

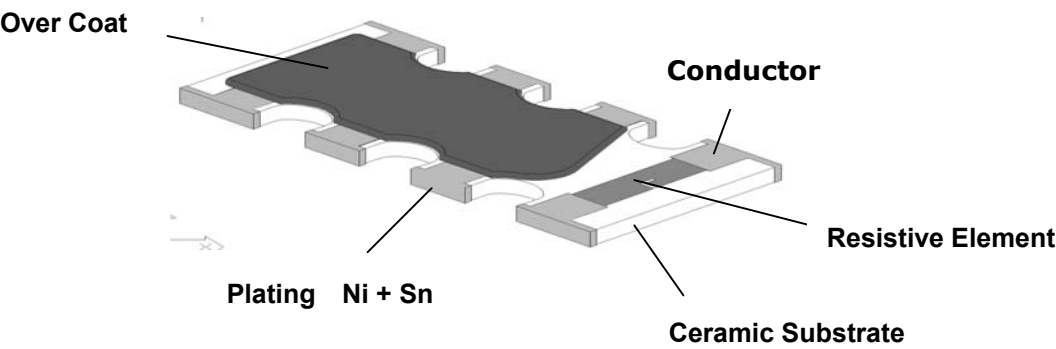
TA-I	Thick Film Chip Resistor Arrays Thick Film Chip Resistor Networks (LEAD-FREE FOR CN SERIES STANDARD)	No	TCN-XXOS001E
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1. Scope :

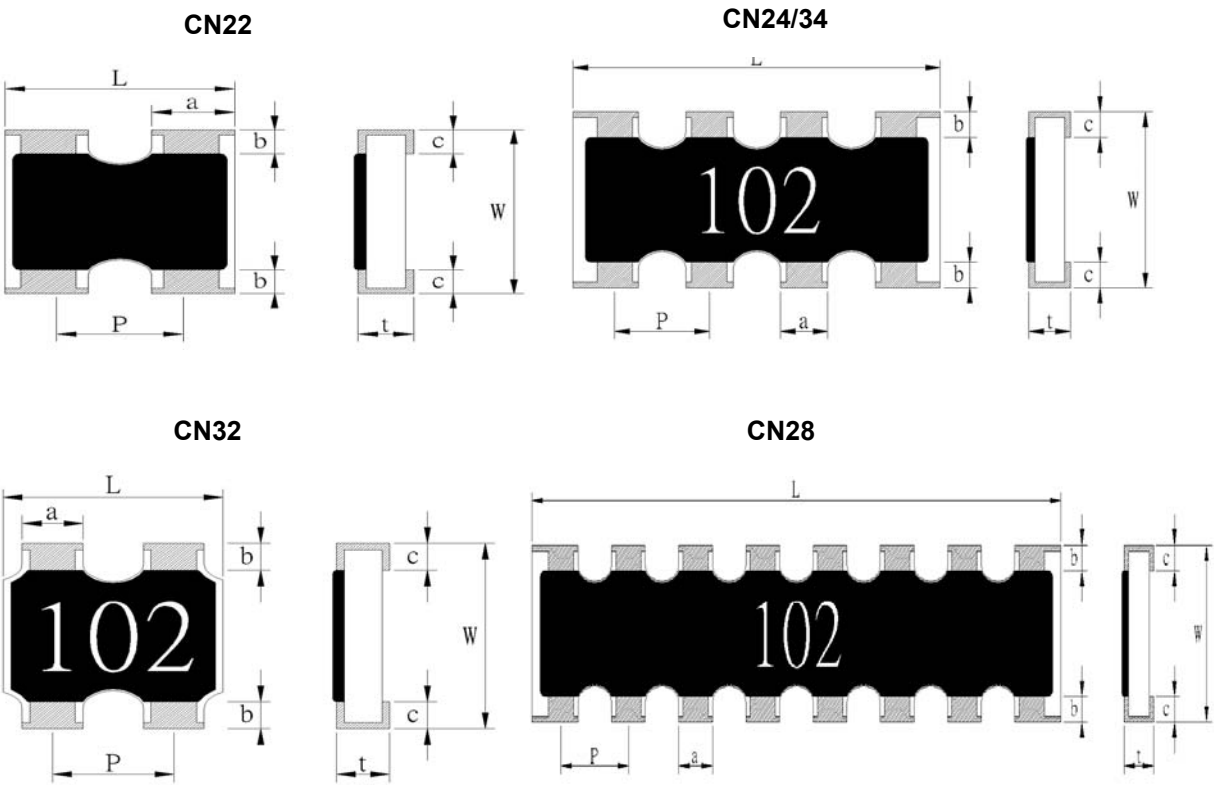
This specification applies for the CN series of thick film chip resistor arrays & chip resistor networks made by TA-I.

