



HKL LONG LIFE ASSURANCE ELECTROLYTIC CAPACITOR

Wide temperature range -55~+105°C

Load life of 3000~5000 hours

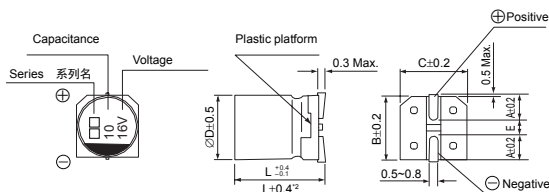
RoHS & REACH compliant, Halogen-free

SPECIFICATIONS

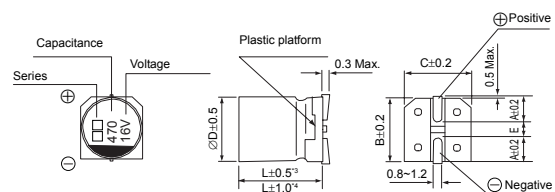
Items	Characteristics																																						
Operation Temperature Range	-55 ~ +105°C																																						
Voltage Range	6.3 ~ 100V																																						
Capacitance Range	0.1 ~ 1500 μ F																																						
Capacitance Tolerance	\pm 20% at 120Hz, 20°C																																						
Leakage Current	Leakage current \leq 0.01CV or 3 μ A (\varnothing 4~ \varnothing 10), whichever is greater (after 2 minutes application of rated voltage at 20°C) Leakage current \leq 0.03CV or 4 μ A (\varnothing 12.5~ \varnothing 16), whichever is greater (after 1 minute application of rated voltage at 20°C) C: Nominal capacitance (μ F), V: Rated voltage (V)																																						
Dissipation Factor (tan δ)	Measurement frequency : 120Hz, Temperature : 20°C <table border="1"> <thead> <tr> <th>Rated Voltage (V)</th> <th>6.3</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50~100</th> </tr> </thead> <tbody> <tr> <td>tan δ (max.)</td> <td>\varnothing4~\varnothing10</td> <td>0.28</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.13</td> <td>0.12</td> </tr> <tr> <td></td> <td>\varnothing12.5~\varnothing16</td> <td>0.38</td> <td>0.34</td> <td>0.30</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> </tr> </tbody> </table>	Rated Voltage (V)	6.3	10	16	25	35	50~100	tan δ (max.)	\varnothing 4~ \varnothing 10	0.28	0.24	0.20	0.16	0.13	0.12		\varnothing 12.5~ \varnothing 16	0.38	0.34	0.30	0.26	0.22	0.18															
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Load Life	After 5000 hrs. (3000 hrs. for \varnothing 4~ \varnothing 6.3 \times 5.8) application of the rated voltage at 105°C, they meet the characteristics listed below. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within \pm30% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>300% or less of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </tbody> </table>	Capacitance Change	Within \pm 30% of initial value	Dissipation Factor	300% or less of initial specified value	Leakage Current	initial specified value or less																																
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Shelf Life	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above.																																						
Resistance to Soldering Heat	After reflow soldering and restored at room temperature, they meet the characteristics listed below. <table border="1"> <tbody> <tr> <td>Capacitance Change</td> <td>Within \pm10% of initial value</td> </tr> <tr> <td>Dissipation Factor</td> <td>initial specified value or less</td> </tr> <tr> <td>Leakage Current</td> <td>initial specified value or less</td> </tr> </tbody> </table>	Capacitance Change	Within \pm 10% of initial value	Dissipation Factor	initial specified value or less	Leakage Current	initial specified value or less																																
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Marking	Black print on the case top.																																						

DRAWING (Unit: mm)

(\varnothing 4~ \varnothing 6.3 \times 7.7)



(\varnothing 8 \times 10.5~ \varnothing 16)



- *1. Voltage mark for 6.3V is [6V]
*2. Applicable to \varnothing 6.3 \times 7.7
*3. Applicable to \varnothing 8 \times 10.5~ \varnothing 10
*4. Applicable to \varnothing 12.5~ \varnothing 16



DIMENSIONS (Unit: mm)

∅D x L	4 x 5.8	5 x 5.8	6.3 x 5.8	6.3 x 7.7	8 x 10.5	10 x 10.5	10 x 13.5	12.5 x 13.5	12.5 x 16	16 x 16.5
A	2.0	2.2	2.6	2.6	3.0	3.3	3.3	4.9	4.9	5.8
B	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0
E ± 0.2	1.0	1.4	1.9	1.9	3.1	4.7	4.7	4.7	4.7	6.4
L	5.8	5.8	5.8	7.7	10.5	10.5	13.5	13.5	16.0	16.5

DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT

WV		6.3		10		16		25	
μF	Code	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
		10	106					4 x 5.8	18
22	226	4 x 5.8	22	5 x 5.8	30	5 x 5.8	30	6.3 x 5.8	44
33	336	5 x 5.8	35	5 x 5.8	36	6.3 x 5.8	48	6.3 x 5.8	50
47	476	5 x 5.8	38	6.3 x 5.8	50	6.3 x 5.8	50	6.3 x 7.7	63
100	107	6.3 x 5.8	69	6.3 x 7.7	81	6.3 x 7.7	81	8 x 10.5	116
150	157	6.3 x 7.7	85	8 x 10.5	125	8 x 10.5	125	10 x 10.5	320
220	227	6.3 x 7.7	120	8 x 10.5	141	10 x 10.5	216	10 x 10.5	320
330	337	8 x 10.5	290	10 x 10.5	290	10 x 10.5	290	10 x 10.5	320
470	477	10 x 10.5	320	10 x 10.5	320	10 x 10.5	320	12.5 x 13.5 (10 x 13.5)	400 (350)
680	687	10 x 10.5	320	10 x 10.5	320	10 x 13.5	420	12.5 x 13.5	415
1000	108	10 x 10.5	410	10 x 13.5	390	12.5 x 13.5	550	12.5 x 13.5	460
1500	158	10 x 13.5	450	12.5 x 13.5	480	12.5 x 13.5	650	12.5 x 16	700
2200	228	12.5 x 13.5	680	12.5 x 16 (12.5 x 13.5)	750 (510)	16 x 16.5	800		
3300	338	12.5 x 16 (12.5 x 13.5)	850 (800)	16 x 16.5	800			Case size	Ripple current

WV		35		50		63		100	
μF	Code	Size	Ripple current	Size	Ripple current	Size	Ripple current	Size	Ripple current
		0.1	104			4 x 5.8	1.0		
0.22	224			4 x 5.8	2.6				
0.33	334			4 x 5.8	3.2				
0.47	474			4 x 5.8	5				
1	105			4 x 5.8	8				
2.2	225			4 x 5.8	12				
3.3	335			4 x 5.8	17			6.3 x 7.7	30
4.7	475	4 x 5.8	16	5 x 5.8	22			8 x 10.5	50
10	106	5 x 5.8	27	6.3 x 5.8	32	6.3 x 7.7	45	8 x 10.5	55
22	226	6.3 x 5.8	44	6.3 x 7.7	58	8 x 10.5	65	10 x 10.5	70
33	336	6.3 x 7.7	57	8 x 10.5	140	10 x 10.5	80	10 x 10.5	80
47	476	8 x 10.5	92	10 x 10.5	310	10 x 10.5	90	12.5 x 13.5 (10 x 13.5)	250 (150)
100	107	10 x 10.5	151	10 x 10.5	310	10 x 13.5	150	12.5 x 13.5	300
150	157	10 x 10.5	290	10 x 10.5	310			16 x 16.5 (12.5 x 16) (12.5 x 13.5)	600 (420) (380)
220	227	10 x 10.5	375	12.5 x 13.5 (10 x 13.5)	340 (320)	12.5 x 13.5	470		
330	337	12.5 x 13.5 (10 x 13.5)	380 (375)	12.5 x 16 (12.5 x 13.5)	600 (500)	16 x 16.5 (12.5 x 16)	650 (550)		
470	477	12.5 x 13.5	520	16 x 16.5	700				
680	687	12.5 x 13.5	550						
1000	108	16 x 16.5 (12.5 x 16)	750 (600)					Case size	Ripple current

•Case size ∅DxL(mm), ripple current (mA rms) at 105°C, 120Hz

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

Frequency		50Hz	120Hz	300Hz	1KHz	10KHz~	
Coefficient	Ø4 ~ Ø10	0.70	1.00	1.17	1.36	1.50	
	Ø12.5 ~ Ø16	~ 68µF	0.75	1.00	1.35	1.57	2.00
		100 ~ 470µF	0.80	1.00	1.23	1.34	1.50
		680 ~ 3300µF	0.85	1.00	1.10	1.13	1.15

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5~10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

◆ How to order

<u>HKL</u>	<u>106</u>	<u>M</u>	<u>0035</u>	<u>0405</u>	<u>R</u>	<u>-</u>
↓	↓	↓	↓	↓	↓	↓
<u>Type</u>	<u>Capacitance code</u>	<u>Tolerance</u>	<u>Rated Voltage</u>	<u>Size Code</u>	<u>Package</u>	<u>Additional characters may be added for special requirements</u>
HKL	pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) 106 = 10uF 107 = 100uF	M: +/-20%	Code 0035: 35VDC For DC Voltage 0006: 6.3VDC 0035: 35VDC 0100: 100VDC	Code 0405: Size 4x5.8mm Size for V-chip E-cap 0405: Size 4x5.8mm 1010: Size 10x10.5mm 1616: Size 16x16.5mm	R: Tape & Reel	

Note: Specification is subject to change without further notice. For more details and updates, please visit our website.