

# LL Series

## Features

- ◆ Extremely low and stable leakage current characteristics.
- ◆ Close capacitance tolerance  $\pm 20\%$  ( $\pm 10\%$  on requested)
- ◆ For detail specifications, please refer to Engineering Bulletin No.E109
- ◆ RoHS Compliant



## Specifications

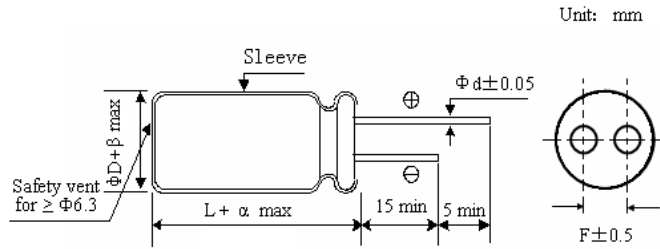
Item	Performance Characteristics							
Operating Temperature Range	-40~+105°C							
Rate Voltage Range	6.3~63 VDC							
Capacitance Range	0.1~2200UF							
Capacitance Tolerance	$\pm 20\%$ (120Hz, +20°C)							
Leakage current (+20°C, max.)	$I \leq 0.002 CV$ or 0.4 (µA)							
	After 3 minute(90sec. $\leq 10\mu f$ ) whichever is greater measured with rated working voltage applied.							
Dissipation factor (tgδ)	Working Voltage(VDC)	6.3	10	16	25	35	50	63
	D.F.(%)max	20	17	13	10	9	8	8
Low Temperature Characteristics (120Hz)	Impedance ratio max.							
	Working Voltage(VDC)	6.3	10	16	25	35	50	63
	Z-25°C / Z+20°C	4	3	3	2	2	2	2
Load Life	Test conditions							
	Duration time	: 2000Hrs						
	Ambient temperature	: +105°C						
	Applied voltage	: Rated DC working voltage						
	After test requirement at +20°C							
	Capacitance change	: $\leq \pm 20\%$ of the initial measured value						
Dissipation factor	: $\leq 150\%$ of the initial specified value							
Leakage current	: $\leq$ The initial specified value							
Shelf Life	Test conditions							
	Duration time	: 1000Hrs						
	Ambient temperature	: +105°C						
	Applied voltage	: None						
	After test requirement at +20°C	: Same limits as Load life.						
Pre-treatment for measurements shall be conducted after application of DC working voltage for 30 minutes								

## Multiplier for Ripple Current vs. Frequency

CAP(UF)\Frequency(HZ)	50(60)	120	400	1K	10K	50K-100K
CAP $\leq 10$	0.8	1	1.30	1.45	1.65	1.70
10<CAP $\leq 100$	0.8	1	1.23	1.36	1.48	1.53
100<CAP $\leq 1000$	0.8	1	1.16	1.25	1.35	1.38

# LL series

## Diagram of Dimensions



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

## Case Size

Voltage	6.3V		10V		16V		25V		35V		50V		63V	
	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current	Case Size	Ripple Current
0.1											5×11	8.8	5×11	8.8
0.22											5×11	8.8	5×11	8.8
0.33											5×11	8.8	5×11	8.8
0.47											5×11	12	5×11	12
1											5×11	17	5×11	17
2.2											5×11	24	5×11	24
3.3											5×11	29	5×11	32
4.7							5×11	32	5×11	33	5×11	36	5×11	39
10					5×11	39	5×11	43	5×11	48	5×11	52	6.3×12	58
22	5×11	36	5×11	50	5×11	62	5×11	65	6.3×12	71	6.3×12	77	6.3×12	94
33	5×11	44	5×11	66	5×11	68	5×11	76	6.3×12	83	6.3×12	99	8×12	110
47	5×11	53	5×11	75	5×11	105	6.3×12	116	6.3×12	125	8×12	138	8×12	152
100	5×11	74	5×11	104	6.3×12	138	8×12	149	8×12	187	10×13	217	10×16	260
220	6.3×12	131	8×12	193	8×12	220	10×13	246	10×13	330	10×20	380	13×21	440
330	6.3×12	161	8×12	256	8×12	268	10×13	352	10×16	440	13×21	506	13×25	594
470	8×12	242	8×12	319	10×13	407	10×16	484	13×21	590	13×25	705		
1000	10×13	390	10×16	605	10×20	704	13×21	847	13×25	1012				
2200	13×21	665	13×21	860	13×25	890								

Ripple Current (mA,rms) at 105°C 120KHz