

# 厚膜網絡電阻器

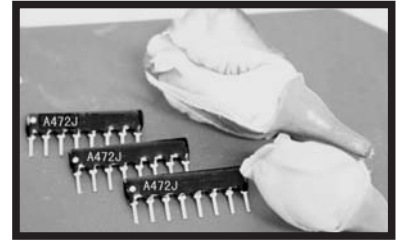
## THICK FILM NETWORK RESISTOR

### 厚膜網絡電阻器

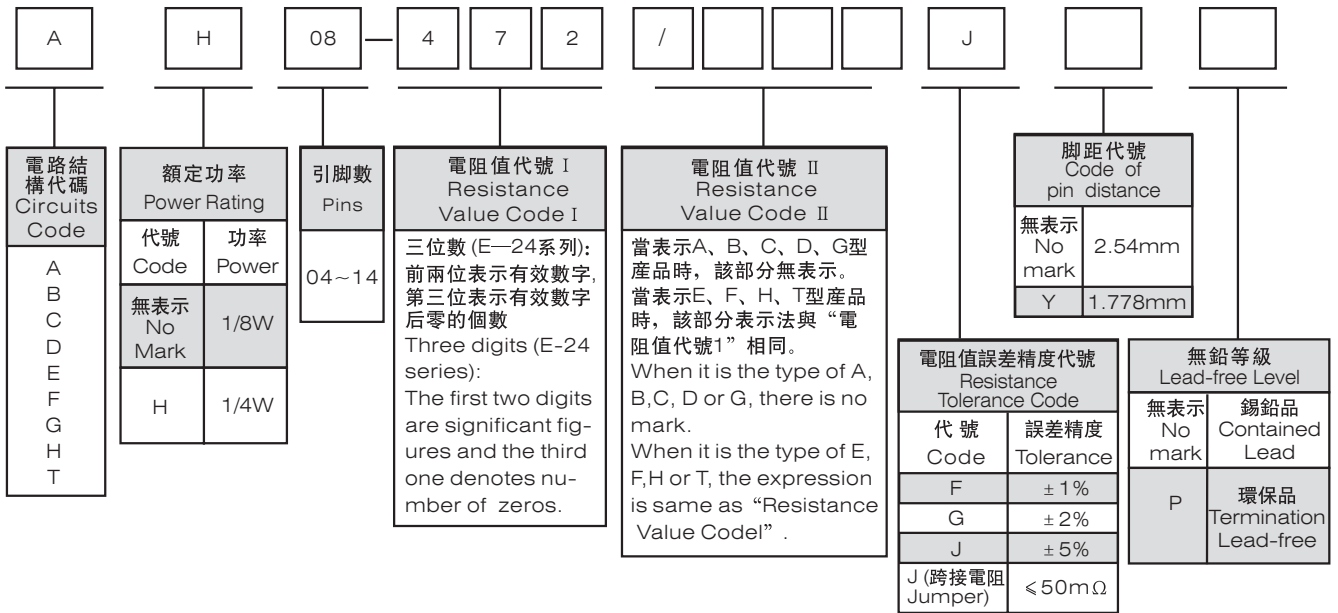
#### THICK FILM NETWORK RESISTOR

#### ● 產品簡介 BRIEF INTRODUCTION

- \* 小型化、高密度組裝
- \* 電性能穩定，可靠性高
- \* 可得到不同電阻值組合
- \* 符合RoHS指令
- Miniature, high density assembly.
- Stable electrical capability, high reliability.
- Combinations of different ohmic value are available
- RoHS compliant



