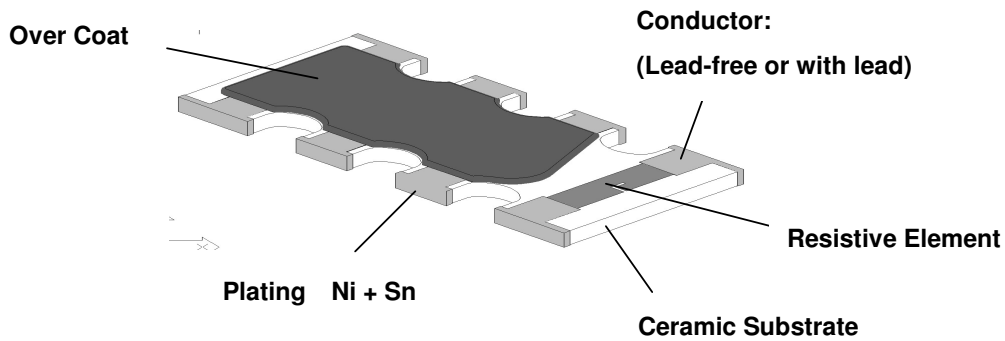


**1. Scope :**

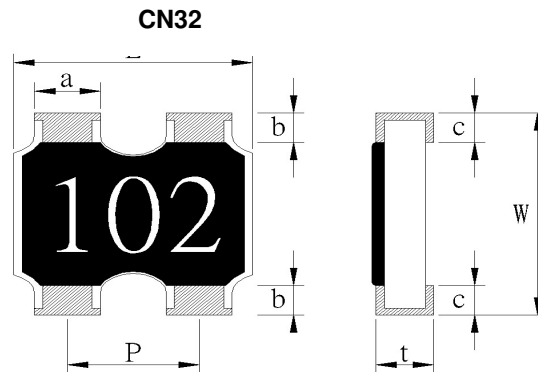
This specification applies for the CN32 series of thick film chip resistor arrays made by TA-I.

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

**2.1 Construction :**



**2.1.1 Chip Resistor Arrays :**

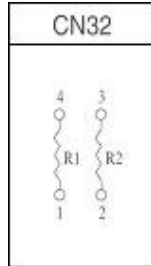


**2.2 Dimension :**

UNIT:mm

| Type | L          | W          | t          | P          | a          | b         | c         |
|------|------------|------------|------------|------------|------------|-----------|-----------|
| CN32 | 1.6 ± 0.15 | 1.6 ± 0.15 | 0.45 ± 0.1 | 0.76 ± 0.1 | 0.46 ± 0.1 | 0.3 ± 0.2 | 0.3 ± 0.2 |

**2.3 Schematic**



**3. Type Designation:**

**3.1 Chip Resistor Arrays**

**CN**

**32**

**J**

**TN**

**103**

**Product Code**  
CN : Chip Resistor Array

**size**  
Power Rating

**Tolerance**

**Packaging**

**Nominal Resistance**

32-0603\*2

J-±5%  
G-±2%  
F-±1%

T- Paper Tape  
N : Lead-free

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

**Note :**

TN : Lead-Free products packaged by paper tape

#### 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 |
|------|----------------------|----------------|----------------------|------------------------|----------------------|--------------------------|----------------------|--------------------------|
| CN32 | 1/16W                | Refer 4.2      | 50V                  | 100V                   | -55<br>∩<br>+125°C   | ±5%<br>±2%<br>±1%        | 10Ω ~ 1MΩ            | ±200                     |

