

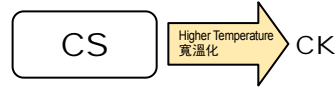
CS Series

CHIP TYPE, STANDARD

貼片式, 標準品



- Operating with general temperature range -40~+85°C
適用於 -40~+85°C 的常規溫度範圍
- Load life of 2000 hours
負荷壽命 2000 小時
- RoHS & REACH compliant, Halogen-free
符合 RoHS 與 REACH, 無鹵

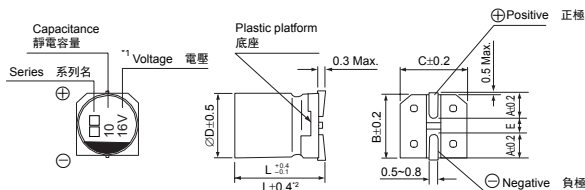


□ SPECIFICATIONS 特性表

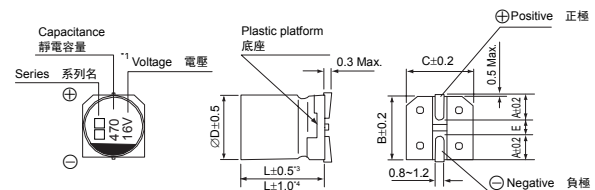
Items 項目	Characteristics 主要特性											
Operation Temperature Range 使用溫度範圍	-40 ~ +85°C											
Voltage Range 額定工作電壓範圍	4 ~ 450V											
Capacitance Range 靜電容量範圍	0.1 ~ 10000µF											
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C											
Leakage Current 漏電流	Rated Voltage 額定工作電壓	6.3 ~ 100V		160 ~ 450V								
	Case size 尺寸	Ø4~Ø10		Ø12.5~Ø18		Ø6.3~Ø18						
	Time 時間	After 2 min. application of rated voltage at 20°C 在 20°C 環境中施加額定工作電壓 2 分鐘後		After 1 min. application of rated voltage at 20°C 在 20°C 環境中施加額定工作電壓 1 分鐘後		After 5 min. application of rated voltage at 20°C 在 20°C 環境中施加額定工作電壓 5 分鐘後						
	Leakage current 漏電流	≤0.01CV or 3µA, whichever is greater ≤0.01CV 或 3µA, 取較大值		≤0.03CV or 4µA, whichever is greater ≤0.03CV 或 4µA, 取較大值		≤0.04CV+100µA, whichever is greater ≤0.04CV+100µA, 取較大值						
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	4	6.3	10	16	25	35	50	63	100	160~250	350~450
	tan δ (max.) 最大損耗角正切	Ø4~Ø10	0.42	0.28	0.24	0.20	0.14	0.12	0.12	0.10	0.10	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		4	6.3	10	16	25	35	50~100	160~250	350~450	
	Impedance Ratio 阻抗比	ZT/Z20 (max.)	Ø4~Ø10	Z(-25°C)/Z(20°C)	7	4	3	2	2	2	2	3
			Ø12.5~Ø18	Z(-25°C)/Z(20°C)	7	5	4	3	2	2	2	2
Load Life 高溫負荷特性	After 2000 hours application of the rated voltage at 85°C, they meet the characteristics listed below. 在 85°C 環境中施加額定工作電壓 2000 小時後, 電容器的特性符合下表的要求。											
	Capacitance Change 靜電容量變化率	Within ±20% of initial value (Within ±30% of initial value for 4V) 初始值的±20%以內 (4V 為±30%以內)										
	Dissipation Factor 損耗角正切	200% or less of initial specified value 不大於規範值的 200%										
Shelf Life 高溫貯存特性	After leaving capacitors under no load at 85°C for 1000 hours, they meet the specified value for load life characteristics listed above. 在 85°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。											
	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										
Resistance to Soldering Heat 耐焊接熱特性 (Please refer page 23 for soldering conditions) (焊接條件請查閱第 23 頁)	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	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 標識	Black print on the case top. 鋁殼頂部黑字印刷。											