#### ● 定貨方式 ORDER

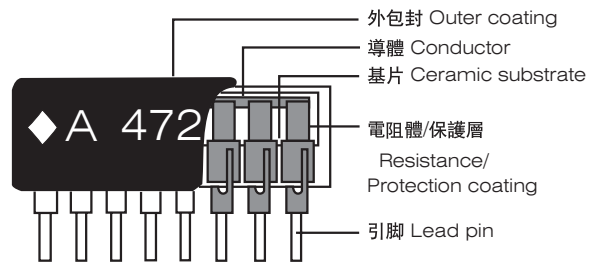


#### ● 結構圖和外形尺寸

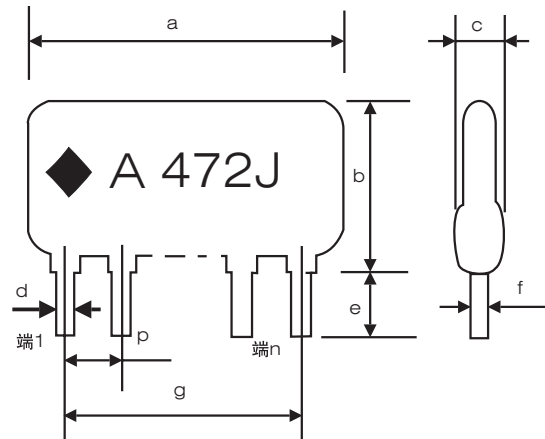
#### CONSTRUCTION AND DIMENSIONS

單位 unit:mm

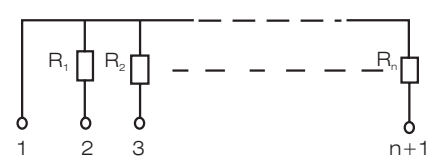
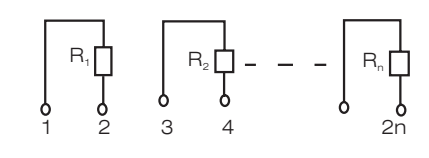
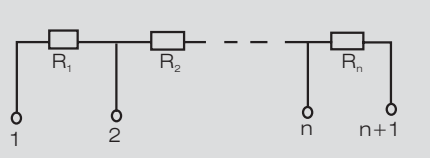
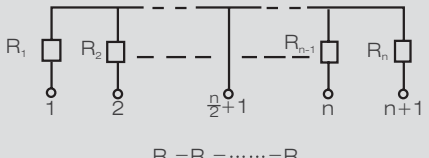
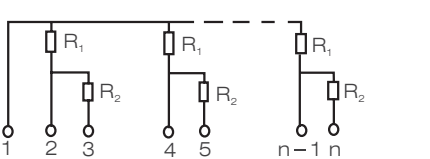
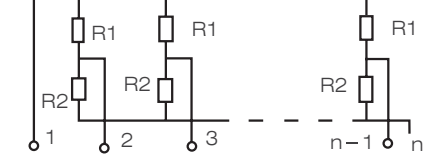
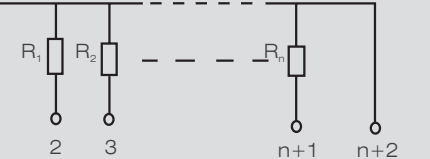
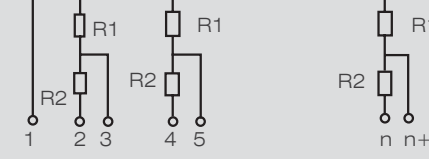
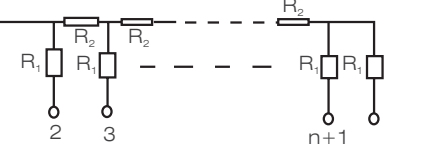
| 代號<br>Code | 常規尺寸<br>Normal dimension             |         | 特殊尺寸<br>Special dimension             |         |
|------------|--------------------------------------|---------|---------------------------------------|---------|
| a          | $2.54 \times (n-1) + 2.50\text{max}$ |         | $1.778 \times (n-1) + 3.20\text{max}$ |         |
| b          | A、B、C、D、E、F、G、H<br>型 Type            | 5.08max | A、B、C、D、E、F、G、H<br>型 Type             | 5.08max |
|            | T型 Type                              | 8.50max | T型 Type                               | 8.50max |
| c          | 3.00max                              |         | 3.00max                               |         |
| d          | $0.50 \pm 0.1$                       |         | $0.50 \pm 0.1$                        |         |
| e          | $3.50 \pm 0.5$                       |         | $3.50 \pm 0.5$                        |         |
| f          | $0.25 \pm 0.1$                       |         | $0.30 \pm 0.1$                        |         |
| g          | $2.54 \times (n-1) \pm 0.3$          |         | $1.778 \times (n-1) \pm 0.3$          |         |
| p          | $2.54 \pm 0.1$                       |         | $1.778 \pm 0.1$                       |         |



注:白色點標記為第一腳  
 Note: The white dot means the first pin.



