CHIP NETWORKS

CNN Thin Film Chip Networks

■ Features
- Metal film chip network resistors.
- Excellent in relative T.C.R. and relative accuracy.
- Pair resistors for high precision OP-Amplifiers.
- As custom products, any pairs between 1kΩ and 100kΩ are available on request.
- Suitable for reflow soldering.
- Products with lead free termination meet EU-RoHS requirements.

■ Reference Standards
IEC 60115-1
JIS C 5201-1

■ Circuit Construction

■ Type Designation

- CNN 2A 2 T TE 103/103 B A
  - Product Code
  - Style
  - Number of Elements
  - Terminal Surface Material
  - Taping
  - Nominal Resistance
  - Absolute Resistance Tolerance
  - Resistance Ratio

- The terminal surface material lead free is standard.
- Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.
- For further information on taping, please refer to APPENDIX C on the back pages.

■ Ratings

- CNN 2A (0805×2) 0.05W/Element 1k, 10k, 100k
- Resistance Tolerance: A:±0.05%, B:±0.1%, C:±0.25%
- T.C.R. (×10⁻⁶/K): ±25
- Max. Working Voltage: 50V, 100V
- Operating Temperature Range: -70℃~+125℃
- Taping & Q’ty/Reel (pcs): TE 4,000

Rated voltage=√(Power Rating×Resistance value or Max. working voltage, whichever is lower).

■ Standard

- Resistance: R1 1kΩ 1kΩ 1kΩ 10kΩ 10kΩ 100kΩ
- R2 1kΩ 10kΩ 100kΩ 10kΩ 100kΩ 100kΩ

First marking number: 3 3 4 4 3
Second marking number: 3 4 5 5 5

■ Custom

- Custom products of any pairs between 1kΩ and 100kΩ are available on request.
- Please ask us beforehand for the custom products.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

Contact our sales representatives before you use our products for applications including automobiles, medical equipment and aerospace equipment.

Malfunction or failure of the products in such applications may cause loss of human life or serious damage.
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■ Precautions for Use

- The properly and electrostatically measured taping materials are used for the components, but attention should be paid to the fact that there is some danger the parts absorb on the top tapes to cause a failure in the mounting and the parts are destructed by static electricity (1kV and more, Human Body Model 100pF 1.5kΩ) to change the resistance in the conditions of an excessive dryness or after the parts are given vibration for a long time as they are packaged on the tapes. Similarly, care should be given not to apply the excessive static electricity when mounting on the boards.
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. while perspiration and saliva include ionic impurities like sodium (Na⁺), chlorine (Cl⁻) etc. Therefore these kinds of ionic substances may induce electrical corrosion when they invade into the products. Either thorough washing or using RMA solder and flux are necessary since lead free solder contains ionic substances. Washing process is needed, before putting on moisture proof material in order to prevent electrical corrosion.
- When heat-resistant masking tapes are attached to the chip resistors at the time of mounting and then detached, there is a possibility of exfoliation of the top electrodes. It is known that the heat applied in the mounting process will enhance the adhesion strength of the tape adhesive so please avoid the use. If the use of masking tapes are unavoidable, then please be sure not to attach the tape adhesives directly on the products.
- When high-pressure shower cleaning is implemented, there is a possibility of exfoliation of the top electrodes caused by the water pressure stress so please avoid the implementation.

If the implementation is unavoidable, then please evaluate the products beforehand.

■ Dimensions (mm)

[Dimensions diagram]

■ Example of Application

[Application diagram]

■ Performance

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Performance Requirements Absolute ΔR± (%+0.05Ω)</th>
<th>Test Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance</td>
<td>Within specified tolerance —</td>
<td>25°C</td>
</tr>
<tr>
<td>T.C.R.</td>
<td>Within specified T.C.R. —</td>
<td>+25°C/−55°C and +25°C/+125°C</td>
</tr>
<tr>
<td>Overload (Short time)</td>
<td>0.1 0.01</td>
<td>Rated voltage×2.5 or Max. overload vol., whichever less, for 5s</td>
</tr>
<tr>
<td>Resistance to soldering heat</td>
<td>0.1 0.02</td>
<td>260°C±5°C, 10s±1s</td>
</tr>
<tr>
<td>Rapid change of temperature</td>
<td>0.25 0.01</td>
<td>−55°C (30min.) / +125°C (30min.) 5 cycles</td>
</tr>
<tr>
<td>Moisture resistance</td>
<td>0.25 0.03</td>
<td>40°C±2°C, 90%〜95%RH, 1000h 1.5h ON/0.5h OFF cycle</td>
</tr>
<tr>
<td>Endurance at 70°C</td>
<td>0.25 0.02</td>
<td>70°C±2°C, 1000h 1.5h ON/0.5h OFF cycle</td>
</tr>
<tr>
<td>High temperature exposure</td>
<td>0.25 0.02</td>
<td>125°C, 100h</td>
</tr>
</tbody>
</table>

■ Derating Curve

[Derating curve diagram]

For resistors operated at an ambient temperature of 70°C or higher, the power shall be derated in accordance with the above derating curve.