



**Chip Resistor Arrays  
(Lead-Free for CNF24 Series )  
Halogen-Free**

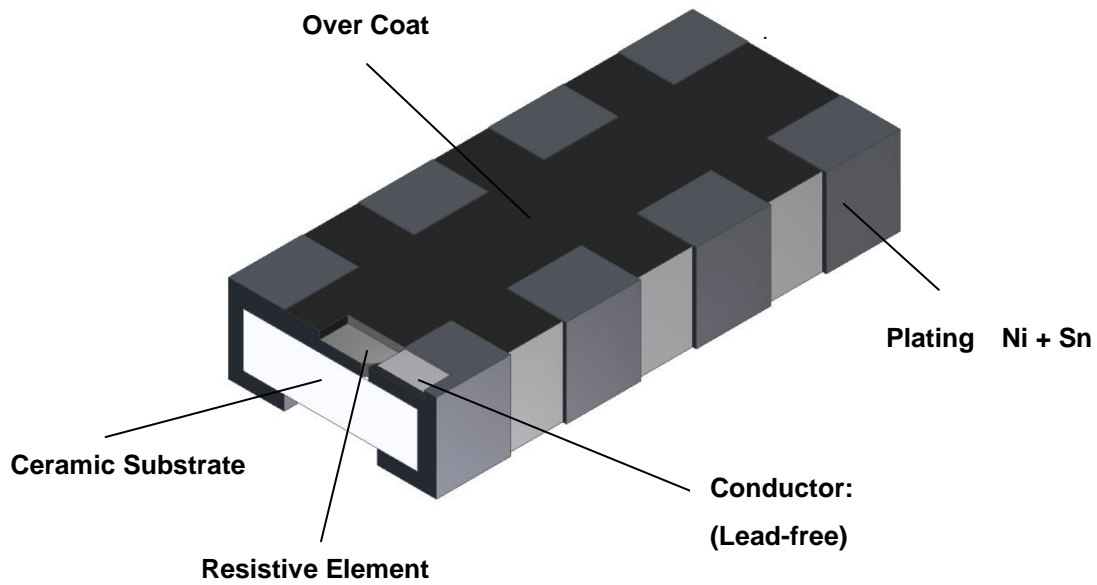
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**1. Scope :**

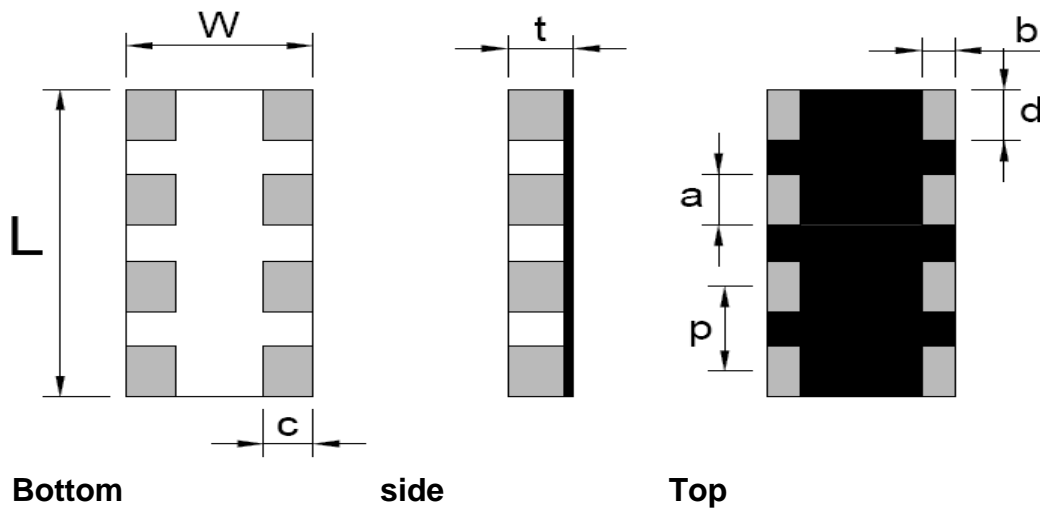
This specification applies for the CNF24 series of chip resistor arrays made by TA-I.

