

Data Sheet

Customer:

Product: Thick Film Array Chip Resistor - CN Series

Size: 0201x2(Flat) / 0201x4(Flat) / 0402x4 / 0603x4 /
0402x4(Concave) / 0603x4(Concave)

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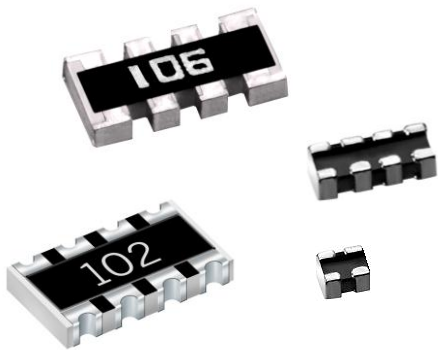
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|---------------------|-----------------|---------------------|------------------------|---------------------------|
| 10-Mar-21 | 10-Mar-21 | 10-Mar-21 | 10-Mar-21 | |
| Susan Huang | J.C. Liu | J.C. Liu | | |

Thick Film Array Chip Resistor



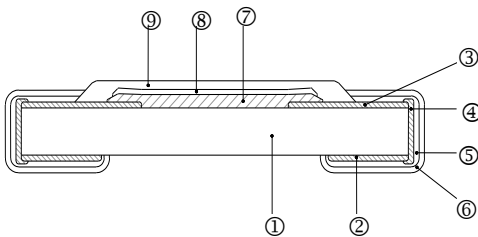
Scope

– This specification applies to all sizes of rectangular-type fixed chip resistors with Ruthenium-base as material.

Features

- Small size and light weight
- Reduction of assembly costs and matching with placement machines
- Reliability, high quality
- Suitable for IR reflow soldering and wave soldering

Construction

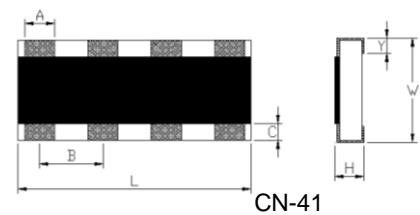
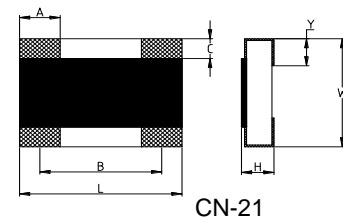
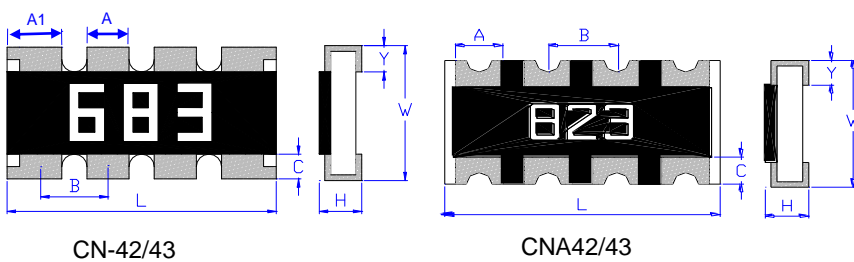


Applications

- Entertainment
- Computer & Related Products
- Communication Equipment
- Power Equipment
- Measuring Instrument

| | | |
|---------------------|----------------------|----------------------|
| ① Alumina Substrate | ④ Edge Electrode | ⑦ Resistor Layer |
| ② Bottom Electrode | ⑤ Barrier Layer | ⑧ Primary Overcoat |
| ③ Top Electrode | ⑥ External Electrode | ⑨ Secondary Overcoat |

