CS Series

CHIP TYPE, STANDARD

貼片式，標準品



- Operating with general temperature range -55(-40/-25)~+85°C
  適用於-55(-40/-25)~+85°C 的常規溫度範圍
- Endurance 2000 hours
  耐久性 2000 小時
- RoHS & REACH compliant, Halogen-free
  符合 RoHS 與 REACH，無鹵

CS → Higher Temperature 寬溫化 → CK

☐ SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性		
Category Temperature Range 工作温度範圍	-55 ~ +85°C	-40 ~ +85°C	-25 ~ +85°C
Voltage Range 額定工作電壓範圍	4 ~ 100V	160 ~ 400V	450V
Capacitance Range 靜電容量範圍	0.1 ~ 10000μF	3.3 ~100μF	3.3 ~ 33μF
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	∅4~∅10	∅12.5~∅18	∅6.3~∅18
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

C: Nominal capacitance (μF) 標稱靜電容量, V: Rated voltage (V) 額定電壓

Dissipation Factor (tan δ) 損耗角正切

Measurement frequency 測試頻率: 120Hz, Temperature 温度: 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	∅4~∅10	0.42	0.28	0.24	0.22	0.16	0.12	0.12	0.10	0.10	0.20	0.25
	∅12.5~∅18	0.45	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.20	0.25

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.)	∅4~∅10	Z(-25°C)/Z(+20°C)	7	4	3	2	2	2	2	2	3
		Z(-55°C)/Z(+20°C)	15	8	6	4	4	3	3	3	6
	∅12.5~∅18	Z(-25°C)/Z(+20°C)	7	5	4	3	2	2	2	2	4
		Z(-55°C)/Z(+20°C)	17	12	10	8	5	4	3	6	10

Endurance 耐久性

When the capacitors are restored to 20°C 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，待電容器恢復至 20°C 時進行測量，電容器的特性符合下表要求。

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%
Leakage Current 漏電流	initial specified value or less 不大於規範值

Shelf Life 高溫貯存特性

When the capacitors are restored to 20°C after leaving under no load at 85°C for 1000 hours, they meet the specified value for endurance characteristics listed above.
在 85°C 環境中無負荷放置 1000 小時後，待電容器恢復至 20°C 時進行測量，電容器的特性符合耐久性特性中所列的規定值。

Resistance to Soldering Heat 耐焊接熱特性

(Please refer page 25 for soldering conditions)
(焊接條件請查閱第 25 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。

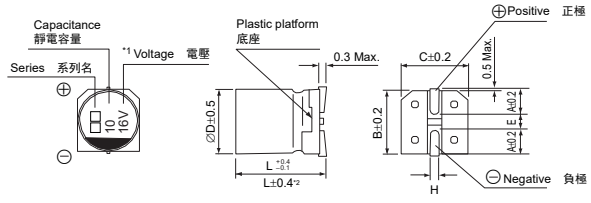
Capacitance Change 靜電容量變化率	Within ±10% of initial value 初始值的±10%以內
Dissipation Factor 損耗角正切	initial specified value or less 不大於規範值
Leakage Current 漏電流	initial specified value or less 不大於規範值

Marking 標識

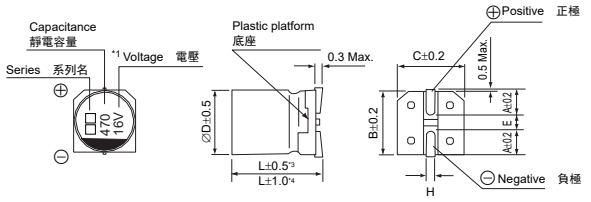
Black print on the case top. 鋁殼頂部黑字印刷。

☐ DRAWING 外形圖 (Unit: mm)

(∅4~∅6.3×7.7)



(∅8×10.5~∅18)



*1. Voltage mark for 6.3V is [6V]
*2. Applicable to ∅6.3×7.7
*3. Applicable to ∅8×10.5~∅10
*4. Applicable to ∅12.5~∅18

