



**Thick Film Chip Resistor Arrays  
Thick Film Chip Resistor Networks  
( CN Series Standard )  
Halogen-Free**

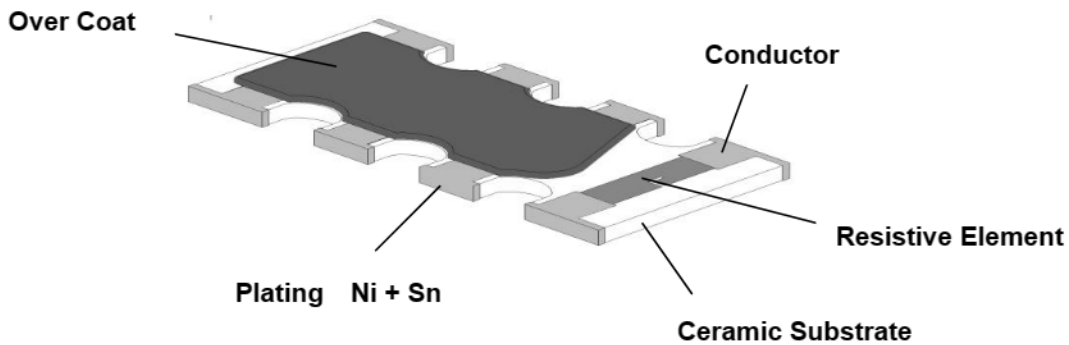
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**1. Scope :**

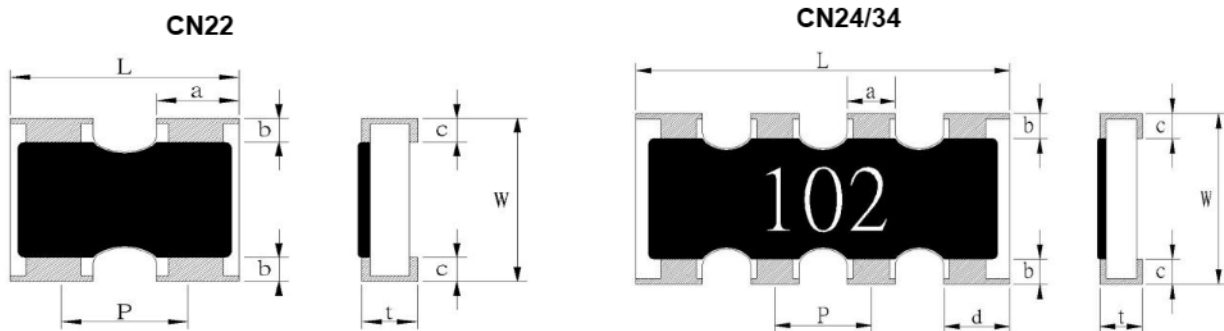
This specification applies for the CN series of thick film chip resistor arrays & chip resistor networks made by TA-I.

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

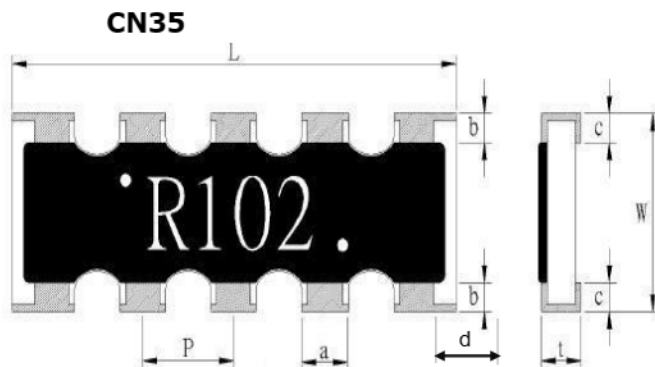
**2.1 Construction :**



**2.1.1 Chip Resistor Arrays :**



**2.1.2 Chip Resistor Networks**





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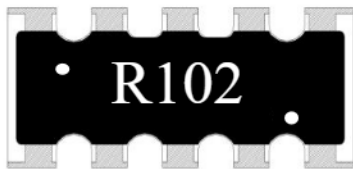
**2.2 Dimension :**

