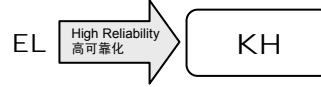
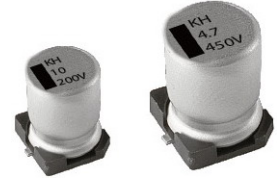


HIGH RELIABILITY

高可靠品

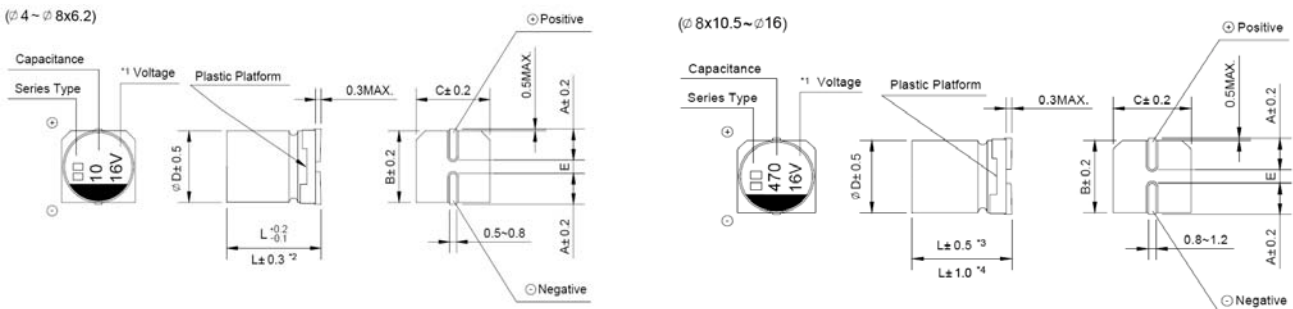
- High temperature range up to +125°C
適用於+125°C 的高溫範圍
- Suitable for automotive equipment
適用於汽車電子裝備
- Load life of 1000~5000 hours
負荷壽命 1000~5000 小時
- Comply with the RoHS directive
符合 RoHS 指令



SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性																																								
Operation Temperature Range 使用溫度範圍	-40 ~ +125°C																																								
Voltage Range 額定工作電壓範圍	10 ~ 450V																																								
Capacitance Range 靜電容量範圍	3.3 ~ 2200µF																																								
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C																																								
Leakage Current 漏電流	Leakage current (10V~100V) ≅ 0.03CV or 4µA, whichever is greater (after 2 minutes application of rated voltage) Leakage current (160V~450V) ≅ 0.04CV or 100µA, whichever is greater (after 2 minutes application of rated voltage) 漏電流 (10V~100V) ≅ 0.03CV 或 4µA, 取較大值 (施加額定工作電壓 2 分鐘後) 漏電流 (160V~450V) ≅ 0.04CV 或 100µA, 取較大值 (施加額定工作電壓 2 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 border="1"> <thead> <tr> <th>Rated Voltage (V) 額定工作電壓</th> <th>10</th> <th>16</th> <th>25</th> <th>35</th> <th>50</th> <th>63</th> <th>100</th> <th>160~250</th> <th>400,450</th> </tr> </thead> <tbody> <tr> <td>tan δ (max.) 最大損耗角正切</td> <td>0.24</td> <td>0.20</td> <td>0.16</td> <td>0.14</td> <td>0.14</td> <td>0.18</td> <td>0.18</td> <td>—</td> <td>—</td> </tr> <tr> <td></td> <td>∅4~∅10</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> <td>0.14</td> <td>0.10</td> <td>0.20</td> </tr> <tr> <td></td> <td>∅12.5~∅16</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Rated Voltage (V) 額定工作電壓	10	16	25	35	50	63	100	160~250	400,450	tan δ (max.) 最大損耗角正切	0.24	0.20	0.16	0.14	0.14	0.18	0.18	—	—		∅4~∅10	0.22	0.18	0.16	0.14	0.12	0.14	0.10	0.20		∅12.5~∅16								
Rated Voltage (V) 額定工作電壓	10	16	25	35	50	63	100	160~250	400,450																																
tan δ (max.) 最大損耗角正切	0.24	0.20	0.16	0.14	0.14	0.18	0.18	—	—																																
	∅4~∅10	0.22	0.18	0.16	0.14	0.12	0.14	0.10	0.20																																
	∅12.5~∅16																																								
Stability at Low Temperature 低溫特性	Measurement frequency 測試頻率: 120Hz <table border="1"> <thead> <tr> <th>Rated Voltage (V) 額定工作電壓</th> <th>10</th> <th>16</th> <th>25</th> <th>35~100</th> <th>160~250</th> <th>400,450</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Impedance Ratio 阻抗比 ZT/Z20 (max.)</td> <td rowspan="2">∅4~∅10</td> <td>Z(-25°C) / Z(20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>—</td> <td>—</td> </tr> <tr> <td>Z(-40°C) / Z(20°C)</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>—</td> <td>—</td> </tr> <tr> <td rowspan="2"></td> <td rowspan="2">∅12.5~∅16</td> <td>Z(-25°C) / Z(20°C)</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>3</td> <td>6</td> </tr> <tr> <td>Z(-40°C) / Z(20°C)</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>6</td> <td>10</td> </tr> </tbody> </table>	Rated Voltage (V) 額定工作電壓	10	16	25	35~100	160~250	400,450	Impedance Ratio 阻抗比 ZT/Z20 (max.)	∅4~∅10	Z(-25°C) / Z(20°C)	4	3	2	2	—	—	Z(-40°C) / Z(20°C)	10	8	6	4	—	—		∅12.5~∅16	Z(-25°C) / Z(20°C)	4	3	2	2	3	6	Z(-40°C) / Z(20°C)	8	6	4	3	6	10	
Rated Voltage (V) 額定工作電壓	10	16	25	35~100	160~250	400,450																																			
Impedance Ratio 阻抗比 ZT/Z20 (max.)	∅4~∅10	Z(-25°C) / Z(20°C)	4	3	2	2	—	—																																	
		Z(-40°C) / Z(20°C)	10	8	6	4	—	—																																	
	∅12.5~∅16	Z(-25°C) / Z(20°C)	4	3	2	2	3	6																																	
		Z(-40°C) / Z(20°C)	8	6	4	3	6	10																																	
Load Life 高溫負荷特性	After 5000 hrs. application of the rated voltage for ∅12.5×16 (10~100V), and 2000 hrs. for ∅8×10.5~∅10 (10~100V), and 1000 hrs. for ∅8×6.2~∅6.3, as well as 2000 hrs. application of rated voltage for ∅12.5×16 (160~450V) at 125°C, they meet the characteristics listed below. 在 125°C 環境中施加額定工作電壓 5000 小時於∅12.5×16 (10~100V), 2000 小時於∅8×10.5~∅10 (10~100V), 1000 小時於∅8×6.2~∅6.3, 以及施加額定工作電壓 2000 小時於∅12.5×16 (160~450V)後, 電容器的特性符合下表的要求。 <table border="1"> <tbody> <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> </tbody> </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																																		
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																																								
Shelf Life 高溫貯存特性	After leaving capacitors under no load at 125°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 125°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 border="1"> <tbody> <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> </tbody> </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																																		
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																																								
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]
*2. Applicable to ∅6.3×7.7

6.3V 的產品標識為 [6V]
適用於 ∅6.3×7.7

*3. Applicable to ∅8×10.5~∅10
*4. Applicable to ∅12.5~∅16

適用於 ∅8×10.5~∅10
適用於 ∅12.5~∅16

NOTE: All designs and specifications are for reference only and are subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.

注: 以上所提供的設計及特性參數僅供參考, 任何修改不作預先通知。如果在使用上有疑問, 請在採購前與我們聯繫, 以便提供技術上的協助。

□ DIMENSIONS (Unit: mm) 尺寸表

∅D x L	4 x 5.4	5 x 5.4	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 & ESR 規格尺寸及最大允許紋波電流及 ESR 值

WV Parameter 參數 μF	10 (1A)				16 (1C)				25 (1E)				
	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	
33	330								6.3 x 5.8	3.3	66	45	
47	470				6.3 x 5.8	3.3	66	43	6.3 x 7.7 (8 x 6.2)	2.3 (2.3)	46 (46)	68 (68)	
100	101	6.3 x 7.7 (8 x 6.2)	2.3 (2.3)	46 (46)	72 (72)	8 x 10.5	1.0	20	115	8 x 10.5	1.0	20	126
220	221	8 x 10.5	1.0	20	136	10 x 10.5	0.7	13.4	175	10 x 10.5	0.7	13.4	211
330	331	10 x 10.5	0.7	13.4	188	10 x 13.5	0.5	9.5	280	12.5 x 13.5 (10.5x13.5)	0.14 (0.5)	2.1 (9.5)	750 (270)
470	471	10 x 13.5	0.5	9.5	300	12.5 x 13.5	0.14	2.1	750	12.5 x 13.5	0.14	2.1	750
680	681					16 x 16.5 (12.5x13.5)	0.10 (0.14)	1.5 (2.1)	1000 (750)	16 x 16.5	0.10	1.5	1000
1000	102	12.5 x 16 (12.5x13.5)	0.11 (0.14)	1.5 (2.1)	900 (750)								
2200	222	16 x 16.5	0.10	1.5	1000								

