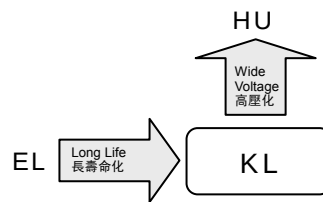


KL Series

5000 HOURS LONG LIFE ASSURANCE

5000 小時長壽命品

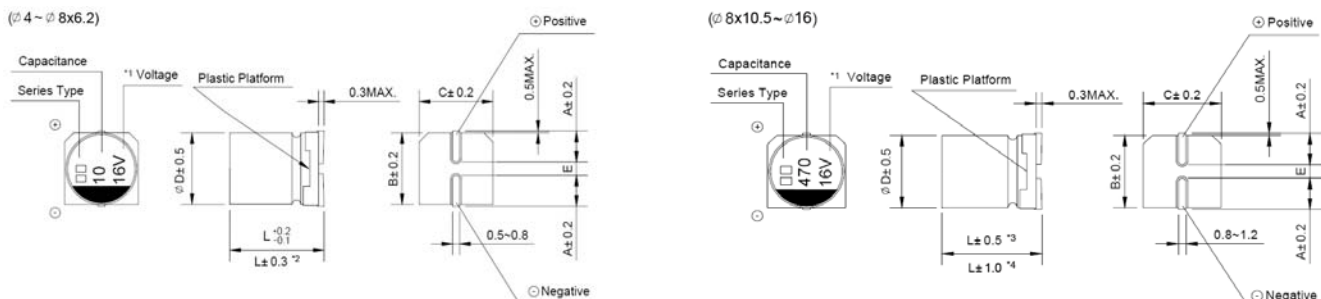
- Wide temperature range -55 ~ +105°C
適用於 -55 ~ +105°C 的寬溫範圍
- Load life of 3000~5000 hours
負荷壽命 3000~5000 小時
- Comply with the RoHS directive
符合 RoHS 指令



□ SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性																																											
Operation Temperature Range 使用溫度範圍	-55 ~ +105°C																																											
Voltage Range 額定工作電壓範圍	6.3 ~ 100V																																											
Capacitance Range 靜電容量範圍	0.1 ~ 1500μF																																											
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C																																											
Leakage Current 漏電流	Leakage current (Ø4~Ø10) ≦0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (Ø12.5~Ø16) ≦0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (Ø4~Ø10) ≦0.01CV 或 3μA, 取較大值 (施加額定工作電壓 2 分鐘後) 漏電流 (Ø12.5~Ø16) ≦0.03CV 或 4μA, 取較大值 (施加額定工作電壓 1 分鐘後)																																											
Dissipation Factor (tan δ) 損耗角正切	Measurement frequency 測試頻率: 120Hz, Temperature 溫度: 20°C <table><tr><td colspan="2">Rated Voltage (V) 額定工作電壓</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50~100</td></tr><tr><td>tan δ (max.)</td><td>Ø4~Ø10</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>最大損耗角正切</td><td>Ø12.5~Ø16</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></table>							Rated Voltage (V) 額定工作電壓		6.3	10	16	25	35	50~100	tan δ (max.)	Ø4~Ø10	0.28	0.24	0.20	0.16	0.13	0.12	最大損耗角正切	Ø12.5~Ø16	0.38	0.34	0.30	0.26	0.22	0.18													
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Stability at Low Temperature 低溫特性	Measurement frequency 測試頻率: 120Hz <table><tr><td colspan="2">Rated Voltage (V) 額定工作電壓</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50~100</td></tr><tr><td rowspan="2">Impedance Ratio 阻抗比 ZT/Z20 (max.)</td><td rowspan="2">Ø4~Ø10</td><td>Z(-25°C) / Z(20°C)</td><td>3</td><td>3</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z(-55°C) / Z(20°C)</td><td>8</td><td>5</td><td>4</td><td>3</td><td>3</td></tr><tr><td rowspan="2"></td><td rowspan="2">Ø12.5~Ø16</td><td>Z(-25°C) / Z(20°C)</td><td>5</td><td>4</td><td>3</td><td>2</td><td>2</td></tr><tr><td>Z(-55°C) / Z(20°C)</td><td>12</td><td>10</td><td>8</td><td>5</td><td>4</td><td>3</td></tr></table>							Rated Voltage (V) 額定工作電壓		6.3	10	16	25	35	50~100	Impedance Ratio 阻抗比 ZT/Z20 (max.)	Ø4~Ø10	Z(-25°C) / Z(20°C)	3	3	2	2	2	Z(-55°C) / Z(20°C)	8	5	4	3	3		Ø12.5~Ø16	Z(-25°C) / Z(20°C)	5	4	3	2	2	Z(-55°C) / Z(20°C)	12	10	8	5	4	3
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Load Life 高溫負荷特性	After 5000 hrs. (3000 hrs. for Ø4~Ø6.3x5.4 & Ø8x6.2) application of the rated voltage at 105°C, they meet the characteristics listed below. 在 105°C 環境中施加額定工作電壓 5000 小時 (Ø4~Ø6.3x5.4 和 Ø8x6.2 為 3000 小時) 後, 電容器的特性符合下表的要求。 <table><tr><td>Capacitance Change 靜電容量變化率</td><td>Within ±30% of initial value 初始值的±30%以內</td></tr><tr><td>Dissipation Factor 損耗角正切</td><td>300% or less of initial specified value 不大於規範值的 300%</td></tr><tr><td>Leakage Current 漏電流</td><td>initial specified value or less 不大於規範值</td></tr></table>							Capacitance Change 靜電容量變化率	Within ±30% of initial value 初始值的±30%以內	Dissipation Factor 損耗角正切	300% or less of initial specified value 不大於規範值的 300%	Leakage Current 漏電流	initial specified value or less 不大於規範值																															
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Shelf Life 高溫貯存特性	After leaving capacitors under no load at 105°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 105°C 環境中無負荷放置 1000 小時後, 電容器的特性符合高溫負荷特性中所列的規定值。																																											
Resistance to Soldering Heat 耐焊接熱特性	After reflow soldering and restored at room temperature, they meet the characteristics listed below. 經過回流焊並冷卻至室溫後, 電容器的特性符合下表的要求。 <table><tr><td>Capacitance Change 靜電容量變化率</td><td>Within ±10% of initial value 初始值的±10%以內</td></tr><tr><td>Dissipation Factor 損耗角正切</td><td>initial specified value or less 不大於規範值</td></tr><tr><td>Leakage Current 漏電流</td><td>initial specified value or less 不大於規範值</td></tr></table>							Capacitance Change 靜電容量變化率	Within ±10% of initial value 初始值的±10%以內	Dissipation Factor 損耗角正切	initial specified value or less 不大於規範值	Leakage Current 漏電流	initial specified value or less 不大於規範值																															
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Marking 標示	Black print on the case top. 鋁殼頂部黑字印刷。																																											

□ DRAWING (Unit: mm) 外形圖



- *1. Voltage mark for 6.3V is [6V] 6.3V 的產品標識為 [6V]
 *2. Applicable to Ø6.3x7.7 適用於 Ø6.3x7.7
 *3. Applicable to Ø8x10.5~Ø10 適用於 Ø8x10.5~Ø10
 *4. Applicable to Ø12.5~Ø16 適用於 Ø12.5~Ø16

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KL Series

□ DIMENSIONS (Unit: mm) 尺寸表

∅D x L	4 x 5.8	5 x 5.8	6.3 x 5.8	6.3 x 7.7	8 x 6.2	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	1.8	2.1	2.4	2.4	3.3	2.9	3.2	3.2	4.7	4.7	5.5
B	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
C	4.3	5.3	6.6	6.6	8.3	8.3	10.3	10.3	13.0	13.0	17.0
E ± 0.2	1.0	1.3	2.2	2.2	2.2	3.1	4.4	4.4	4.4	4.4	6.7
L	5.4	5.4	5.4	7.7	6.2	10.5	10.5	13.5	13.5	16.0	16.5

