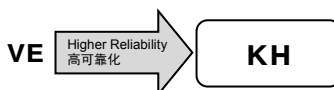


HIGH RELIABILITY

高可靠品

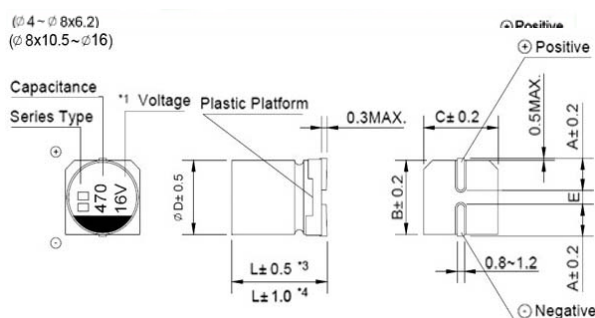
- High temperature range up to +125°C
適用於+125°C 的高溫範圍
- Suitable for automotive equipment
適用於汽車電子裝備
- Load life of 1000~5000 hours
負荷壽命 1000~5000 小時
- Comply with the RoHS directive
符合 RoHS 指令



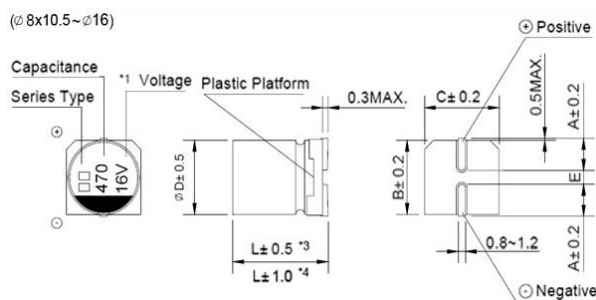
SPECIFICATIONS 特性表

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 +100μA, whichever is greater (after 2 minute application of rated voltage) 漏電流（10V~100V）≤0.03CV 或 4 μA，取較大值（施加額定工作電壓 2 分鐘後） 漏電流（160V~450V）≤0.04CV+100 μA，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										
	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	0.20	0.20
Stability at Low Temperature 低溫特性	Measurement frequency 測試頻率: 120Hz										
	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.)	Ø4~Ø10	Z (-25°C) / Z (20°C)	4	3	2	2	-	-		
		Ø12.5~Ø16	Z (-40°C) / Z (20°C)	10	8	6	4	-	-		
		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 forØ12.5~16 (10~100V) ,and 2000 hrs.forØ8X10.5~Ø10 (10~100V) , and 1000 hrs.for Ø6.3,as well as 2000 hrs. application of rated voltage forØ12.5~16(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Ø12.5~16（10~100V）, 2000 小時於Ø8X10.5~Ø10（10~100V）, 1000 小時於Ø6.3, 以及施加額定工作電壓 2000 小時於Ø12.5~16（160~450V）電容器的特性符合下表的要求。										
	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。										
	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] 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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KH Series

□ DIMENSIONS (Unit: mm) 尺寸表

∅D x L	4x5.8	5x5.8	6.3x5.8	6.3x7.7	8x10.5	10x10.5	10x12.5	12.5x13.5	12.5x16	16x16.5
A	2.0	2.2	2.6	2.6	3.0	3.2	3.2	4.6	4.6	5.8
B	4.3	5.3	6.6	6.6	8.3	10.3	10.3	12.8	12.8	17.0
C	4.3	5.3	6.6	6.6	8.3	10.3	10.3	12.8	12.8	17.0
E ± 0.2	1.0	1.5	2.1	2.1	3.1	4.6	4.6	4.6	4.6	6.4
L	5.8	5.8	5.8	7.7	10.5	10.5	12.5	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

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									6.3x5.8	3.3	66	45
47	470					6.3x5.8	3.3	66	43	6.3x7.7	2.3	46	68
100	101	6.3x7.7	2.3	46	72	8x10.5	1.0	20	115	8x10.5	1.0	20	126
220	221	8x10.5	1.0	20	136	10x10.5	0.7	13.4	175	10x10.5	0.7	13.4	211
330	331	10x10.5	0.7	13.4	188	10x12.5	0.5	9.5	280	12.5x13.5 (10x12.5)	0.14 (0.5)	2.1 (9.5)	750 (270)
470	471	10x12.5	0.5	9.5	300	12.5x13.5	0.14	2.1	750	12.5x13.5	0.14	2.1	750
680	681					16x16.5 (12.5x13.5)	0.10 (0.14)	1.5 (2.1)	1000 (750)	16x16.5	0.10	1.5	1000
1000	102	12.5x16 (12.5x13.5)	0.11 (0.14)	1.5 (2.1)	900 (750)								
2200	222	16x16.5	0.10	1.5	1000								

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	6.3x5.8	3.3	66	38	6.3x7.7 (6.3x5.8)	2.3 (3.3)	46 (66)	50 (38)
22	220	6.3x5.8	3.3	66	39	6.3x7.7	2.3	46	50
33	330	6.3x7.7	2.3	46	62	8x10.5	1.0	20	83
47	470	8x10.5	1.0	20	92	10x10.5	0.7	13.4	111
68	680	8x10.5	1.0	20	92				
100	101	10x10.5	0.7	13.4	151	10x10.5 12.5x13.5	0.7 0.23	13.4 3.5	165 550
220	221	12.5x13.5 (10x12.5)	0.14 (0.5)	2.1 (9.5)	750 (260)	16x16.5 (12.5x13.5)	0.15 (0.23)	2.3 (3.5)	800 (550)
330	331	12.5x13.5	0.14	2.1	750	16x16.5 (12.5x16)	0.15 (0.18)	2.3 (2.7)	850 (700)
470	471	16x16.5 (12.5x16)	0.10 (0.11)	1.5 (1.5)	1000 (900)				

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	6.3x7.7	2.3	115	42	8x10.5	1.00	50	53
22	220	8x10.5	1.0	50	56	10x10.5	0.70	35	63
33	330	8x10.5 10x10.5	1.0 0.7	50 35	65 77	10x12.5	0.45	22.5	130
47	470	8x10.5 10x12.5	1.0 0.45	50 22.5	100 150	12.5x13.5	0.33	16.5	450
68	680					12.5x16	0.26	13	550
100	101	12.5x13.5	0.25	12.5	500	16x16.5	0.24	12	650
220	221	12.5x16	0.20	10	600				
330	331	16x16.5	0.18	9	820				

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KH Series

□ 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
		220~470μF	0.35	0.50	0.85	0.94
		680~2200μF	0.40	0.60	0.85	0.95

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

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