2. Construction , Dimensions , Schematic :

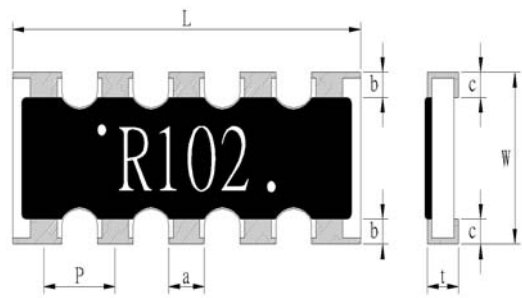
2.1 Construction :



2.1.1 Chip Resistor Arrays :



2.1.2 Chip Resistor Networks

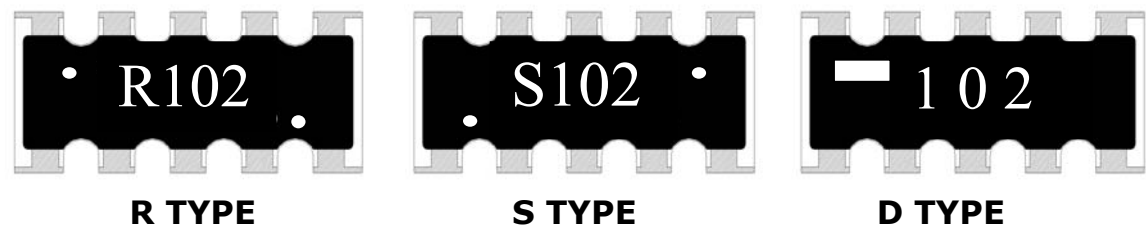


2.2 Dimension :

UNIT: mm

Style	L	W	t	P	a	b	c
CN22	1.0 ± 0.1	1.0 ± 0.1	0.35 ± 0.1	0.65 ± 0.1	0.33 ± 0.1	0.15 ± 0.1	0.25 ± 0.1
CN24	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
CN28	4.0 ± 0.2	1.6 ± 0.15	0.4 ± 0.1				
CN32	1.6 ± 0.15	1.6 ± 0.15	0.45 ± 0.1	0.76 ± 0.1	0.6 ± 0.1	0.3 ± 0.2	0.3 ± 0.2
CN34	3.2 ± 0.2	1.6 ± 0.15	0.5 ± 0.1	0.8 ± 0.05	0.45 ± 0.1	0.3 ± 0.2	0.3 ± 0.2
CN35				0.6 ± 0.05	0.35 ± 0.1		

2.3 Schematic :



CN22, CN32	CN24, CN34	CN28 16P8R	CN35, 10P8R	9P8R
			<div> <div> (S circuit) </div> <div> (R circuit) </div> <div> (D circuit) </div> </div>	

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3. Type Designation:

3.1 Chip Resistor Arrays

<u>CN</u>	<u>34</u>	<u>J</u>	<u>TN</u>	<u>103</u>
Product Code CN : Chip Resistor Array	size Power Rating	Tolerance	Packaging	Nominal Resistance
<div>22-0402*2</div> <div>24-0402*4</div> <div>28-0402*8</div> <div>32-0603*2</div> <div>34-0603*4</div> <div>35-0603*5</div>		<div>J-±5%</div> <div>G-±2%</div> <div>F-±1%</div>	<div>T- Paper Tape</div> <div>N : Lead-free</div>	<div>3 digits E.G.:</div> <div>(E-24) 103 = 10K</div> <div>5R6 = 5.6Ω</div> <div>4 digits E.G. :</div> <div>(E-96) 1540 = 154Ω</div> <div>43R2 = 43.2Ω</div>

