Approval Specification

Customer :

Product: Thick Film Array Chip Resistor

CN-22 / CN-42 / CN-43/ CN-82

CNA43

±5%

Sizes : Convex Array

0402x2 / 0402x4

0603x4 / 0402x8

Concave Array

0603x4

Approval Date. :_____

Customer Approval :

1. Features

- Less board space than individual chip resistors
- Cost reduction efficiency by eliminating mounter operations
- Lead free products are available

2. Applications

- All general purpose applications

3. Description

The resistors are constructed on the alumina substrate. Top electrodes are added to each end and connected with resistive paste that is applied to top surface of the alumina substrate. The resistive layer is made by resistive paste that is prepared to approach the nominal value. Laser trimming process makes the resistance value to meet the nominal value and within the tolerance.

The resistive layer is protected by primary overcoat and secondary overcoat. Marking on secondary overcoat let user to know the resistance value directly. The barrier layer is added to edge electrodes for platting with external electrode that is the main role makes the resistor mounted on PCB.

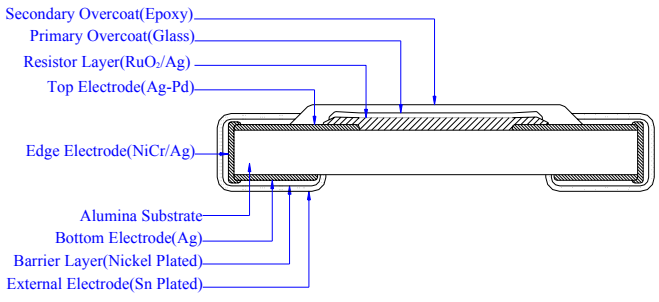


Fig. 1 Product construction

4. Quick Reference Data

Type name	CN-22	CN-42	CN-82	CN-43	CNA43
Size code	Convex Array 0402x2	Convex Array 0402x4	Convex Array 0402x8	Convex Array 0603x4	Concave Array 0603x4
Resistance tolerance	±5%(E24 series)				
Resistance range	±5%: 10Ω~1MΩ, Jumper		±5%: 10Ω~560kΩ, Jumper	±5%: 10Ω~1MΩ, Jumper	
Temperature Coefficient of Resistance (ppm/°C) 10Ω ≤ R ≤ 560KΩ 620KΩ ≤R ≤ 1MΩ	±5% ±200 ±200		±5% ±200 -	±5% ±200 ±200	
Power rating (at 70°C)	1/16W	1/16W	1/32W	1/16W	
Max. operation voltage (DC or RMS)	25V	25V	25V	50V	
Max. overload voltage	50V	50V	50V	100V	
Jumper Rated current	1A	1A	0.5A	1A	
Climatic category (IEC 60068)	55/125/42			55/155/42	

5. Order information

Digits	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Order Code	C	N	-	4	3	J	-	7	-	-	-	1	0	K
	Type Name CN-22: Convex Array 0402x2 CN-42: Convex Array 0402x4 CN-43: Convex Array 0603x4 CN-82: Convex Array 0402x8 CNA43: Concave Array 0603x4					**Tolerance** J : ?5% K : ?10%	**Function code** - : Normal F : ?100ppm G : ?200ppm L : Lead Free U : ?100ppm Lead Free W : ?200ppm Lead Free	**Packaging** 6 : 7” reel, paper tape, 10000 pcs/reel 7 : 7” reel, paper tape, 5000 pcs/reel A : 10” reel, paper tape, 10000 pcs/reel B : 10” reel, paper tape, 20000 pcs/reel C : 13” reel, paper tape, 40000 pcs/reel D : 13” reel, paper tape, 20000 pcs/reel	**Resistance Value** ----0R : Jumper --3K32 : 3.32K? --10K2 : 10.2K? --100K : 100K? ---1M2 : 1.2M?					

6. Functional description

Derating curve

For resistors operate in the ambient temperature over 70℃, loading power ratio will derate in accordance with following curve.

