

The content of this specification may change without notification 12/13/07

Custom solutions are available.

## HOW TO ORDER



### Packaging

M = Tape/Reel

### Tracking TCR

L = 1      N = 3      Q = 10  
M = 2      P = 5

### Absolute TCR

P = ±5      X = ±25  
Q = ±10

### Ratio Tolerance

T = 0.01      B = 0.1  
Q = 0.02      C = 0.25  
A = 0.05      D = 0.5

### Absolute Tolerance (%)

A = ±0.05      D = ±0.5  
B = ±0.1      F = ±1  
C = ±0.25

### Resistance Value

3 sig. fig & 1 multiplier ±1%

### Circuit Layout

Refer to Specification

### Model (Refer to Spec)

|    |     |      |
|----|-----|------|
| 1A | 6D  | S8D  |
| 1D | S6D | M16D |
| 2D | 8D  | 16D  |

### Series

High Precision Resistor Array & Networks



U-Shaped Product with Electrode Structure  
Processed product with grooves



## FEATURES

AAC thin film network resistors ensure stable high performance as indicated by the excellent ratio T.C.R as between elements 1pp/°C or less and absolute T.C.R as 5 pp/°C. The absolute tolerance as 0.5%.

- "U-type" electrodes offering excellent durability, ensuring superb durability for soldering flow, re-flow soldering, or dip soldering, and is also very beneficial for the durability of wire bonding
- A perfect solution to replace the network resistor of SOP, SIP or DIP types.
- Lead Free and RoHs Compliant
- Custom designed circuits are available upon special request

## ELECTRICAL CHARACTERISTICS

| Model   | Total Rated Power | Resistance Range (Ω) by Circuit Configuration |              |                 |
|---------|-------------------|---|--------------|-----------------|
|         |                   | B   | 2B           | C               |
| CTN1A   | 0.125 W           | 10 ~ 50K                                      |              | 10.0 ~ 100K     |
| CTN1D   | 0.125 W           | 10 ~ 50K                                      |              | 10.0 ~ 100K     |
| CTN2D   | 0.100 W           | 10 ~ 25K                                      |              | 10.0 ~ 50.0K    |
| CTN6D   | 0.250 W           |   | 10.0 ~ 100K  | 10.0 ~ 100K     |
| CTNS6D  | 0.150 W           |   | 10.0 ~ 10.0K | 10.0 ~ 50.0K    |
| CTN8D   | 0.500 W           |   |              | 10.0 ~ 200K     |
| CTN8U   | 0.500 W           |   |              | (1.00M ~ Total) |
| CTNS8D  | 0.125 W           |   |              | 10.0 ~ 50.0K    |
| CTNM16D | 1.00 W            |   |              | 2.00M Total     |
| CTNM16U | 1.00 W            |   |              | 2.00M Total     |
| CTN16D  | 1.50 W            |   |              | 10.0M Total     |
| CTN16U  | 1.50 W            |   |              | 10.0M Total     |

## APPLICATIONS

- Medical Instrument
- Test Equipment For Semiconductor
- Precision Measuring Equipment
- Electric Components For Automotive

## CONSTRUCTION

1. Epoxy Protective Film
2. Ni-Cr Resistive Element
3. Cu Electrode
4. Ni Plating and Tin Plating
5. High Purity Alumina Substrate



