10x12	240	10x12	290	10x17	320	10x20	220
330	8x11	235	8x11	250	10x12	315	10x17	380	10x20	440	13x21	480
470	8x11	285	10x12.5	360	10x17	430	10x20	500	13x21	580		
1000	10x16	540	10x20	630	13x21	720	13x25	890	16x26			