UNIT: mm

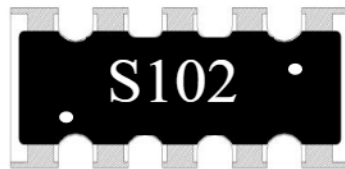
Type	L	W	t	P	a	b	c	d
CN22	1.0 ± 0.1	1.0 ± 0.1	0.35 ± 0.1	0.65 ± 0.1	0.33 ± 0.1	0.15 ± 0.1	0.25 ± 0.1	0.33 ± 0.1
CN24	2.0 ± 0.1	1.0 ± 0.1	0.4 ± 0.1	0.5 ± 0.05	0.3 ± 0.1	0.15 ± 0.1	0.25 ± 0.1	0.4 ± 0.1
CN34	3.2 ± 0.2	1.6 ± 0.15	0.5 ± 0.1	0.8 ± 0.05	0.45 ± 0.1	0.3 ± 0.2	0.3 ± 0.2	0.6 ± 0.1
CN35				0.64 ± 0.05	0.35 ± 0.1			0.5 ± 0.1

**2.3 Schematic :**

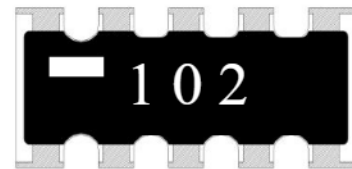
**CN35**



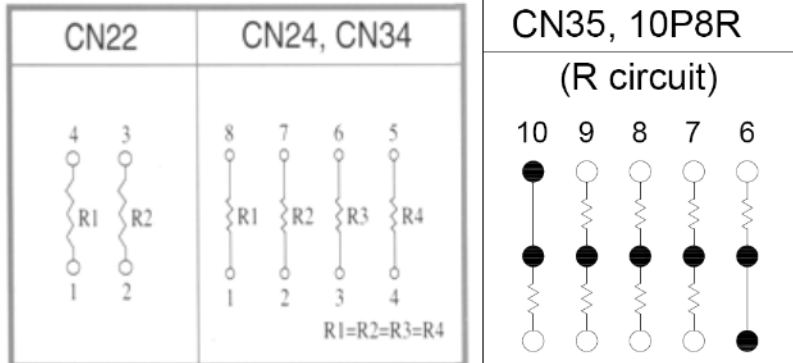
**R TYPE**



**S TYPE**



**D TYPE**





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**3. Type Designation:**

**3.1 Chip Resistor Arrays**

**CN**

**34**

**J**

**TN**

**103**

Product Code  
CN : Chip Resistor Array

size  
Power Rating

Tolerance

Packaging

Nominal  
Resistance

22-0402*2 24-0402*4 34-0603*4 35-0603*5	J-±5% G-±2% F-±1%	T- Paper Tape <hr/> N : normal (RoHS Exclusion clause) W : Totally Lead free	3 digits E.G.: (E-24) 103 = 10KΩ 5R6 = 5.6Ω 0 = 0Ω 4 digits E.G. : (E-96) 1540 = 154Ω 43R2 = 43.2Ω
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**3.2 Chip Resistor Networks**

**CN**

**35**

**J**

**TN**

**R**

**103**

Product Code  
CN : Chip Resistor Array

Size  
Power Rating

Tolerance

Packaging

Circuit

Resistance value

35-0603*5	J-±5%	T-Paper tape <hr/> N : normal (RoHS Exclusion clause) W : Totally Lead free	R-10P8R 5.10 com	3 digits E.G. : (E-24)103 =10KΩ
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**Note :**

TN : Lead-Free products packaged by paper tape.