Dimensions

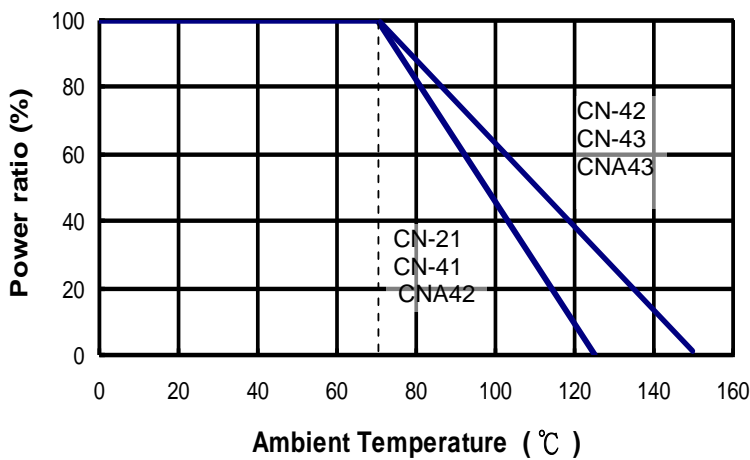


| Type | Number of Resistors | L (mm) | W (mm) | H (mm) | A (mm) | A1 (mm) | B (mm) | C (mm) | Y (mm) | Weight (g) (1000pcs) |
|-------|---------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------|
| CN-21 | 2 | 0.80±0.10 | 0.60±0.10 | 0.35±0.10 | 0.30±0.10 | - | 0.50±0.10 | 0.15±0.10 | 0.15±0.10 | 0.500 |
| CN-41 | 4 | 1.40±0.10 | 0.60±0.10 | 0.35±0.10 | 0.20±0.10 | - | 0.40±0.10 | 0.10±0.07 | 0.15±0.05 | 0.833 |
| CN-42 | 4 | 2.00±0.10 | 1.00±0.10 | 0.45±0.10 | 0.30±0.10 | 0.40±0.10 | 0.50±0.05 | 0.22±0.15 | 0.22±0.15 | 2.817 |
| CN-43 | 4 | 3.20±0.15 | 1.60±0.15 | 0.55±0.10 | 0.50±0.15 | 0.65±0.10 | 0.80±0.05 | 0.30±0.15 | 0.30±0.15 | 8.288 |
| CNA42 | 4 | 2.00±0.10 | 1.00±0.10 | 0.40±0.10 | 0.30±0.10 | - | 0.50±0.05 | 0.20±0.10 | 0.25±0.10 | 3.003 |
| CNA43 | 4 | 3.20±0.15 | 1.60±0.15 | 0.60±0.10 | 0.60±0.15 | - | 0.80±0.05 | 0.30±0.15 | 0.30±0.15 | 10.115 |

Part Numbering

| | | | | | |
|------------------------------------|--|-----------------------------|----------------------|---|---|
| CN- | 43 | J | L | 7 | - - - 1 0 R |
| Product Type | Dimensions | Resistance Tolerance | Function Code | Packaging Code | Resistance |
| CN- (Flat/Convex) CNA (Concave) | 21: 0201x2 41: 0201x4 42: 0402x4 43: 0603x4 | F: ±1% J: ±5% | L: 4P2R/8P4R | 6: 7" Reel 10Kpcs 7: 7" Reel 5Kpcs A: 10" Reel 10Kpcs B: 10" Reel 20Kpcs C: 13" Reel 40Kpcs D: 13" Reel 20Kpcs | --- 1R2: 1.2Ω --- 3K3: 3.3KΩ --- 10K: 10KΩ -- 100K: 100KΩ "-" to fill up 6 spaces |

Derating Curve



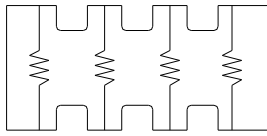
Standard Electrical Specifications

| Item Type | Power Rating at 70°C Jumper Rated Current | Operating Temp. Range | Max. Operating Voltage | Max. Overload Voltage | Number of Resistors | Resistance Range | | TCR (PPM/°C) |
|--------------|---|-----------------------|------------------------|-----------------------|---------------------|------------------|------------|--------------|
| | | | | | | ±1% (E24,E96) | ±5% (E24) | |
| CN-21 | 1/32W Jumper: 0.5A | -55 ~ +125°C | 12.5V | 25V | 2 | - | 3Ω - 9.1Ω | ±300 |
| | | | | | | 10Ω - 1MΩ | | ±200 |
| | - | | | | | 0Ω (<50mΩ) | - | |
| CN-41 | 1/32W Jumper: 0.5A | -55 ~ +125°C | 12.5V | 25V | 4 | 10Ω - 1MΩ | | ±200 |
| | | | | | | - | 0Ω (<50mΩ) | - |
| | 10Ω - 1MΩ | | | | | ±200 | | |
| CN-42 | 1/16W Jumper: 1A | -55 ~ +155°C | 25V | 50V | 4 | 10Ω - 1MΩ | 1Ω - 1MΩ | ±200 |
| | | | | | | - | 0Ω (<50mΩ) | - |
| | 10Ω - 1MΩ | | | | | ±200 | | |
| CN-43 | 1/10W Jumper: 1A | -55 ~ +155°C | 50V | 100V | 4 | 10Ω - 1MΩ | 1Ω - 1MΩ | ±200 |
| | | | | | | - | 0Ω (<50mΩ) | - |
| | 10Ω - 1MΩ | | | | | ±200 | | |
| CNA42 | 1/16W Jumper: 1A | -55 ~ +125°C | 50V | 100V | 4 | 10Ω - 1MΩ | | ±200 |
| | | | | | | - | 0Ω (<50mΩ) | - |
| | 10Ω - 1MΩ | | | | | ±200 | | |
| CNA43 | 1/16W Jumper: 1A | -55 ~ +155°C | 50V | 100V | 4 | 10Ω - 1MΩ | | ±200 |
| | | | | | | - | 0Ω (<50mΩ) | - |
| | 10Ω - 1MΩ | | | | | ±200 | | |

