

### 通用型Y5V片容

通用型Y5V片容屬於Ⅱ類低頻電容器，其電容量受溫度、電壓、時間變化大。

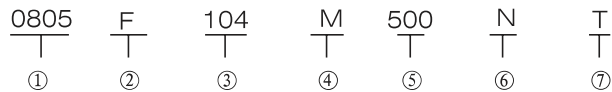
#### ● 特性

- \* 在-25℃ ~ 85℃工作範圍內，其溫度特性為+30%，-80%。
- \* 疊層獨石結構，具有高可靠性。
- \* 優良的可焊性和耐焊性，適用於回流焊和波峰焊。

#### ● 應用

適用於各種濾波線路。

#### ● 產品規格型號表示方法



| ① 尺寸 |             |             |
|------|-------------|-------------|
| 型號   | 英制(英寸)      | 公制(毫米)      |
| 0402 | 0.04 × 0.02 | 1.00 × 0.50 |
| 0603 | 0.06 × 0.03 | 1.60 × 0.80 |
| 0805 | 0.08 × 0.05 | 2.00 × 1.25 |
| 1206 | 0.12 × 0.06 | 3.20 × 1.60 |

| ② 介質種類 |      |
|--------|------|
| 代碼     | 介質材料 |
| F      | Y5V  |

| ③ 標稱電容量(PF) |                      |
|-------------|----------------------|
| 表示方式        | 實際值                  |
| 102         | 10 × 10 <sup>2</sup> |
| 103         | 10 × 10 <sup>3</sup> |
| 104         | 10 × 10 <sup>4</sup> |

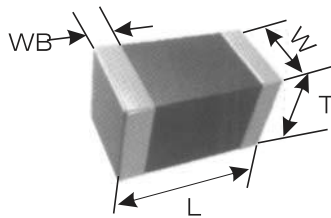
| ④ 誤差級別 |              |
|--------|--------------|
| 代碼     | 誤差           |
| M      | ± 20%        |
| Z      | +80%<br>-20% |

| ⑤ 工作電壓 |      |
|--------|------|
| 表示方法   | 實際電壓 |
| 6R3    | 6.3V |
| 100    | 10V  |
| 250    | 25V  |
| 500    | 50V  |

| ⑥ 端頭類別 |                        |
|--------|------------------------|
| 表示方法   | 端頭材料                   |
| S      | 純銀端頭                   |
| C      | 純銅端頭                   |
| N      | 三層電鍍端頭<br>(銀或銅層/鎳層/錫層) |

| ⑦ 包裝方式 |        |
|--------|--------|
| 表示方法   | 包裝     |
| 無標記    | 袋裝散包裝  |
| T      | 編帶包裝   |
| B      | 塑料盒散包裝 |

#### ● 外形尺寸



| 規格型號 |      | 尺寸( mm)     |             |   |             |
|------|------|-------------|-------------|---|-------------|
| 英制表示 | 公制表示 | L           | W           | T   | WB          |
| 0402 | 1005 | 1.00 ± 0.05 | 0.50 ± 0.05 | 0.50 ± 0.05                               | 0.25 ± 0.10 |
| 0603 | 1608 | 1.60 ± 0.10 | 0.80 ± 0.10 | 0.80 ± 0.10                               | 0.30 ± 0.10 |
| 0805 | 2012 | 2.00 ± 0.20 | 1.25 ± 0.20 | 0.80 ± 0.10<br>1.00 ± 0.10<br>1.25 ± 0.20 | 0.50 ± 0.25 |
| 1206 | 3216 | 3.20 ± 0.30 | 1.60 ± 0.20 | 0.80 ± 0.10<br>1.00 ± 0.10<br>1.25 ± 0.20 | 0.50 ± 0.25 |

## Y5V MLCC for General-use

Y5V MLCC for General-use is class II low frequency capacitor, its capacitance will change a lot along with the temperature, voltage, time.

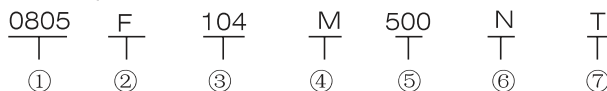
### Features

- \* Its operating temperature is  $-25^{\circ}\text{C} \sim 85^{\circ}\text{C}$ , within the range, the temperature coefficient is  $+30\%$ ,  $-80\%$ .
- \* It has multi-layer monolithic structure, has high reliability.
- \* It has good solderability and soldering resistance, suitable for flow soldering/reflow soldering.

### Applications

It is suitable for all kinds of filter circuits.

### Product Part Number Expression



| ①Dimensions |                    |                    |
|-------------|--------------------|--------------------|
| Type        | British (Inch)     | Metric (mm)        |
| 0402        | $0.04 \times 0.02$ | $1.00 \times 0.50$ |
| 0603        | $0.06 \times 0.03$ | $1.60 \times 0.80$ |
| 0805        | $0.08 \times 0.05$ | $2.00 \times 1.25$ |
| 1206        | $0.12 \times 0.06$ | $3.20 \times 1.60$ |

| ②Dielectric Type |            |
|------------------|------------|
| Code             | Dielectric |
| F                | Y5V        |

| ③Normal Capacitance (PF) |                  |
|--------------------------|------------------|
| Expression Method        | Actual Value     |
| 102                      | $10 \times 10^2$ |
| 103                      | $10 \times 10^3$ |
| 104                      | $10 \times 10^4$ |

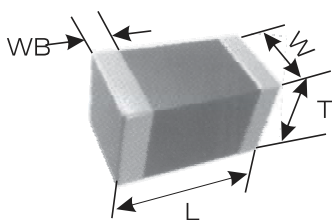
| ④Capacitance Tolerance |                    |
|------------------------|--------------------|
| Code                   | Tolerance          |
| M                      | $\pm 20\%$         |
| Z                      | $+80\%$<br>$-20\%$ |

| ⑤Rated Voltage    |              |
|-------------------|--------------|
| Expression Method | Actual Value |
| 250               | 25V          |
| 500               | 50V          |
| 101               | 100V         |
| 201               | 200V         |

| ⑥Termination Type |   |
|-------------------|---|
| Expression Method | Termination Material  |
| S                 | Pure Silver   |
| C                 | Pure Copper   |
| N                 | Three Layers Plating Terminal (Silver or Copper layer/ Nickel layer /Tin layer) |

| ⑦Package Method   |                            |
|-------------------|----------------------------|
| Expression Method | Packaging                  |
| No Mark           | Bulk Packaging in a Bag    |
| T                 | Taping Packaging           |
| B                 | Bulk Plastic Box Packaging |

### Outside Dimension



| Type               |                   | Dimension (mm)  |                 |   |                 |
|--------------------|-------------------|-----------------|-----------------|---|-----------------|
| British expression | Metric expression | L               | W               | T   | WB              |
| 0402               | 1005              | $1.00 \pm 0.05$ | $0.50 \pm 0.05$ | $0.50 \pm 0.05$                                       | $0.25 \pm 0.10$ |
| 0603               | 1608              | $1.60 \pm 0.10$ | $0.80 \pm 0.10$ | $0.80 \pm 0.10$                                       | $0.30 \pm 0.10$ |
| 0805               | 2012              | $2.00 \pm 0.20$ | $1.25 \pm 0.20$ | $0.80 \pm 0.10$<br>$1.00 \pm 0.10$<br>$1.25 \pm 0.20$ | $0.50 \pm 0.25$ |
| 1206               | 3216              | $3.20 \pm 0.30$ | $1.60 \pm 0.20$ | $0.80 \pm 0.10$<br>$1.00 \pm 0.10$<br>$1.25 \pm 0.20$ | $0.50 \pm 0.25$ |

# 多層片式陶瓷電容器

## MULTILAYER CHIP CERAMIC CAPACITOR

- 電容量範圍

| 項目     | 通用型Y5V片容 |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
|--------|----------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|
| 尺寸     | 0402     |     |     |     |     | 0603 |     |     |     |     | 0805 |     |     |     |     | 1206 |     |     |     |     |
| 工作電壓   | 6.3V     | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V |
| 電容量    |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 1000PF |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 1.5nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 2.2nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 3.3nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 4.7nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 6.8nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 10nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 12nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 15nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 22nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 27nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 33nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 39nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 47nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 56nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 68nF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 100nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 150nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 220nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 270nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 330nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 470nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 680nF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 1 μF   |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 2.2 μF |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 4.7 μF |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 10 μF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 22 μF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 33 μF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 47 μF  |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 100 μF |          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |

• Capacitance Range

| Item           | Y5V MLCC for General-use |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
|----------------|--------------------------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|
| Dimension      | 0402                     |     |     |     |     | 0603 |     |     |     |     | 0805 |     |     |     |     | 1206 |     |     |     |     |
| Rated Volatage | 6.3V                     | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V | 6.3V | 10V | 16V | 25V | 50V |
| Capacitance    |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 1000PF         |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 1.5nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 2.2nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 3.3nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 4.7nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 6.8nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 10nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 12nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 15nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 22nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 27nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 33nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 39nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 47nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 56nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 68nF           |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 100nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 150nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 220nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 270nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 330nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 470nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 680nF          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 1 μ F          |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 2.2 μ F        |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 4.7 μ F        |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 10 μ F         |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 22 μ F         |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 33 μ F         |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 47 μ F         |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |
| 100 μ F        |                          |     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |

