

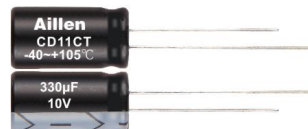
## 產品特點 Features

Rated working voltage range 6.3 to 50V DC operation temperature range -40 to +105°C.

This series is for communication equipments, switching power supply, industrial measuring instruments, automotive electric products, etc.

額定工作電壓範圍：6.3~50V, 溫度範圍-40 to +105°C。

適用於通訊設備、開關電源、工業測量儀器、汽車電器產品等。

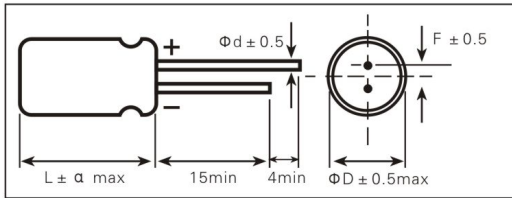


## 規格書 SPECIFICATION

| 項目Item                                    | 特性系數 Performance Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                            |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|--|---------------------|---------------------------|----|----|----|----|----|---------------|--------------------------------------------|------|------|------|------|------|---------------|--------------------------------------|---|---|---|---|---|
| 使用溫度範圍<br>Operating Temperature Range     | -40 to +105℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 額定電壓範圍<br>Rated Working Voltage Range     | 6.3 to 50V                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 容量範圍<br>Nominal Capacitance Range         | 3.3 to 330 μ F                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 容量允許偏差<br>Capacitance Tolerance           | ± 20% at 120Hz, +20℃                                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 漏電流<br>Leakage Current                    | I ≤0.01CV or 3 (μ A)<br>在常溫加額定電壓2分鐘讀數，兩者取大值<br>whichever is greater measured after 2 minutes application of rated working voltage at +20℃                                                                                                                                                                                                                                                                                                                                   |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 損耗角正切值(20℃, 120Hz)<br>tan δ (120Hz, +20℃) | <table><tr><td>Working Voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td>tan δ (max.)</td><td>0.24</td><td>0.21</td><td>0.18</td><td>0.15</td><td>0.13</td><td>0.12</td></tr></table>                                                                                                                                                                                                                                         |      |      |      |      |      |  | Working Voltage (V) | 6.3                       | 10 | 16 | 25 | 35 | 50 | tan δ (max.)  | 0.24                                       | 0.21 | 0.18 | 0.15 | 0.13 | 0.12 |               |                                      |   |   |   |   |   |
| Working Voltage (V)                       | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10   | 16   | 25   | 35   | 50   |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| tan δ (max.)                              | 0.24                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.21 | 0.18 | 0.15 | 0.13 | 0.12 |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 低溫特性<br>Low Temperature Characteristics   | Impedance ratio max. at 120Hz <table><tr><td>Working Voltage (V)</td><td>6.3</td><td>10</td><td>16</td><td>25</td><td>35</td><td>50</td></tr><tr><td>Z-25℃ / Z+20℃</td><td>4</td><td>2</td><td>2</td><td>2</td><td>2</td><td>2</td></tr><tr><td>Z-40℃ / Z+20℃</td><td>8</td><td>5</td><td>4</td><td>3</td><td>3</td><td>3</td></tr></table>                                                                                                                                 |      |      |      |      |      |  | Working Voltage (V) | 6.3                       | 10 | 16 | 25 | 35 | 50 | Z-25℃ / Z+20℃ | 4                                          | 2    | 2    | 2    | 2    | 2    | Z-40℃ / Z+20℃ | 8                                    | 5 | 4 | 3 | 3 | 3 |
| Working Voltage (V)                       | 6.3                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 10   | 16   | 25   | 35   | 50   |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| Z-25℃ / Z+20℃                             | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2    | 2    | 2    | 2    | 2    |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| Z-40℃ / Z+20℃                             | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 5    | 4    | 3    | 3    | 3    |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 高溫負荷特性<br>High Temperature Loading        | 在105℃的前提下施加額定電壓與額定紋波電流1000H,然後取出恢復常溫後測試<br>Test time:1,000 hours Test temperature:+105℃<br>Test conditions :Rated DC working voltage with rated ripple current<br>Post test requirements at +20℃ <table><tr><td>Leakage current</td><td colspan="6">≤ Initial specified value</td></tr><tr><td>Cap. change</td><td colspan="6">within ± 20% of the initial measured value</td></tr><tr><td>tan δ</td><td colspan="6">≤200% of the initial specified value</td></tr></table> |      |      |      |      |      |  | Leakage current     | ≤ Initial specified value |    |    |    |    |    | Cap. change   | within ± 20% of the initial measured value |      |      |      |      |      | tan δ         | ≤200% of the initial specified value |   |   |   |   |   |
| Leakage current                           | ≤ Initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| Cap. change                               | within ± 20% of the initial measured value                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| tan δ                                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 高溫貯存特性<br>Shelf Life                      | 105℃不加电压贮存1000H，然後取出恢復到常溫后测试<br>At +105℃ no voltage applied after 1,000 hours and then being stabilized at +20℃ the capacitors shall meet the following limits <table><tr><td>Leakage current</td><td colspan="6">≤ Initial specified value</td></tr><tr><td>Cap. change</td><td colspan="6">within ± 20% of the initial measured value</td></tr><tr><td>tan δ</td><td colspan="6">≤200% of the initial specified value</td></tr></table>                                   |      |      |      |      |      |  | Leakage current     | ≤ Initial specified value |    |    |    |    |    | Cap. change   | within ± 20% of the initial measured value |      |      |      |      |      | tan δ         | ≤200% of the initial specified value |   |   |   |   |   |
| Leakage current                           | ≤ Initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| Cap. change                               | within ± 20% of the initial measured value                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| tan δ                                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                        |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |
| 參考國際標準 Industrial Standard                | JIS C – 5101-4 (IEC 60384-4)                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |      |      |      |      |  |                     |                           |    |    |    |    |    |               |                                            |      |      |      |      |      |               |                                      |   |   |   |   |   |