**2. Construction , Dimensions , Schematic :**

**2.1 Construction :**



**2.2 Dimension :**



UNIT:mm

Type	L	W	t	P	a	b	c	d
CNF24	$2.0 \pm 0.1$	$1.0 \pm 0.1$	$0.4 \pm 0.1$	$0.5 \pm 0.05$	$0.3 \pm 0.1$	$0.15 \pm 0.1$	$0.25 \pm 0.1$	$0.4 \pm 0.1$



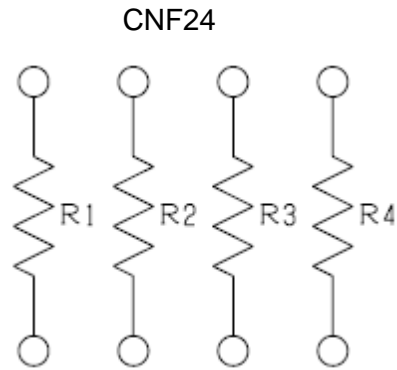
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**2.3 Schematic**



R1=R2=R3=R4

**3. Type Designation:**

**3.1 Chip Resistor Arrays**

**CNF**

**24**

**J**

**TA**

**103**

Product Code

size

Tolerance

Packaging

Nominal

CNF : Chip Resistor Array

Power Rating

Resistance

24-0402\*4

J-±5%  
G-±2%  
F-±1%

T- Paper Tape  
A: Totally Lead free+  
Anti-Sulfurated

3 digits e.g.,:  
(E-24) 103 = 10KΩ  
5R6 = 5.6Ω  
4 digits e.g., :  
(E-96) 1540 = 154Ω  
43R2 = 43.2Ω



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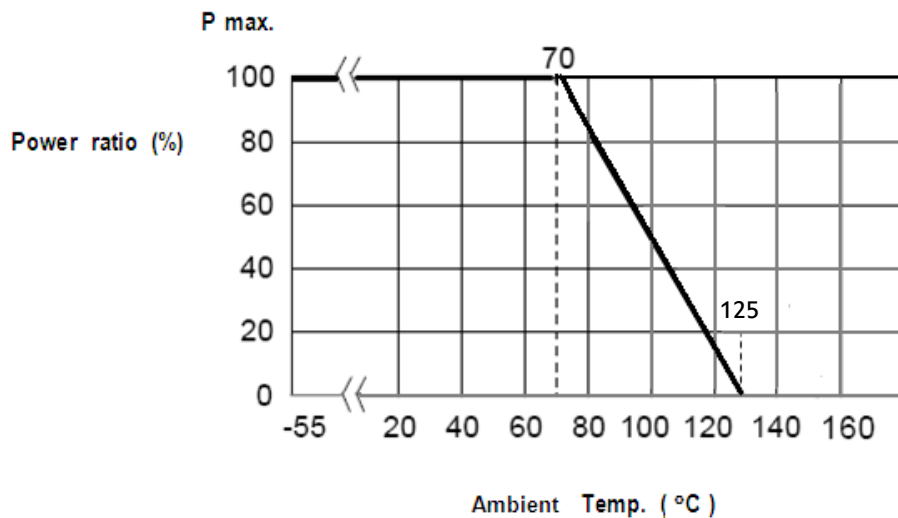
**4. Ratings & Characteristics :**

Type	Power Rating at 70°C	Rating Voltage	Max. Working Voltage	Max. Over Load Voltage	Operating Temp. (°C)	Resistance Tolerance (%)	Resistance Range (Ω)	Temp Co-efficient PPM/°C
CNF24	1/16W	Refer 4.2	25V	50V	-55 ↓ +125°C	±5%	101 Ω ~ 1M Ω	±250
						±2%	10~100 Ω	±200
						±1%	3.0 Ω ~ 9.1 Ω	±200

0Ω THICK FILE CHIP RESISTOR ARRAYS			
Type	Rate Current	Max Overload Current	Resistance Range
CNF 24	1A	2.5A	50mΩ MAX

**4.1 Derating Curve :**

For resistors operated at ambient temperature over 70°C , power rating shall be derated in accordance with figure 1.



**Figure 1**

**4.2 Rated Voltage:**

The rated voltage is calculated by the following formula:

$$E = \sqrt{P * R}$$

E=Rated Voltage(V)  
 P=Rated Power(W)  
 R=Resistance Value(Ω)

E.G. : What is CNF24JTA102 the rated voltage ?