# 多層片式陶瓷電容器

## MULTILAYER CHIP CERAMIC CAPACITOR

### ■ 通用型X7R、X5R、Z5U、Y5V可靠性測試方法

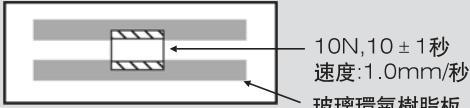
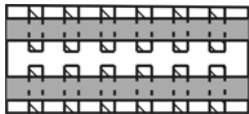
| 編號 | 項目          | 標準   |   | 測試方法  |
|----|-------------|--|---|---|
| 1  | 工作溫度範圍      | X5R: -55°C ~ 85°C<br>X7R: -55°C ~ 125°C  | Z5U: 10°C ~ 85°C<br>Y5V: -25°C ~ 85°C   |   |
| 2  | 外觀          | 1. 瓷體顏色一致性好。<br>2. 芯片無可見損傷,光滑平整。<br>3. 瓷體無外露電極,裂痕,孔洞。<br>4. 端電極無裂痕,孔洞,磨損及表面氧化等。<br>5. 端電極應無延伸現象或延伸部分不超過端頭寬度的一半。  |   | ※在 $\geq 10$ 倍以上的顯微鏡下觀察。  |
| 3  | 尺寸          | 在規定尺寸範圍內   |   | ※使用千分尺或游標卡尺。  |
| 4  | 電容量         | 在規定偏差範圍內   |   | ※測試儀器:<br>HP4278A電橋、HP4284電橋。   |
| 5  | 損耗因數(D.F.)  | X5R,X7R  | Z5U,Y5V   | ※測試條件:<br>1. 測試溫度: $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ,<br>濕度: 30% ~ 75%。<br>2. 測試電壓: $1.0 \pm 0.2\text{V}$ ,<br>(Y5V) $0.5 \pm 0.2\text{V}$ (Z5U)。<br>3. 測試頻率: $1.0 \pm 0.1\text{KHz}$ 。   |
|    |             | $U_r \geq 50\text{V}$ , $D_f \leq 250 \times 10^{-4}$<br>$U_r = 25\text{V}, 16\text{V}$ : $D_f \leq 350 \times 10^{-4}$<br>$U_r = 10\text{V}$ : $D_f \leq 500 \times 10^{-4}$<br>$U_r = 6.3\text{V}$ :<br>$C < 3.3\mu\text{F}$ , $D_f \leq 500 \times 10^{-4}$<br>$C \geq 3.3\mu\text{F}$ , $D_f \leq 1000 \times 10^{-4}$ | $U_r \geq 50\text{V}$ , $D_f \leq 500 \times 10^{-4}$<br>$U_r = 25\text{V}$ :<br>$C < 1.0\mu\text{F}$ , $D_f \leq 700 \times 10^{-4}$<br>$C \geq 1.0\mu\text{F}$ , $D_f \leq 900 \times 10^{-4}$<br>$U_r = 16\text{V}, 10\text{V}, 6.3\text{V}$ :<br>$D_f \leq 1250 \times 10^{-4}$ |   |
| 6  | 絕緣電阻 (I.R.) | $C \leq 25\text{nF}$ , $I_R \geq 10000\text{M}\Omega$<br>$C > 25\text{nF}$ , $R \times C \geq 500\text{S}$   | $C \leq 25\text{nF}$ , $I_R \geq 4000\text{M}\Omega$<br>$C > 25\text{nF}$ , $R \times C \geq 500\text{S}$   | ※測試儀器: 絕緣電阻測試儀(如: SF2511絕緣測試機)。<br>※測試方法: 施加額定工作電壓, 在 $60 \pm 5$ 秒內測量絕緣電阻。  |
| 7  | 耐電壓強度       | $> 3 \times$ 額定工作電壓  |   | ※施加3倍額定工作電壓, 持續 $60 \pm 1$ 秒, 未出現擊穿現象並且充電 / 放電電流低於50mA。   |
| 8  | 電容量溫度特性     | 在工作溫度範圍內符合電容器特性溫度系數要求  |   | ※首先進行預處理: 進行 $150 \pm 0 / -10^{\circ}\text{C}$ 熱處理 $60 \pm 5$ 分鐘, 然后在室溫條件下放置 $24 \pm 2$ 小時。<br>※在 $-55 \sim 125^{\circ}\text{C}$ 或者 $-55 \sim 85^{\circ}\text{C}$ (X7R, X5R); $-25^{\circ}\text{C} \sim 85^{\circ}\text{C} + 10^{\circ}\text{C} \sim 85^{\circ}\text{C}$ (Y5V ~ Z5U) 範圍內測試電容量, 其電容值相對於 $25^{\circ}\text{C}$ 時數值的變化率應在規定範圍內。 |
| 9  | 可焊性         | 75% 端電極覆蓋錫   |   | ※將電容器浸在乙醇和松香溶液中。<br>然後浸入有鉛 $235 \pm 5^{\circ}\text{C}$ (無鉛 $245 \pm 5^{\circ}\text{C}$ ) 的混合焊錫溶液 $2 \pm 0.5$ 秒。<br>浸入速度: $25 \pm 2.5\text{mm/秒}$ 。  |

● X7R、X5R、Z5U、Y5V MLCC for general use reliability test method

| Number | Item                                   | Standard  |  | Test Method  |
|--------|--|---|--|--|
| 1      | Operating Temperature Range            | X5R: -55°C ~ 85°C<br>X7R: -55°C ~ 125°C   | Z5U: 10°C ~ 85°C<br>Y5V: -25°C ~ 85°C  |  |
| 2      | Appearance                             | 1. Good ceramic body color continuity.<br>2. The chips have no visual damages and must be very smooth.<br>3. No exposed inner- electrode, no cracks or holes.<br>4. The outer electrode should have no cracks, holes, damages or surface oxidation.<br>5. Outer electrode no prolongation or the prolongation is less than half of that of the termination width. |  | ※Check by using microscope $\geq 10 \times$ .  |
| 3      | Dimensions                             | Within the specified dimensions   |  | ※Using micrometer or vernier calipers  |
| 4      | Capacitance)                           | Within the specified tolerance  |  | ※Measuring Equipments:<br>HP4278 capacitance meter,<br>HP4284 capacitance,   |
| 5      | Dissipation Factor (DF)                | X5R,X7R   | Z5U,Y5V  | ※Measuring Conditions:<br>1.Measuring Temperature:<br>$25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Humidity: 30% ~ 75%.<br>2.Measuring Voltage: $1.0 \pm 0.2\text{V}$ .<br>3.Measuring Frequency:<br>$1.0 \pm 0.1\text{MHz}$   |
|        |  | $U_r \geq 50\text{V}$ , $\text{DF} \leq 250 \times 10^{-4}$<br>$U_r = 25\text{V}, 16\text{V}$ : $\text{DF} \leq 350 \times 10^{-4}$<br>$U_r = 10\text{V}$ : $\text{DF} \leq 500 \times 10^{-4}$<br>$U_r = 6.3\text{V}$ :<br>$C < 3.3\mu\text{F}$ , $\text{DF} \leq 500 \times 10^{-4}$<br>$C \geq 3.3\mu\text{F}$ , $\text{DF} \leq 1000 \times 10^{-4}$          | $U_r = 50\text{V}$ , $\text{DF} \leq 500 \times 10^{-4}$<br>$U_r = 25\text{V}$ :<br>$C < 1.0 \mu\text{F}$ , $\text{DF} \leq 700 \times 10^{-4}$<br>$C \geq 1.0 \mu\text{F}$ , $\text{DF} \leq 900 \times 10^{-4}$<br>$U_r = 16\text{V}, 10\text{V}, 6.3\text{V}$ :<br>$\text{DF} \leq 1250 \times 10^{-4}$ |  |
| 6      | Insulation Resistance                  | $C \leq 25\text{nF}$ , $\text{IR} \geq 10000\text{M}\Omega$<br>$C > 25\text{nF}$ , $R \times C \geq 500\text{S}$  | $C \leq 25\text{nF}$ , $\text{IR} \geq 40000\text{M}\Omega$<br>$C > 25\text{nF}$ , $R \times C \geq 500\text{S}$   | ※Measuring Equipment:<br>Insulation resistance meter (such as Sf2511 insulation resistance).<br>※Measuring Method:<br>Must measure at rated voltage, and measure the IR within $60 \pm 5$ seconds.   |
| 7      | Withstanding Voltage                   | $> 3U_r$  |  | ※Must measure at 3 times rated voltage, dwell time: $60 \pm 1$ seconds, no short and the changing/discharging current less than 50mA.  |
| 8      | Capacitance Temperature Characteristic | Must meet the capacitor character temperature coefficient requirements within the operating temperature range.  |  | ※First, pre-heat: heat treat $60 \pm 5$ minutes at $150 \pm 0 / -10^{\circ}\text{C}$ , then set it for $24 \pm 2$ hours at room temperature.<br>※Measure the capacitance at $-55 \sim 125^{\circ}\text{C}$ or $-55 \sim 85^{\circ}\text{C}$ , the capacitance change ratio comparing to that of $25^{\circ}\text{C}$ must be within the specified range. |
| 9      | Solderability                          | Tin coverage should be 75% of the outer electrode   |  | ※Dip the capacitor into ethanol or colophony solution, and then dip it into $245 \pm 5^{\circ}\text{C}$ eutectic solder solution for $2 \pm 0.5$ seconds. Dipping speed: $25 \pm 2.5\text{mm/second}$ .  |