□ DRAWING 外形圖 (Unit: mm)

(Ø4~Ø6.3×7.7)



(Ø8×10.5~Ø18)



- *1. Voltage mark for 6.3V is [6V]
- *2. Applicable to Ø6.3×7.7
- *3. Applicable to Ø8×10.5~Ø10
- *4. Applicable to Ø12.5~Ø18

- 6.3V 的產品標識為 [6V]
- 適用於 Ø6.3×7.7
- 適用於 Ø8×10.5~Ø10
- 適用於 Ø12.5~Ø18

Dimension table in next page.
尺寸表見下一頁。

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□ DIMENSIONS (Unit: mm) 尺寸表

∅D x L	4 x 5.4	5 x 5.4	6.3 x 5.4	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	18 x 16.5	18 x 18.5
A	2.0	2.2	2.6	2.6	3.0	3.3	3.3	4.9	4.9	5.8	6.2	6.2
B	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0	19.0	19.0
C	4.3	5.3	6.6	6.6	8.4	10.4	10.4	13.0	13.0	17.0	19.0	19.0
E ± 0.2	1.0	1.4	1.9	1.9	3.1	4.7	4.7	4.7	4.7	6.4	6.4	6.4
L	5.4	5.4	5.4	7.7	10.5	10.5	13.5	13.5	16.0	16.5	16.5	18.5

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

WV Code 代碼	μF	4		6.3		10		16		25		
		0G		0J		1A		1C		1E		
4.7	4R7										4 x 5.4	19
10	100							4 x 5.4	25		5 x 5.4 (4 x 5.4)	28 (20)
15	150							4 x 5.4	28		5 x 5.4	34
22	220			4 x 5.4	31	5 x 5.4 (4 x 5.4)	35 (28)	5 x 5.4 (4 x 5.4)	39 (28)	6.3 x 5.4 (5 x 5.4)	52 (35)	
33	330	4 x 5.4	26	5 x 5.4 (4 x 5.4)	39 (31)	5 x 5.4 (4 x 5.4)	43 (32)	6.3 x 5.4 (5 x 5.4)	57 (40)	6.3 x 5.4 (5 x 5.4)	63 (42)	
47	470	4 x 5.4	34	5 x 5.4 (4 x 5.4)	47 (36)	5 x 5.4	43	6.3 x 5.4 (5 x 5.4)	68 (44)	6.3 x 5.4	68	
56	560	4 x 5.4	39	5 x 5.4	46	6.3 x 5.4	57	6.3 x 5.4	74	6.3 x 5.4	82	
68	680	5 x 5.4	45	6.3 x 5.4 (5 x 5.4)	62 (52)	6.3 x 5.4	72	6.3 x 5.4	80	6.3 x 5.4	94	
100	101	5 x 5.4	61	6.3 x 5.4 (5 x 5.4)	71 (55)	6.3 x 5.4 (5 x 5.4)	76 (70)	6.3 x 5.4	86	6.3 x 7.7	130	
150	151	6.3 x 5.4	74	6.3 x 5.4	78	6.3 x 5.4	88	6.3 x 7.7	135	8 x 10.5 (6.3 x 7.7)	200 (130)	
220	221	6.3 x 5.4	82	6.3 x 5.4	95	6.3 x 7.7	150	8 x 10.5 (6.3 x 7.7)	215 (150)	8 x 10.5	250	
330	331	6.3 x 7.7	150	6.3 x 7.7	150	8 x 10.5	280	8 x 10.5	280	10 x 10.5 (8 x 10.5)	340 (310)	
470	471	6.3 x 7.7	150	8 x 10.5 (6.3 x 7.7)	300 (150)	10 x 10.5 (8 x 10.5)	320 (300)	10 x 10.5 (8 x 10.5)	420 (330)	10 x 10.5	400	
680	681	8 x 10.5	300	8 x 10.5	300	10 x 10.5	380	10 x 10.5	450	10 x 13.5	550	
1000	102	8 x 10.5	330	10 x 10.5 (8 x 10.5)	430 (330)	10 x 10.5	450	12.5 x 13.5 (10 x 13.5) (10 x 10.5)	710 (550) (490)	12.5 x 13.5	820	
1500	152	10 x 10.5	450	10 x 13.5 (10 x 10.5)	650 (450)	10 x 13.5	650	12.5 x 13.5	750	12.5 x 16	1000	
2200	222	10 x 13.5 (10 x 10.5)	620 (480)	12.5 x 13.5 (10 x 13.5)	890 (720)	12.5 x 13.5	960	16 x 16.5 (12.5 x 16)	1150 (1000)	16 x 16.5	1250	
3300	332	10 x 13.5	700	12.5 x 16 (12.5 x 13.5)	1000 (900)	16 x 16.5 (12.5 x 16)	1300 (1050)	16 x 16.5	1350	18 x 16.5	1450	
4700	472	12.5 x 13.5	850	16 x 16.5	1400	16 x 16.5	1450	18 x 16.5	1600	18 x 18.5	1750	
6800	682	16 x 16.5 (12.5 x 16)	1350 (900)	18 x 16.5	1700	18 x 16.5	1700	18 x 18.5	2000	Case size 尺寸	Ripple current 紋波電流	
10000	103			18 x 18.5	2000	18 x 18.5	2000					