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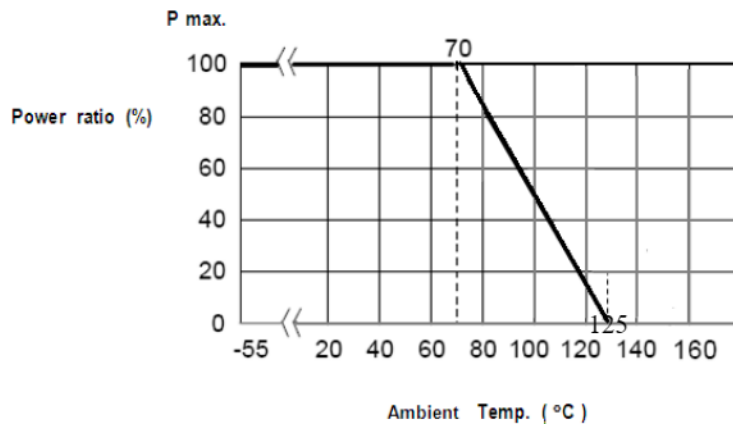
**4. Ratings & Characteristics :**

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
CN22	1/16W	Refer 4.2	25V	50V	-55 ∩ +125°C	±5%	10Ω~1MΩ	±250
CN24			50V	100V		±2%	10Ω~1MΩ	±200
CN34			25V	50V		±1%	56Ω~100KΩ	±200
CN35			50V	100V			±400	
CN22			25V	50V		±5%	3.0Ω~9.1Ω	±500
CN24								

0Ω THICK FILE CHIP RESISTOR ARRAYS			
Type	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:**

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 $\pm$ 2°C, 90~95% RH 1.5hours "ON" , 0.5hour "OFF"	1%: $\pm(1.0\%+0.05\Omega)$ 5%: $\pm(3.0\%+0.1\Omega)$ 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 $\pm$ 5°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°C solder , 10 $\pm$ 1 sec dwell .	0.5%, 1%: $\pm(1.0\%+0.05\Omega)$ 2%, 5%: $\pm(2.0\%+0.1\Omega)$ 0Ω : 50mΩ or less

Note\* : RCWV : Rated continuous working voltage .



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**6. Marking**

**6.1 ±2% & ±5%(E24) : CN24 / 34 / 35**

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) : CN24 / 34**

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

**6.3 CN24 / 34 / 35**

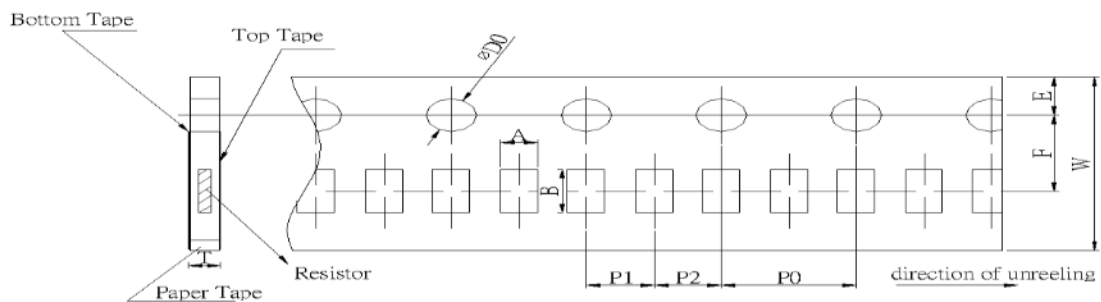
E.G. :  $0 = 0 \Omega$

**6.4 No Marking for CN22**

**7. Taping & Reel**

**7.1 Taping Dimensions**

**7.1.1 2 mm pitch paper**



**UNIT: mm**

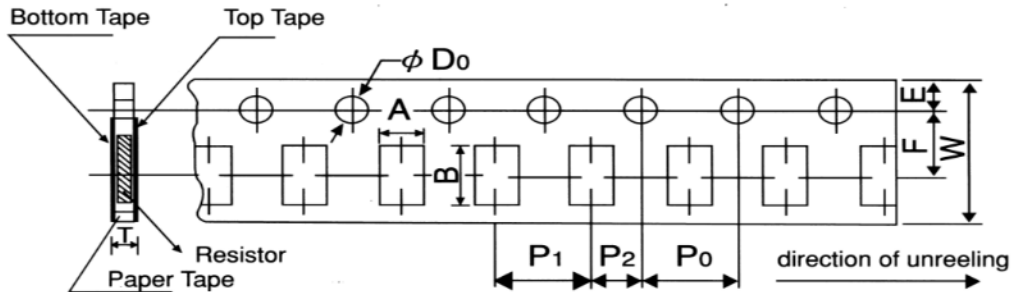
Type	A	B	W	F	E	P1	P2	P0	$\phi$ D0	T0
CN22	1.2±0.15	1.2±0.1	8.0±0.2	3.5±0.05	1.75±0.1	2.0±0.1	2.0±0.05	4.0±0.1	+0.1	0.45±0.1
CN24		2.2±0.2							-0	0.64±0.1