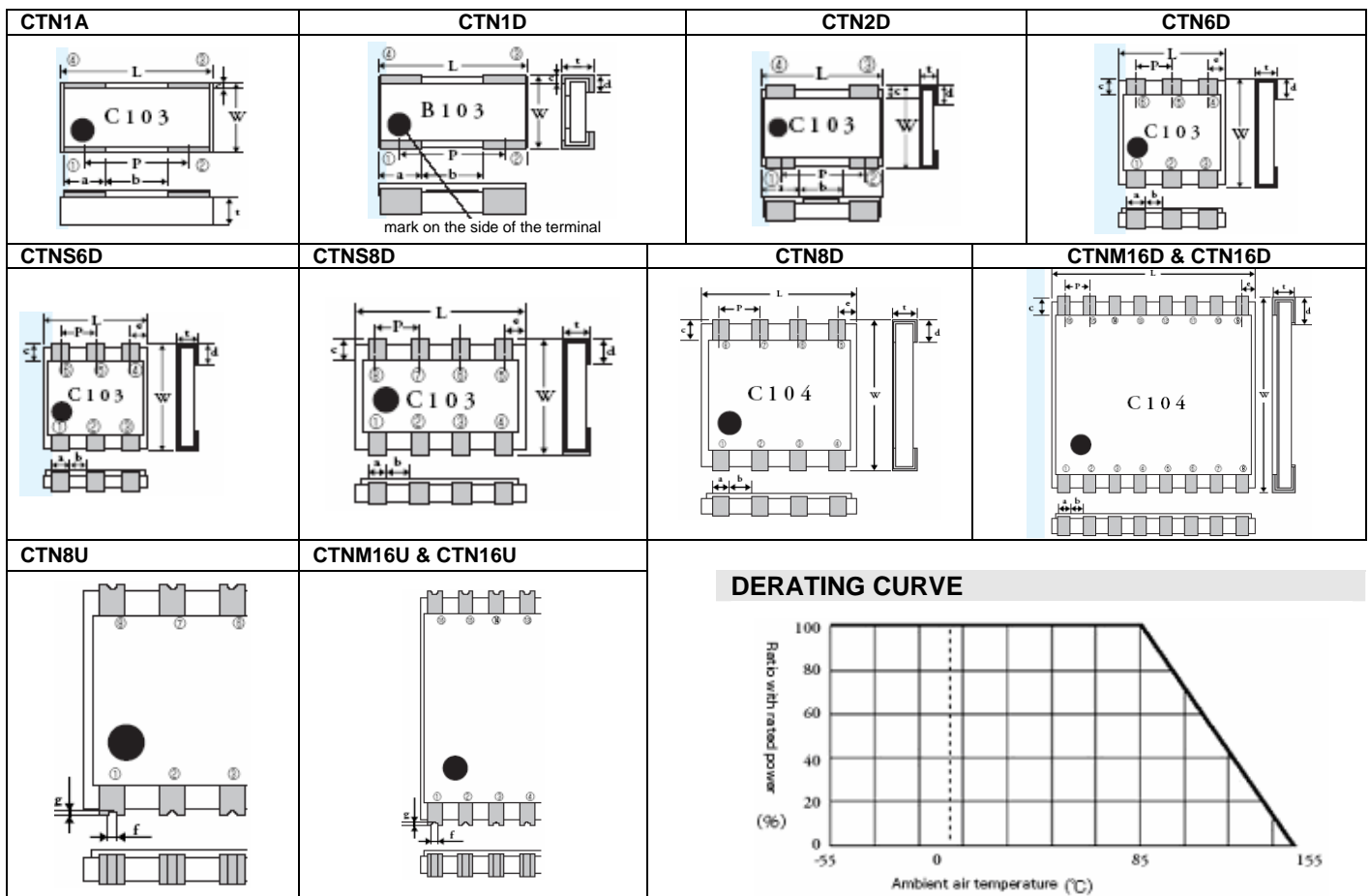
## CIRCUIT LAYOUT

| CTN1A, CTN1D, CTN2D |   | CTNS6D, CTN6D |   | CTNS8D, CTN8D, CTN8U | CTNM16D, CTNM16U, CTN16D, CTN16U |
|---------------------|---|---------------|---|----------------------|----------------------------------|
| B                   | C | 2B            | C | C                    | C                                |
|                     |   |               |   |                      |                                  |