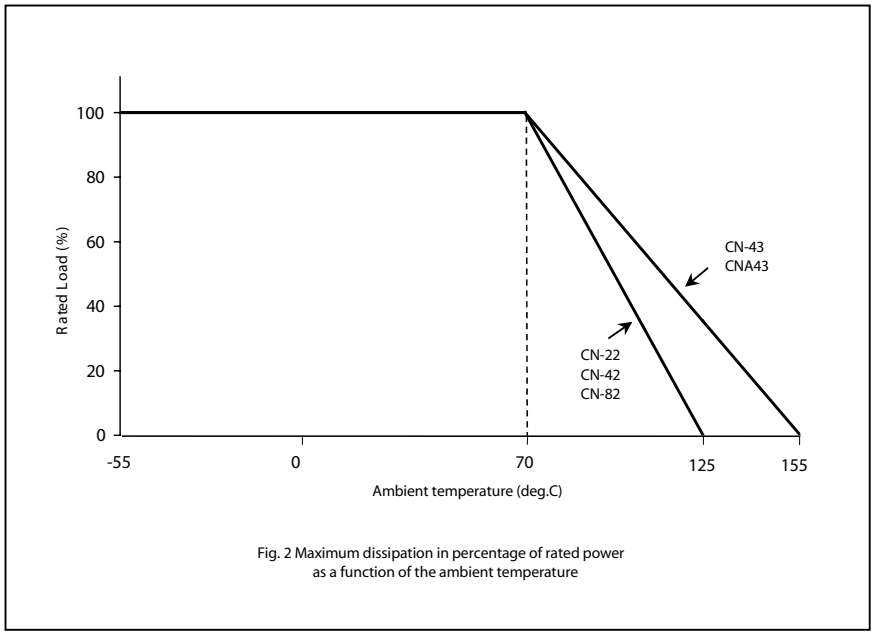


Fig. 2 Maximum dissipation in percentage of rated power as a function of the ambient temperature

Soldering condition

TMTEC chip resistor can be applied in lead/tin and pure tin processes. Typical example of soldering processed that provide reliable joints without any damage are given in Figs. 3.