□ DIMENSIONS & MAXIMUM PERMISSIBLE RIPPLE CURRENT 規格尺寸及最大允許紋波電流

WV Code 代碼	μF	6.3		10		16		25	
		0J		1A		1C		1E	
10	100					4 x 5.8	18	5 x 5.8	27
22	220	4 x 5.8	22	5 x 5.8	30	5 x 5.8	30	6.3 x 5.8	44
33	330	5 x 5.8	35	5 x 5.8	36	6.3 x 5.8	48	6.3 x 5.8	50
47	470	5 x 5.8	38	6.3 x 5.8	50	6.3 x 5.8	50	6.3 x 7.7 (8 x 6.2)	63 (63)
100	101	6.3 x 5.8	69	6.3 x 7.7 (8 x 6.2)	81 (81)	6.3 x 7.7 (8 x 6.2)	81 (81)	8 x 10.5	116
150	151	6.3 x 7.7 (8 x 6.2)	85 (85)	8 x 10.5	125	8 x 10.5	125	10 x 10.5	320
220	221	6.3 x 7.7 (8 x 6.2)	120 (120)	8 x 10.5	141	10 x 10.5	216	10 x 10.5	320
330	331	8 x 10.5	290	10 x 10.5	290	10 x 10.5	290	10 x 10.5	320
470	471	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	681	10 x 10.5	320	10 x 10.5	320	10 x 13.5	420	12.5 x 13.5	415
1000	102	10 x 10.5	410	10 x 13.5	390	12.5 x 13.5	550	12.5 x 13.5	460
1500	152	10 x 13.5	450	12.5 x 13.5	480	12.5 x 13.5	650	12.5 x 16	700
2200	222	12.5 x 13.5	680	12.5 x 16 (12.5 x 13.5)	750 (510)	16 x 16.5	800		
3300	332	12.5 x 16 (12.5 x 13.5)	850 (800)	16 x 16.5	800			Case size 尺寸	Ripple current 紋波電流

WV Code 代碼	μF	35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4 x 5.8	1.0				
0.22	R22			4 x 5.8	2.6				
0.33	R33			4 x 5.8	3.2				
0.47	R47			4 x 5.8	5				
1	010			4 x 5.8	8				
2.2	2R2			4 x 5.8	12				
3.3	3R3			4 x 5.8	17			6.3 x 7.7 (8 x 6.2)	30 (30)
4.7	4R7	4 x 5.8	16	5 x 5.8	22			8 x 10.5	50
10	100	5 x 5.8	27	6.3 x 5.8	32	6.3 x 7.7 (8 x 6.2)	45 (45)	8 x 10.5	55
22	220	6.3 x 5.8	44	6.3 x 7.7 (8 x 6.2)	58 (58)	8 x 10.5	65	10 x 10.5	70
33	330	6.3 x 7.7 (8 x 6.2)	57 (57)	8 x 10.5	140	10 x 10.5	80	10 x 10.5	80
47	470	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	101	10 x 10.5	151	10 x 10.5	310	10 x 13.5	150	12.5 x 13.5	300
150	151	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	221	10 x 10.5	375	12.5 x 13.5 (10 x 13.5)	340 (320)	12.5 x 13.5	470		
330	331	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	471	12.5 x 13.5	520	16 x 16.5	700				
680	681	12.5 x 13.5	550						
1000	102	16 x 16.5 (12.5 x 16)	750 (600)					Case size 尺寸	Ripple current 紋波電流

• Case size ∅D x L (mm), ripple current (mA rms) at 105°C 120Hz • 尺寸 ∅D x L (mm), 紋波電流 (mA rms) 於 105°C 120Hz

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□ FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT 紋波電流頻率補償系數

Frequency 頻率			50Hz	120Hz	300Hz	1KHz	10KHz~
Coefficient 系數	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

- Taping specifications are given in page 11. 編帶標準請參閱第 11 頁。
- Please refer to page 12 for the minimum package quantity. 最小包裝數量請參閱第 12 頁。

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