CNF24JTA102 P:1/16W ; R:102 = 1KΩ = 1000Ω

$$E = \sqrt{0.0625(W) * 1000(\Omega)} = 7.9 (V)$$



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**5. Reliability Tests:**

Test Items	Reference standard	Condition of Test	Test Limits ( $\Delta R$ )
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-1-4.8	-55~ +125 °C	Refer 4.0
Short Time Overload	IEC60115-1-4.13 JIS-C5201-1-4.13	2.5 X rated voltage for 5 sec	$\pm(2.0\%+0.1\Omega)$ 0Ω : 50 mΩ or less
Intermittent Overload	IEC60115-1-4.39 JIS-C5201-1-4.39	2.5X rated voltage or Max Overloading Voltage , 1 sec "ON" 25 sec "OFF" , 10000 cycles	$\pm(5.0\%+0.1\Omega)$ 0Ω : 50mΩ or less
Load Life	IEC60115-1-4.25.1 JIS-C5201-1-4.25.1	1000 hours at rated voltage , 70°C , 1.5hours "ON " , 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$ 0Ω :100 mΩ or less
Load Life with Humidity	IEC60115-1-4.24 JIS-C5201-1-4.24	1000 hours at rated voltage , 40±2°C, 90~95% RH 1.5hours "ON " , 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$ 0Ω :100 mΩ or less
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55°C (30 min. ) / +155 °C (30 min. ) 5 cycles	1%: $\pm(0.5\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.05\Omega)$ 0Ω :50 mΩ or less
Solderability	IEC60115-1-4.17 JIS-C5201-1-4.17	245±5°C solder, 2±0.5 sec dwell. Solder : Sn96.5 / Ag3.0 / Cu0.5	At least 95% of surface area of electrode shall be covered with new solder.
Core body	IEC60115-1-4.15 JIS-C5201-1-4.15	Pressure 1.0 kgf a R0.5 pressure rod for 10 sec	Without mechanical damage such as breaks. Electrical characteristics shall be satisfied
Dielectric Withstanding Voltage (Voltage Proof)	IEC60115-1-4.7 JIS-C5201-1-4.7	Applying voltage 100V for 1 minute.	No abnormalities such as flashover, burning dielectric breakdown shall appear.
Resistance to Solder Heat	IEC60115-1-4.18 JIS-C5201-1-4.18	270 ±5°C solder , 10 ±1 sec dwell .	0.5%,1%: $\pm(1.0\%+0.05\Omega)$ 2%,5%: $\pm(2.0\%+0.1\Omega)$ 0Ω : 50mΩ or less
Sulfuration Test	ASTM-B-809-95	Sulfur (Sulfur Vapor) 1,000 hours,105±2°C, unpowered	$\pm(2\%+0.05\Omega)$

Note\* : RCWV : Rated continuous working voltage .



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**6. Marking**

**6.1 ±5% (E24)**

Resistance value is expressed by 3 digits, the first two digits represent the significant figures of nominal resistance value in  $\Omega$ , and the third digit represents exponent for base of 10.

E.G.  $472 = 47 \times 10^2 = 4700 \Omega = 4.7K \Omega$

**6.2 ±1% (E96)**

Resistance value is expressed by 4 digits, the first three digits represent the significant figures of nominal resistance value in  $\Omega$ , and the fourth digit represents exponent for base of 10.

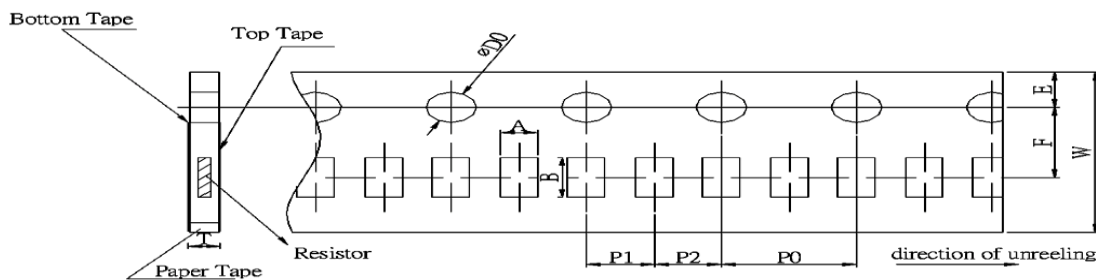
E.G.  $4701 = 470 \times 10^1 = 4700 \Omega = 4.7k \Omega$

**7. Taping & Reel**

**7.1 Taping Dimensions**

**7.1.1 2 mm pitch paper**

UNIT: mm



Type	A	B	W	F	E	P1	P2	P0	$\phi D0$	T0
CNF24	1.2±0.15	2.2±0.2	8.0±0.2	3.5±0.05	1.75±0.1	2.0±0.1	2.0±0.05	4.0±0.1	1.5 +0.1 -0	0.64±0.1