• 等效電路 EQUIVALENT CIRCUIT

| 型號<br>Type | 等效電路<br>Equivalent Circuit  | 型號<br>Type | 等效電路<br>Equivalent Circuit   |
|------------|---|------------|--|
| A          |  <p style="text-align: center;"><math>R_1=R_2=\dots=R_n</math></p>                   | B          |  <p style="text-align: center;"><math>R_1=R_2=\dots=R_n</math></p>                   |
| C          |  <p style="text-align: center;"><math>R_1=R_2=\dots=R_n</math></p>                   | D          |  <p style="text-align: center;"><math>R_1=R_2=\dots=R_n</math></p>                   |
| E          |  <p style="text-align: center;"><math>R_1=R_2</math>或<math>R_1 \neq R_2</math></p> | F          |  <p style="text-align: center;"><math>R_1=R_2</math>或<math>R_1 \neq R_2</math></p> |
| G          |  <p style="text-align: center;"><math>R_1=R_2=\dots=R_n</math></p>                 | H          |  <p style="text-align: center;"><math>R_1=R_2</math>或<math>R_1 \neq R_2</math></p> |
| T          |  <p style="text-align: center;"><math>R_1=R_2</math>或<math>R_1 \neq R_2</math></p> |            |  |

• 參考標準 REFERENCE STANDARD

GB/T 15654-1995  
 GB/T 2828.1-2003  
 GB/T 2829-2002

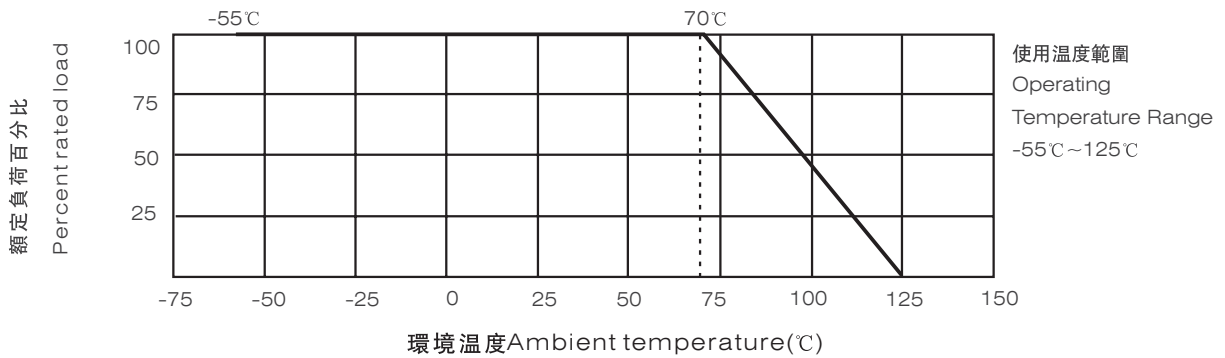
• IEC E-24 系列電阻值代碼對照表

IEC E-24 Series Resistance Cross-reference List

E-24 系列 E-24 Series ( $\times 10^n \Omega$ )  
(單位unit:  $1\Omega$ 、 $10\Omega$ 、 $100\Omega$ 、 $1K\Omega$ 、 $10K\Omega$ 、 $100K\Omega$ 、 $1M\Omega$ )

|     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|
| 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8 |
| 1.1 | 1.6 | 2.4 | 3.6 | 5.1 | 7.5 |
| 1.2 | 1.8 | 2.7 | 3.9 | 5.6 | 8.2 |
| 1.3 | 2.0 | 3.0 | 4.3 | 6.2 | 9.1 |

• 負荷下降曲線 DERATING CURVE



\* 當電阻使用的環境溫度超過70°C時，其額定負荷(額定功率或額定電流)按上述曲線下降。  
For resistors operated in ambient over 70°C, rated load (power rating or current rating) shall be derated in accordance with above figure.