# 多層片式陶瓷電容器

## MULTILAYER CHIP CERAMIC CAPACITOR

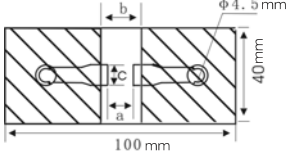
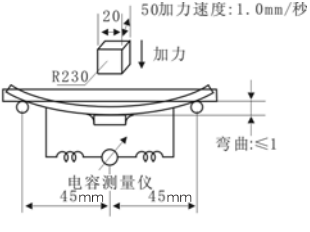
| 編號 | 項目      | 標準  |                                      | 測試方法  |
|----|---------|---|--------------------------------------|---|
| 10 | 耐焊接熱    | 外觀  | 無明顯缺陷                                | ※首先進行預處理：進行 $150 \pm 0 / -10^{\circ}\text{C}$ 熱處理 $60 \pm 5$ 分鐘，然后在室溫條件下放置 $24 \pm 2$ 小時。<br>※然後按下表預熱電容器。將電容器浸入 $265 \pm 5^{\circ}\text{C}$ 的混合焊錫溶液 $10 \pm 1$ 秒。再在室溫條件下放置 $24 \pm 2$ 小時，然後進行測量。<br>浸入速度： $25 \pm 2.5\text{mm/秒}$ 。<br>※預熱條件如下： |
|    |         | 電容量變化率  | X7R, X5R:在20%範圍內<br>Z5U, Y5V:在30%範圍內 |   |
|    |         | D.F.  | 同初始標準                                |   |
|    |         | I.R.  | 同初始標準                                |   |
| 11 | 端電極結合強度 | 不應出現端電極脫落或其它缺陷。   |                                      | ※使用混合焊錫將電容器焊接在圖 1 中所示的測試夾具（玻璃環氧樹脂板）上。然後沿箭頭方向施加 10N 的力。焊接應利用烙鐵或使用回流焊方法進行，而且應謹慎作業，以使焊接均勻且不會出現熱衝擊等不良現象。  |
|    |         |  <p>圖1</p>   |                                      |   |
| 12 | 耐振動性    | 外觀  | 無缺陷或異常                               | ※將電容器焊接在測試夾具（玻璃環氧樹脂板）上。電容器應進行簡諧運動，其總幅值為 1.5mm，頻率在近似 10—55Hz 之間均勻變化。頻率範圍（從 10 至 55Hz 再返回 10Hz）應在約 1 分鐘內完成。振動應在三個相互垂直方向各進行 2 小時（總計 6 小時）。   |
|    |         | 電容量   | 在規定偏差範圍內                             |   |
|    |         | D.F.  | 同初始標準                                |   |
| 13 | 抗彎曲性能   | 不應出現裂痕或其他缺陷   |                                      | ※使用混合焊錫將電容器焊接在圖 3 中所示的測試夾具（玻璃環氧樹脂板）上，然後在圖 4 所示的方向加力。焊接應利用烙鐵或使用回流焊方法進行，而且應謹慎作業，以使焊接均勻且不會出現熱衝擊等不良現象。  |
|    |         |  <p>圖2</p> |                                      |   |

| Number            | Item   | Standard   |   | Test Method  |          |             |      |   |   |          |   |   |          |
|-------------------|--|--|---|--|----------|-------------|------|---|---|----------|---|---|----------|
| 10                | Resistance to Soldering                      | Appearance   | No defects visible                      | ※First pre-heat: heat treat for $60 \pm 5$ minutes at $150 \pm 0/-10^\circ\text{C}$ , then set it for $24 \pm 2$ hours at room temperature.<br>※Then pre-heat the capacitance according to the following chart. Dip the capacitor into $265 \pm 5^\circ\text{C}$ eutectic solder solution for $10 \pm 1\text{s}$ . Then set it for $24 \pm 2$ hours at room temperature, then measure. Dipping speed: $25 \pm 2.5\text{mm/second}$ .<br>※Preheat conditions: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Stage</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>100^\circ\text{C} - 120^\circ\text{C}</math></td> <td>1 minute</td> </tr> <tr> <td>2</td> <td><math>170^\circ\text{C} - 200^\circ\text{C}</math></td> <td>1 minute</td> </tr> </tbody> </table> | Stage    | Temperature | Time | 1 | $100^\circ\text{C} - 120^\circ\text{C}$ | 1 minute | 2 | $170^\circ\text{C} - 200^\circ\text{C}$ | 1 minute |
|                   |  | Stage  | Temperature                             |  | Time     |             |      |   |   |          |   |   |          |
|                   |  | 1  | $100^\circ\text{C} - 120^\circ\text{C}$ |  | 1 minute |             |      |   |   |          |   |   |          |
|                   |  | 2  | $170^\circ\text{C} - 200^\circ\text{C}$ |  | 1 minute |             |      |   |   |          |   |   |          |
| Cap. Change ratio | X7R, X5R: within 20%<br>Z5U, Y5V: within 30% |  |   |  |          |             |      |   |   |          |   |   |          |
| DF                | Same as original spec.                       |  |   |  |          |             |      |   |   |          |   |   |          |
| IR                | Same as original spec.                       |  |   |  |          |             |      |   |   |          |   |   |          |
| 11                | Adhesive Strength of Termination             | No removal of the terminations or other defect shall occur |   | ※Solder the capacitor to the test jig (glass epoxy resin board) shown in Fig.1 using a eutectic solder. Then apply a 10N force in the direction shown as the arrowhead. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock, etc. <div style="text-align: center;"> <p>10N, 10±1s<br/>Speed: 1.0mm/s<br/>Glass epoxy resinboard</p> </div> <p>Fig.1</p>  |          |             |      |   |   |          |   |   |          |
| 12                | Resistance to Vibration                      | Appearance   | No defects or abnormalities             | ※Solder the capacitor to the test jig (glass epoxy resin board). The capacitor should be subjected to a simple harmonic motion having a total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55Hz, shall be traversed (from 10 Hz to 55 Hz then 10 Hz again) in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total is 6 hours). <div style="text-align: center;"> </div> <p>Fig.2</p>  |          |             |      |   |   |          |   |   |          |
|                   |  | Capacitance  | Within the specified tolerance range    |  |          |             |      |   |   |          |   |   |          |
|                   |  | D.F.   | Same as original spec.                  |  |          |             |      |   |   |          |   |   |          |
| 13                | Bending Resistance                           | No cracks or other defects shall occur                     |   | ※Solder the capacitor to the test jig (glass epoxy resin board) shown in Fig.3 using a eutectic solder. Then apply a 10N force in the direction shown as Fig.4. The soldering shall be done either with an iron or using the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock, etc.  |          |             |      |   |   |          |   |   |          |



# 多層片式陶瓷電容器

## MULTILAYER CHIP CERAMIC CAPACITOR

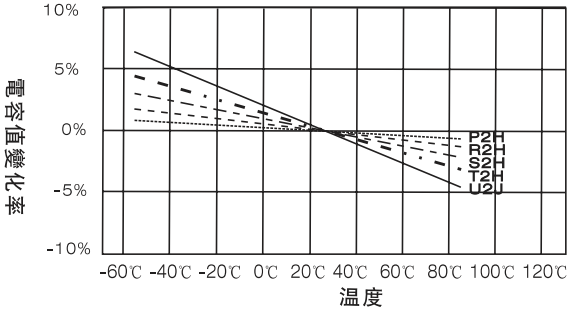
| 編號          | 項目   | 標準   | 測試方法  |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
|-------------|--|--|---|-------------|---------|--|------|-------|------|-------|--|----|-----------|-----------|-----|-----------|--------|---------|-----|-----|-----|-----------|--------|-----|-----|-----|
| 13          | 抗彎曲性能  |  |   <p>50加力速度: 1.0mm/秒<br/>加力<br/>R230<br/>20<br/>φ4.5mm<br/>40mm<br/>100mm<br/>a<br/>b<br/>c<br/>圖3<br/>圖4<br/>45mm<br/>45mm<br/>彎曲: ≤1<br/>电容測量儀</p> <table border="1" data-bbox="906 660 1252 801"> <thead> <tr> <th rowspan="2">L×W<br/>(mm)</th> <th colspan="4">尺寸 (mm)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>4.5×2.0</td> <td>3.5</td> <td>7.0</td> <td>2.4</td> <td rowspan="3">1.0</td> </tr> <tr> <td>4.5×3.2</td> <td>3.5</td> <td>7.0</td> <td>3.7</td> </tr> <tr> <td>5.7×6.3</td> <td>4.5</td> <td>8.0</td> <td>5.6</td> </tr> </tbody> </table> | L×W<br>(mm) | 尺寸 (mm) |  |      |       | a    | b     | c  | d  | 4.5×2.0   | 3.5       | 7.0 | 2.4       | 1.0    | 4.5×3.2 | 3.5 | 7.0 | 3.7 | 5.7×6.3   | 4.5    | 8.0 | 5.6 |     |
| L×W<br>(mm) | 尺寸 (mm)  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
|             | a  | b  | c   | d           |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 4.5×2.0     | 3.5  | 7.0  | 2.4   | 1.0         |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 4.5×3.2     | 3.5  | 7.0  | 3.7   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 5.7×6.3     | 4.5  | 8.0  | 5.6   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
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| 外觀          | 無缺陷或異常   |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 電容量變化率      | X7R, X5R:<br>在 ±20%範圍內<br>Z5U, Y5V:<br>在 ±30%範圍內 |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| D.F.        | 同初始標準  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| I.R.        | 同初始標準  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 階段          | 溫度 ( °C )  | 時間 ( 分鐘 )  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 1           | 最低工作溫度 ±3  | 30 ± 3   |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 2           | 常溫   | 2—3  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 3           | 最高工作溫度 ±2  | 30 ± 3   |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 4           | 常溫   | 2—3  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 15          | 濕度(穩態)   | <table border="1"> <tr> <td>外觀</td> <td>無缺陷或異常</td> </tr> <tr> <td>電容量變化率</td> <td>X7R, X5R:<br/>在 ±20%範圍內<br/>Z5U, Y5V:<br/>在 ±30%範圍內</td> </tr> <tr> <td>D.F.</td> <td>同初始標準</td> </tr> <tr> <td>I.R.</td> <td>同初始標準</td> </tr> </table> | 外觀  | 無缺陷或異常      | 電容量變化率  | X7R, X5R:<br>在 ±20%範圍內<br>Z5U, Y5V:<br>在 ±30%範圍內 | D.F. | 同初始標準 | I.R. | 同初始標準 | <p>※在 40 ± 2°C 和 90—95% 相對濕度條件下放置 500+24/-0小時。然後將其移動到室溫條件下恢復放置 48 ± 2 小時，進行測量。</p>   |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 外觀          | 無缺陷或異常   |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
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| 16          | 濕度負荷   | <table border="1"> <tr> <td>外觀</td> <td>無缺陷或異常</td> </tr> <tr> <td>電容量變化率</td> <td>X7R, X5R:<br/>在 ±20%範圍內<br/>Z5U, Y5V:<br/>在 ±30%範圍內</td> </tr> <tr> <td>D.F.</td> <td>同初始標準</td> </tr> <tr> <td>I.R.</td> <td>同初始標準</td> </tr> </table> | 外觀  | 無缺陷或異常      | 電容量變化率  | X7R, X5R:<br>在 ±20%範圍內<br>Z5U, Y5V:<br>在 ±30%範圍內 | D.F. | 同初始標準 | I.R. | 同初始標準 | <p>※在 40 ± 2°C 和 90—95% 相對濕度條件下施加額定電壓 500+24/-0小時。然後將其移動到室溫條件下放置 48 ± 2 小時，進行測量。</p>   |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
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| 電容量變化率      | X7R, X5R:<br>在 ±20%範圍內<br>Z5U, Y5V:<br>在 ±30%範圍內 |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| D.F.        | 同初始標準  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| I.R.        | 同初始標準  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 17          | 壽命   | <table border="1"> <tr> <td>外觀</td> <td>無缺陷或異常</td> </tr> <tr> <td>電容量變化率</td> <td>X7R, X5R:<br/>在 ±20%範圍內<br/>Z5U, Y5V:<br/>在 ±30%範圍內</td> </tr> <tr> <td>D.F.</td> <td>同初始標準</td> </tr> <tr> <td>I.R.</td> <td>同初始標準</td> </tr> </table> | 外觀  | 無缺陷或異常      | 電容量變化率  | X7R, X5R:<br>在 ±20%範圍內<br>Z5U, Y5V:<br>在 ±30%範圍內 | D.F. | 同初始標準 | I.R. | 同初始標準 | <p>※在上限溫度下施加2倍的額定工作電壓1000 ± 12小時，充放電電流不超過50mA。將其移動到室溫條件下恢復放置 48 ± 2 小時，進行測量。</p>   |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 外觀          | 無缺陷或異常   |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| 電容量變化率      | X7R, X5R:<br>在 ±20%範圍內<br>Z5U, Y5V:<br>在 ±30%範圍內 |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| D.F.        | 同初始標準  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |
| I.R.        | 同初始標準  |  |   |             |         |  |      |       |      |       |  |    |           |           |     |           |        |         |     |     |     |           |        |     |     |     |