3.2 Chip Resistor Networks

<u>CN</u>	<u>35</u>	<u>J</u>	<u>TN</u>	<u>R</u>	<u>103</u>
Product Code	Size	Tolerance	Packaging	Circuit	Resistance value
CN : Chip Resistor Array	Power Rating				
35-0603*5	J-±5%	T-Paper tape +N : Lead-Free	R-10P8R 5.10 com s-10P8R 1.6 com D-9P8R 10 com	3 digits E.G. : (E-24)103 = 10K	

Note :
TN : Lead-Free products packaged by paper tape

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4. Ratings & Characteristics :

Style	Power Rating at 70℃	Rating Voltage	Max. Working Voltage	Max. Over Load Voltage	Operating Temp. (℃)	Resistance Tolerance (%)	Resistance Range (Ω)	Temp Co-efficient PPM/℃	
CN22	1/16W	Refer 4.2	25V	50V	-55 ∩ +125℃	±1%	10Ω~1MΩ	±250	
CN24									
CN28			50V	100V		±5%	10Ω~1MΩ	±200	
CN32									
CN34									
CN35			25V	50V					

0Ω THICK FILE CHIP RESISTOR ARRAYS			
STYLE	Rate Current	Max Overload Current	Resistance Range
CN Series	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.

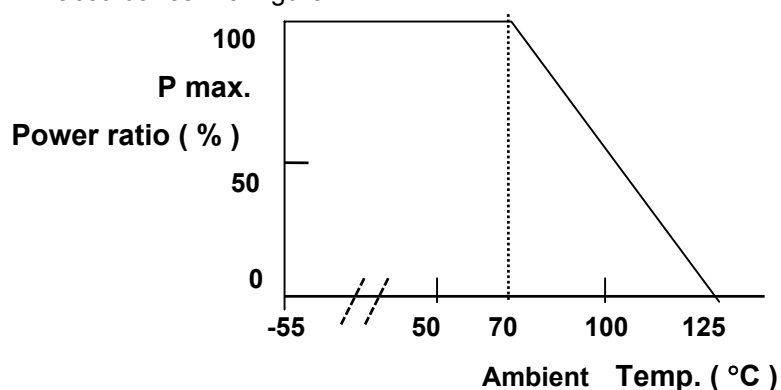


Figure 1

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 CN34JTN102 the rated voltage ?

CN34JTN102 P:1/16W ; R:102 = 1KΩ = 1000Ω

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

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5. Reliability Tests:(As specified in JIS C 5202)

Temperature Coefficient of Resistance	JIS-C5202-5.2	+25~ +125 °C	Refer 5.0
Short Time Overload	JIS-C5202-5.5	2.5 X rated voltage for 5s	$\pm(2.0\%+0.1\Omega)$ 0 Ω : 50 m Ω or less
Intermittent Overload Test	JIS-C5202-5.8	2.5X rated power 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	JIS-C5202-7.10	1000 hours at rated voltage , 70°C , 1.5hours "ON " , 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$ 0 Ω :100 m Ω or less
Load Life with Humidity	JIS-C5202-7.9	1000 hours at rated voltage , 40 \pm 2°C , 90~95% RH 1.5hours "ON " , 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$ 0 Ω :100 m Ω or less
Rapid Change of Temperature	JIS-C5202-7.4	-55°C (30 min.) / +125 °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	JIS-C5202-6.11	245 \pm 5°C solder, 3 \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.
Robustness of Termination (Bending Strength)	JIS-C5202—6.1	3mm deflection	0.5%,1%: $\pm(0.5\%+0.05\Omega)$ 2%,5%: $\pm(1.0\%+0.05\Omega)$ 0 Ω : 50m Ω or less
Dielectric Withstanding Voltage (Voltage Proof)	JIS-C5202-5.7	Applying voltage 100V for 1 minute.	No abnormalities such as flashover, burning dielectric breakdown shall appear.
Resistance to Dry Heat	JIS-C5202-7.2	125 \pm 5°C for 96 \pm 4hrs	0.5%,1%: $\pm(1.0\%+0.05\Omega)$ 2%,5%: $\pm(2.0\%+0.1\Omega)$ 0 Ω : 50m Ω or less
Resistance to Soldering Heat	JIS-C5202-6.10	270 \pm 5°C solder , 10 \pm 1 sec dwell .	1%: $\pm(0.5\%+0.05\Omega)$ 5%: $\pm(1.0\%+0.05\Omega)$ 0 Ω :50 m Ω or less