外形圖 DIMENSIONS

Unit: mm



|          |                         |     |                             |     |
|----------|-------------------------|-----|-----------------------------|-----|
| $\Phi D$ | 4                       | 5   | 6.3                         | 8   |
| F        | 1.5                     | 2.0 | 2.5                         | 3.5 |
| $\Phi d$ | $(L \leq 7) \quad 0.45$ |     | $(7 < L \leq 9) \quad 0.50$ |     |
| $\alpha$ | $(L \leq 7) \quad 1$    |     | $(L \geq 9) \quad 1.5$      |     |

紋波電流修正係數 RIPPLE CURRENT MULTIPLIER

Frequency Coefficient

| Coefficient<br>Cap(μF) | Freq. (Hz) | 50   | 120  | 300  | 1k   | 10k~ |
|------------------------|------------|------|------|------|------|------|
| $\leq 47$              |            | 0.75 | 1.00 | 1.35 | 1.57 | 2.00 |
| 68~220                 |            | 0.80 | 1.00 | 1.23 | 1.34 | 1.50 |

一覽表 Standard

| Voltage (Code) |      | 6.3V      |                | 10V       |                | 16V       |                | 25V       |                |
|----------------|------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|
| Cap. (μF)      | Code | Case Size | Ripple Current | Case Size | Ripple Current | Case Size | Ripple Current | Case Size | Ripple Current |
| 10             | 106  |           |                |           |                | 4 x 7     | 29             | 4 x 7     | 29             |
| 22             | 226  | 4 x 7     | 34             | 4 x 7     | 34             | 4 x 7     | 38             | 5 x 7     | 45             |
| 33             | 336  | 4 x 7     | 37             | 4 x 7     | 40             | 5 x 7     | 50             | 5 x 7     | 55             |
| 47             | 476  | 4 x 7     | 44             | 5 x 7     | 50             | 5 x 7     | 60             | 6.3 x 7   | 67             |
| 100            | 107  | 5 x 7     | 67             | 5 x 7     | 72             | 6.3 x 7   | 92             | 6.3 x 7   | 97             |
|                |      |           |                | 6.3 x 7   | 83             | 8 x 7     | 106            | 8 x 7     | 113            |
| 220            | 227  | 6.3 x 7   | 112            | 8 x 7     | 140            | 8 x 9     | 174            |           |                |
| 330            | 337  | 8 x 7     | 158            |           |                |           |                |           |                |

Maximum Allowable Ripple Current (mAmps) at 105°C 120Hz  
在105°C 120Hz條件下的最大紋波值

Case Size  $\Phi D \times L$  (mm)  
尺寸  $\Phi D \times L$  (mm)

| Voltage (Code) |      | 35V       |                | 50V       |                |
|----------------|------|-----------|----------------|-----------|----------------|
| Cap. (μF)      | Code | Case Size | Ripple Current | Case Size | Ripple Current |
| 3.3            | 335  |           |                | 4 x 7     | 24             |
| 4.7            | 475  | 4 x 7     | 24             | 5 x 7     | 29             |
| 10             | 106  | 5 x 7     | 36             | 5 x 7     | 38             |
|                |      |           |                | 6.3 x 7   | 44             |
| 22             | 226  | 6.3 x 7   | 57             | 8 x 7     | 65             |
| 33             | 336  | 6.3 x 7   | 62             |           |                |
| 47             | 476  | 6.3 x 7   | 74             |           |                |
| 100            | 107  | 8 x 9     | 110            |           |                |

Maximum Allowable Ripple Current (mAmps) at 105°C 120Hz  
在105°C 120Hz條件下的最大紋波值

Case Size  $\Phi D \times L$  (mm)  
尺寸  $\Phi D \times L$  (mm)