#### 4.1 Derating Curve :

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

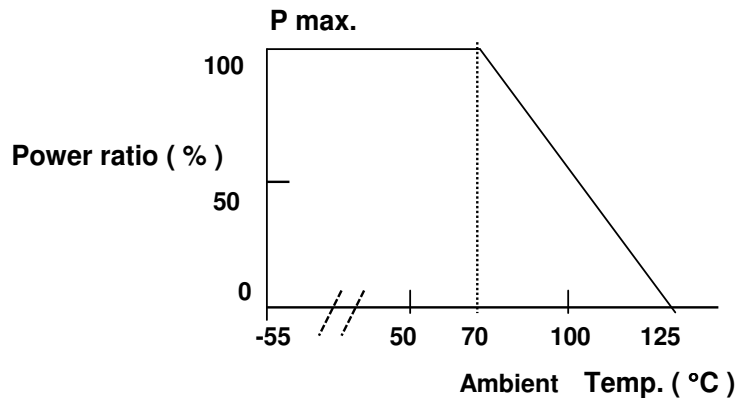


Figure 1

#### 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 CN32JTN102 the rated voltage ?

CN32JTN102 P:1/16W ; R:102 = 1KΩ = 1000Ω

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

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

| Test Items                                      | Reference standard | Condition of Test   | Test Limits   |
|---|--------------------|---|---|
| Temperature Coefficient of Resistance           | JIS-C5202-5.2      | -55 ~ +125 °C   | Refer 4.0   |
| Short Time Overload                             | JIS-C5202-5.5      | 2.5 X rated voltage for 5 sec   | ±(2.0%+0.1 Ω)<br>0 Ω : 50 m Ω or less   |
| Intermittent Overload                           | JIS-C5202-5.8      | 2.5X rated voltage or Max Overloading Voltage ,<br>1 sec "ON" 25 sec "OFF" , 10000 cycles | ±(5.0%+0.1 Ω)<br>0 Ω : 50m Ω or less  |
| Load Life                                       | JIS-C5202-7.10     | 1000 hours at rated voltage , 70°C , 1.5hours<br>"ON " , 0.5hour "OFF"                    | 1%:±(1.0%+0.05 Ω)<br>5%:±(3.0%+0.1 Ω)<br>0 Ω :100 m Ω or less                                 |
| Load Life with Humidity                         | JIS-C5202-7.9      | 1000 hours at rated voltage , 40±2°C ,<br>90~95% RH 1.5hours "ON " , 0.5hour "OFF"        | 1%:±(1.0%+0.05 Ω)<br>5%:±(3.0%+0.1 Ω)<br>0 Ω :100 m Ω or less                                 |
| Rapid Change of Temperature                     | JIS-C5202-7.4      | -55°C (30 min. ) / +155 °C (30 min. ) 5 cycles  | 1%:±(0.5%+0.05 Ω)<br>5%:±(1.0%+0.05 Ω)<br>0 Ω :50 m Ω or less                                 |
| Solderability                                   | JIS-C5202-6.11     | 245±5°C solder, 2±0.5 sec dwell.<br>Solder : Sn96.5 / Ag3.0 / Cu0.5                       | At least 95% of surface area<br>of electrode shall be covered<br>with new solder.             |
| Core body                                       | JIS C-5202-6.1.4   | Pressure 1.0 kgf a R0.5 pressure rod for 10 sec   | Without mechanical damage<br>such as breaks. Electrical<br>characteristics shall be satisfied |
| Dielectric Withstanding Voltage (Voltage Proof) | JIS-C5202-5.7      | Applying voltage 100V for 1 minute.   | No abnormalities such as<br>flashover, burning dielectric<br>breakdown shall appear.          |
| Resistance to Solder Heat                       | JIS-C5202-6.10     | 270 ±5°C solder , 10 ±1 sec dwell .   | 0.5%,1%:±(1.0%+0.05 Ω)<br>2%,5%:±(2.0%+0.1 Ω)<br>0 Ω : 50m Ω or less                          |