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Whisker	SONY SS-00254-8	<p>Component , Lead-Free Soldering part 8 : Solder Heat Resistance Test for SMD. Lead-Free Soldering “</p> <p>Temp. Cycles : -35 ± 5℃ / 125 ± 5℃ , Keep 7 min Testing duration : 500±4 hours</p> <p>Temp. Humidity Chambers: Temperature : 85℃ Humidity : 85% RH Testing duration : 500±4 hours .</p>	Whisker formation : 50 um or less .
Resistance to soldering heat	SONY SS-00254-5	<p>Component , Lead-Free Soldering part 5 : Solder Heat Resistance Test for SMD. Lead-Free Soldering “</p> <p>Flow Solder : Pre – heat : 100 to 105 ℃ 30±5 sec Temperature : 260±3℃ 10 +1/- 0 sec The entire sample shall be dipped in solder. The specimen shall be stored at standard atmospheric conditions for 1 hour .</p> <p>Iron Solder : Bit temperature : 350 ±10℃ Application time of soldering iron : 3 +1/- 0sec Apply the soldering iron to the electrode . The specimen shall be stored at standard atmospheric conditions for 1 hour , after which the measurements shall be made</p>	Electrical characteristics shall be Satisfied . Without distinct deformation in appearance

Note* : RCWV : Rated continuous working voltage .

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 Ω , and the third digit represents exponent for base of 10.

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

6.2 ±1% (E96)

Resistance value is expressed by 3 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.

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

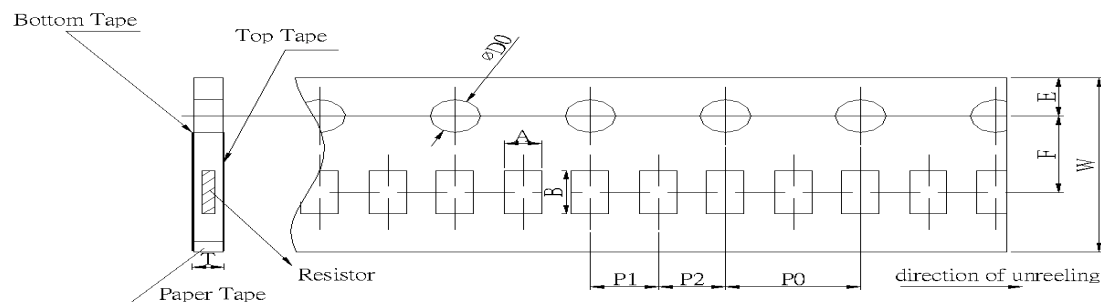
6.3 No Marking for CN22

7. Taping & Reel

7.1 Taping Dimensions

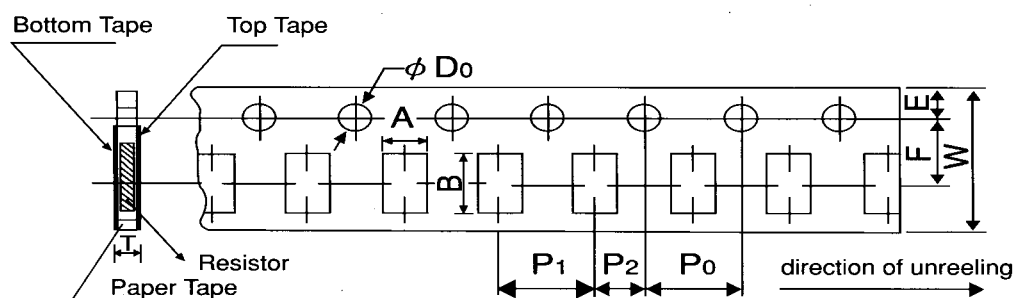
7.1.1 2 mm pitch paper

UNIT: mm



Style	A	B	W	F	E	P1	P2	P0	$\phi D0$	T0
CN22	1.2±0.15	1.2±0.1	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	0.45±0.1
CN24		2.2±0.2								0.64±0.1