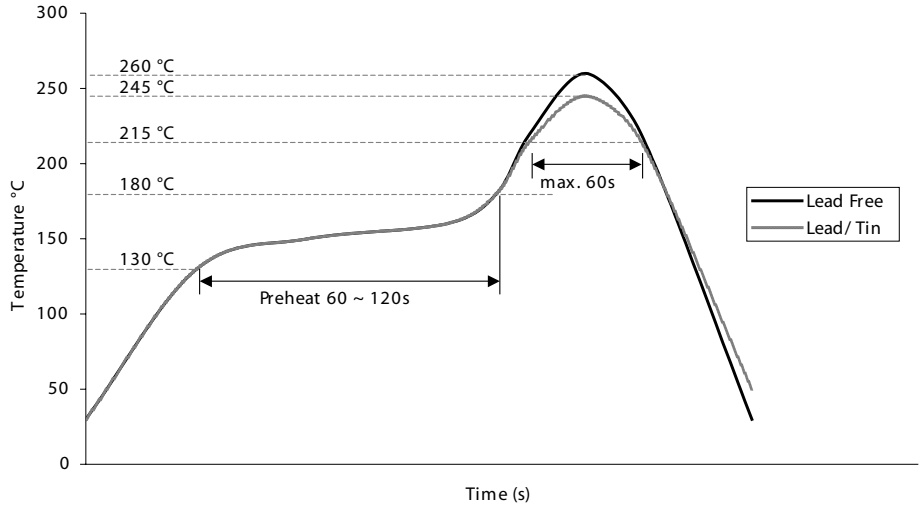


Fig.3 Infrared soldering profile for lead free, lead/ tin chip resistor

7. Mechanical Data

Mass per 1000 pcs

TYPE NAME	MASS (g)
CN-22	0.95
CN-42	2.857
CN-43	8.474
CN-82	9.19
CNA43	9.186

Outline

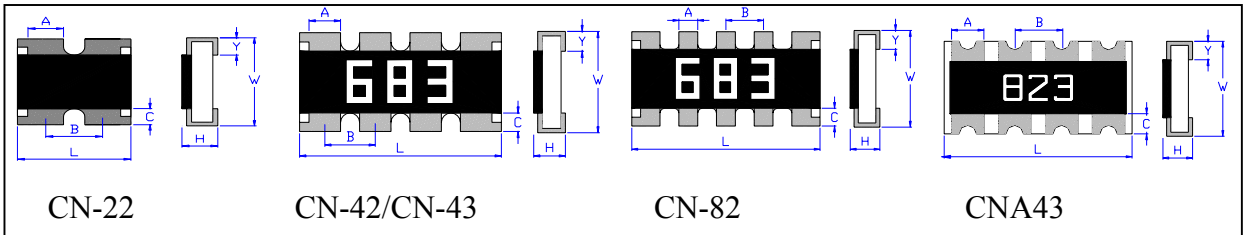


Fig.4. product outline

Dimension

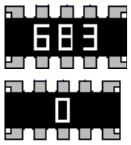
Type	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	C(mm)	Y(mm)
CN-22	1.00±0.10	1.00±0.10	0.35±0.10	0.25±0.10	0.65±0.05	0.20±0.10	0.25±0.10
CN-42	2.00±0.10	1.00±0.10	0.45±0.10	0.30±0.10	0.50±0.05	0.22±0.15	0.22±0.15
CN-43	3.20±0.15	1.60±0.15	0.55±0.10	0.50±0.15	0.80±0.05	0.30±0.15	0.30±0.15
CN-82	3.20±0.15	1.60±0.15	0.55±0.15	0.35±0.10	0.64±0.05	0.40±0.15	0.40±0.15
CNA43	3.20±0.15	1.60±0.15	0.55±0.10	0.50±0.15	0.80±0.05	0.30±0.15	0.40±0.15

Marking

Type A: product with 3 digits marking, the first two digits are significant figures; third digit is number of zeros to follow. Letter “R” is as decimal point. Letter “0” for jumper

Type B: CN-22 is without marking due the size is too small.

The marking example is as table 1.

Type	Product	Value	Example
A	CN-42 CN-43 CN-82 CNA43	68K? Jumper	
B	CN-22	N/A	

8. Test And Requirements

In table 3 the tests and requirements are listed with reference relevant clause of IEC 60115-1. A short description of the test procedure is given. Essentially all tests are carried out refer to the schedule of IEC 60115-8-1. The testing also covers the requirements specified by EIA.

Table 3 Test procedure and requirements

Test Item	Test Method	Test Condition	Requirement	
			?5%	Jumper
Temperature Coefficient of Resistance(T.C.R)	JIS C 5202 5.2 IEC 60115-1 4.8	-55?C~+125/+155 ?C 20?C is the reference temperature	Within the specification	
Short Time Overload	JIS C 5202 5.5 IEC 60115-1 4.13	2.5 times RCWV or RCOV, for 5 seconds	?(2.0%+0.05?)	<50m?
Insulation Resistance	JIS C 5202 5.6 IEC 60115-1 4.6	RCOV for 1 minute	?10G	
Voltage Proof	JIS C 5202 5.7 IEC 60115-1 4.7	1.42 times RCWV (RMS) for 1 minute	no breakdown or flashover	
Substrate Bending Test	JIS C 5202 6.1 IEC 60115-1 4.33	Bending once for 5 seconds	?(1.0%+0.05?)	<50m?
Resistance to soldering heat	JIS C 5202 6.4 IEC 60115 4.18	260?5?C for 10 seconds	?(1.0%+0.05?)	<50m?
Leaching	JIS C 5202 6.4 IEC 60115 4.18	260?5?C for 60 seconds	no leaching	
Solderability	JIS C 5202 6.5 IEC 60115-1 4.17	235?5?C for 2 seconds. lead free application: 245?3?C for 2 seconds.	>95% coverage	
Endurance at upper category temperature	JIS C 5202 7.2 IEC 60115-1 2.23.2	at +125/+155 ?C for 1000 hrs	?(1.5%+0.10?)	<50m?
Rapid change of temperature	JIS C 5202 7.4 IEC 60115-1 4.19	-55?C to +125/+155 ?C, 5 cycles	?(1.0%+0.05?)	<50m?
Damp heat with load	JIS 5202 7.9	40?2?C, 90~95% R.H. RCWV, for 1000 hrs with 1.5hrs “ON” and 0.5 hrs “OFF”	?(3.0%+0.10?)	<100m?
Endurance	JIS C 5202 7.10 IEC 60115-1 4.25.1	70?2?C, RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”	?(3.0+0.10?)	<100m?

