



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

Document No.

TCNF-240S001D

Revise Date

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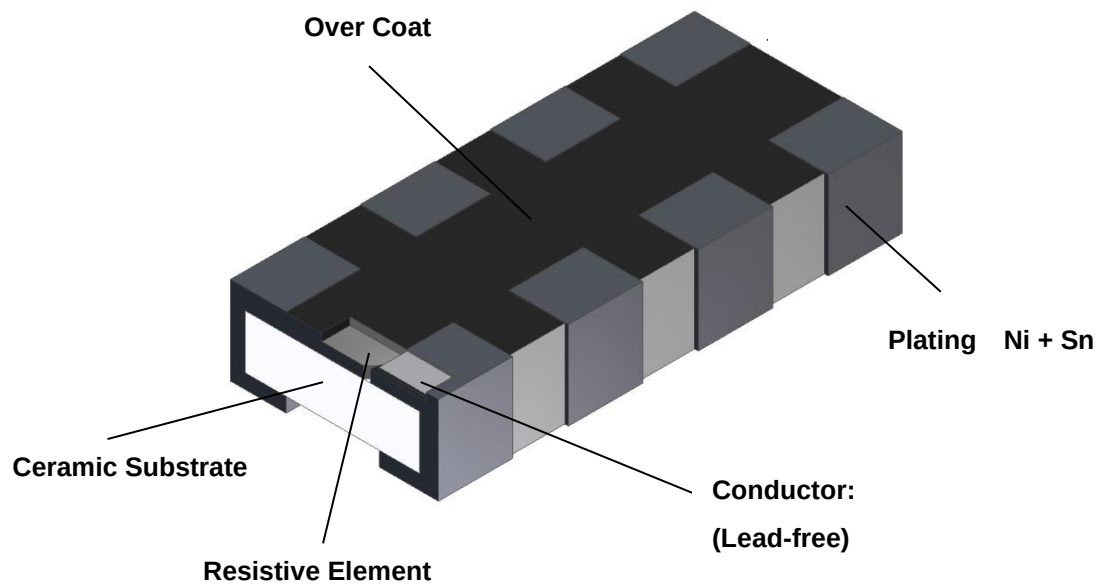
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1. Scope :

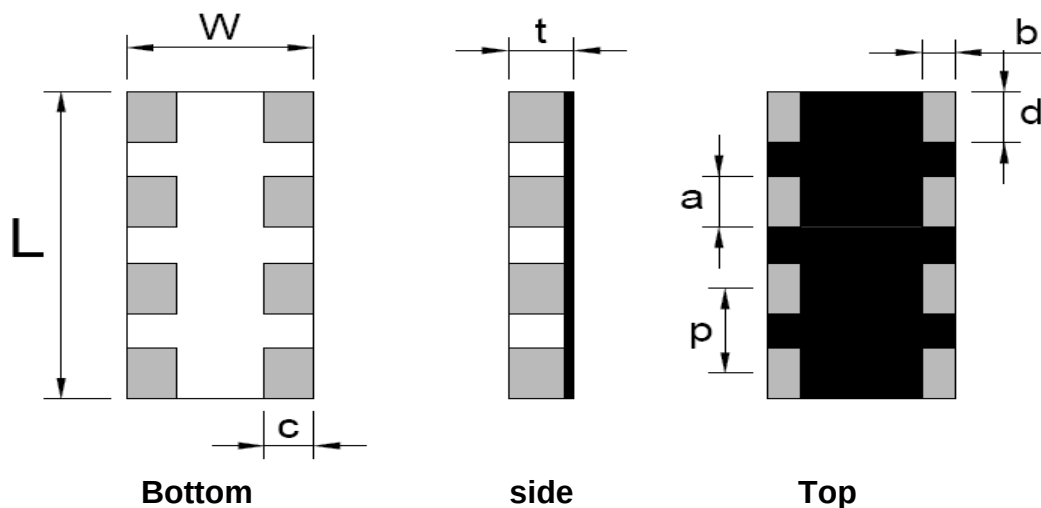
This specification applies for the CNF24 series of chip resistor arrays made by TA-I.