6.3V 的產品標識為 [6V]
適用於∅6.3×7.7
適用於∅8×10.5~∅10
適用於∅12.5~∅18

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

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☐ DIMENSIONS (Unit: mm) 尺寸表

ØD x L	4 x 5.4	5 x 5.4	6.3 x 5.4/7.7	8 x 10.5	10 x 10.5/13.5	12.5 x 13.5/16	16 x 16.5	18 x 16.5/18.5
A	2.0	2.2	2.6	3.0	3.3	4.9	5.8	6.2
B	4.3	5.3	6.6	8.4	10.4	13.0	17.0	19.0
C	4.3	5.3	6.6	8.4	10.4	13.0	17.0	19.0
E ± 0.2	1.0	1.4	1.9	3.1	4.7	4.7	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
H	0.5~0.8	0.5~0.8	0.5~0.8	0.8~1.2	0.8~1.2	0.8~1.2	1.1~1.4	1.1~1.4

☐ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

WV / Code 代碼 / μF		4		6.3		10		16		25	
		0G		0J		1A		1C		1E	
4.7	4R7									4 × 5.4	19
10	100							4 × 5.4	25	5 × 5.4 (4 × 5.4)	28 (20)
15	150							4 × 5.4	28	5 × 5.4	34
22	220	4 × 5.4	22	4 × 5.4	31	5 × 5.4 (4 × 5.4)	35 (28)	5 × 5.4 (4 × 5.4)	39 (28)	6.3 × 5.4 (5 × 5.4)	52 (35)
33	330	5 × 5.4 (4 × 5.4)	32 26	5 × 5.4 (4 × 5.4)	39 (31)	5 × 5.4 (4 × 5.4)	43 (32)	6.3 × 5.4 (5 × 5.4)	57 (40)	6.3 × 5.4 (5 × 5.4)	63 (42)
47	470	5 × 5.4 (4 × 5.4)	38 (34)	5 × 5.4 (4 × 5.4)	47 (36)	5 × 5.4	43	6.3 × 5.4 (5 × 5.4)	68 (44)	6.3 × 5.4	68
56	560	4 × 5.4	39	5 × 5.4	46	6.3 × 5.4	57	6.3 × 5.4	74	6.3 × 5.4	82
68	680	5 × 5.4	45	6.3 × 5.4 (5 × 5.4)	62 (52)	6.3 × 5.4	72	6.3 × 5.4	80	6.3 × 5.4	94
100	101	6.3 × 5.4 (5 × 5.4)	70 (61)	6.3 × 5.4 (5 × 5.4)	71 (55)	6.3 × 5.4 (5 × 5.4)	76 (70)	6.3 × 5.4	86	6.3 × 7.7	130
150	151	6.3 × 5.4	74	6.3 × 5.4	78	6.3 × 5.4	88	6.3 × 7.7	135	8 × 10.5	200
220	221	6.3 × 5.4	82	6.3 × 7.7 (6.3 × 5.4)	130 (95)	6.3 × 7.7	150	8 × 10.5 (6.3 × 7.7)	215 (150)	8 × 10.5	250
330	331	6.3 × 7.7	150	6.3 × 7.7	150	8 × 10.5	280	8 × 10.5	280	10 × 10.5 (8 × 10.5)	340 (310)
470	471	6.3 × 7.7	150	8 × 10.5	300	10 × 10.5 (8 × 10.5)	320 (300)	10 × 10.5 (8 × 10.5)	420 (330)	10 × 10.5	400
680	681	8 × 10.5	300	8 × 10.5	300	10 × 10.5	380	10 × 10.5	450	10 × 13.5	550
1000	102	8 × 10.5	330	10 × 10.5	430	10 × 10.5	450	12.5 × 13.5 (10 × 13.5) (10 × 10.5)	710 (550) (490)	12.5 × 13.5	820
1500	152	10 × 10.5	450	10 × 13.5 (10 × 10.5)	650 (450)	10 × 13.5	650	12.5 × 13.5	750	12.5 × 16	1000
2200	222	10 × 13.5 (10 × 10.5)	620 (480)	12.5 × 13.5 (10 × 13.5)	890 (720)	12.5 × 13.5	960	16 × 16.5 (12.5 × 16)	1150 (1000)	16 × 16.5	1250
3300	332	10 × 13.5	700	12.5 × 16 (12.5 × 13.5)	1000 (900)	16 × 16.5 (12.5 × 16)	1300 (1050)	16 × 16.5	1350	18 × 16.5	1450
4700	472	12.5 × 13.5	850	16 × 16.5	1400	16 × 16.5	1450	18 × 16.5	1600	18 × 18.5	1750
6800	682	16 × 16.5 (12.5 × 16)	1350 (900)	18 × 16.5	1700	18 × 16.5	1700	18 × 18.5	2000	Case size 尺寸	Ripple current 紋波電流
10000	103			18 × 18.5	2000	18 × 18.5	2000				

