CK Series

WIDE TEMPERATURE

寬溫品



- Operating with wide temperature range -40 ~ +105°C
  適用於 -40 ~ +105°C 的寬溫範圍
- Load life of 2000 hours
  負荷壽命 2000 小時
- Comply with the RoHS directive
  符合 RoHS 指令

CS → Long life 長壽命 → CK

□ SPECIFICATIONS 特性表

Items 項目	Characteristics 主要特性
Operation Temperature Range 使用温度範圍	-40 ~ +105°C
Voltage Range 額定工作電壓範圍	4 ~ 450V
Capacitance Range 靜電容量範圍	0.1 ~ 6800μF
Capacitance Tolerance 靜電容量允許偏差	±20% at 120Hz, 20°C
Leakage Current 漏電流	Leakage current (∅4~∅10) ≦0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage) 漏電流 (∅4~∅10) ≦0.01CV 或 3μA，取較大值（施加額定工作電壓 2 分鐘後） Leakage current (∅12.5~∅16) ≦0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage) 漏電流 (∅12.5~∅16) ≦0.03CV 或 4μA，取較大值（施加額定工作電壓 1 分鐘後） / Leakage current (∅6.3~∅16) ≦0.04CV or 100μA, whichever is greater (after 5 minutes application of rated voltage) 漏電流 (∅6.3~∅16) ≦0.04CV 或 100μA，取較大值（施加額定工作電壓 5 分鐘後）

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	0.35	0.30	0.24	0.20	0.16	0.14	0.14	0.12	0.12	0.20	0.25
	∅12.5~∅16	0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.12	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	50~63	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	3	2	3
		Z(-40°C) / Z(20°C)	15	8	6	4	4	3	3	4	3	6
	∅12.5~∅16	Z(-25°C) / Z(20°C)	7	5	4	3	2	2	2	2	2	4
		Z(-40°C) / Z(20°C)	17	12	10	8	5	4	3	3	6	10

Load Life 高溫負荷特性

After 2000 hrs. (1000 hrs. for ∅4~∅6.3×5.4) application of the rated voltage at 105°C, they meet th e characteristics listed below. 在 105°C 環境中施加額定工作電壓 2000 小時（∅4~∅6.3×5.4 為 1000 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 for capacitors of 10V or more (Within ±30% of initial value for capacitors of 4V or less) ≥10V 為初始值的±20%以內（≤4V 為初始值的±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

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。

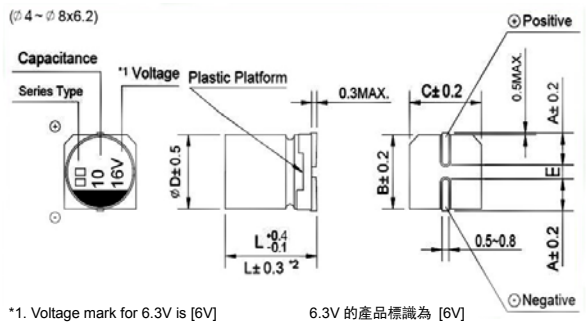
Resistance to Soldering Heat 耐焊接熱特性

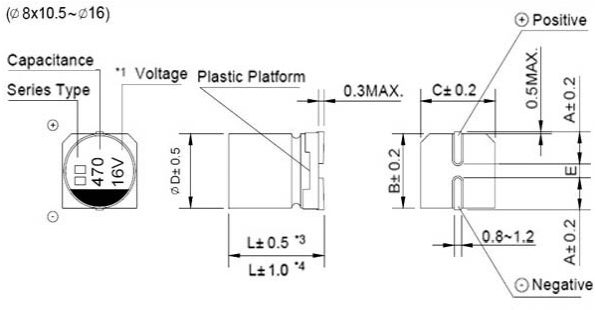
After reflow soldering and restored at room temperature, they meet the characteristics listed below.
經過回流焊並冷卻至室溫後，電容器的特性符合下表的要求。

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 ∅6.3×7.7 — 適用於∅6.3×7.7
*3. Applicable to ∅8×10.5~∅10 — 適用於∅8×10.5~∅10
*4. Applicable to ∅12.5~∅16 — 適用於∅12.5~∅16