|             |  |      |              |
|-------------|--|------|--------------|
| <b>TA-I</b> | <b>Thick Film Chip Resistor Arrays<br/>Thick Film Chip Resistor Networks<br/>(Lead-Free for CN32 Series)</b> | No   | TCN-320S005E |
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|                           |                    |   |   |
|---------------------------|--------------------|---|---|
| Whisker                   | SONY<br>SS-00254-8 | <p>Component , Lead-Free Soldering part 8 :<br/>Solder Heat Resistance Test for SMD. Lead-Free Soldering "</p> <p>Temp. Cycles :<br/>-55°C (30 min.) / +155°C (30 min. )<br/>Testing duration : 500±4 hours</p> <p>Temp. Humidity Chambers:<br/>Temperature : 85°C<br/>Humidity : 85% RH<br/>Testing duration : 500±4 hours .</p>   | Whisker formation :<br>50 um or less .  |
| Resistance to Solder Heat | SONY<br>SS-00254-5 | <p>Component , Lead-Free Soldering part 5 :<br/>Solder Heat Resistance Test for SMD. Lead-Free Soldering "</p> <p>Flow Solder :<br/>Pre – heat : 100 to 105 °C 30±5 sec<br/>Temperature : 260±3°C 10 +1/ -0 sec<br/>The entire sample shall be dipped in solder.<br/>The specimen shall be stored at standard atmospheric conditions for 1 hour .</p> <p>Iron Solder :<br/>Bit temperature : 350 ±10°C<br/>Application time of soldering iron : 3 +1/- 0sec<br/>Apply the soldering iron to the electrode .<br/>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 .<br>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  $\Omega$  , 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  $\Omega$  , and the fourth digit represents exponent for base of 10.

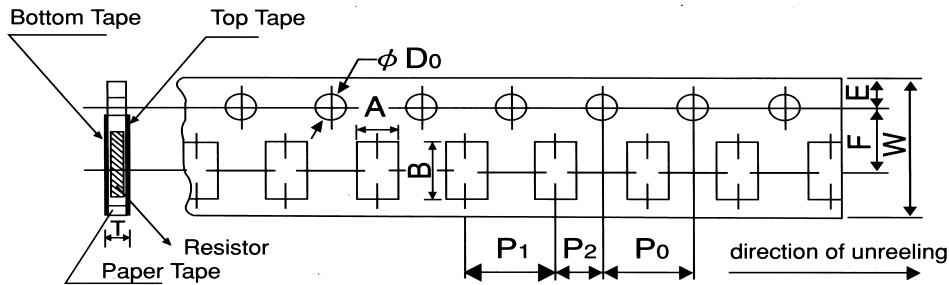
$$\text{E.G. } 4701 = 470 \times 10^1 = 4700 \Omega = 4.7k \Omega$$

**7. Taping & Reel**

**7.1 Taping Dimensions**

**7.1.1 4 mm pitch paper**

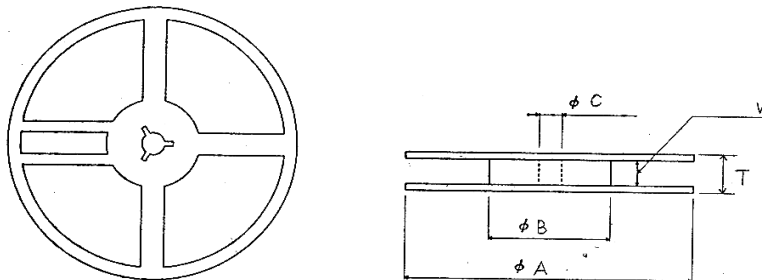
UNIT: mm



| Type | A       | B       | W       | F        | E        | P1      | P2       | P0      | $\phi D0$                         | T0       |
|------|---------|---------|---------|----------|----------|---------|----------|---------|-----------------------------------|----------|
| CN32 | 1.8±0.2 | 1.8±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 <sup>+0.1</sup> <sub>-0</sub> | 0.84±0.1 |

|              |            |
|--------------|------------|
| Package Type | Paper Tape |
|              | 4 mm pitch |
|              | 178mm/R    |
| CN32         | 5000       |