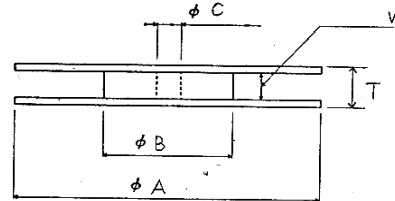
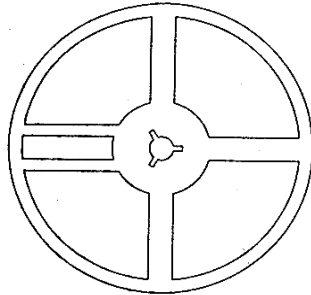
Package Type	Paper Tape
	2 mm pitch
	178mm/R
CNF24	10000



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**7.2 Reel Specifications:**

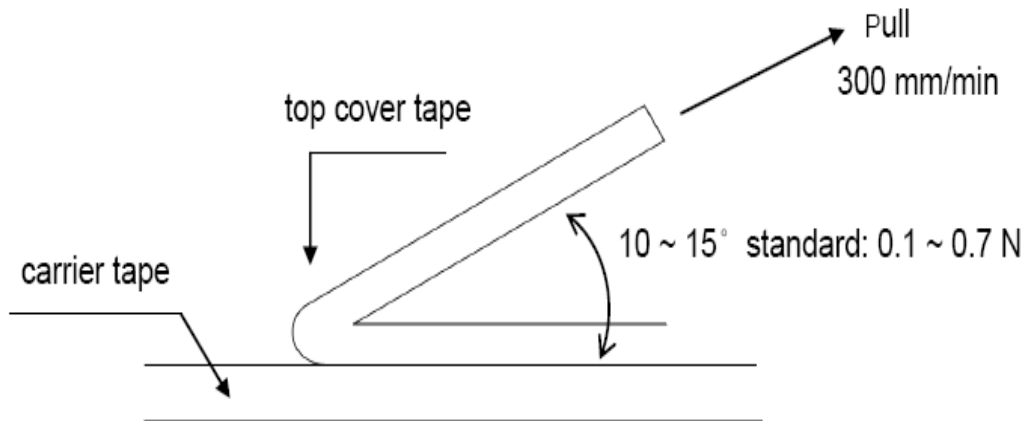


UNIT: mm

Type	$\phi A$	$\phi B$	$\phi C$	W	T
CNF24	$178.0 \pm 2.0$	$60.0 \pm 1.0$	$13.0 \pm 1.0$	$9.0 \pm 1.0$	$11.5 \pm 1.0$

**7.3 Peel off Strength:**

Peel –off force of paper and blister tape is in accordance with “JIS-C5202”  
that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.





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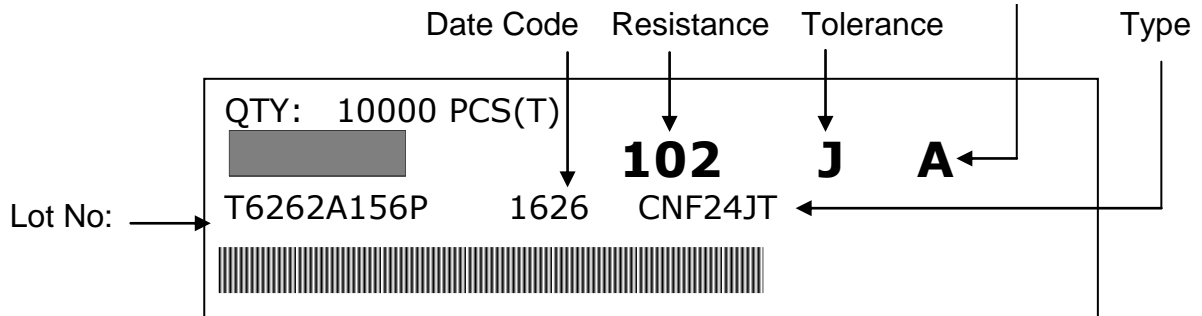
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**8. Label**