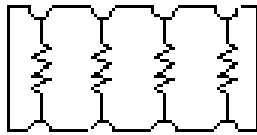
Operating Voltage= $\sqrt{P \cdot R}$ or Max. Operating Voltage listed above, whichever is lower.
 Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. Overload Voltage listed above, whichever is lower.

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

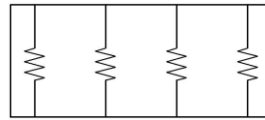
Equivalent Circuit Diagram



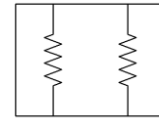
CN-42/43



CNA42/43

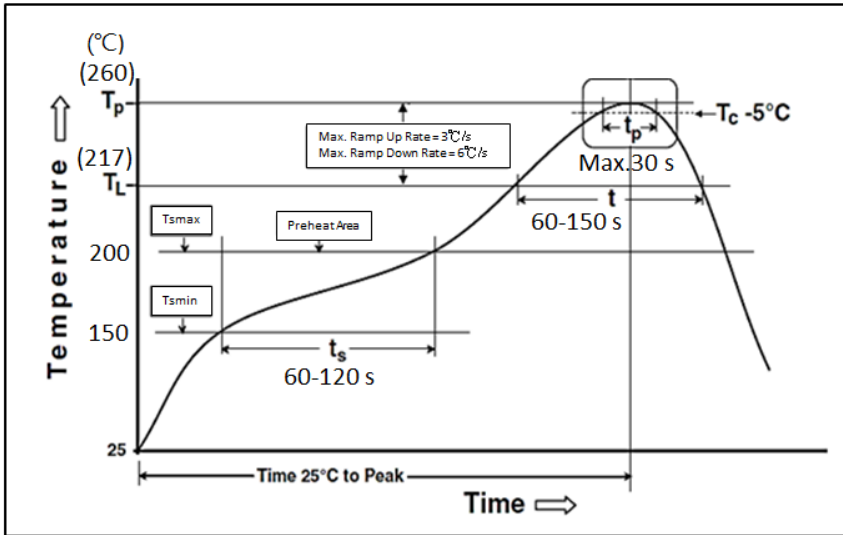


CN-41



CN-21

Soldering Condition(IPC/JEDEC J-STD-020)



Environmental Characteristics

| Item | Requirement | | | Test Method |
|--|---|---|--|--|
| | ±1% | ±5% | Jumper | |
| Temperature Coefficient of Resistance (T.C.R.) | As Spec. | | | JIS-C-5201-1 4.8 IEC-60115-1 4.8 At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature |
| Short Time Overload | ±(1.0%+0.05Ω) CNA42/43: ±(2.0%+0.05Ω) | ±(2.0%+0.05Ω) | <50mΩ | JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds |
| Insulation Resistance | ≥10G | | | JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. Overload Voltage for 1 minute |
| Endurance | ±(2.0%+0.10Ω) | ±(3.0%+0.10Ω) | <50mΩ CN-21/41 & CNA42/43: <100mΩ | JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" |
| Damp Heat with Load | ±(2.0%+0.10Ω) | ±(3.0%+0.10Ω) | <50mΩ CNA42/43: <100mΩ | JIS-C-5201-1 4.24 IEC-60115-1 4.24 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" |
| Dry Heat | ±(1.0%+0.05Ω) | ±(1.5%+0.10Ω) CN-21/41: ±(3.0%+0.10Ω) | <50mΩ CN-21/41: <100mΩ | JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +125/+155°C for 1000 hrs |