• 額定值 RATINGS

| 項目<br>Item                                   | 標準<br>Specification   |
|--|---|
| 額定功率<br>Power Rating                         | 1/8W (1/4w)   |
| 最大工作電壓<br>Max. Working Voltage               | 200V  |
| 最大過負荷電壓<br>Max. Overload Voltage             | 280V  |
| 跨接電阻額定電流<br>Jumper Rated Current             | 2A  |
| 電阻溫度係數<br>Resistance Temperature Coefficient | $10\Omega \leq R \leq 1M\Omega$ : $\pm 100\text{ppm}/^\circ\text{C}$<br>$1\Omega \leq R < 10\Omega, 1M\Omega < R \leq 10M$ : $\pm 250\text{ppm}/^\circ\text{C}$ |
| 阻值誤差精度<br>Resistance Tolerance               | $\pm 1\%$ , $\pm 2\%$ , $\pm 5\%$ , 跨接電阻 Jumper: $\leq 50\text{m}\Omega$  |
| 阻值範圍<br>Resistance Range                     | $0\Omega$ (跨接電阻 Jumper)、 $1.0\Omega \sim 10M\Omega$<br>E-24系列   |
| 使用溫度範圍<br>Operating Temperature Range        | $-55^\circ\text{C} \sim 125^\circ\text{C}$  |
| 額定溫度<br>Rated Temperature                    | $+70^\circ\text{C}$   |

\* 注：額定電壓 =  $\sqrt{\text{額定功率} \times \text{標稱電阻值}}$  或最大工作電壓中的較小值。  
Note: Rated Voltage =  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$  or Max. Working Voltage, whichever is lower.

• 特性 CHARACTERISTICS

| 項目<br>Item                                      | 標準<br>Specifications  | 測試方法 ( GB/T 15654-1995)<br>Test Methods ( GB/T 15654-1995)   |
|---|---|--|
| 電阻溫度系數<br>T. C. R                               | 在規定值內<br>Within the specified T.C.R   | 測定範圍: $-55^{\circ}\text{C}\sim 125^{\circ}\text{C}$<br>measure between $-55^{\circ}\text{C}\sim 125^{\circ}\text{C}$   |
| 短時間過負載<br>Short Time Overload                   | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm (2.0\%R + 0.05\Omega)$<br>跨接電阻 Jumper: $R \leq 50m\Omega$ | 2.5倍額定電壓或最大過負荷電壓(取最小者)<br>保持5秒<br>$2.5 \times \text{Rated voltage or Max. Overload Voltage}$ , choose the lower, for 5 seconds   |
| 包封絕緣阻抗<br>Coating Insulation Resistance         | 100M $\Omega$ Min   | 施加 500V DC<br>Apply 500V DC  |
| 包封絕緣耐電壓<br>Coating Insulation Withstand Voltage | 無弧光, 燃燒及本體被擊穿<br>No arc, inflammation and damage  | 施加500V DC 保持1min<br>Apply 500V DC 1min   |
| 可焊性<br>Solderability                            | 可焊面積 $\geq 95\%$<br>95%Cover Min  | $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 2 $\pm 0.5$ 秒<br>$260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 2 $\pm 0.5$ S   |
| 耐溶劑性<br>Resistance to Solvent                   | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.05\Omega)$<br>跨接電阻 Jumper: $R \leq 50m\Omega$ | 浸入異丙醇溶液 10 $\pm 1$ 小時, 溶液溫度為 $23 \pm 2^{\circ}\text{C}$<br>Dip in isopropyl alcohol solution of 10h $\pm 1$ h the solution temperature of $23 \pm 2^{\circ}\text{C}$ .   |
| 引綫強度<br>Pin strength                            | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.05\Omega)$<br>跨接電阻 Jumper: $R \leq 50m\Omega$ | 將引綫焊接在網絡電阻的受試引出端后,<br>以10mm/s平挂, 拉力到500g止<br>Speed:10mm/s, pull strength:500g.   |
| 抗彎強度<br>Bending strength                        | 無可見損傷<br>No mechanical damage   | 端子綫末端負重0.5kg,使電阻器本體與端子綫彎成 $90^{\circ}$ ,<br>保持5s, 為一個循環, 做2個循環<br>Force with 0.5kg on the terminal pin, between the resistor and the terminal pin is 90 degree, duration: 5s for 1 cycle, total 2 cycles                       |
| 耐焊接熱<br>Resistance to Soldering Heat            | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.05\Omega)$<br>跨接電阻 Jumper: $R \leq 50m\Omega$ | $270^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 10 $\pm 1$ 秒<br>$270^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 10s $\pm 1$ s  |
| 溫度循環<br>Temperature Cycling                     | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.05\Omega)$<br>跨接電阻 Jumper: $R \leq 50m\Omega$ | $-55^{\circ}\text{C}$ ( 30分鐘) $\sim$ 常溫 ( 2 $\sim$ 3分鐘) $\sim 125^{\circ}\text{C}$<br>( 30分鐘) 5個循環<br>$-55^{\circ}\text{C}$ ( 30min) $\sim$ normal temperature<br>( 2 $\sim$ 3min) $\sim 125^{\circ}\text{C}$ ( 30min) 5cycles |

