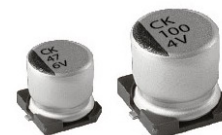
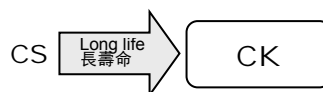


## WIDE TEMPERATURE

### 寬溫品

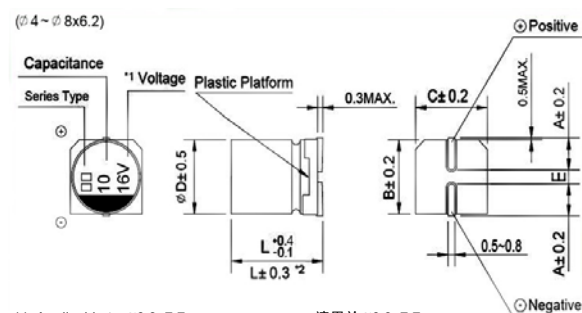
- Operating with wide temperature range -40 ~ +105°C  
適用於 -40 ~ +105°C 的寬溫範圍
- Load life of 2000 hours  
負荷壽命 2000 小時
- Comply with the RoHS directive  
符合 RoHS 指令



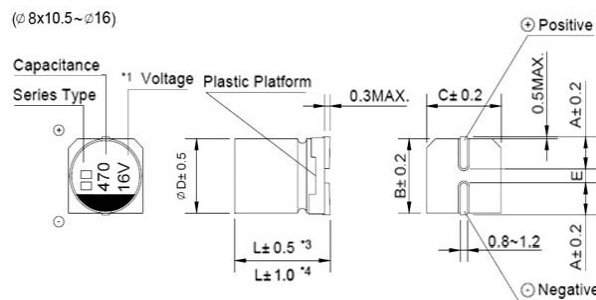
### SPECIFICATIONS 特性表

| Items 項目                            | Characteristics 主要特性  |                    |   |      |      |      |   |      |       |      |         |         |      |
|-------------------------------------|---|--------------------|---|------|------|------|---|------|-------|------|---------|---------|------|
| Operation Temperature Range 使用溫度範圍  | -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 (Ø4~Ø10) ≦ 0.01CV or 3μA, whichever is greater (after 2 minutes application of rated voltage)<br>漏電流 (Ø4~Ø10) ≦ 0.01CV 或 3μA, 取較大值 (施加額定工作電壓 2 分鐘後)<br>Leakage current (Ø12.5~Ø16) ≦ 0.03CV or 4μA, whichever is greater (after 1 minute application of rated voltage)<br>漏電流 (Ø12.5~Ø16) ≦ 0.03CV 或 4μA, 取較大值 (施加額定工作電壓 1 分鐘後) |                    |   |      |      |      | Leakage current (Ø6.3~Ø16) ≦ 0.04CV or 100μA, whichever is greater (after 5 minutes application of rated voltage)<br>漏電流 (Ø6.3~Ø16) ≦ 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 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.)  | Ø4~Ø10             | 0.35  | 0.30 | 0.24 | 0.20 | 0.16  | 0.14 | 0.14  | 0.12 | 0.12    | 0.20    | 0.25 |
|                                     | 最大損耗角正切   | Ø12.5~Ø16          | 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<br>ZT/Z20 (max.)  | Ø4~Ø10             | Z(-25°C) / Z(20°C)  | 7    | 4    | 3    | 2   | 2    | 2     | 3    | 2       | 3       |      |
| Z(-40°C) / Z(20°C)                  |   |                    | 15  | 8    | 6    | 4    | 3   | 3    | 4     | 3    | 6       |         |      |
| Ø12.5~Ø16                           |   | 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 Ø4~Ø6.3×5.4) application of the rated voltage at 105°C, they meet the characteristics listed below. 在 105°C 環境中施加額定工作電壓 2000 小時 (Ø4~Ø6.3×5.4 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<br>(Within ±30% of initial value for capacitors of 4V or less)<br>≥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

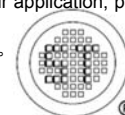


- \*1. Applicable to Ø6.3x7.7 適用於 Ø6.3x7.7  
 \*2. Applicable to Ø8x10.5~Ø10 適用於 Ø8x10.5~Ø10  
 \*3. Applicable to Ø12.5~Ø16 適用於 Ø12.5~Ø16



**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。



# CK Series

## □ 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 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       | 2.0     | 2.2     | 2.6       | 2.6       | 3.3     | 3.0      | 3.2       | 3.2       | 4.6         | 4.6       | 5.8       |
| B       | 4.3     | 5.3     | 6.6       | 6.6       | 8.3     | 8.3      | 10.3      | 10.3      | 12.8        | 12.8      | 17.0      |
| C       | 4.3     | 5.3     | 6.6       | 6.6       | 8.3     | 8.3      | 10.3      | 10.3      | 12.8        | 12.8      | 17.0      |
| E ± 0.2 | 1.0     | 1.5     | 2.1       | 2.1       | 2.2     | 3.1      | 4.6       | 4.6       | 4.6         | 4.6       | 6.4       |
| L       | 5.4     | 5.4     | 5.4       | 7.7       | 6.2     | 10.5     | 10.5      | 12.5      | 13.5        | 16.0      | 16.5      |