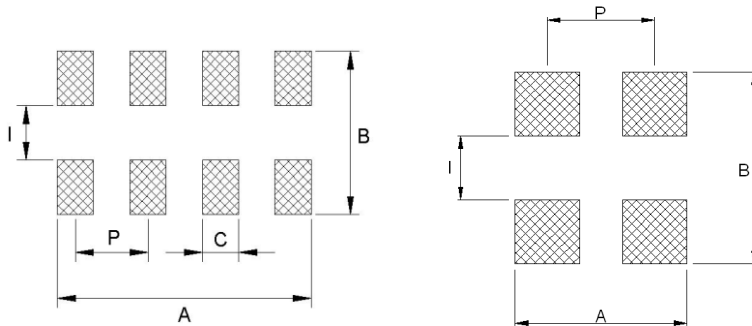
Thick Film Array Chip Resistor

| Item | Requirement | | | Test Method |
|------------------------------|--|-------------------------|--------|---|
| | ±1% | ±5% | Jumper | |
| Bending Strength | $\pm(1.0\%+0.05\Omega)$ | $\pm(1.0\%+0.05\Omega)$ | <50mΩ | JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 60 seconds with 3mm |
| Solderability | 95% min. coverage | | | JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds |
| Resistance to Soldering Heat | $\pm(0.5\%+0.05\Omega)$ CNA42/43: $\pm(1\%+0.05\Omega)$ | $\pm(1.0\%+0.05\Omega)$ | <50mΩ | JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds |
| Voltage Proof | No breakdown or flashover | | | JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times Max. Operating Voltage for 1 minute |
| Leaching | Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$ | | | JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260±5°C for 30 seconds |
| Rapid Change of Temperature | $\pm(0.5\%+0.05\Omega)$ | $\pm(1.0\%+0.05\Omega)$ | <50mΩ | JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +125/+155°C, 5 cycles |

RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

■ **Storage Temperature: 15~28°C; Humidity < 80%RH**

■ **Recommend Land Pattern**

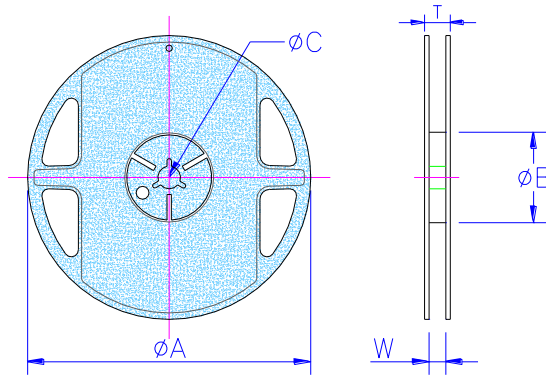


| Type | A (mm) | B (mm) | C (mm) | I (mm) | P (mm) |
|-------|--------|--------|--------|--------|--------|
| CN-21 | 0.80 | 0.90 | -- | 0.30 | 0.50 |
| CN-41 | 1.40 | 0.90 | 0.20 | 0.30 | 0.40 |
| CN-42 | 2.10 | 1.80 | 0.30 | 0.50 | 0.50 |
| CN-43 | 3.10 | 2.85 | 0.45 | 0.80 | 0.80 |
| CNA42 | 2.10 | 1.80 | 0.30 | 0.50 | 0.50 |
| CNA43 | 3.10 | 2.85 | 0.45 | 0.80 | 0.80 |