| Number      | Item                          | Standard   |            | Test Method  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|-------------|-------------------------------|--|------------|--|-------------|------------------|-------------|---|-------------------------------|-------|---|------------------|-----|---------|------------------------------|-------|-----|------------------|---------|-----|-----|-----|-----|---------|-----|-----|-----|--|
| 13          | Bending Resistance            |  |            | <table border="1"> <thead> <tr> <th rowspan="2">L×W<br/>(mm)</th> <th colspan="4">Dimension</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>4.5×2.0</td> <td>3.5</td> <td>7.0</td> <td>2.4</td> <td></td> </tr> <tr> <td>4.5×3.2</td> <td>3.5</td> <td>7.0</td> <td>3.7</td> <td>1.0</td> </tr> <tr> <td>5.7×6.3</td> <td>4.5</td> <td>8.0</td> <td>5.6</td> <td></td> </tr> </tbody> </table> | L×W<br>(mm) | Dimension        |             |   |                               | a     | b | c                | d   | 4.5×2.0 | 3.5                          | 7.0   | 2.4 |                  | 4.5×3.2 | 3.5 | 7.0 | 3.7 | 1.0 | 5.7×6.3 | 4.5 | 8.0 | 5.6 |  |
| L×W<br>(mm) | Dimension                     |  |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | a                             | b  | c          | d  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 4.5×2.0     | 3.5                           | 7.0  | 2.4        |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 4.5×3.2     | 3.5                           | 7.0  | 3.7        | 1.0  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 5.7×6.3     | 4.5                           | 8.0  | 5.6        |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 14          | Temperature Cycle             | Appearance   | No defects | <table border="1"> <thead> <tr> <th>Stage</th> <th>Temperature (°C)</th> <th>Time (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Min. Operating Temperature ±3</td> <td>30 ±3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>2—3</td> </tr> <tr> <td>3</td> <td>Max. Operating Temperature 2</td> <td>30 ±3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>2—3</td> </tr> </tbody> </table>                    | Stage       | Temperature (°C) | Time (min.) | 1 | Min. Operating Temperature ±3 | 30 ±3 | 2 | Room Temperature | 2—3 | 3       | Max. Operating Temperature 2 | 30 ±3 | 4   | Room Temperature | 2—3     |     |     |     |     |         |     |     |     |  |
| Stage       | Temperature (°C)              | Time (min.)  |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 1           | Min. Operating Temperature ±3 | 30 ±3  |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 2           | Room Temperature              | 2—3  |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 3           | Max. Operating Temperature 2  | 30 ±3  |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 4           | Room Temperature              | 2—3  |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | Cap. Change ratio             | X7R, X5R:<br>within ±20%<br>Z5U, Y5V:<br>within ±30% |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | D.F.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | I.R.                          | same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 15          | Humidity Steady State         | Appearance   | No defects | ※Set the capacitor for 500+24/-0 hours at the condition of 40±2°C and 90-95% humidity. Then remove and set it for 48±2 hours at room temperature, then measure.  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | Cap. Change ratio             | X7R, X5R:<br>within ±20%<br>Z5U, Y5V:<br>within ±30% |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | D.F.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | I.R.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 16          | Humidity Load                 | Appearance   | No defects | ※Apply rated voltage to the capacitor for 500+24/-0 hours at the condition of 40±2°C and 90-95% humidity. Remove and set it for 48±2 hours at room temperature, then measure.  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | Cap. Change ratio             | X7R, X5R:<br>within ±20%<br>Z5U, Y5V:<br>within ±30% |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | D.F.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | I.R.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
| 17          | Life Test                     | Appearance   | No defects | ※Apply two times rated voltage to the capacitor for 1000±12 hours at the upper temperature limits, the charging current should be less than 50mA. Remove and set it for 24 2 hours at room temperature, then measure.  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | Cap. Change ratio             | X7R, X5R:<br>within ±20%<br>Z5U, Y5V:<br>within ±30% |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | D.F.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |
|             | I.R.                          | Same as original standard                            |            |  |             |                  |             |   |                               |       |   |                  |     |         |                              |       |     |                  |         |     |     |     |     |         |     |     |     |  |