WV Parameter 參數 μF	35 (1V)				50 (1H)				
	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	
10	100	6.3 x 5.8	3.3	66	38	6.3 x 7.7 (6.3 x 5.8)	2.3 (3.3)	46 (66)	50 (38)
22	220	6.3 x 5.8	3.3	66	39	6.3 x 7.7 (8 x 6.2)	2.3 (2.3)	46 (46)	50 (50)
33	330	6.3 x 7.7 (8 x 6.2)	2.3 (2.3)	46 (46)	62 (62)	8 x 10.5	1.0	20	83
47	470	8 x 10.5	1.0	20	92	10 x 10.5	0.7	13.4	111
100	101	10 x 10.5	0.7	13.4	151	12.5 x 13.5	0.23	3.5	550
220	221	12.5 x 13.5 (10 x 13.5)	0.14 (0.5)	2.1 (9.5)	750 (280)	16 x 16.5 (12.5 x 13.5)	0.15 (0.23)	2.3 (3.5)	850 (550)
330	331	12.5 x 13.5	0.14	2.1	750	16 x 16.5 (12.5 x 16)	0.15 (0.18)	2.3 (2.7)	850 (700)
470	471	16 x 16.5 (12.5 x 16)	0.10 (0.11)	1.5 (1.5)	1000 (900)				

WV Parameter 參數 μF	63 (1J)				100 (2A)				
	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	Case size ∅DxL (mm) 尺寸	E.S.R. (Ω) 20°C E.S.R.值	E.S.R. (Ω) -40°C E.S.R.值	Ripple current (mA rms) at 125°C 100KHz 紋波電流	
10	100	6.3 x 7.7 (8 x 6.2)	2.3 (2.3)	115 (115)	42 (42)	8 x 10.5	1.00	50	53
22	220	8 x 10.5	1.0	50	56	10 x 10.5	0.70	35	63
33	330	10 x 10.5	0.7	35	77	10 x 13.5	0.45	22.5	130
47	470	10 x 13.5	0.45	22.5	150	12.5 x 13.5	0.33	16.5	450
68	680					12.5 x 16	0.26	13	550
100	101	12.5 x 13.5	0.25	12.5	500	16 x 16.5	0.24	12	650
220	221	12.5 x 16	0.20	10	600				
330	331	16 x 16.5	0.18	9	820				

NOTE: All designs and specifications are for reference only and are subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.

注：以上所提供的設計及特性參數僅供參考，任何修改不預先通知。如果在使用上有疑問，請在採購前與我們聯繫，以便提供技術上的協助。

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

μF	WV Code 代碼	160		200		250		400		450	
		2C		2D		2E		2G		2W	
3.3	3R3									12.5×16	65
4.7	4R7							12.5×13.5	70	16×16.5	85
6.8	6R8							16×16.5	100		
10	100	12.5×13.5	100	12.5×13.5	100	12.5×16	110			Case size 尺寸	Ripple current 紋波電流
22	220	16×16.5	180	16×16.5	180						

• Case size $\varnothing D \times L$ (mm), ripple current (mA rms) at 125°C 120Hz • 尺寸 $\varnothing D \times L$ (mm), 紋波電流(mA rms)於 125°C 120Hz

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

Frequency 頻率		50Hz	120Hz	1KHz	10KHz~	100KHz~	
Coefficient 系數	10~100V	10 ~ 100μF	0.35	0.40	0.75	0.90	1.00
		220 ~ 470μF	0.35	0.50	0.85	0.94	1.00
		680 ~ 2200μF	0.40	0.60	0.85	0.95	1.00

Frequency 頻率		50Hz	120Hz	300Hz	1KHz	10KHz	100KHz~
Coefficient 系數	160~450V	0.75	1.00	1.25	1.50	1.75	1.80

- 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。

NOTE: All designs and specifications are for reference only and are subject to change without prior notice. If any doubt about safety for your application, please contact us immediately for technical assistance before purchase.
 注：以上所提供的設計及特性參數僅供參考，任何修改不作預先通知。如果在使用上有疑問，請在採購前與我們聯繫，以便提供技術上的協助。