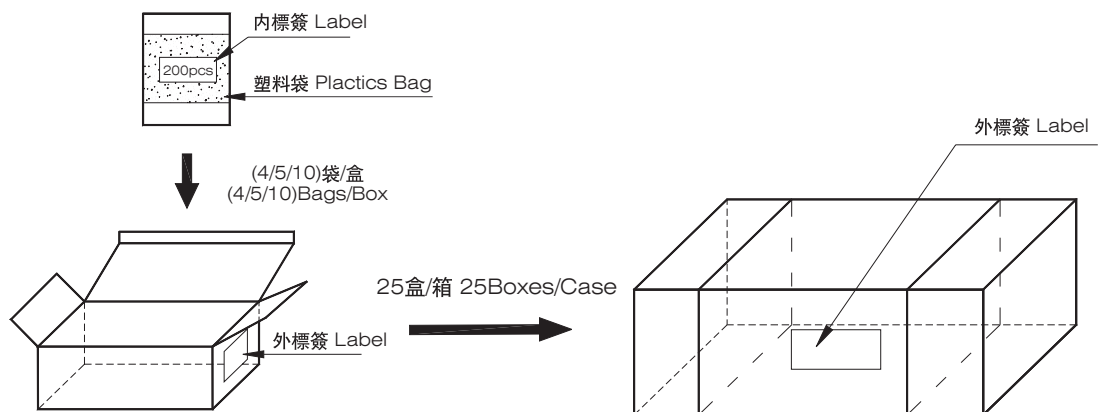
# 厚膜網絡電阻器

## THICK FILM NETWORK RESISTOR

| 項目<br>Item                                  | 標 准<br>Specifications   | 測試方法 ( GB/T 15654-1995 )<br>Test Methods ( GB/T 15654-1995 )   |
|---|---|--|
| 穩態濕熱<br>Steady state humidity               | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm ( 3.0\%R + 0.1\Omega )$<br>跨接電阻 Jumper: $R \leq 100m\Omega$ | $40\text{C} \pm 2\text{C}$ 90%~95%RH1000小時<br>$40\text{C} \pm 2\text{C}$ 90%~95%RH1000h  |
| 70°C 耐久性<br>Load Life(70°C)                 | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm ( 3.0\%R + 0.1\Omega )$<br>跨接電阻 Jumper: $R \leq 100m\Omega$ | 70°C ± 2°C, 1000小時, 額定電壓或最大工作電壓兩者中的較小值, 1.5小時/斷0.5小時<br>70°C ± 2°C, 1000h, Rated Voltage or Max. Working Voltage, whichever is lower. 1.5h on/0.5h off |
| 上限類別溫度耐久性<br>Endurance at upper temperature | 無可見損傷, No mechanical damage<br>$\Delta R \leq \pm ( 3.0\%R + 0.1\Omega )$<br>跨接電阻 Jumper: $R \leq 100m\Omega$ | $125\text{C} \pm 2\text{C}$ 1000小時<br>$125\text{C} \pm 2\text{C}$ 1000h  |

### ● 包裝 PACKAGING

\* 包裝形式 Packaging style



\* 包裝數量 Packaging quantity

| 塑料袋散包裝<br>Bag | 袋<br>Bag | 盒 Box       |             |              | 箱<br>Case     |
|---------------|----------|-------------|-------------|--------------|---------------|
|               |          | 4, 5 腳 Pins | 6~11 腳 Pins | 12~14 腳 Pins |               |
|               | 200pcs   | 10 Bags     | 5 Bags      | 4 Bags       | 25 boxes Max. |

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