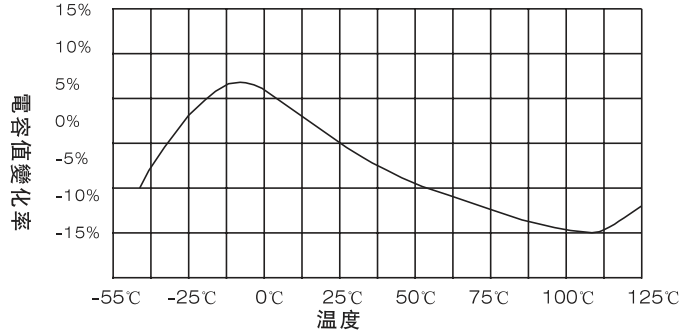
■ 通用型片容特性曲綫

- COG和PH、RH、SH、TH、UH系列

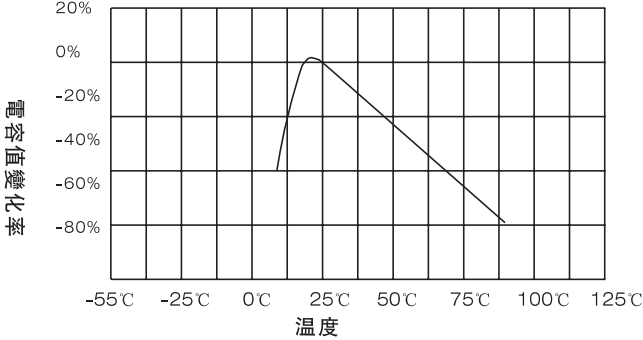
溫度系數圖



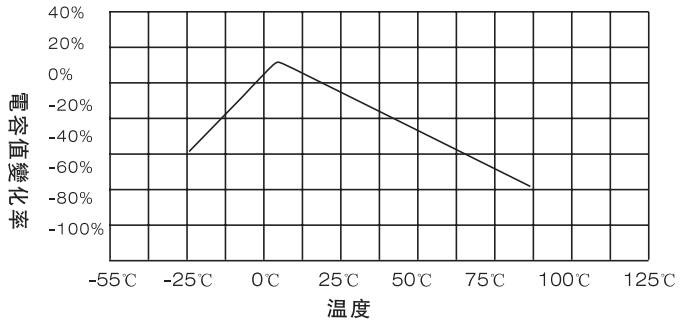
X7R溫度特性



Z5U溫度特性

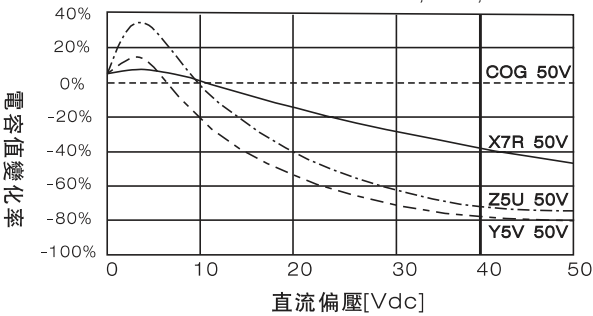


Y5V溫度特性



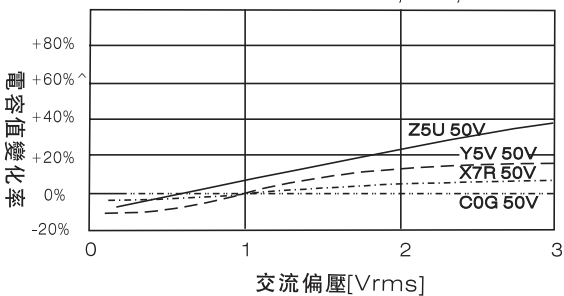
- 電容器偏壓特性圖

測量條件: COG :1MHZ  
X7R,Z5U,Y5V:1KHZ

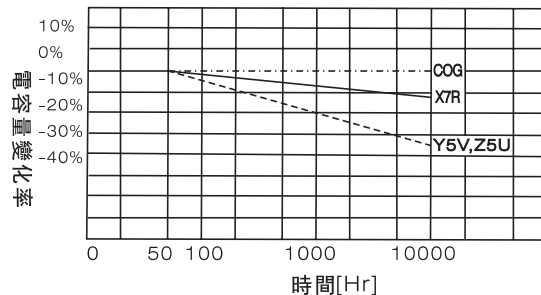


- 電容器交流電壓特性圖

測量條件: COG :1MHZ  
X7R,Z5U,Y5V:1KHZ

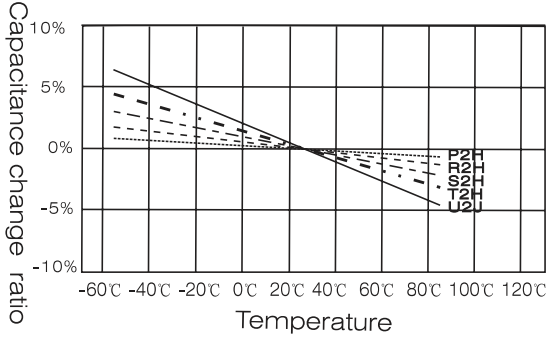


- 電容器老化特性圖

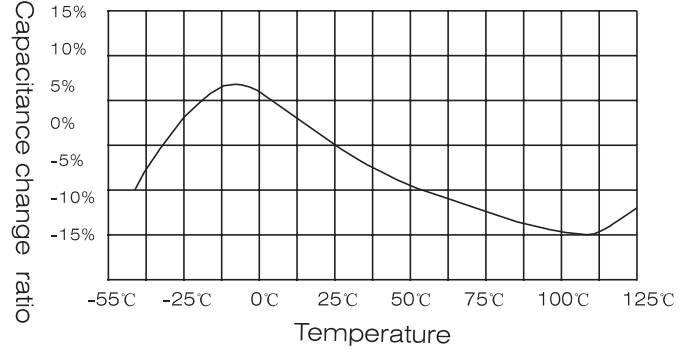


■ GENEREL-USE MLCC CHARACTER PROFILES

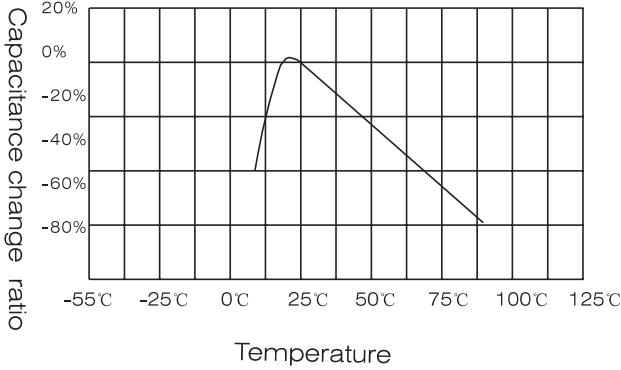
- COG and PH、RH、SH、TH、UH series temperature coefficient