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

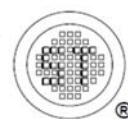
| μF   | WV<br>Code<br>代碼 | 4                        |              | 6.3                        |              | 10                                   |                     | 16  |                       | 25                      |                        |
|------|------------------|--------------------------|--------------|----------------------------|--------------|--------------------------------------|---------------------|---|-----------------------|-------------------------|------------------------|
|      |                  | 0G                       |              | 0J                         |              | 1A                                   |                     | 1C  |                       | 1E                      |                        |
| 4.7  | 4R7              |                          |              |                            |              |                                      |                     |   |                       | 4 x 5.4                 | 13                     |
| 10   | 100              |                          |              | 4 x 5.4                    | 18           |                                      |                     | 4 x 5.4                                   | 18                    | 5 x 5.4<br>(4 x 5.4)    | 20<br>(14)             |
| 22   | 220              |                          |              | 4 x 5.4                    | 22           | 5 x 5.4<br>(4 x 5.4)                 | 25<br>(20)          | 5 x 5.4<br>(4 x 5.4)                      | 27<br>(20)            | 6.3 x 5.4<br>(5 x 5.4)  | 36<br>(25)             |
| 33   | 330              | 5 x 5.4<br>(4 x 5.4)     | 30<br>(18)   | 5 x 5.4<br>(4 x 5.4)       | 27<br>(22)   | 5 x 5.4<br>(4 x 5.4)                 | 30<br>(22)          | 6.3 x 5.4<br>(5 x 5.4)                    | 40<br>(28)            | 6.3 x 5.4<br>(5 x 5.4)  | 44<br>(29)             |
| 47   | 470              | 5 x 5.4<br>(4 x 5.4)     | 36<br>(24)   | 5 x 5.4<br>(4 x 5.4)       | 33<br>(25)   | 6.3 x 5.4<br>(5 x 5.4)<br>(4 x 5.4)  | 41<br>(30)<br>(25)  | 6.3 x 5.4<br>(5 x 5.4)                    | 48<br>(31)            | 5 x 5.4<br>6.3 x 5.4    | 35<br>48               |
| 100  | 101              | 6.3 x 5.4<br>(5 x 5.4)   | 60<br>(43)   | 6.3 x 5.4<br>(5 x 5.4)     | 50<br>(39)   | 5 x 5.4<br>6.3 x 5.4                 | 39<br>(53)          | 6.3 x 5.4<br>(8 x 6.2)                    | 60<br>(120)           | 6.3 x 7.7<br>(8 x 6.2)  | 85<br>91               |
| 150  | 151              | 6.3 x 5.4                | 52           | 6.3 x 5.4                  | 55           | 6.3 x 5.4                            | 62                  | 6.3 x 7.7                                 | 95                    | 8 x 10.5<br>(6.3 x 7.7) | 140<br>(100)           |
| 220  | 221              | 6.3 x 5.4                | 57           | 6.3 x 7.7<br>(6.3 x 5.4)   | 105<br>(67)  | 6.3 x 5.4<br>6.3 x 7.7<br>(8 x 6.2)  | 67<br>105<br>(105)  | 8 x 10.5<br>(6.3 x 7.7)<br>(8 x 6.2)      | 150<br>(105)<br>(85)  | 8 x 10.5                | 175                    |
| 330  | 331              | 6.3 x 7.7                | 100          | 6.3 x 7.7<br>8 x 6.2       | 105<br>105   | 6.3 x 7.7<br>8 x 10.5                | 105<br>196          | 8 x 10.5                                  | 195                   | 10 x 10.5<br>(8 x 10.5) | 240<br>(220)           |
| 470  | 471              | 6.3 x 7.7                | 105          | 8 x 10.5<br>(6.3 x 7.7)    | 210<br>(120) | 6.3 x 7.7<br>10 x 10.5<br>(8 x 10.5) | 120<br>260<br>(210) | 10 x 10.5<br>(8 x 10.5)                   | 295<br>(230)          | 10 x 10.5<br>8 x 10.5   | 310<br>240             |
| 680  | 681              | 8 x 10.5                 | 210          | 8 x 10.5                   | 210          | 10 x 10.5                            | 270                 | 10 x 10.5                                 | 315                   | 10 x 10.5<br>10 x 12.5  | 350<br>400             |
| 1000 | 102              | 8 x 10.5                 | 230          | 10 x 10.5<br>(8 x 10.5)    | 300<br>(230) | 10 x 10.5<br>(8 x 10.5)              | 315<br>(230)        | 12.5 x 13.5<br>(10 x 12.5)<br>(10 x 10.5) | 500<br>(390)<br>(340) | 12.5 x 13.5             | 580                    |
| 1500 | 152              | 10 x 10.5                | 315          | 10 x 12.5<br>(10 x 10.5)   | 450<br>(315) | 10 x 12.5                            | 460                 | 12.5 x 13.5                               | 550                   | 12.5 x 16               | 850                    |
| 2200 | 222              | 10 x 12.5<br>(10 x 10.5) | 440<br>(340) | 12.5 x 13.5<br>(10 x 12.5) | 620<br>(500) | 12.5 x 13.5                          | 680                 | 16 x 16.5<br>(12.5 x 16)                  | 950<br>(750)          | 16 x 16.5               | 1050                   |
| 3300 | 332              | 10 x 12.5                | 490          | 12.5 x 16<br>(12.5 x 13.5) | 700<br>(660) | 16 x 16.5                            | 1000                | 16 x 16.5                                 | 1000                  |                         |                        |
| 4700 | 472              | 12.5 x 13.5              | 600          | 16 x 16.5                  | 1000         |                                      |                     |   |                       | Case size<br>尺寸         | Ripple current<br>紋波電流 |
| 6800 | 682              | 16 x 16.5<br>(12.5 x 16) | 950<br>(650) |                            |              |                                      |                     |   |                       |                         |                        |