## DIMENSIONS (mm)

| Model   | L           | W          | P          | a           | b           | c           | d          | e           | f   | g   | t        |
|---------|-------------|------------|------------|-------------|-------------|-------------|------------|-------------|-----|-----|----------|
| CTN1A   | 3.2 ± 0.2   | 1.6 ± 0.2  | 2.0 ± 0.1  | 1.0 ± 0.1   | 1.0 ± 0.1   | 0.15 ± 0.05 |            |             |     |     | 0.55 max |
| CTN1D   |             |            |            |             |             |             | 0.4 ± 0.1  |             |     |     |          |
| CTN2D   | 2.0 ± 0.2   | 1.25 ± 0.2 | 1.3 ± 0.2  | 0.7 ± 0.2   | 0.6 ± 0.2   | 0.1 ± 0.05  | 0.25 ± 0.1 |             |     |     | 0.55 max |
| CTN6D   | 2.54 ± 0.1  | 2.54 ± 0.1 | 0.86 ± 0.1 | 0.43 ± 0.1  | 0.43 ± 0.2  | 0.41 ± 0.2  | 0.5 ± 0.2  | 0.41 ± 0.1  |     |     | 0.55 max |
| CTNS6D  | 2.0 ± 0.1   | 2.0 ± 0.1  | 0.72 ± 0.1 | 0.36 ± 0.1  | 0.36 ± 0.1  | 0.28 ± 0.2  | 0.4 ± 0.2  | 0.28 ± 0.1  |     |     | 0.55 max |
| CTN8D   | 5.08 ± 0.2  | 5.1 ± 0.2  | 1.27 ± 0.2 | 0.635 ± 0.1 | 0.635 ± 0.1 | 0.6 ± 0.2   | 0.8 ± 0.2  | 0.635 ± 0.1 |     |     | 0.9 max  |
| CTN8U   |             |            |            |             |             |             |            |             | 0.2 | 0.1 |          |
| CTNS8D  | 3.2 ± 0.2   | 1.6 ± 0.2  | 0.8 ± 0.1  | 0.4 ± 0.1   | 0.4 ± 0.1   | 0.3 ± 0.2   | 0.4 ± 0.2  | 0.3 ± 0.1   |     |     | 0.55 max |
| CTNM16D | 10.16 ± 0.2 | 5.1 ± 0.2  | 1.27 ± 0.2 | 0.635 ± 0.1 | 0.635 ± 0.1 | 0.6 ± 0.2   | 0.8 ± 0.2  | 0.635 ± 0.1 |     |     | 0.9 max  |
| CTNM16U |             |            |            |             |             |             |            |             | 0.2 | 0.1 |          |
| CTN16D  |             |            |            |             |             |             |            |             |     |     |          |
| CTN16U  |             | 0.2        |            |             |             |             |            |             | 0.1 |     |          |

## SCHEMATIC



## DERATING CURVE



## PERFORMANCE

| Item                                     | Test Condition  | Specification                 |
|--|---|-------------------------------|
| Short Time Overload                      | Application of 2.5 times the rated voltage for 5 seconds          | ± (0.1% + 0.05Ω)              |
| Heat Resistance During Soldering         | Dip in Solder at 260°C ± 5°C for 10 ± 1 seconds                   | ± (0.05% + 0.05Ω)             |
| Temperature Cycles                       | 100 cycles between -55°C ~ +125°C                                 | ± (0.1% + 0.05Ω)              |
| Service Life Under Heavy Load            | 1,000 hours at 85°C, rated voltage with intermittent load         | ± (0.1% + 0.05Ω)              |
| Longevity Under Heavy Humidity Load      | 95% RH for 1000 hrs at 40°C, rated voltage with intermittent load | ± (0.1% + 0.05Ω)              |
| Absolute Value indicating Secular Change | 1 year at ambient temperature, normal humidity without load       | ±50ppm (within ±50ppm / year) |
| Relative Value Indicating Secular Change | 1 year at ambient temperature, normal humidity without load       | ±10ppm (within ±10ppm / year) |