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**7.1.2 4 mm pitch paper**

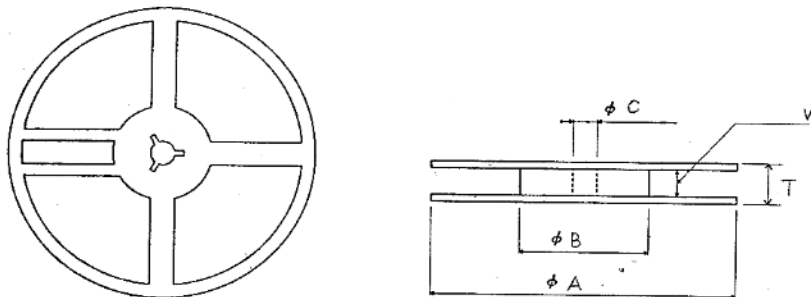


UNIT: mm

Type	A	B	W	F	E	P1	P2	P0	φ D0	T
CN34 , 35	2.0±0.15	3.6±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	+0.1 -0	0.84±0.1

Package Type	Paper Tape			
	4 mm pitch		2 mm pitch	
	178mm/R	250mm/R	178mm/R	250mm/R
CN22			10000	20000
CN24			10000	20000
CN34	5000	10000		
CN35	5000	10000		

**7.2 Reel Specifications**



UNIT: mm

Type	φ A	φ B	φ C	W	T
CN 22/24 CN 34/35	178.0 ± 2.0	60.0 ± 1.0	13.0 ± 1.0	9.0 ± 1.0	11.5 ± 1.0

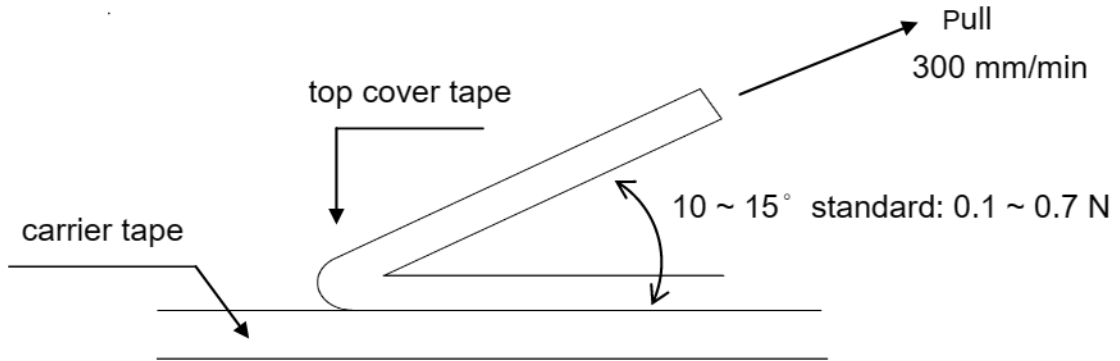


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**7.3 Peel off Strength:**

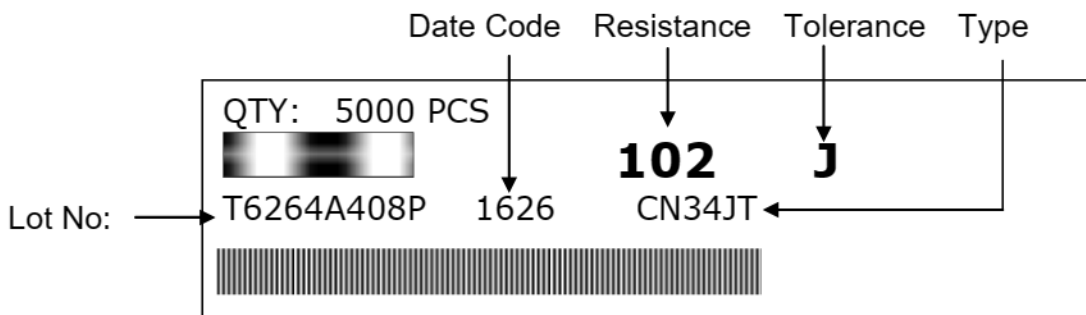
Peel –off force of paper and blister tape is in accordance with “JIS-C5202” that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.