**7.2 Reel Specifications**

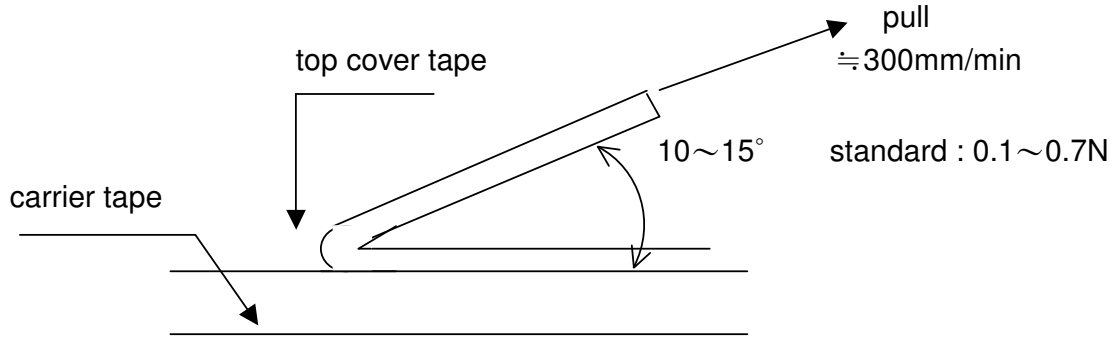


UNIT: mm

| Type | $\phi A$    | $\phi B$   | $\phi C$   | W         | T          |
|------|-------------|------------|------------|-----------|------------|
| CN32 | 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:**

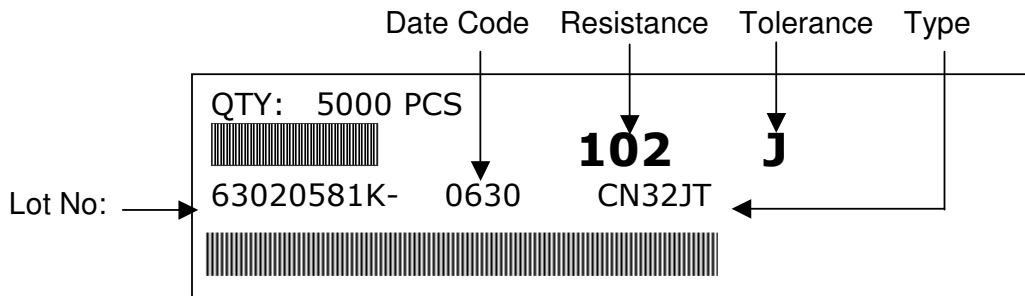
Peel –off force of paper and blister tape is in accordance with “JIS-C5202” that is , 0.1 to 0.7 N at a peel-off speed of 300 mm / minute.