Thick Film Array Chip Resistor

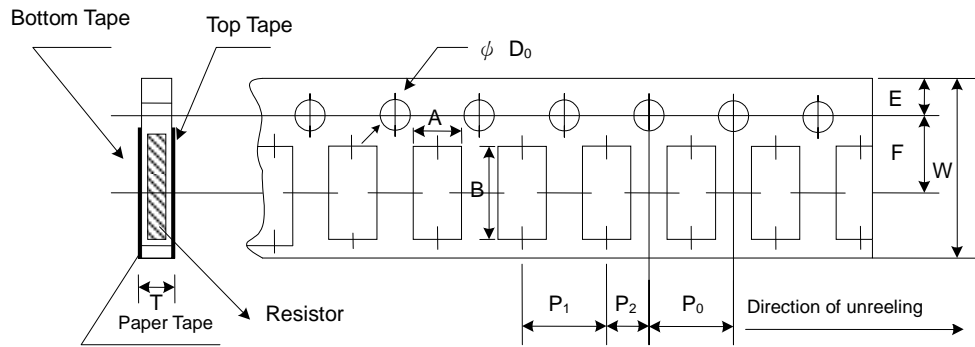
■ Packaging

Reel Specifications & Packaging Quantity



| Type | Packaging Quantity | | Tape Width | Reel Diameter | ΦA (mm) | ΦB (mm) | ΦC (mm) | W (mm) | T (mm) |
|----------------|--------------------|-----|------------|---------------|---------------|---------------------|---------------|---------|----------|
| CN-21 CN-41 | Paper | 10K | 8mm | 7 inch | 178.5±1.5 | 60 ^{+1/-0} | 13.0±0.2 | 9.0±0.5 | 12.5±0.5 |
| CN-42 CNA42 | Paper | 10K | 8mm | 7 inch | 178.5±1.5 | 60 ^{+1/-0} | 13.0±0.2 | 9.0±0.5 | 12.5±0.5 |
| | | 20K | 8mm | 10 inch | 254±1.0 | 100±0.5 | 13.0±0.2 | 9.5±0.5 | 13.5±0.5 |
| | | 40K | 8mm | 13 inch | 330±1.0 | 100±0.5 | 13.0±0.2 | 9.5±0.5 | 13.5±0.5 |
| CN-43 CNA43 | Paper | 5K | 8mm | 7 inch | 178.5±1.5 | 60 ^{+1/-0} | 13.0±0.2 | 9.0±0.5 | 12.5±0.5 |
| | | 10K | 8mm | 10 inch | 254±1.0 | 100±0.5 | 13.0±0.2 | 9.5±0.5 | 13.5±0.5 |
| | | 20K | 8mm | 13 inch | 330±1.0 | 100±0.5 | 13.0±0.2 | 9.5±0.5 | 13.5±0.5 |

Paper Tape Specifications



| Type | A (mm) | B (mm) | W (mm) | E (mm) | F (mm) | P ₀ (mm) | P ₁ (mm) | P ₂ (mm) | ΦD_0 (mm) | T (mm) |
|-------|-----------|-----------|---------|----------|----------|---------------------|---------------------|---------------------|-----------------|----------|
| CN-21 | 0.77±0.05 | 0.97±0.05 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | 1.50+0.1,-0 | 0.50±0.1 |
| CN-41 | 0.77±0.05 | 1.57±0.05 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | 1.50+0.1,-0 | 0.50±0.1 |
| CN-42 | 1.20±0.1 | 2.20±0.1 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | 1.50+0.1,-0 | 0.70±0.1 |
| CN-43 | 1.95±0.1 | 3.50±0.1 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 4.0±0.05 | 2.0±0.05 | 1.50+0.1,-0 | 0.85±0.1 |
| CNA42 | 1.20±0.1 | 2.20±0.1 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 2.0±0.05 | 2.0±0.05 | 1.50+0.1,-0 | 0.70±0.1 |
| CNA43 | 1.95±0.1 | 3.50±0.1 | 8.0±0.2 | 1.75±0.1 | 3.5±0.05 | 4.0±0.1 | 4.0±0.05 | 2.0±0.05 | 1.50+0.1,-0 | 0.85±0.1 |

■ Marking

No Marking for CN-21/CN-41/CNA42

Jumper for all: Letter "0"

1% for CN-42/CN-43/CNA43: 4 digits marking (non-including E24 series)

Example:

| Resistance | 102Ω | 2.49KΩ | 30K1Ω | 49.9KΩ | 121KΩ |
|------------|------|--------|-------|--------|-------|
| marking | 1020 | 2491 | 3012 | 4992 | 1213 |

1% & 5% for CN-42/CN-43/CNA43: 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1st and 2nd are E24 code and 3rd code is multiplier)

| E24 code | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 20 | 22 | 24 | 27 | 30 | 33 | 36 | 39 | 43 | 47 | 51 | 56 | 62 | 68 | 75 | 82 | 91 |
|----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | | | | | | | | | | | | | | | | | | | | | | | |

REVISION HISTORY

| REVISION | DATE | CHANGE NOTIFICATION | DESCRIPTION |
|-----------------|--------------|----------------------------|---|
| Version A9 | Jun 03, 2014 | - | <ul style="list-style-type: none">- Recommend Land Pattern updated- Environmental Characteristics updated |
| Version B | May 05, 2015 | - | <ul style="list-style-type: none">- CNA43 Dimensions updated- Derating Curve updated- CNA42 Electrical Specifications updated- Environmental Characteristics updated- CNA42 Marking updated |
| Version B1 | Jul 15, 2016 | - | <ul style="list-style-type: none">- Remove Material Description- Modify Storage Temperature |
| Version B2 | Jan 12, 2018 | - | <ul style="list-style-type: none">- Modify Electrical Specifications (0R) |
| Version B3 | May 20, 2019 | - | <ul style="list-style-type: none">- Modify TCR Test description |
| Version B4 | Sep 24, 2020 | - | <ul style="list-style-type: none">- Add CN-42/CN-43 Dimension A1- Environmental Characteristics updated |
| Version B5 | Mar 10, 2021 | - | <ul style="list-style-type: none">- Modify Soldering Condition |