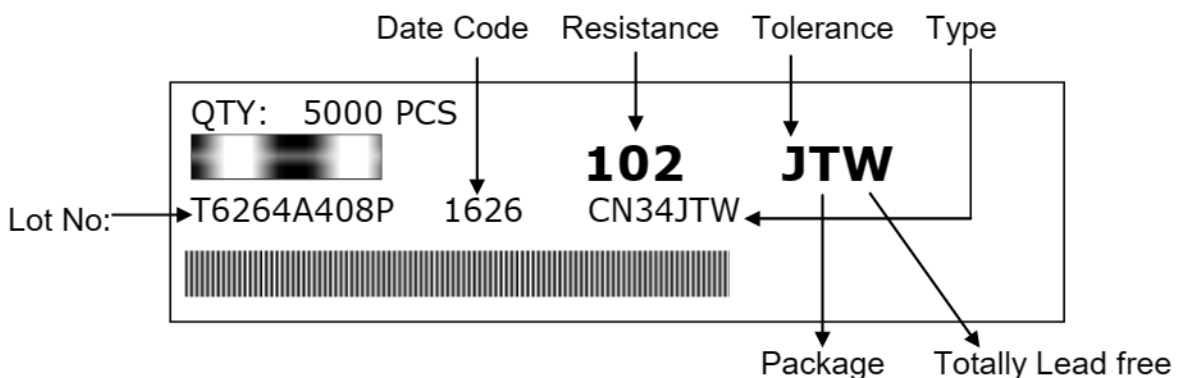
**8. Label**

**8.1 Manufacture Label :**

**8.1.1 Chip Resistor Array : Normal (RoHS Exclusion clause)**



**8.1.2 Chip Resistor Array : Totally Lead free**



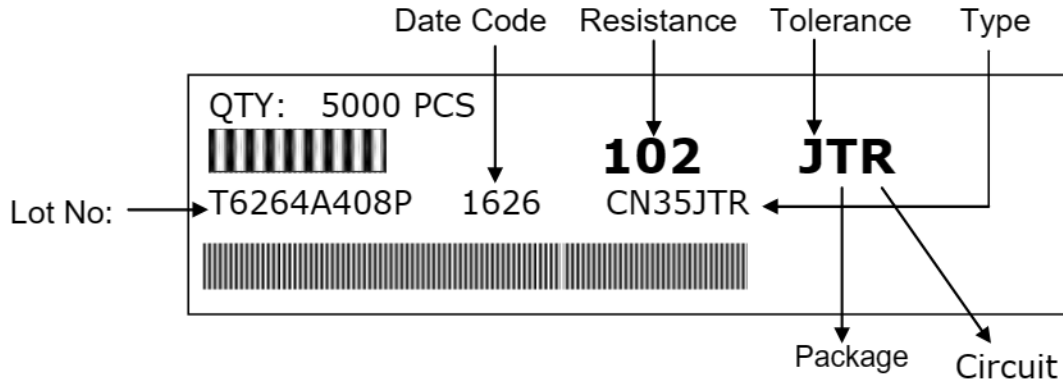




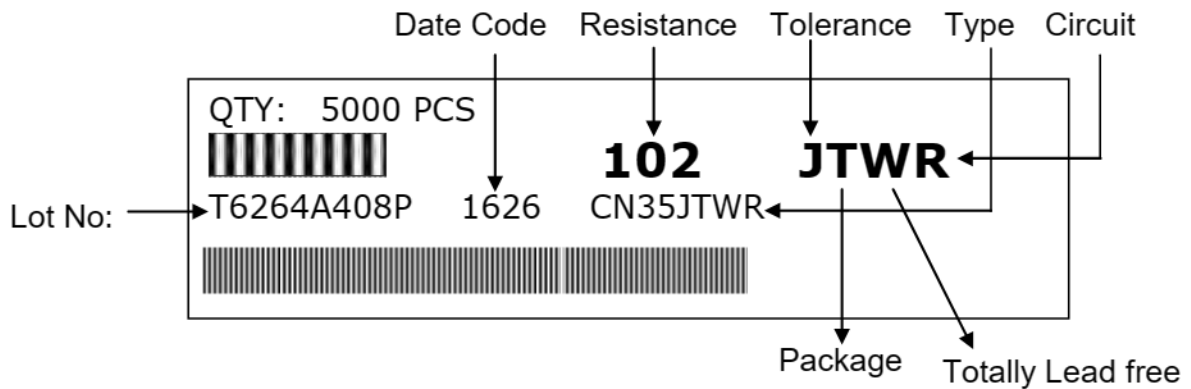
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**8.1.3 Chip Resistor Networks : Normal (RoHS Exclusion clause)**