2. Construction , Dimensions , Schematic :

2.1 Construction :



2.2 Dimension :



UNIT : mm

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



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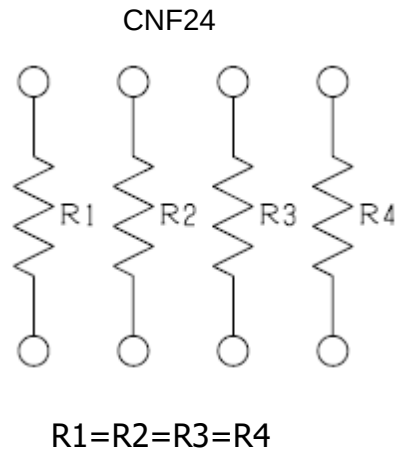
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2.3 Schematic



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 - $\pm 5\%$

G - $\pm 2\%$

F - $\pm 1\%$

T- Paper Tape

A: Totally Lead free+
Anti-Sulfurated

3 digits e.g.,:

(E-24) 103 = $10K\Omega$

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

0Ω THICK FILM 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℃ , power rating shall be derated in accordance with figure 1.

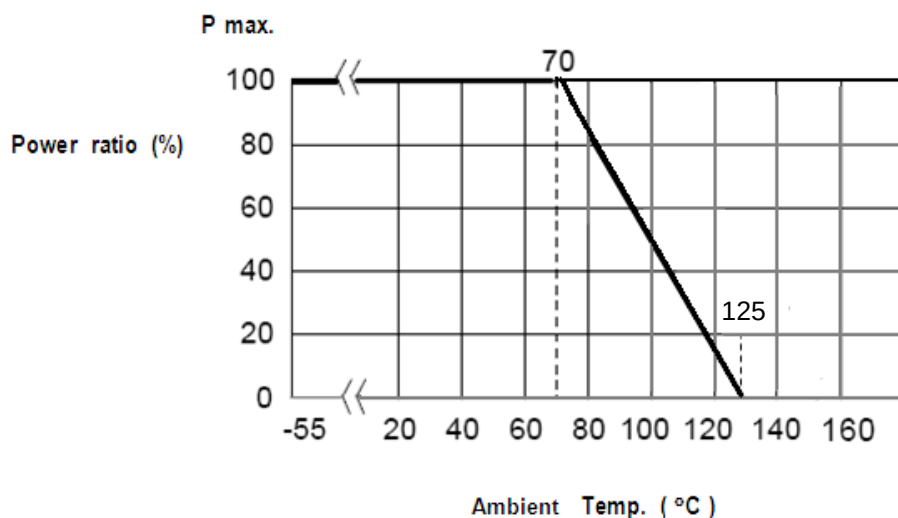


Figure 1

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 (ΔR)
Temperature Coefficient of Resistance	IEC60115-1-4.8 JIS-C5201-1-4.8	-55 $\sim$ +125 $^{\circ}\text{C}$	Refer 4.0
Short Time Overload	IEC60115-1-4.13 JIS-C5201-1-4.13	2.5 X rated voltage for 5 sec	$\pm(2.0\% + 0.1\Omega)$ 0 Ω : 50 m Ω 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	$\pm(5.0\% + 0.1\Omega)$ 0 Ω : 50m Ω or less
Load Life	IEC60115-1-4.25.1 JIS-C5201-1-4.25.1	1000 hours at rated voltage , 70 $^{\circ}\text{C}$, 1.5hours "ON " , 0.5hour "OFF"	1% : $\pm(1.0\% + 0.05\Omega)$ 5% : $\pm(3.0\% + 0.1\Omega)$ 0 Ω :100 m Ω or less
Load Life with Humidity	IEC60115-1-4.24 JIS-C5201-1-4.24	1000 hours at rated voltage , 40 $\pm$ 2 $^{\circ}\text{C}$, 90~95% RH 1.5hours "ON " , 0.5hour "OFF"	1% : $\pm(1.0\% + 0.05\Omega)$ 5% : $\pm(3.0\% + 0.1\Omega)$ 0 Ω :100 m Ω or less
Rapid Change of Temperature	IEC60115-1-4.19 JIS-C5201-1-4.19	-55 $^{\circ}\text{C}$ (30 min.) / +155 $^{\circ}\text{C}$ (30 min.) 5 cycles	1% : $\pm(0.5\% + 0.05\Omega)$ 5% : $\pm(1.0\% + 0.05\Omega)$ 0 Ω :50 m Ω or less
Solderability	IEC60115-1-4.17 JIS-C5201-1-4.17	245 $\pm$ 5 $^{\circ}\text{C}$ solder, 2 $\pm$ 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 $\pm$ 5 $^{\circ}\text{C}$ solder , 10 $\pm$ 1 sec dwell .	0.5%,1% : $\pm(1.0\% + 0.05\Omega)$ 2%,5% : $\pm(2.0\% + 0.1\Omega)$ 0 Ω : 50m Ω or less
Sulfuration Test	ASTM-B-809-95	Sulfur (Saturated Vapor) 1,000 hours,105 $\pm$ 2 $^{\circ}\text{C}$, unpowered	$\pm(2\% + 0.1\Omega)$