9. Packaging

Packaging Methods

Type (unit: piece)	Paper Tape		
	7" (178mm)	10" (254mm)	13" (330mm)
CN-22/ CN-42	10,000	20,000	40,000
CN-43/CN-82 /CNA43	5,000	10,000	20,000

Paper Tape

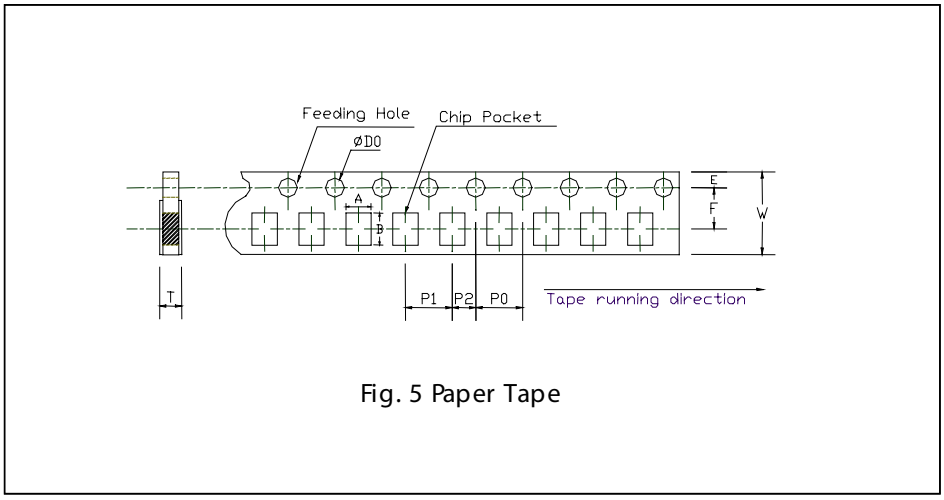
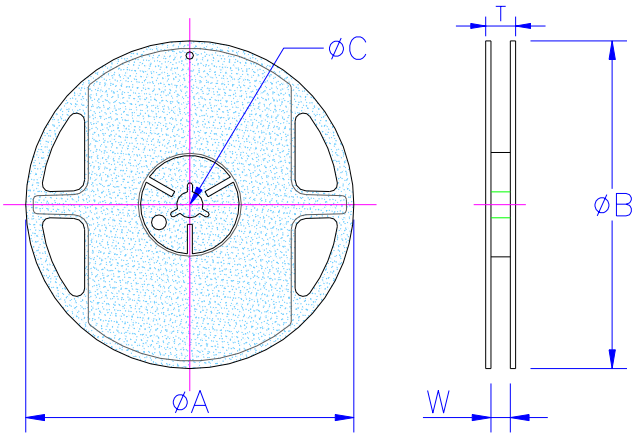


Fig. 5 Paper Tape

Dimension	A	B	W	E	F	P0	P1	P2	? D0	T
CN-22	1.20±0.1	1.20±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.10	2.0±0.05	$1.5^{?0.1}_{?0}$	0.45±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	$1.5^{?0.1}_{?0}$	0.70±0.1
CN-43	2.0±0.1	3.6±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	$1.5^{?0.1}_{?0}$	0.85±0.1
CN-82	2.0±0.1	3.6±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	$1.5^{?0.1}_{?0}$	0.85±0.1
CNA43	2.0±0.1	3.6±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	$1.5^{?0.1}_{?0}$	0.85±0.1

Unit: mm

Reel Specification



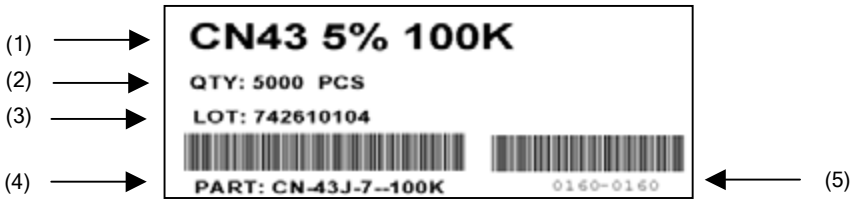
Unit:㎜

Style	Packing	Tape width	Reel Diameter	ϕA	ϕB	ϕC	W	T
CN-22 CN-42 CN-43 CN-82 CNA43	Paper	8 ㎜	7 inch	$180^{+0/-3}$	$60^{+1/-0}$	13.0±0.2	9.0±0.3	11.4±1
			10 inch	254±1	100±1	13.0±0.2	9.5±0.5	13.5±1
			13 inch	330±1	100±1	13.0±0.2	9.5±0.5	13.5±1

Label

The label put on each reel denoted with each products types, tolerance, resistance value, Q'ty, each Lot tracing no and barcode etc.

Example



(1) Type / Tolerance / Resistance value
(2) Reel packing quantity
(3) Lot Number
(4) Part Number
(5) Labeling control sequence

10. Revising History

Revision	Date	Change notification	Description
Rev.1	2004/7/30		New issue
Rev.2	2004/10/7		CN-22 paper tape dimension - T