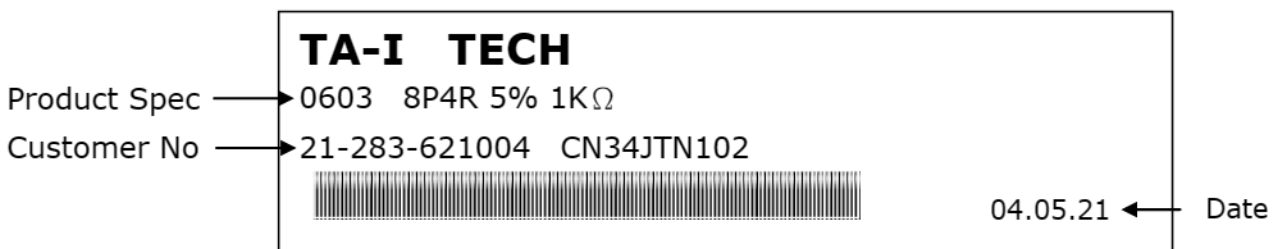


**8.1.4 Chip Resistor Networks : Totally Lead free**

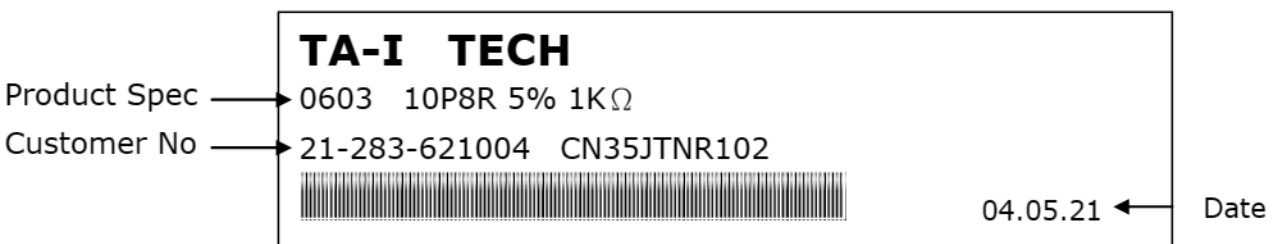


**8.2. Customer Label ( By customer request ) :**

**8.2.1 Chip Resistor Array :**



**8.2.2 Chip Resistor Networks :**



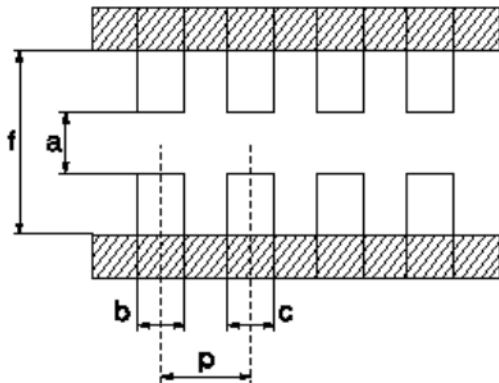


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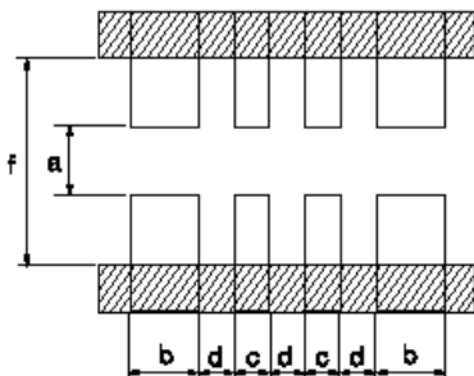
**9. Recommended land patterns :**

**9.1 CN22, CN34,CN35**



Type	Size	Land pattern				
		Dimension ( mm )				
		a	b	c	p	f
CN	22	0.5	0.35~0.4	0.35~0.4	0.65	1.4~1.5
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**