WV Code 代碼	μF	35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4 x 5.4	1.0	4 x 5.4	1.0		
0.22	R22			4 x 5.4	2.3	4 x 5.4	2.3		
0.33	R33			4 x 5.4	3.5	4 x 5.4	3.5		
0.47	R47			4 x 5.4	5.0	4 x 5.4	5.0		
1	010			4 x 5.4	10	4 x 5.4	10	4 x 5.4	10
1.5	1R5			4 x 5.4	12	4 x 5.4	12	6.3 x 5.4	15
2.2	2R2			4 x 5.4	15	4 x 5.4	15	6.3 x 5.4	20
3.3	3R3	4 x 5.4	18	4 x 5.4	18	5 x 5.4	20	6.3 x 7.7 (6.3 x 5.4)	45 (28)
4.7	4R7	4 x 5.4	20	5 x 5.4 (4 x 5.4)	23 (19)	5 x 5.4	23	6.3 x 7.7 (6.3 x 5.4)	50 (30)
10	100	5 x 5.4 (4 x 5.4)	30 (20)	6.3 x 5.4 (5 x 5.4)	34 (27)	6.3 x 7.7 (6.3 x 5.4)	55 (34)	8 x 10.5 (6.3 x 7.7)	110 (50)
22	220	6.3 x 5.4 (5 x 5.4)	54 (42)	6.3 x 5.4	60	8 x 10.5 (6.3 x 7.7)	140 (70)	10 x 10.5 (8 x 10.5)	180 (120)
33	330	6.3 x 5.4	60	6.3 x 7.7	85	8 x 10.5 (6.3 x 7.7)	160 (85)	10 x 10.5	190
47	470	6.3 x 5.4 (6.3 x 7.7)	70 (165)	10 x 10.5 (8 x 10.5) (6.3 x 7.7)	130 (110) (90)	10 x 10.5 (8 x 10.5)	230 (170)	Case size 尺寸	Ripple current 紋波電流

• Case size ∅D x L (mm), ripple current (mA rms) at 85°C, 120Hz • 尺寸 ∅D x L (mm), 紋波電流 (mA rms) 於 85°C, 120Hz