Note* : RCWV : Rated continuous working voltage .



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6. Marking

6.1 $\pm 5\%$ (E24)

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

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

6.2 $\pm 1\%$ (E96)

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

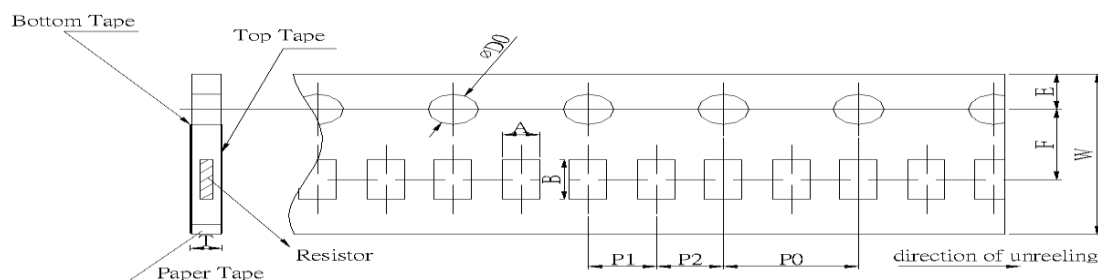
E.G. $4701 = 470 \times 10^1 = 4700 \Omega = 4.7k \Omega$

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	ϕ D0	T0
CNF24	1.2 $\pm$ 0.15	2.2 $\pm$ 0.2	8.0 $\pm$ 0.2	3.5 $\pm$ 0.05	1.75 $\pm$ 0.1	2.0 $\pm$ 0.1	2.0 $\pm$ 0.05	4.0 $\pm$ 0.1	+0.1 1.5 -0	0.64 $\pm$ 0.1

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



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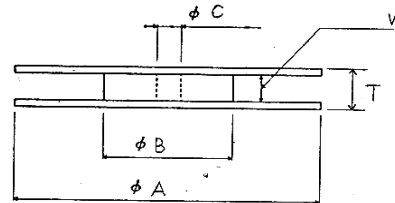
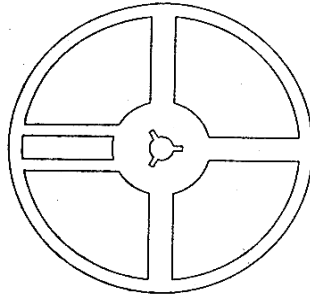
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7.2 Reel Specifications:



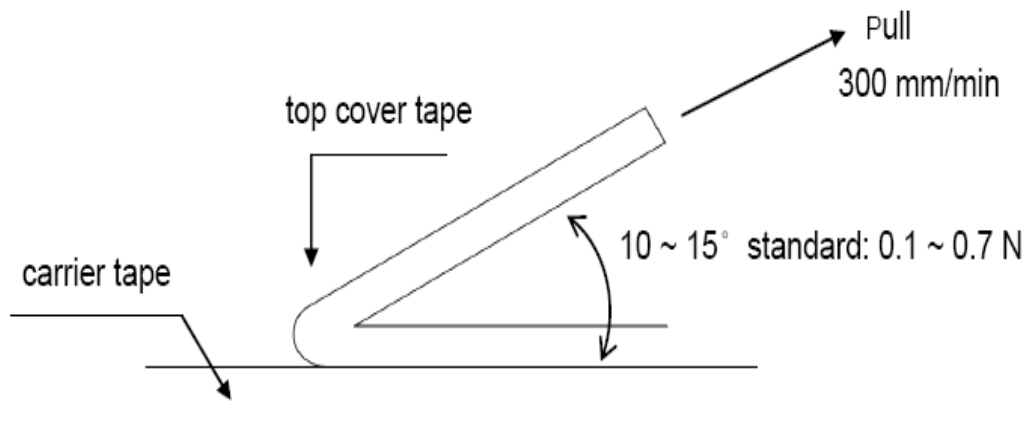
UNIT: mm

Type	ϕA	ϕB	ϕC	W	T
CNF24	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	9.0 ± 1.0	11.5 ± 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.





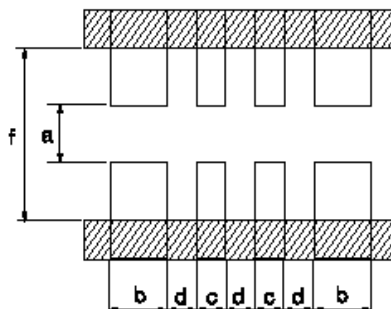
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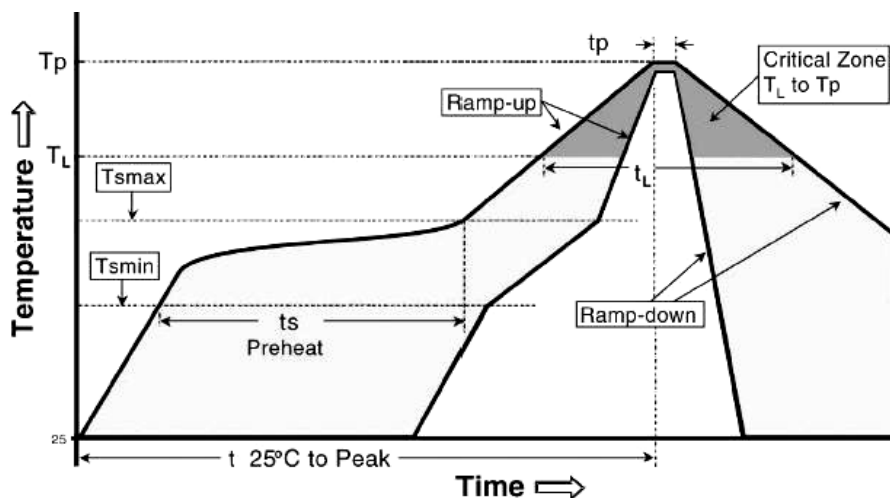
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8. Recommended land patterns



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

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



Profile Feature	Lead (Pb)-Free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C / second max.
Preheat - Temperature Min (Tsmin) - Temperature Max (Tsmax) - Time (Tsmin to Tsmax) (ts)	150°C 200°C 60 -120 seconds
Time maintained above : - Temperature (TL) - Time (tL)	217°C 60-150 seconds



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Peak Temperature (Tp)	260℃
Time within $+0^{\circ}\text{C}$ to -5°C of actual Peak Temperature (tp) ²	10 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8minutes max.

Allowed Re-flow times : 3 times

Remark : To avoid discoloration phenomena of chip on terminal electrodes,
please use N2 Re-flow furnace.

10. Storage Conditions:

Temperature : 5 to 35 °C

Related Humidity :40 to 75% RH

11. Shelf Life :

2 Years from manufacturing date.

12. 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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13. Manufacturing Country & City :

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

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(3) FORTUNE TASK ENTERPRISES LIMITED.(China – Dongguan)

Tel : (+86) 769-8339-4790~3 Fax : (+86) 769-8339-4794

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

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