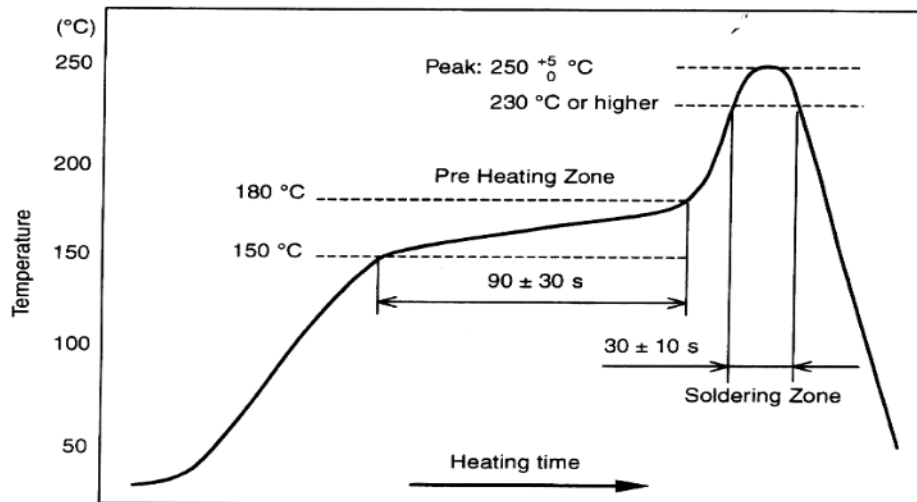
Type	Size	Land pattern				
		Dimension ( mm )				
		a	b	c	d	f
CN	24	0.4	0.525	0.25	0.25	1.4



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



Peak :  $250 \begin{matrix} +5 \\ -0 \end{matrix} \text{ } ^\circ\text{C}$  , 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 – 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 )  
Tel : 62-21-89830123 Fax : 62-21-89830703



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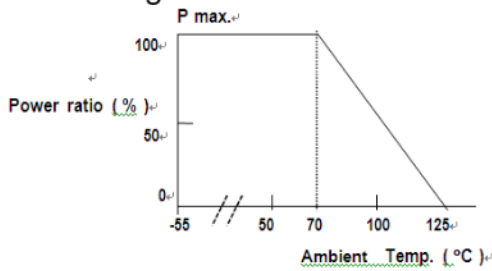
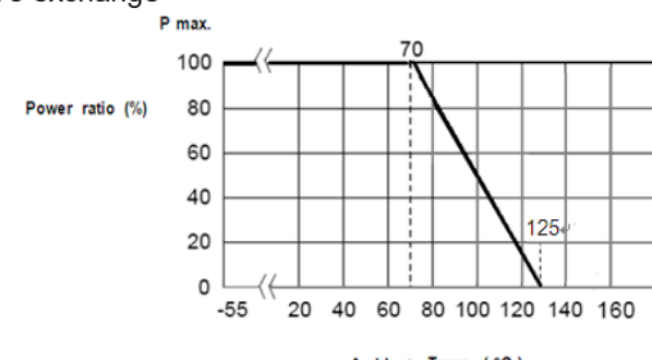
**Revise record**