7.1.2 4 mm pitch paper

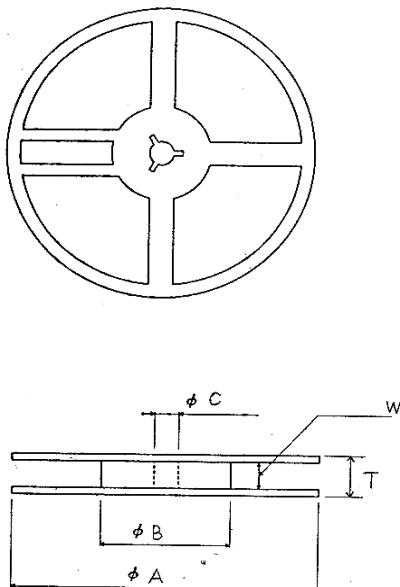


UNIT: mm

Style	A	B	W	F	E	P1	P2	P0	$\phi D0$	T
CN28	1.9±0.2	4.3±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	1.5 +0.1 -0	0.84±0.1
CN32	1.8±0.2	1.8±0.2								
CN34, 35	2.0±0.15	3.6±0.2								

Package Style	Paper Tape			
	4 mm pitch		2 mm pitch	
	180mm/R	250mm/R	180mm/R	250mm/R
CN22			10000	20000
CN24			10000	20000
CN28	5000			
CN32	5000			
CN34	5000	10000		
CN35	5000	10000		

7.2 Reel Specifications

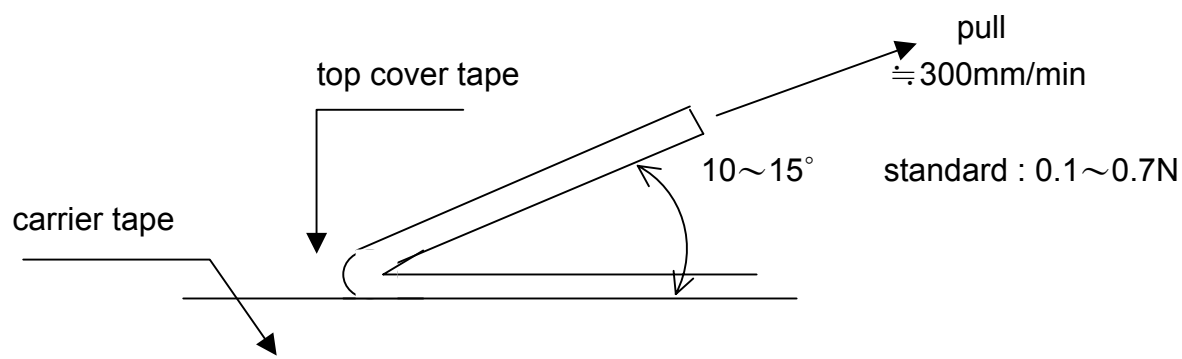


UNIT: mm

Style	ϕA	ϕB	ϕC	W	T
CN22/24/28 CN32/34/35	178.0 ± 1.0	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.

