

# LL 系列 Series

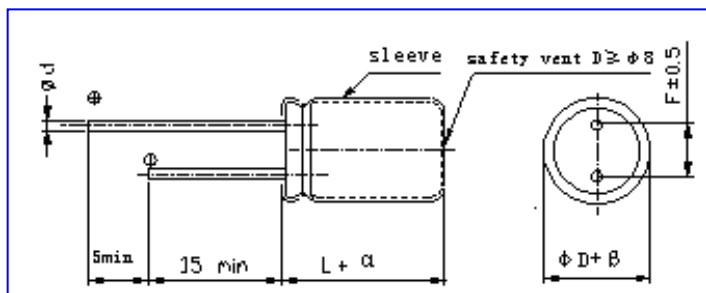
- 耐高纹波，耐高温，超长寿命，105℃ 12,000~20,000 小时  
High Ripple Current High Temperature , extremely Long Life, Life time 105℃ 12,000~20,000hours
- 专为 LED 驱动电源设计制造  
Specially designed for light emitting diode lamp (LED)drive source
- RoHS 指令已对应完毕。  
Adapted to the RoHS directive.

## 主要技术性能 Specifications

项目 Item	特性 Performance Characteristics														
使用温度范围 Operating temperature range	-40℃ ~ +105℃														
额定电压范围 Rated voltage range	160V ~ 450V														
标称容量范围 Nominal capacitance range	1μF ~150μF														
容量允许偏差 Capacitance tolerance	± 20% (120Hz, +20℃)														
漏电流 Leakage current (+20℃)	$I \leq 0.02 CV + 10 \mu A$ (2分钟, 20℃) $0.02 CV + 10 \mu A$ (at 20℃ ,after 2 minutes) C: 标称容量Capacitance (μF); V: 额定电压Rated voltage range (V)														
损耗角正切值 Dissipation factor (tg δ) (+20℃, 120Hz)	<table border="1"> <thead> <tr> <th>U<sub>R</sub> (V)</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>tg δ</td> <td>0.24</td> <td>0.24</td> <td>0.24</td> <td>0.24</td> <td>0.24</td> <td>0.24</td> </tr> </tbody> </table>	U <sub>R</sub> (V)	160	200	250	350	400	450	tg δ	0.24	0.24	0.24	0.24	0.24	0.24
U <sub>R</sub> (V)	160	200	250	350	400	450									
tg δ	0.24	0.24	0.24	0.24	0.24	0.24									
温度特性 Temperature characteristics (Impedance ratio at 120Hz)	<table border="1"> <thead> <tr> <th>U<sub>R</sub> (V)</th> <th>160</th> <th>200</th> <th>250</th> <th>350</th> <th>400</th> <th>450</th> </tr> </thead> <tbody> <tr> <td>Z-40℃ / +20℃</td> <td>6</td> <td>6</td> <td>6</td> <td>7</td> <td>7</td> <td>9</td> </tr> </tbody> </table>	U <sub>R</sub> (V)	160	200	250	350	400	450	Z-40℃ / +20℃	6	6	6	7	7	9
U <sub>R</sub> (V)	160	200	250	350	400	450									
Z-40℃ / +20℃	6	6	6	7	7	9									
耐久性 Load life	<p>在+105℃ 条件下，施加含额定纹波电流的额定电压，持续规定时间，并在+20℃下恢复 16 小时后，电容器应符合下列要求 The following specifications shall be met when the capacitors are restored to +20℃ for 16 hours after D.C. bias rated ripple current is applied at +105℃, the peak voltage shall not exceed the voltage.</p> <table border="1"> <thead> <tr> <th>Time</th> <th>6.3×9, 6.3×11, 8×9, 10×9</th> <th>12, 000hours</th> </tr> </thead> <tbody> <tr> <td></td> <td>8×11.5, 8×16, 8×20, 10×12.5</td> <td>15, 000hours</td> </tr> <tr> <td></td> <td>φ ≥ 10×16</td> <td>20, 000 hours</td> </tr> </tbody> </table> <p>Capacitance change : ±30%初始测量值以内 ±30% of the Initial measured value Leakage current : ≤初始规定值 ≤the Initial specified value Dissipation factor : ≤3 倍初始规定值 ≤3times of the Initial specified value</p>	Time	6.3×9, 6.3×11, 8×9, 10×9	12, 000hours		8×11.5, 8×16, 8×20, 10×12.5	15, 000hours		φ ≥ 10×16	20, 000 hours					
Time	6.3×9, 6.3×11, 8×9, 10×9	12, 000hours													
	8×11.5, 8×16, 8×20, 10×12.5	15, 000hours													
	φ ≥ 10×16	20, 000 hours													
高温贮存 Shelf life	<p>+105℃ 1000 小时贮存后，恢复 16 小时后 After storage for 1000 hours at +105℃ and then resumed for 16 hours:</p> <p>Capacitance change : ±20%初始测量值以内 ±20% of the Initial measured value Leakage current : ≤2 倍初始规定值 ≤2 times of the Initial specified value Dissipation factor : ≤2 倍初始规定值 ≤2times of the Initial specified value</p>														