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

WV Code 代碼	μF	35		50		63		100		160	
		1V		1H		1J		2A		2C	
22	220									10 × 13.5	100
33	330									12.5 × 13.5	290
47	470									12.5 × 13.5 (16 × 16.5)	300 (370)
56	560	6.3 × 7.7	80	6.3 × 7.7	110	10 × 10.5	250			12.5 × 16	390
68	680	6.3 × 7.7	110	8 × 10.5	170	10 × 10.5	260			16 × 16.5	500
100	101	8 × 10.5 (6.3 × 7.7)	175 (120)	10 × 10.5 (8 × 10.5)	240 (200)	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	380 (290) (280)	12.5 × 13.5	440	16 × 16.5 (18 × 16.5)	650 (690)
150	151	8 × 10.5	220	10 × 10.5	240	10 × 13.5	310	12.5 × 13.5	540		
220	221	10 × 10.5 (8 × 10.5)	310 (270)	10 × 13.5 (10 × 10.5)	400 (320)	12.5 × 13.5	580	16 × 16.5	700		
330	331	10 × 10.5	350	12.5 × 13.5 (10 × 13.5)	600 (420)	16 × 16.5 (12.5 × 16)	820 (720)	18 × 16.5	780		
470	471	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	600 (530) (400)	16 × 16.5 (12.5 × 16)	850 (740)	16 × 16.5	950				
680	681	12.5 × 13.5	750	16 × 16.5	950	18 × 16.5	1100				
1000	102	16 × 16.5 (12.5 × 16)	1100 (800)	18 × 16.5	1350						
2200	222	18 × 16.5	1450							Case size 尺寸	Ripple current 紋波電流
3300	333	18 × 18.5	1750								

WV Code 代碼	μF	200		250		350		400		450	
		2D		2E		2V		2G		2W	
3.3	3R3							10 × 13.5	80	10 × 13.5	80
4.7	4R7					10 × 13.5	115	10 × 13.5 (12.5 × 13.5)	100 (120)	10 × 13.5 (12.5 × 13.5)	100 (120)
10	100	10 × 13.5	135	10 × 13.5	135	12.5 × 13.5	120	12.5 × 13.5	120	12.5 × 13.5 (12.5 × 16)	120 (130)
22	220	12.5 × 13.5	240	12.5 × 13.5	150	16 × 16.5	140	16 × 16.5	140	16 × 16.5	140
33	330	12.5 × 13.5	300	12.5 × 16 (16 × 16.5)	240 (300)	16 × 16.5	140	16 × 16.5	140	18 × 16.5	180
47	470	16 × 16.5	420	16 × 16.5	340	18 × 16.5	280	18 × 16.5	280	Case size 尺寸	Ripple current 紋波電流
100	101	16 × 16.5	420	18 × 16.5	440	18 × 18.5	350	18 × 18.5	350		

•Case size $\varnothing D \times L$ (mm), ripple current (mA rms) at 85°C, 120Hz •尺寸 $\varnothing D \times L$ (mm), 紋波電流(mA rms)於 85°C, 120Hz

□ 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	0.1 ~ 68μF	0.70	1.00	1.17	1.36
		100 ~ 3300μF	0.85	1.00	1.08	1.20
	Ø12.5 ~ Ø18	~ 68μF	0.75	1.00	1.35	1.57
		100 ~ 680μF	0.80	1.00	1.23	1.34
		1000 ~ 6800μF	0.85	1.00	1.10	1.13

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. 鋁電解電容器在疊加紋波電流後會引起發熱，溫度每上升 5~10°C 壽命會減半。若要保持長壽命性能，請在使用過程中適當降低紋波電流。

- Taping specifications are given in page 17. 編帶標準請查閱第 17 頁。
- Soldering conditions and recommended land size are given in page 23. 焊接條件及推薦安裝尺寸請查閱第 23 頁。
- Please refer to page 18 for the minimum package quantity. 最小包裝數量請查閱第 18 頁。
- Please refer to page 15 for the Part Number System. 產品編碼規則請查閱第 15 頁。

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