Date	Content	Owner																	
Nov.25.2005	2. Construction , Dimensions , Schematic : Adding to "R", "S", "D" type 4. Ratings & Characteristics : Adding Rating Voltage	Hank Liu																	
Dec.12.2005	5. Reliability Tests: Intermittent Overload : 3X rate power changed 2.5X rated voltage Whisker : -35±5°C / 125±5°C, Keep 7 min changed -55°C (30 min.) / +155°C (30 min. )	Hank Liu																	
Jul.06.2006	2.1 Conductor : Adding to (Lead-free or with lead) 5. Reliability Tests: Temperature Coefficient of Resistance : Refer 5.0 changed Refer4.0 8.1 Manufacture label : Series number 3 codes changed to 4 codes 14. Manufacturing Country & City: Adding TA-I TECHNOLOGY (DONGGUAN ) CO., LTD	Vincent																	
Nov.13.2006	4. Ratings & Characteristics : Adding resistance range 5.1 Ω – 9.1 Ω for CN34 type 5% product .	Vincent																	
Mar.28.2007	2.2 Dimension CN28 b : from 0.15 ± 0.1 revise to 0.25 ± 0.1 CN35 p : from 0.6 ± 0.05 revise to 0.64 ± 0.05	Vincent																	
May.31.2007	<b>4. Ratings &amp; Characteristics :</b> CN35 Resistance Range ( Ω ) : 10Ω ~1MΩ changed to <b>56Ω ~1MΩ</b>	Vincent																	
Aug.23.2007	Adding resistance range <table border="1" style="margin-left: 20px;"> <tr> <td>CN32</td> <td rowspan="3">1/16W</td> <td rowspan="3">Refer 4.2</td> <td>50V</td> <td>100V</td> <td rowspan="3">-55 ∩ +125°C</td> <td rowspan="3">±5%</td> <td rowspan="3">3.0Ω~9.1Ω</td> <td>±400</td> </tr> <tr> <td>CN22</td> <td>25V</td> <td>50V</td> <td>±500</td> </tr> <tr> <td>CN24</td> <td></td> <td></td> <td></td> </tr> </table>	CN32	1/16W	Refer 4.2	50V	100V	-55 ∩ +125°C	±5%	3.0Ω~9.1Ω	±400	CN22	25V	50V	±500	CN24				Vincent
CN32	1/16W	Refer 4.2			50V	100V				-55 ∩ +125°C	±5%	3.0Ω~9.1Ω	±400						
CN22					25V	50V							±500						
CN24																			
June.19.2008	1. Reliability test : To delete special customer's standard: SS-00254 standard. 2. Resistance range of CN35 To correct resistance range from 1MΩ 56~1MΩ to 56~100KΩ .	Vincent																	
March.10.2011	Reliability test : Reference standard from JIS-5202 change to IEC60115 & JIS-C5201	Kate																	
June 27.2011	Adding Dimension "d" CN24/CN28: 0.4 ± 0.1mm CN34: 0.6 ± 0.1mm CN35: 0.5 ± 0.1mm	Kate																	



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<p>June 19.2012</p>	<p>4.1 Derating Curve :</p>  <p>Figure 1</p> <p>To exchange</p> 	<p>kate</p>
<p>July 25.2012</p>	<p>Adding Halogen-free words</p>	<p>kate</p>
<p>Nov 07.2012</p>	<p>6. Marking : 6.2 <math>\pm 1\%</math>(E96) : From 3 digits make corrections 4 digits</p>	<p>ken</p>
<p>JUNE.27.2016</p>	<p>1.Packaging expression : N : normal (RoHS Exclusion clause) W : Totally Lead free 2.Delete lead free words 3.Delete CN35 S/D Circuit</p>	<p>ken</p>
<p>April 06.2020</p>	<p>Adding 6.3 CN24~35 0 = 0Ω</p>	<p>ken</p>
<p>Aug 06.2020</p>	<p>1. 3.1 Nominal Resistance Adding 0 = 0Ω 2. Delete CN28 series</p>	<p>ken</p>
<p>Nov 25.2021</p>	<p>Remove CN32</p>	<p>ken</p>