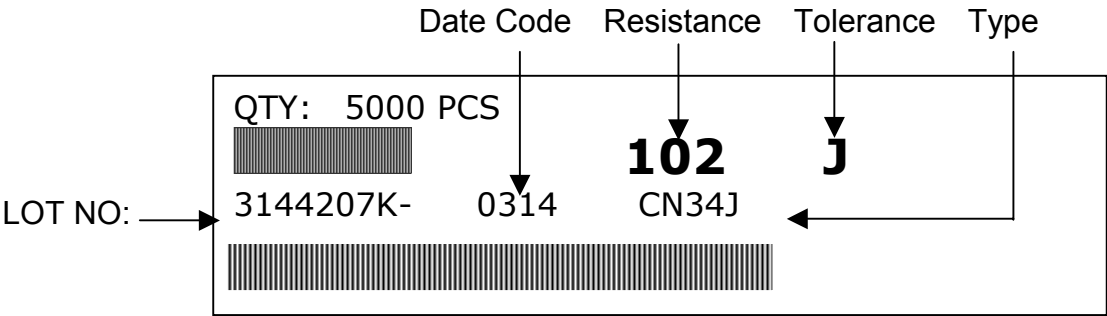


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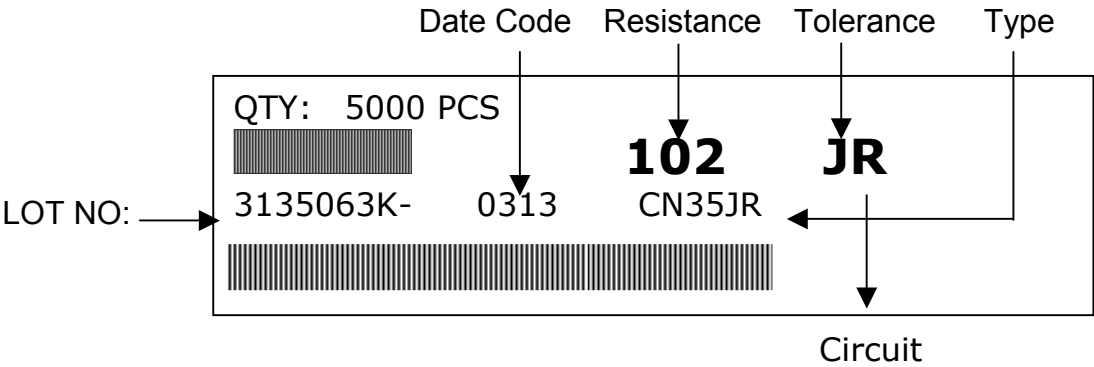
8. Label