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

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

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

| μF   | WV<br>Code<br>代碼 | 35  |                          | 50   |                              | 63  |                       | 100                                       |                        |
|------|------------------|---|--------------------------|--|------------------------------|---|-----------------------|---|------------------------|
|      |                  | 1V  |                          | 1H   |                              | 1J  |                       | 2A  |                        |
| 47   | 470              | 6.3 × 7.7<br>(6.3 × 5.4)                        | 70<br>(50)               | 8 × 6.2<br>8 × 10.5<br>(6.3 × 7.7)                     | 95<br>120<br>(63)            | 10 × 10.5<br>(8 × 10.5)                   | 160<br>(119)          | 12.5 × 13.5<br>(10 × 12.5)<br>(10 × 10.5) | 250<br>(160)<br>(140)  |
| 68   | 680              | 6.3 × 5.4                                       | 75                       |  |                              | 10 × 10.5                                 | 175                   | 12.5 × 13.5<br>(10 × 12.5)                | 300<br>(180)           |
| 100  | 101              | 8 × 6.2<br>8 × 10.5<br>6.3 × 5.4<br>(6.3 × 7.7) | 110<br>120<br>75<br>(84) | 10 × 10.5<br>(8 × 10.5)<br>6.3 × 7.7                   | 170<br>(140)<br>105          | 12.5 × 13.5<br>(10 × 12.5)<br>(10 × 10.5) | 270<br>(210)<br>(196) | 16 × 16.5<br>(12.5 × 13.5)                | 450<br>(380)           |
| 150  | 151              | 8 × 10.5  | 155                      | 10 × 10.5  | 170                          | 10 × 12.5                                 | 225                   |   |                        |
| 220  | 221              | 10 × 10.5<br>(8 × 10.5)                         | 220<br>(190)             | 10 × 12.5<br>(10 × 10.5)                               | 280<br>(220)                 | 16 × 16.5<br>(12.5 × 13.5)                | 560<br>(470)<br>(235) | 16 × 16.5                                 | 550                    |
| 330  | 331              | 10 × 10.5                                       | 245                      | 16 × 16.5<br>(12.5 × 13.5)<br>(10 × 12.5)<br>10 × 10.5 | 600<br>(420)<br>(295)<br>285 | 16 × 16.5<br>(12.5 × 16)<br>12.5 × 13.5   | 700<br>(510)<br>460   |   |                        |
| 470  | 471              | 12.5 × 13.5<br>10 × 10.5<br>(10 × 12.5)         | 520<br>305<br>(375)      | 12.5 × 13.5<br>16 × 16.5<br>(12.5 × 16)                | 240<br>700<br>(520)          | 16 × 16.5                                 | 750                   |   |                        |
| 680  | 681              | 12.5 × 13.5<br>(10 × 12.5)                      | 530<br>(395)             | 16 × 16.5  | 750                          |   |                       | Case size<br>尺寸                           | Ripple current<br>紋波電流 |
| 1000 | 102              | 16 × 16.5<br>(12.5 × 16)                        | 750<br>(600)             | 16 × 16.5  | 800                          |   |                       |   |                        |

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

• Case size ØD×L(mm), ripple current (mA rms) at 105°C 120Hz • 尺寸ØD×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<br>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   |

**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。