**8.1 Manufacture Label :**

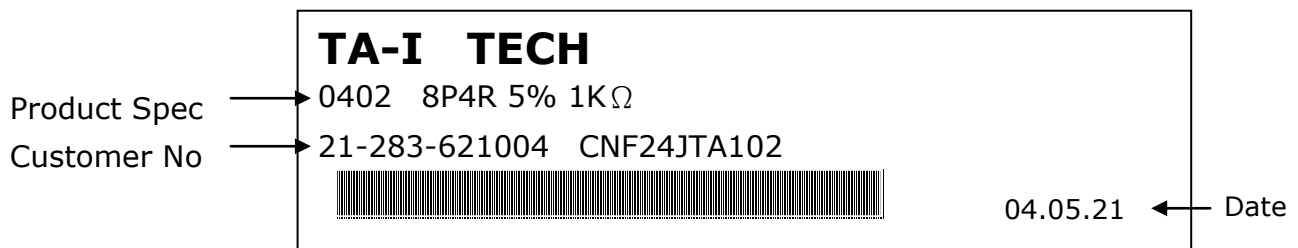
**8.1.1 Chip Resistor Array**

Totally Lead free +  
Anti-Sulfurated

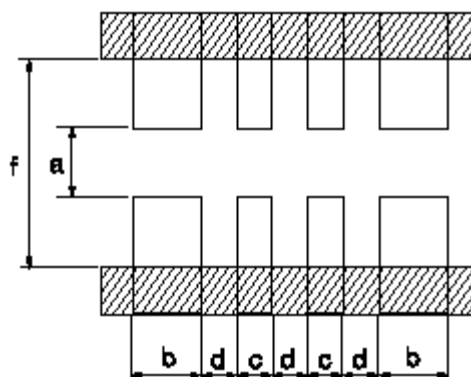


**8.2. Customer Label ( By customer request ) :**

**8.2.1 Chip Resistor Array**



**9. Recommended land patterns**



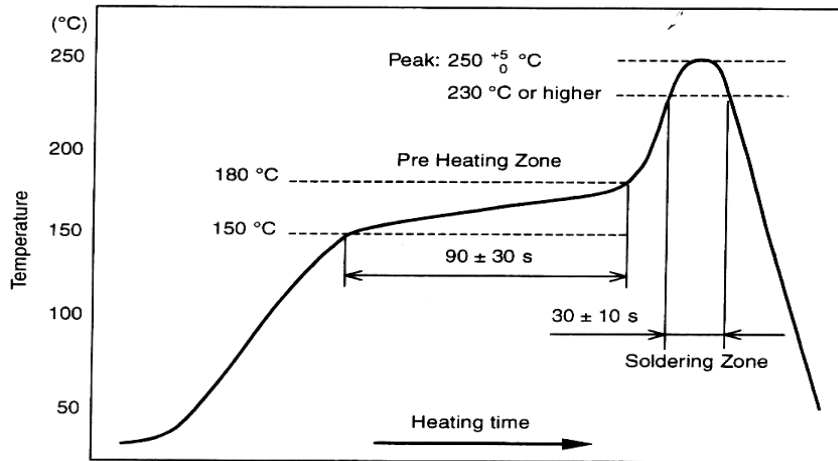
Land pattern		Dimension ( mm )				
		a	b	c	d	f
Type	Size					
CNF	24	0.4	0.525	0.25	0.25	1.4



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**10. Recommend IR – Reflow profile : (solder : Sn96.5 / Ag3 / Cu0.5)**



Peak :  $250 \begin{matrix} +5 \\ -0 \end{matrix}$  °C , 5 sec  
Pre – heat Zone : 150 to 180 °C ,  $90 \pm 30$  sec  
Soldering Zone : 230°C or higher ,  $30 \pm 10$  sec

**11. Storage Conditions:**

Temperature : 5 to 35 °C  
Related Humidity :40 to 75% RH

**12. Shelf Life :**

2 Years from manufacturing date.

**13. ECN :**

Engineering Change Notice: The customer will be informed with ECN if there is significant modification on the characteristics and materials described in Approval Sheet.





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**14. Manufacturing Country & City :**

TA-I TECHNOLOGY CO., LTD. ( Taiwan– Tao Yuan )

Tel: 886-3-3246169 Fax : 886-3-3246167

**Associated companies :**

(1) FORTUNE TASK RESISTOR FACTORY ( China – Dongguan )

Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(2) TA-I TECHNOLOGY (DONGGUAN ) CO., LTD. ( China –Dongguan )

Tel : 86-769-8339-4790~3 Fax : 86-769-8339-4794

(3) TA-I TECHNOLOGY ( SU ZHOU ) CO., LTD. ( China – Su Zhou)

Tel :86- 512-63457879 Fax : 86-512-63457869

(4) TAI OHM ELECTRONICS ( M ) SDN. BHD. ( Malaysia –Penang )

Tel :604- 3900480 Fax : 604-3901481

(5) P.T.TAI ELECTRONICS Indonesia ( Indonesia – Jakarta )

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