**8. Label**

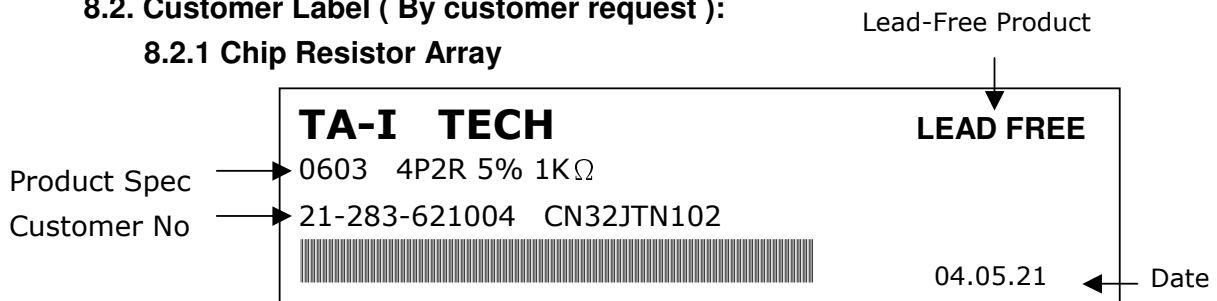
**8.1 Manufacture Label :**

**8.1.1 Chip Resistor Array**

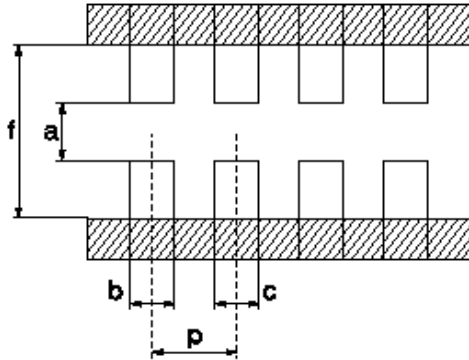


**8.2. Customer Label ( By customer request ):**

**8.2.1 Chip Resistor Array**

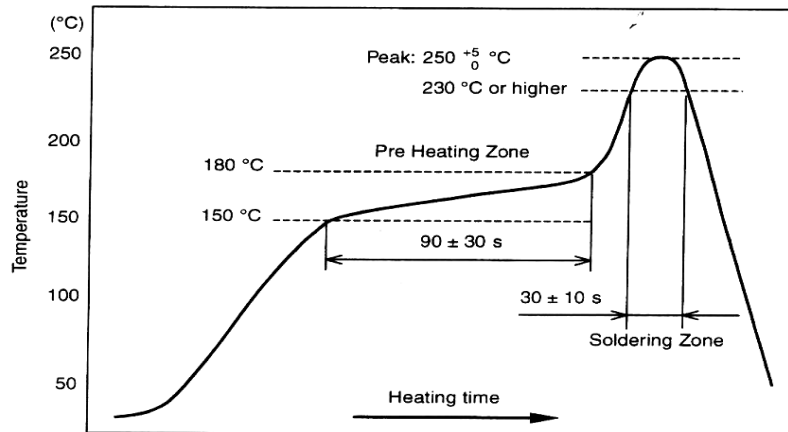


9. Recommended land patterns



| Land pattern |      | Dimension ( mm ) |         |         |     |         |
|--------------|------|------------------|---------|---------|-----|---------|
| Type         | Size | a                | b       | c       | p   | f       |
| CN           | 32   | 0.7~0.9          | 0.4~0.5 | 0.4~0.5 | 0.8 | 2.2~2.6 |

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 ,  $90 \pm 30$  sec

Soldering Zone : 230°C or higher ,  $30 \pm 10$  sec



|             |  |             |              |
|-------------|--|-------------|--------------|
| <b>TA-I</b> | <b>Thick Film Chip Resistor Arrays<br/>Thick Film Chip Resistor Networks<br/>(Lead-Free for CN32 Series)</b> | <b>No</b>   | TCN-320S005E |
|             |  | <b>page</b> | 9/10         |

**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.

**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 – Pulaupinang )

Tel :604- 3900480 Fax : 604-3901481

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

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

|             |  |             |              |
|-------------|--|-------------|--------------|
| <b>TA-I</b> | <b>Thick Film Chip Resistor Arrays<br/>Thick Film Chip Resistor Networks<br/>(Lead-Free for CN32 Series)</b> | <b>No</b>   | TCN-320S005E |
|             |  | <b>page</b> | 10/10        |

**Revise record**

| Date        | Content  | Owner    |
|-------------|--|----------|
| Nov.25.2005 | 4. Ratings & Characteristics :<br>Adding Rating Voltage<br>5. Reliability Tests:<br>Adding to Whisker & Resistance to soldering heat<br>Deleted to Robustness of Termination (Bending Strength)<br>Adding to Core body<br>7.3 Storage Conditions:<br>Deleted to Storage Conditions<br>8.2 Customer Label<br>Adding to Customer Label<br>10. Recommend IR – Reflow profile<br>Adding to Recommend IR – Reflow profile<br>11. Storage Conditions:<br>Adding to Storage Conditions:<br>12. Shelf Life<br>Adding to Shelf Life : | Hank Liu |
| Dec.12.2005 | 5. Reliability Tests:<br>Intermittent Overload : 3X rate power changed 2.5X rated voltage<br>Whisker :<br>-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)<br>5. Reliability Tests:<br>Temperature Coefficient of Resistance : Refer 5.0 changed Refer4.0<br>Resistance to Solder Heat :<br>1%:±(0.5%+0.05Ω) changed 0.5%,1%:±(1.0%+0.05Ω)<br>5%:±(1.0%+0.05Ω) changed 2%,5%:±(2.0%+0.1Ω)<br>8.1 Manufacture label :<br>Series number 3 codes changed to 4 codes<br>14. Manufacturing Country & City:<br>Adding TA-I TECHNOLOGY (DONGGUAN ) CO., LTD   | Vincent  |