8.1 Manufacture Label :

8.1.1 Chip Resistor Array

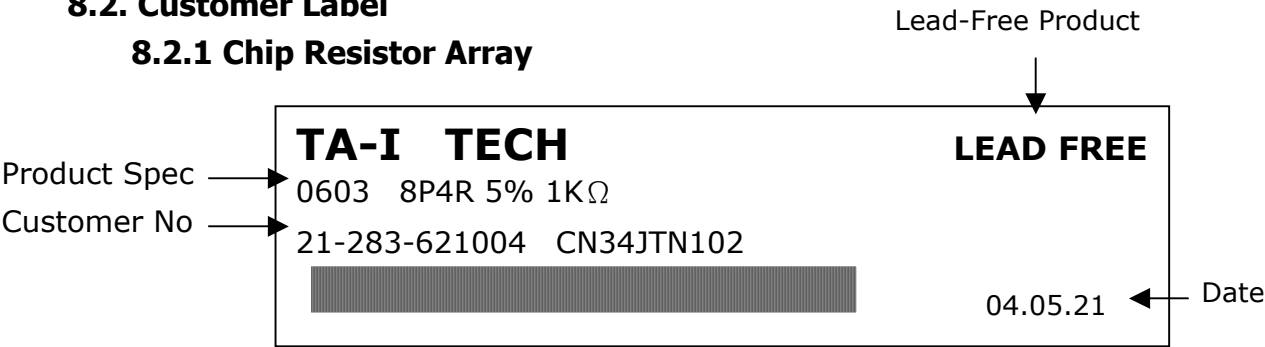


8.1.2 Chip Resistor Networks

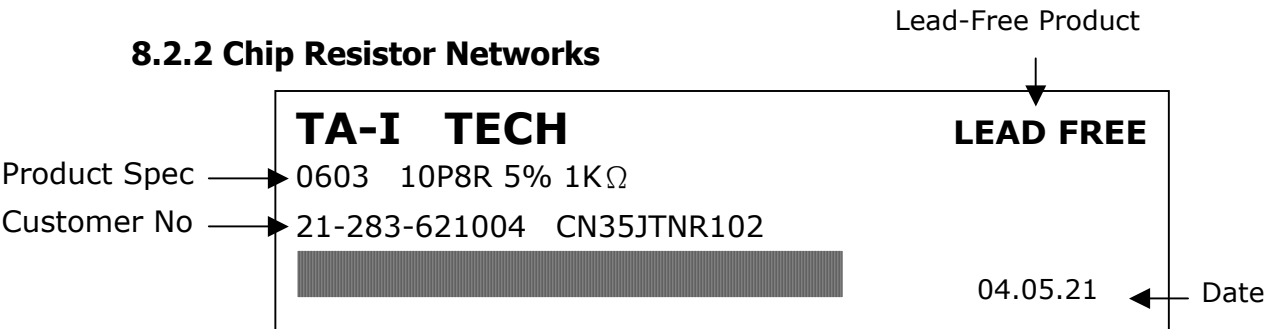


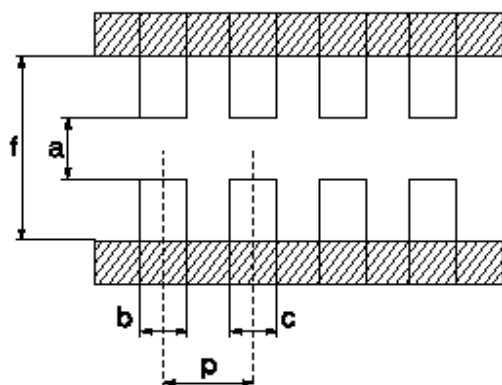
8.2. Customer Label

8.2.1 Chip Resistor Array

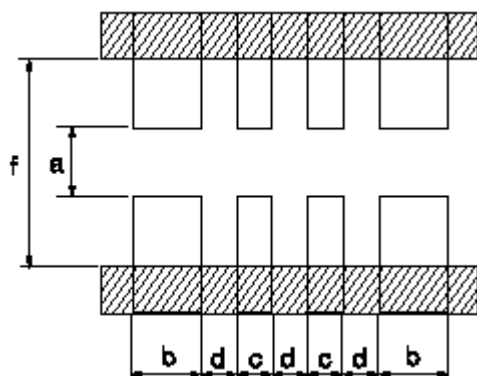


8.2.2 Chip Resistor Networks

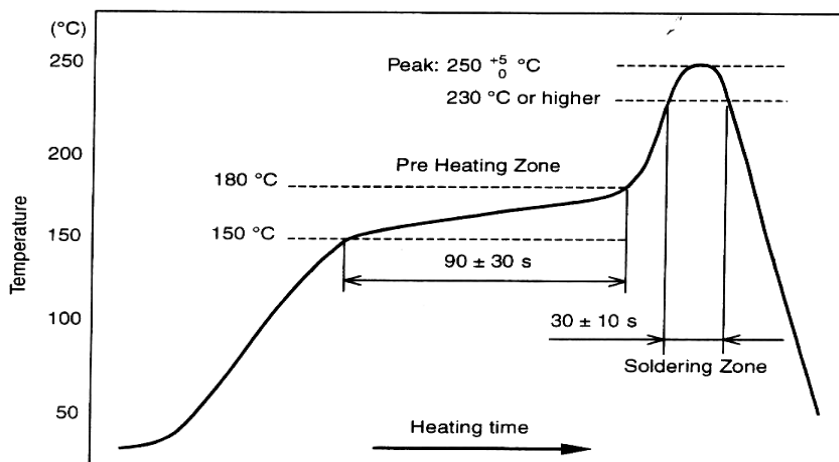


9. Recommended land patterns :**9.1 CN22,CN32,CN34,CN35**

Land pattern		Dimension (mm)				
Style	Size	a	b	c	p	f
CN	22	0.5	0.35~0.4	0.35~0.4	0.65	1.4~1.5
CN	32	0.7~0.9	0.4~0.5	0.4~0.5	0.8	2.2~2.6
CN	34	0.7~0.9	0.4~0.5	0.4~0.5	0.8	2.2~2.6
CN	35	0.7~0.9	0.4~0.5	0.3~0.4	0.64	2.2~2.6

9.2 CN24 ,CN28

Land pattern		Dimension (mm)				
Style	Size	a	b	c	d	f
CN	24	0.4	0.525	0.25	0.25	1.4
CN	28	1.0	0.425	0.25	0.25	2.0

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

Peak : $250 \begin{smallmatrix} +5 \\ -0 \end{smallmatrix}^{\circ}\text{C}$, 5 sec

Pre – heat Zone : 150 to 180 °C , 90 ± 30 sec

Soldering Zone : 230°C or higher , 30 ± 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 – Dong Guan)

Tel : 86-769-3394790 Fax : 86-769-3394794

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

Tel :86- 512-3457879 Fax : 86-512-3457869

(3) TAI OHM ELECTRONICS (M) SDN. BHD. (Malaysia – Pulaupinang)

Tel :604- 3900480 Fax : 604-3901481

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

Tel :002-62-21-44820254 Fax : 002-62-21-44820256

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Revise record

Date	Content	Owner
2005/11/25	2. Construction , Dimensions , Schematic : Adding to “R”, ”S”, ”D” type 4. Ratings & Characteristics : Adding Rating Voltage	Hank Liu