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Rev:20

☐ DIMENSIONS (Unit: mm) 尺寸表

ØD x L	4 x 5.4	5 x 5.4	6.3 x 5.4	6.3 x 7.7	8 x 6.2	8 x 10.5	10 x 10.5	10 x 12.5	12.5 x 13.5	12.5 x 16	16 x 16.5
A	1.9	2.2	2.6	2.6	3.3	3.2	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 / μF / Code 代碼		4		6.3		10		16		25	
		0G		0J		1A		1C		1E	
4.7	4R7									4 × 5.4	13
10	100							4 × 5.4	18	5 × 5.4 (4 × 5.4)	20 (14)
22	220			4 × 5.4	22	5 × 5.4 (4 × 5.4)	25 (20)	5 × 5.4 (4 × 5.4)	27 (20)	6.3 × 5.4 (5 × 5.4)	36 (25)
33	330	5 × 5.4 (4 × 5.4)	30 (18)	5 × 5.4 (4 × 5.4)	27 (22)	5 × 5.4 (4 × 5.4)	30 (22)	6.3 × 5.4 (5 × 5.4)	40 (28)	6.3 × 5.4 (5 × 5.4)	44 (29)
47	470	5 × 5.4 (4 × 5.4)	36 (24)	5 × 5.4 (4 × 5.4)	33 (25)	6.3 × 5.4 (5 × 5.4) (4 × 5.4)	41 (30) (25)	6.3 × 5.4 (5 × 5.4)	48 (31)	5 × 5.4 6.3 × 5.4	35 48
100	101	6.3 × 5.4 (5 × 5.4)	60 (43)	6.3 × 5.4 (5 × 5.4)	50 (39)	5 × 5.4 6.3 × 5.4	39 (53)	6.3 × 5.4 (8 × 6.2)	60 (120)	6.3 × 5.4 6.3 × 7.7 (8 × 6.2)	65 85 91
150	151	6.3 × 5.4	52	6.3 × 5.4	55	6.3 × 5.4	62	6.3 × 7.7	95	8 × 10.5 (6.3 × 7.7)	140 (100)
220	221	6.3 × 5.4	57	6.3 × 7.7 (6.3 × 5.4)	105 (67)	6.3 × 5.4 6.3 × 7.7 (8 × 6.2)	67 105 (105)	8 × 10.5 (6.3 × 7.7) (8 × 6.2)	150 (105) (85)	6.3 × 7.7 8 × 10.5	125 175
330	331	6.3 × 7.7	100	6.3 × 7.7 8 × 6.2	105 105	6.3 × 7.7 8×10.5	105 196	8 × 10.5	195	10 × 10.5 (8 × 10.5)	240 (220)
470	471	6.3 × 7.7	105	8 × 10.5 (6.3 x 7.7)	210 (120)	6.3 × 7.7 10 × 10.5 (8 × 10.5)	120 260 (210)	10 × 10.5 (8 × 10.5)	295 (230)	8 × 10.5 10 × 10.5	250 310
680	681	8 × 10.5	210	8 × 10.5	210	10 × 10.5	270	10 × 10.5	315	10 × 12.5	400
1000	102	8 × 10.5	230	10 × 10.5 (8 × 10.5)	300 (230)	10 × 10.5 (8 × 10.5)	315 (230)	12.5 × 13.5 (10 × 12.5) (10 × 10.5)	500 (390) (340)	12.5 × 13.5	580
1500	152	10 × 10.5	315	10 × 12.5 (10 × 10.5)	450 (315)	10 × 12.5	460	12.5 × 13.5	550	12.5 × 16	850
2200	222	10 × 12.5 (10 × 10.5)	440 （340）	12.5 × 13.5 (10 × 12.5)	620 (500)	12.5 × 13.5	680	16 × 16.5 (12.5 × 16)	950 (750)	16 × 16.5	1050
3300	332	10 × 12.5	490	12.5 × 16 (12.5 × 13.5)	700 (660)	16 × 16.5	1000	16 × 16.5	1000		
4700	472	12.5 × 13.5	600	16 × 16.5	1000					Case size 尺寸	Ripple current 紋波電流
6800	682	16 × 16.5 (12.5 × 16)	950 （650）								