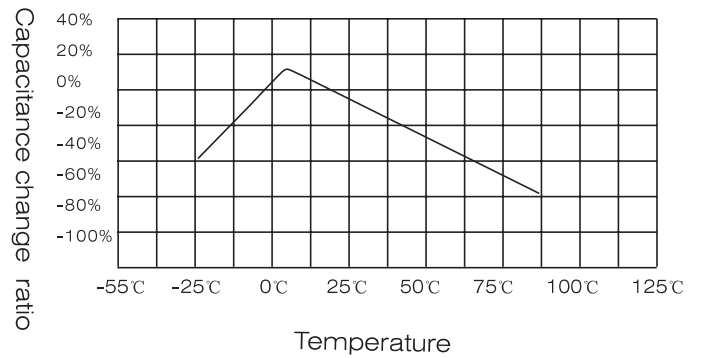
X7R temperature characteristics



Z5U temperature character

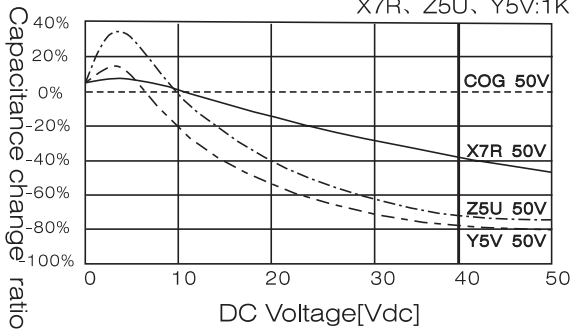


Y5V temperature characteristics



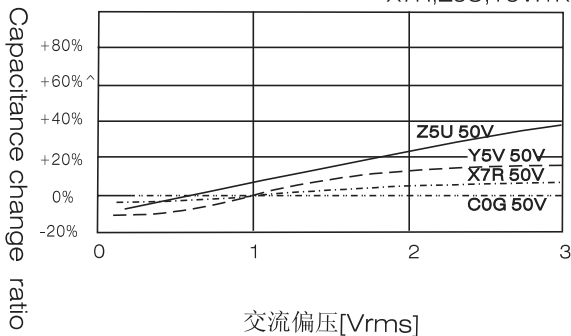
- DC Voltage Characteristics

Measuring condition COG :1MHz  
X7R、Z5U、Y5V:1KHz

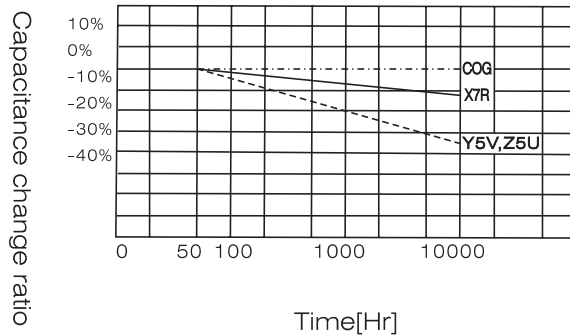


- Capacitance-AC Voltage Characteristics

Measuring condition: COG :1MHz  
X7R,Z5U,Y5V:1KHz



- Capacitance change aging

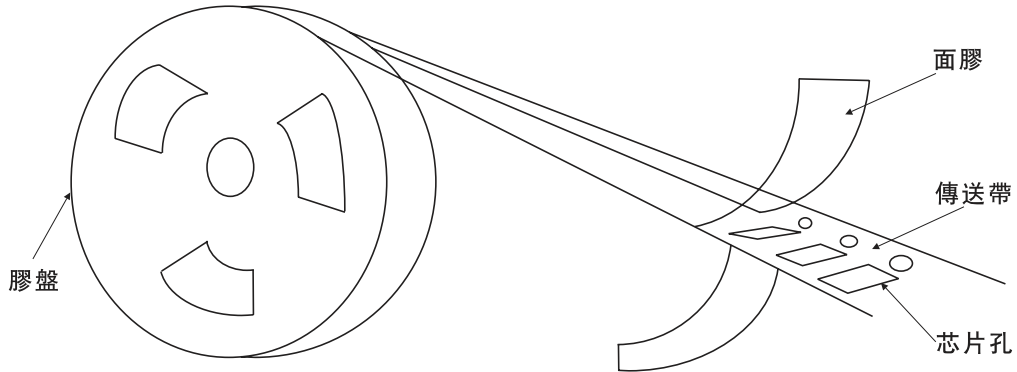


# 多層片式陶瓷電容器

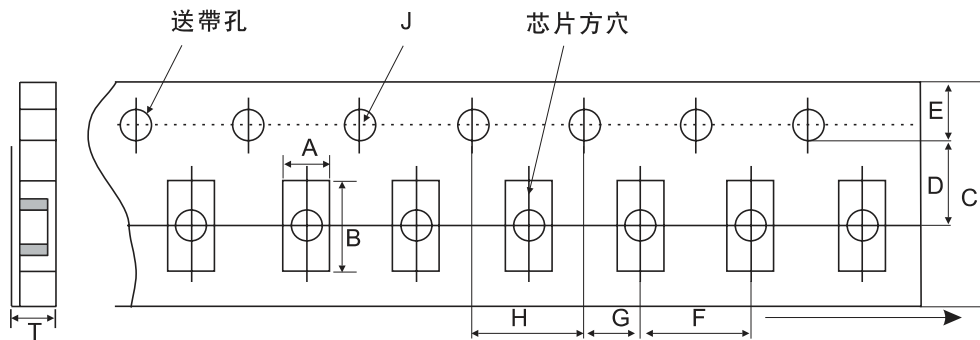
## MULTILAYER CHIP CERAMIC CAPACITOR

### ■ 包裝

#### ● 紙帶卷盤結構



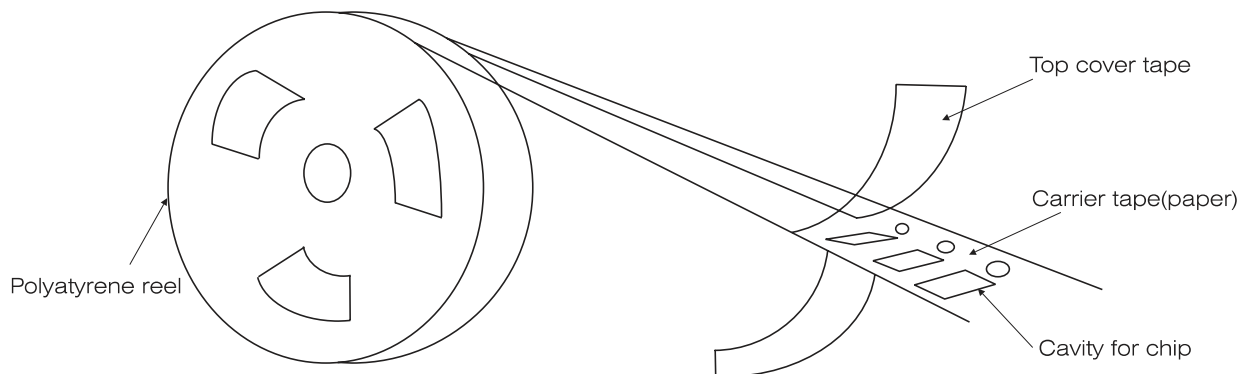
\* 適合 0402,0603, 0805, 1206 常規尺寸產品的紙帶尺寸



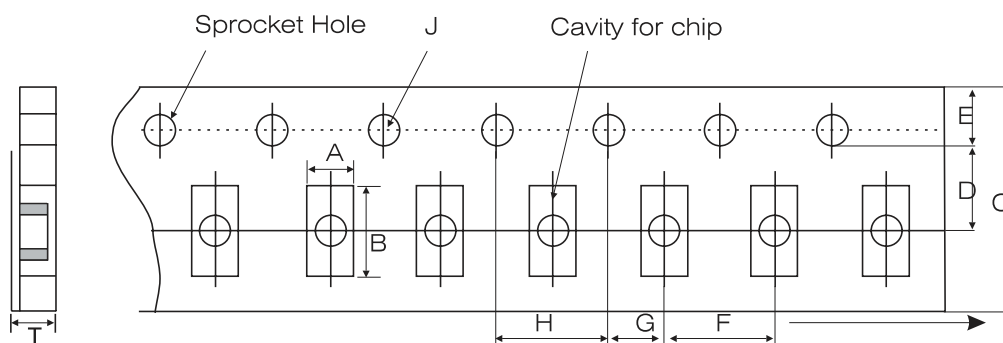
| 代號<br>紙帶規格 | A             | B             | C             | D             | E             | F             | G             | H             | J                | T*         |
|------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|------------|
| 0402       | 0.65<br>±0.10 | 1.15<br>±0.10 | 8.00<br>±0.10 | 3.50<br>±0.05 | 1.75<br>±0.10 | 2.00<br>±0.05 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>0.80 |
| 0603       | 1.10<br>±0.20 | 1.90<br>±0.20 | 8.00<br>±0.20 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>1.10 |
| 0805       | 1.45<br>±0.20 | 2.30<br>±0.20 | 8.00<br>±0.20 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>1.10 |
| 1206       | 1.80<br>±0.20 | 3.40<br>±0.20 | 8.00<br>±0.20 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>1.10 |

## ■ Package

- Paper Tape Taping



※Dimensions of paper take taping for 0402, 0603, 0805, 1206



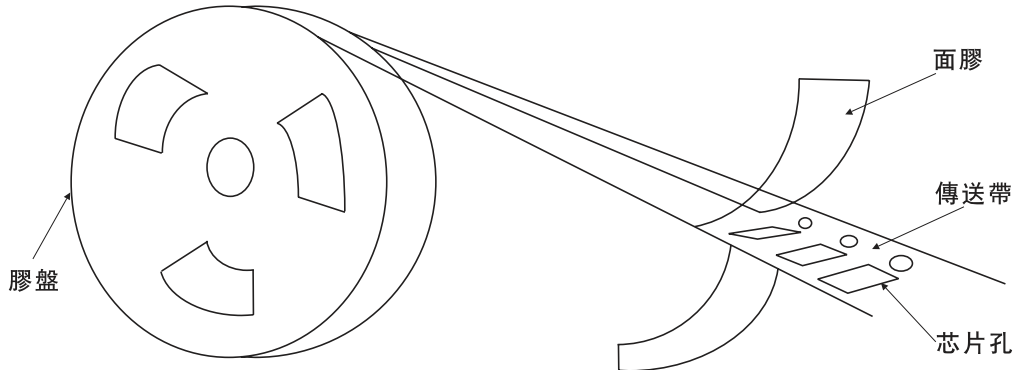
| Code<br>Paper size | A             | B             | C             | D             | E             | F             | G             | H             | J                | T*            |
|--------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|---------------|
| 0402               | 0.65<br>±0.10 | 1.15<br>±0.10 | 8.00<br>±0.10 | 3.50<br>±0.05 | 1.75<br>±0.10 | 2.00<br>±0.05 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | Below<br>0.80 |
| 0603               | 1.10<br>±0.20 | 1.90<br>±0.20 | 8.00<br>±0.20 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | Below<br>1.10 |
| 0805               | 1.45<br>±0.20 | 2.30<br>±0.20 | 8.00<br>±0.20 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | Below<br>1.10 |
| 1206               | 1.80<br>±0.20 | 3.40<br>±0.20 | 8.00<br>±0.20 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | Below<br>1.10 |

# 多層片式陶瓷電容器

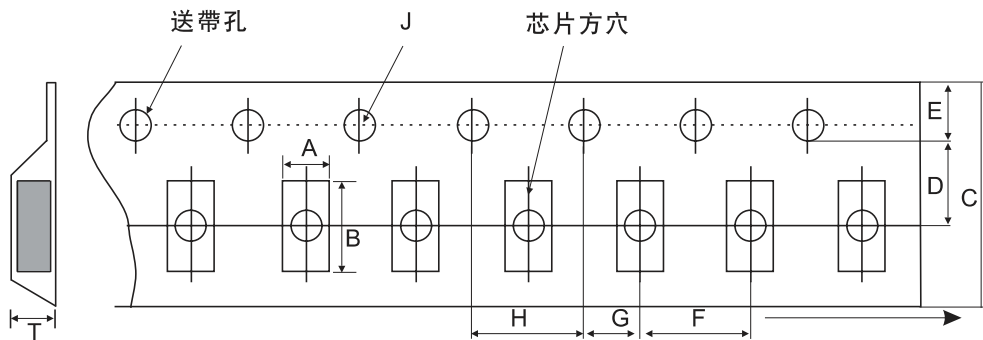
## MULTILAYER CHIP CERAMIC CAPACITOR

### ■ 包裝

- 紙帶卷盤結構



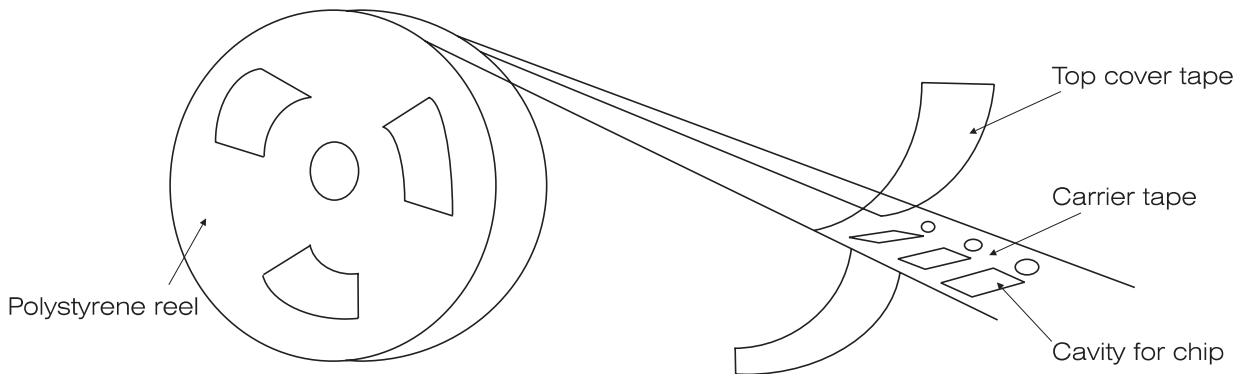
\* 適合0805, 1206, 1210, 1808, 1812常規尺寸產品的塑膠帶尺寸



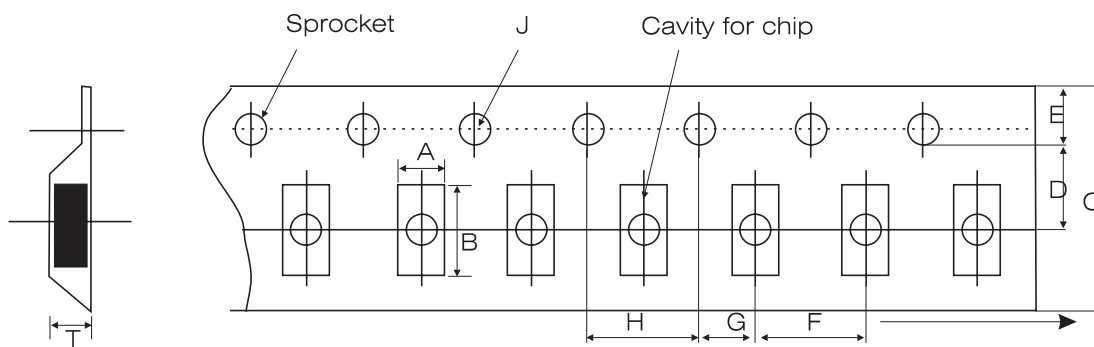
| 代號<br>紙帶規格 | A             | B             | C              | D             | E             | F*            | G             | H             | J                | T          |
|------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|------------------|------------|
| 0805       | 1.55<br>±0.20 | 2.35<br>±0.20 | 8.00<br>±0.20  | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低於<br>1.50 |
| 1206       | 1.95<br>±0.20 | 3.60<br>±0.20 | 8.00<br>±0.20  | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低於<br>1.85 |
| 1210       | 2.70<br>±0.10 | 3.42<br>±0.10 | 8.00<br>±0.10  | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低於<br>3.2  |
| 1808       | 2.20<br>±0.10 | 4.95<br>±0.10 | 12.00<br>±0.10 | 5.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低於<br>3.0  |
| 1812       | 3.66<br>±0.10 | 4.95<br>±0.10 | 12.00<br>±0.10 | 5.50<br>±0.05 | 1.75<br>±0.10 | 8.00<br>±0.10 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低於<br>4.0  |