## 外形图及尺寸表 Case size table

Unit :mm



D	5	6.3	8	10	12.5
F	2.0	2.5	3.5	5.0	
d	0.5	0.5	0.5、0.6	0.6	

α MAX	( L < 20 ) 1.5	β MAX	0.5
	( L ≥ 20 ) 2.0		

## ◇允许纹波电流的修正系数 Coefficient of allowable ripple current

频率 Frequency (Hz)	50	120	1K	10K	100K
修正系数 Coefficient	0.40	0.50	0.80	0.90	1.00

## ■尺寸 Dimensions

容量 C <sub>s</sub> (μF)	代码 Code	160V (2C)			200V (2D)			250V (2E)		
		Size	ESR	Ripple	Size	ESR	Ripple	Size	ESR	Ripple
		φ D×L (mm)	Ω MAX	(mA)	φ D×L (mm)	Ω MAX	(mA)	φ D×L (mm)	Ω MAX	(mA)
1	010	6.3×9	18.5	50	6.3×9	17.4	52	6.3×9	22.0	54
1.5	1R5	6.3×9	13.9	60	6.3×9	17.4	62	6.3×9	22.0	65
1.8	1R8	6.3×9	13.9	65	6.3×9	13.9	68	6.3×11	17.4	70
2.2	2R2	6.3×9	13.9	70	6.3×11	13.9	72	6.3×11	15.1	75
2.7	2R7	6.3×11	13.9	80	6.3×11	11.3	84	6.3×11	15.1	88
3.3	3R3	6.3×11	11.3	85	6.3×11	11.3	90	6.3×11	15.1	92
4.7	4R7	6.3×11	11.3	105	6.3×11	11.3	110	6.3×11	11.8	120
5.6	5R6	6.3×11	11.3	110	8×9	7.98	115	8×9	9.89	130
6.8	6R8	6.3×11	11.3	125	8×9	7.98	130	8×9	9.89	160
8.2	8R2	8×9	11.3	135	8×9	7.98	145	8×9	9.89	175
10	100	8×9	7.5	150	8×11.5	3.65	160	8×11.5	9.89	200
15	150	8×11.5	4.27	190	8×16	3.65	230	10×12.5	8.92	270
		10×9	4.27	210	10×12.5	3.65	280			
22	220	10×12.5	2.25	250	10×16	3.24	340	10×16	4.65	380
33	330	10×16	1.87	415	10×20	2.38	550	10×20	4.65	570
47	470	10×20	1.87	525	12.5×20	1.38	710	12.5×20	4.65	795

容量 C <sub>s</sub> (μF)	代码 Code	350V (2V)			400V (2G)			450V (2W)		
		Size	ESR	Ripple	Size	ESR	Ripple	Size	ESR	Ripple
		φ D×L (mm)	Ω MAX	(mA)	φ D×L (mm)	Ω MAX	(mA)	φ D×L (mm)	Ω MAX	(mA)
1.0	010	6.3×9	33.0	50	6.3×11	38.0	54	6.3×11	38.0	58
1.2	1R2	6.3×11	33.0	55	8×9	38.0	60	8×11.5	38.0	65
1.5	1R5	6.3×11	33.0	63	8×9	38.0	66	8×11.5	38.0	70
1.8	1R8	6.3×11	33.0	70	8×9	33.0	75	8×11.5	38.0	80
2.2	2R2	8×9	33.0	77	8×9	33.0	78	8×11.5	33.0	88
		8×11.5	33.0	80	8×11.5	33.0	82			
2.7	2R7	8×11.5	33.0	85	8×11.5	33.0	88	8×16	33.0	100
3.3	3R3	8×11.5	21.0	100	8×11.5	21.0	100	8×16	33.0	110
		10×9	21.0	115	10×9	21.0	120			
4.7	4R7	10×9	21.0	120	10×12.5	14.0	126	10×12.5	18.4	145
5.6	5R6	8×16	21.0	135	8×20	14.0	155	10×16	18.4	180
					10×12.5	14.0	158			
6.8	6R8	10×12.5	16.2	165	8×20	10.2	170	10×16	12.0	200
					10×16	10.2	180			
8.2	8R2	10×16	13.5	180	10×16	10.2	190	10×20	12.0	235
10	100	10×16	13.5	215	10×16	9.50	220	10×20	6.50	285
15	150	10×20	9.50	295	12.5×20	4.30	300			

Size φ D×L(mm)

Maximum Allowable Ripple Current (mA rms) at 105°C 100KHz

Maximum ESR (Ω) at 20°C 100KHz