WV / μF / Code 代碼		35		50		63		100	
		1V		1H		1J		2A	
0.1	0R1			4 × 5.4	0.7	4 × 5.4	0.7		
0.22	R22			4 × 5.4	1.6	4 × 5.4	1.6		
0.33	R33			4 × 5.4	2.5	4 × 5.4	2.5		
0.47	R47			4 × 5.4	3.5	4 × 5.4	3.5		
1	010			4 × 5.4	7	4 × 5.4	7	4 × 5.4	7
2.2	2R2			4 × 5.4	11	4 × 5.4	11	6.3 × 5.4	14
3.3	3R3	4 × 5.4	13	4 × 5.4	13	5 × 5.4	13	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	32 (20) (30)
4.7	4R7	4 × 5.4	14	5 × 5.4 (4 × 5.4)	16 (13)	5 × 5.4	16	5 × 5.4 6.3 × 7.7 (6.3 × 5.4)	14 35 (21)
10	100	5 × 4.5 5 × 5.4 (4 × 5.4)	18 21 (14)	5 × 5.4 6.3 × 5.4	21 24	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	39 (24) (25)	(6.3 × 7.7) 8 × 6.2 8 × 10.5	(35) 40 77
22	220	5 × 5.4 6.3 × 5.4	30 38	6.3 × 7.7 (6.3 × 5.4) (8 × 6.2)	51 (42) (70)	8 × 10.5 (6.3 × 7.7)	98 (49)	10 × 10.5 (8 × 10.5)	126 (84)
33	330	6.3 × 5.4 (8 × 6.2)	42 (84)	6.3 × 7.7	60	8 × 10.5	112	10 × 10.5	133
								Case size 尺寸	Ripple current 紋波電流

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

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WV / Code 代碼 / μF		35		50		63		100	
		1V		1H		1J		2A	
47	470	6.3 × 7.7 (6.3 × 5.4)	70 (50)	8 × 6.2 8 × 10.5 (6.3 × 7.7)	95 120 (63)	10 × 10.5 (8 × 10.5)	160 (119)	12.5 × 13.5 (10 × 12.5) (10 × 10.5)	250 (160) (140)
68	680	6.3 × 5.4	75			10 × 10.5	175	12.5 x 13.5 (10 x 12.5)	300 (180)
100	101	8 × 6.2 8 × 10.5 (6.3 × 7.7)	110 120 (84)	10 × 10.5 (8 × 10.5)	170 (140)	12.5 × 13.5 (10 × 12.5) (10 × 10.5)	270 (210) (196)	16 × 16.5 (12.5 x 13.5)	450 (380)
150	151	8 × 10.5	155	10 × 10.5	170	10 × 12.5	225		
220	221	10 × 10.5 (8 × 10.5)	220 (190)	10 × 12.5 (10 × 10.5)	280 (220)	16 × 16.5 (12.5 × 13.5)	560 (470) (235)	16 × 16.5	550
330	331	10 × 10.5	245	16 × 16.5 (12.5 × 13.5) (10 x 12.5) 10 x 10.5	600 (420) (295) 275	16 × 16.5 (12.5 × 16)	700 (510)		
470	471	12.5 × 13.5 (10 × 12.5) (10 × 10.5)	520 (375) (280)	12.5 × 13.5 16 × 16.5 (12.5 × 16)	240 700 (520)	16 × 16.5	750		
680	681	12.5 × 13.5 (10 × 12.5)	530 (395)	16 × 16.5	750			Case size 尺寸	Ripple current 紋波電流
1000	102	16 × 16.5 (12.5 × 16)	750 (600)						

WV / Code 代碼 / μF		160		200					
		2C		2D					
1	010	6.3 × 7.7	45						
47	470			16 × 16.5	320			Case size 尺寸	Ripple current 紋波電流

•Case size ∅D×L(mm), ripple current (mA rms) at 105°C 120Hz •尺寸∅D×L(mm)，紋波電流(mA rms)於 105°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	1.50
		100 ~ 3300μF	0.85	1.00	1.08	1.20	1.30
	Ø12.5 ~ Ø16	~ 68μF	0.75	1.00	1.35	1.57	2.00
		100 ~ 680μF	0.80	1.00	1.23	1.34	1.50
		1000 ~ 6800μF	0.85	1.00	1.10	1.13	1.15

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ST:

CS1H101M-CRF10 MM1Z43 MMBD4148SE(A7) MMBT8050C MM1Z51 MMBT8050D(1.5A)-Y1
1N4148WS-BL CS0J471M-CRE77 CS1E471M-CRG10 MM1Z3B3 BC857A MM3Z5V6 MMBT4403
ZMM6V2PF-M ES1M MM5Z12 MMBT9014C(J6) ZM4733APF MM1Z24 1N4448W 1SS181 MM1Z18
ZMM8V2PF 1N4148W BZX84C6V8 MM3Z12 MMBT8550D MM1Z24B 1N4148WT MMBD7000