注意:\*表示此處對尺寸的要求非常精確

• Embossed Taping



※Dimensions of embossed taping for 0805, 1206, 1210, 1808, 1812 type



| Code<br>Tape size | A             | B             | C              | D             | E             | F*            | G             | H             | J                | T          |
|-------------------|---------------|---------------|----------------|---------------|---------------|---------------|---------------|---------------|------------------|------------|
| 0805              | 1.55<br>±0.20 | 2.35<br>±0.20 | 8.00<br>±0.20  | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>1.50 |
| 1206              | 1.95<br>±0.20 | 3.60<br>±0.20 | 8.00<br>±0.20  | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>1.85 |
| 1210              | 2.70<br>±0.10 | 3.42<br>±0.10 | 8.00<br>±0.10  | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>3.2  |
| 1808              | 2.20<br>±0.10 | 4.95<br>±0.10 | 12.00<br>±0.10 | 5.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>3.0  |
| 1812              | 3.66<br>±0.10 | 4.95<br>±0.10 | 12.00<br>±0.10 | 5.50<br>±0.05 | 1.75<br>±0.10 | 8.00<br>±0.10 | 2.00<br>±0.05 | 4.00<br>±0.10 | 1.50-0/<br>+0.10 | 低于<br>4.0  |

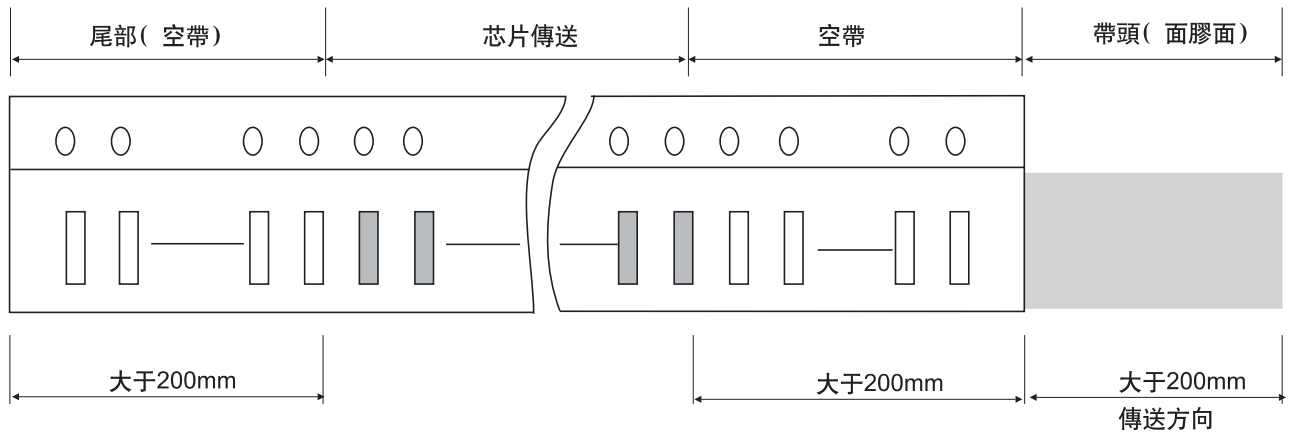
Note: The place with "\*" means where needs exactly dimensions.



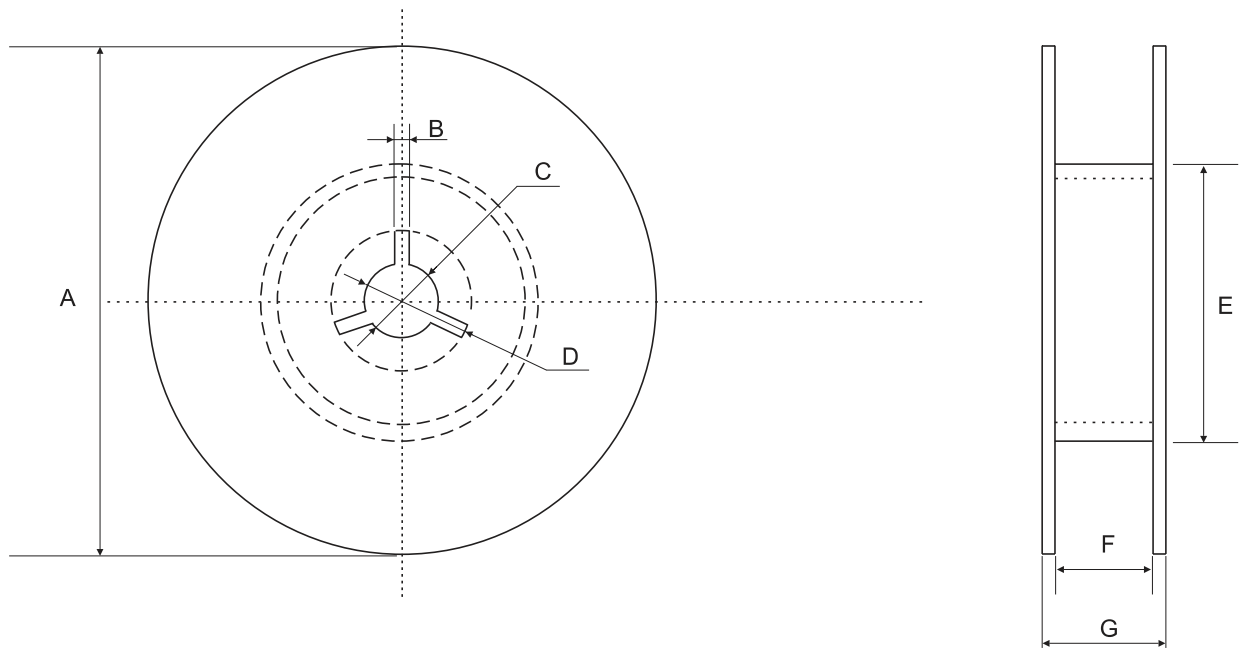
# 多層片式陶瓷電容器

## MULTILAYER CHIP CERAMIC CAPACITOR

- 傳送帶的前後結構



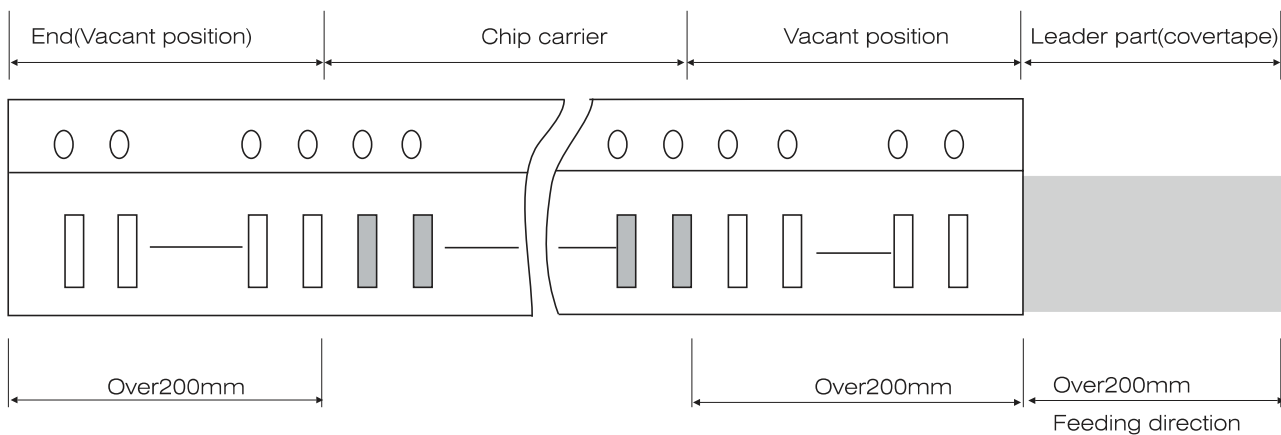
- 卷盤尺寸(單位:mm)



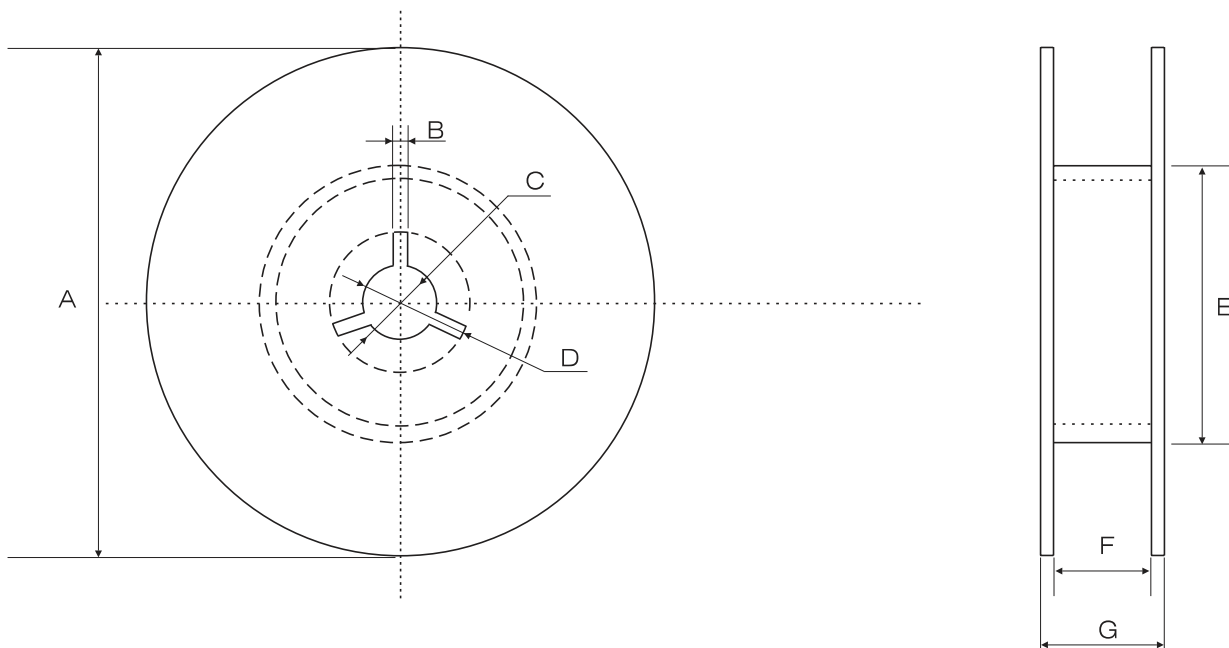
- 尺寸代碼

| A                      | B    | C                     | D                     | E                | F                | G     |
|------------------------|------|-----------------------|-----------------------|------------------|------------------|-------|
| $\Phi 178.00 \pm 2.00$ | 3.00 | $\Phi 13.00 \pm 0.50$ | $\Phi 21.00 \pm 0.80$ | $\Phi 50.00$ 或更大 | $10.00 \pm 1.50$ | 12MAX |
| $\Phi 330.00 \pm 2.00$ | 3.00 | $\Phi 13.00 \pm 0.50$ | $\Phi 21.00 \pm 0.80$ | $\Phi 50.00$ 或更大 | $10.00 \pm 1.50$ | 12MAX |