WV / Code 代碼 / μF		35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4 × 5.4	1.0	4 × 5.4	1.0		
0.22	R22			4 × 5.4	2.3	4 × 5.4	2.3		
0.33	R33			4 × 5.4	3.5	4 × 5.4	3.5		
0.47	R47			4 × 5.4	5.0	4 × 5.4	5.0		
1	010			4 × 5.4	10	4 × 5.4	10	4 × 5.4	10
1.5	1R5			4 × 5.4	12	4 × 5.4	12	6.3 × 5.4	15
2.2	2R2			4 × 5.4	15	4 × 5.4	15	6.3 × 5.4	20
3.3	3R3	4 × 5.4	18	4 × 5.4	18	5 × 5.4	20	6.3 × 7.7 (6.3 × 5.4)	45 (28)
4.7	4R7	4 × 5.4	20	5 × 5.4 (4 × 5.4)	23 (19)	5 × 5.4	23	6.3 × 7.7 (6.3 × 5.4)	50 (30)
10	100	5 × 5.4 (4 × 5.4)	30 (20)	6.3 × 5.4 (5 × 5.4)	34 (27)	6.3 × 7.7 (6.3 × 5.4)	55 (34)	8 × 10.5 (6.3 × 7.7)	110 (50)
22	220	6.3 × 5.4 (5 × 5.4)	54 (42)	6.3 × 7.7 (6.3 × 5.4)	85 60	8 × 10.5 (6.3 × 7.7)	140 (70)	10 × 10.5 (8 × 10.5)	180 (120)
33	330	6.3 × 5.4	60	6.3 × 7.7	85	8 × 10.5 (6.3 × 7.7)	160 (85)	10 × 10.5	190
47	470	6.3 × 7.7 (6.3 × 5.4)	98 (70)	8 × 10.5 (6.3 × 7.7)	110 (90)	10 × 10.5 (8 × 10.5)	230 (170)	Case size 尺寸	Ripple current 紋波電流

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

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CAT.2026/V2.1

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☐ DIMENSIONS & STANDARD RATINGS 規格尺寸及標準參數

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							10 × 10.5	240	16 × 16.5 (12.5 × 13.5)	370 (300)
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	18 × 16.5 (16 × 16.5)	690 (650)
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	16 × 16.5 (12.5 × 13.5) (10 × 13.5)	780 (600) (420)	16 × 16.5 (12.5 × 16)	820 (720)	18 × 16.5	780		
470	471	12.5 × 13.5 (10 × 13.5)	600 (530)	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 (8 × 12.5)	80 (68)
4.7	4R7					10 × 13.5	115	12.5 × 13.5 (10 × 13.5)	120 (100)	12.5 × 13.5 (10 × 13.5)	120 (100)
10	100	10 × 13.5	135	10 × 13.5	135	12.5 × 13.5	120	12.5 × 13.5	120	12.5 × 13.5	120
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	16 × 16.5 (12.5 × 16)	300 (240)	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 ∅D×L(mm), ripple current (mA rms) at 85°C, 120Hz •尺寸∅D×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	∅4 ~ ∅10	0.1 ~ 68μF	0.70	1.00	1.17	1.36	1.50
		100 ~ 3300μF	0.85	1.00	1.08	1.20	1.30
	∅12.5 ~ ∅18	~ 68μF	0.75	1.00	1.35	1.57	2.00
		100 ~ 680μF	0.80	1.00	1.23	1.34	1.50
		1000 ~ 10000μF	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. 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 19. 編帶標準請查閱第 19 頁。
- Soldering conditions and recommended land size are given in page 25. 焊接條件及推薦安裝尺寸請查閱第 25 頁。
- Please refer to page 20 for the minimum package quantity. 最小包裝數量請查閱第 20 頁。
- Please refer to page 18 for the Part Number System. 產品編碼規則請查閱第 18 頁。

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