• Structure of leader part and end part of the carrier paper



• Reel Dimensions (unit:mm)



• Code

| A                      | B    | C                     | D                     | E                   | F                | G     |
|------------------------|------|-----------------------|-----------------------|---------------------|------------------|-------|
| $\Phi 178.00 \pm 2.00$ | 3.00 | $\Phi 13.00 \pm 0.50$ | $\Phi 21.00 \pm 0.80$ | $\Phi 50.00$ or max | $10.00 \pm 1.50$ | 12MAX |
| $\Phi 330.00 \pm 2.00$ | 3.00 | $\Phi 13.00 \pm 0.50$ | $\Phi 21.00 \pm 0.80$ | $\Phi 50.00$ or max | $10.00 \pm 1.50$ | 12MAX |

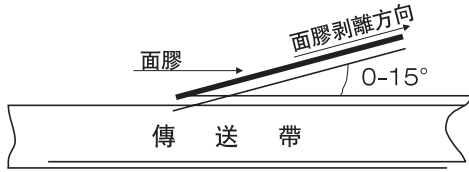
# 多層片式陶瓷電容器

## MULTILAYER CHIP CERAMIC CAPACITOR

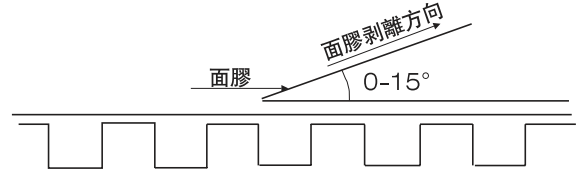
### 關於卷帶的說明

- 面膠剝離強度

(A)紙帶



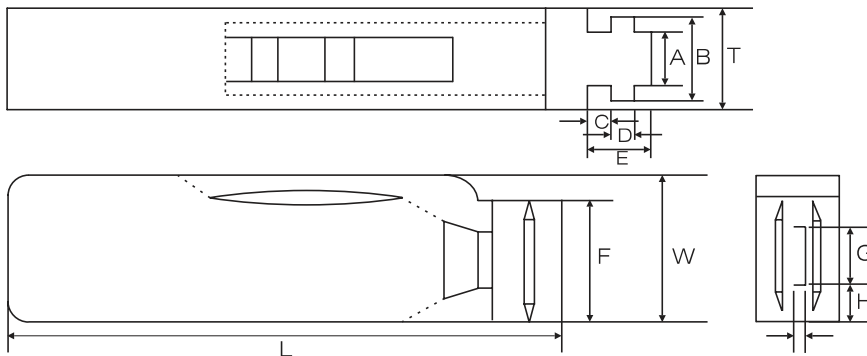
(B)塑料膠盤



標準：0.1N<剝離強度<0.7N；在剝離時，紙帶不能有紙碎，也不能粘在底、面膠上。

- 塑料盒散包裝

|    |               |              |            |               |              |           |
|----|---------------|--------------|------------|---------------|--------------|-----------|
| 標示 | A             | B            | T          | C             | D            | E         |
| 尺寸 | 6.80±0.10     | 8.80±1.00    | 12.00±0.10 | 15.00+0.10/-0 | 2.00±0/-0.10 | 4.70±0.10 |
| 標示 | F             | W            | G          | H             | L            | I         |
| 尺寸 | 31.50+0.20/-0 | 36.00+0/-0.2 | 19.00±0.35 | 7.00±0.35     | 110.00±0.70  | 5.00±0.35 |



- 包裝數量

| 尺寸   | 包裝形式和數量 |                                |       |      |
|------|---------|--------------------------------|-------|------|
|      | 紙帶卷盤    | 膠帶卷盤                           | 塑料盒散裝 | 一般散裝 |
| 0402 | 10000   |                                | 20000 | 5000 |
| 0603 | 4000    |                                | 15000 | 5000 |
| 0805 | 4000    | 3000                           | 10000 | 5000 |
| 1206 | 4000    | T≤1.35mm 3000<br>T>1.35mm 2000 | 5000  | 5000 |
| 1210 |         | T≤1.80mm 2000<br>T>1.80mm 1000 |       | 2000 |
| 1808 |         | 2000                           |       | 2000 |
| 1812 |         | T≤1.85mm 1000<br>T>1.85mm 500  |       | 2000 |
| 2225 |         | 500                            |       | 500  |
| 3035 |         | 500                            |       |      |

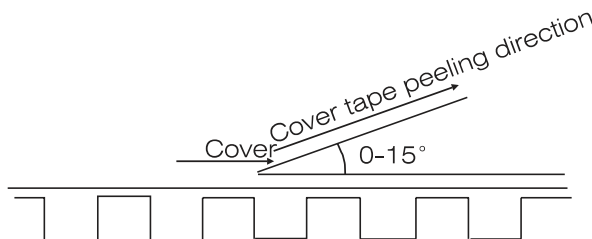
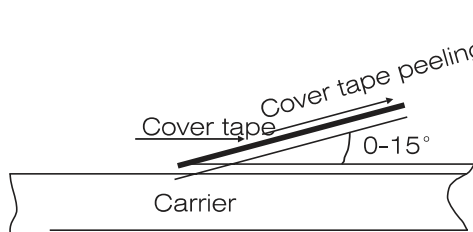
注意：包裝的形式和數量可根據客戶的要求來定。

## ■ TAPING SPECIFICATION

- Top cover tape peeling strength

(A) Paper Taping

(b) Cover tape peeling direction

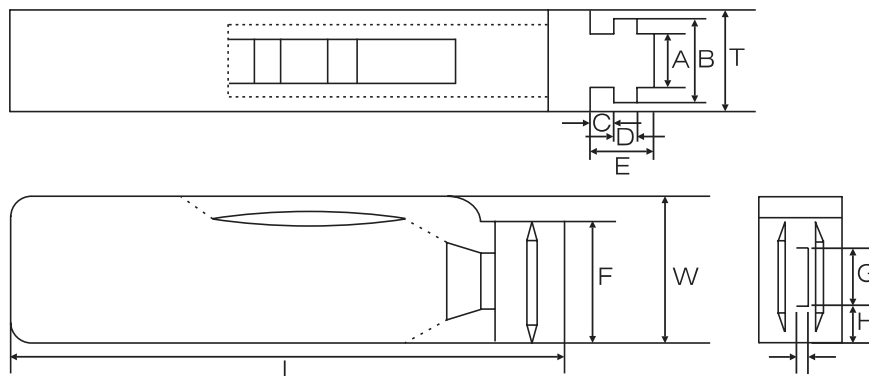


Standard:  $0.1N < \text{peeling forc} < 0.7N$ ;

No paper dirty remains on the scotch when peeling, and no sticks to top and bottom cover tape.

- Bulk Case Package

|           |                     |                    |                  |                     |                      |                 |
|-----------|---------------------|--------------------|------------------|---------------------|----------------------|-----------------|
| Symbol    | A                   | B                  | T                | C                   | D                    | E               |
| Dimension | $6.80 \pm 0.10$     | $8.80 \pm 1.00$    | $12.00 \pm 0.10$ | $15.00 + 0.10 / -1$ | $2.00 \pm 0 / -0.10$ | $4.70 \pm 0.10$ |
| Symol     | F                   | W                  | G                | H                   | L                    | I               |
| Dimension | $31.50 + 0.20 / -0$ | $36.00 + 0 / -0.2$ | $19.00 \pm 0.35$ | $7.00 \pm 0.35$     | $110.00 \pm 0.70$    | $5.00 \pm 0.35$ |



- Pack Quantity

| Size | Pakaging method and quantity |   |                            |                       |
|------|------------------------------|---|----------------------------|-----------------------|
|      | Paper tape taping            | Plastic embossed taping                                 | Bulk plastic box packaging | Normal bulk packaging |
| 0402 | 10000                        |   | 20000                      | 5000                  |
| 0603 | 4000                         |   | 15000                      | 5000                  |
| 0805 | 4000                         | 3000  | 10000                      | 5000                  |
| 1206 | 4000                         | $T \leq 1.35\text{mm}$ 3000<br>$T > 1.35\text{mm}$ 2000 | 5000                       | 5000                  |
| 1210 |                              | $T \leq 1.80\text{mm}$ 2000<br>$T > 1.80\text{mm}$ 1000 |                            | 2000                  |
| 1808 |                              | 2000  |                            | 2000                  |
| 1812 |                              | $T \leq 1.85\text{mm}$ 1000<br>$T > 1.85\text{mm}$ 500  |                            | 2000                  |
| 2225 |                              | 500   |                            | 500                   |
| 3035 |                              | 500   |                            |                       |

Note: We can choose packing style and quantity can be according to the customer's requirement.