

Chip Networks Resistors

Type CNB & CND Series

ISO 9001:2000
TS-16949

1. Features

- Manufactured to type RK73 standards
- Four or eight bussed resistor elements included in one array
- Products with lead-free terminations meet EU RoHS requirements. EU RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.
- Concave or convex terminations
- Less board space than individual chips

2. Dimensions

Size Code	L	W	t	P1	P2	a (top)	a (bot.)	b (ref.)	c (ref.)	d
2B9Z	.252±.008 (6.4±0.2)	.126±.008 (3.2±0.2)	.024±.004 (0.6±0.1)	.051±.004 (1.3±0.1)	.026±.004 (0.65±0.1)	.033 (0.85)	.024±.004 (0.6±0.1)	.006 (0.15)	.018 (0.45)	.024±.006 (0.6±0.15)
2E5Z	.126±.008 (3.2±0.2)	.098±.008 (2.5±0.2)	.024±.004 (0.6±0.1)	.039±.004 (1.0±0.1)	.020±.004 (0.50±0.1)	.026 (0.65)	.022±.004 (0.55±0.1)	.006 (0.15)	.012 (0.3)	.020±.006 (0.5±0.15)

Size Code	Figure No.	L	W	C	d	e	t	a (top)	a2	a (bot.)	b	p
1J10VK	2	.126±.004 (3.2±0.1)	.063±.004 (1.6±0.1)	.012±.008 (0.3±0.2)	.012±.004 (0.3±0.1)	—	.020±.004 (0.5±0.1)	.016±.004 (0.4±0.1)	—	.012 (0.3)	—	.025 (0.64)
1J10K	2	.126±.006 (3.2±0.15)	.063±.008 (1.6±0.2)	.012±.008 (0.3±0.2)	.010±.004 (0.25±0.1)	—	.020±.004 (0.5±0.1)	.016±.004 (0.4±0.1)	.022±.004 (0.55±0.1)	.012±.008 (0.3±0.2)	—	.025 (0.64)
1J10Y	1			.014±.004 (0.35±0.1)	.014±.004 (0.35±0.1)	.016±.006 (0.4±0.15)	.022±.004 (0.55±0.1)	.013±.006 (0.33±0.15)	—	.012±.004 (0.3±0.1)	.008±.004 (0.2±0.1)	
2A10Y	1	.157±.008 (4.0±0.2)	.083±.008 (2.1±0.2)	.010±.008 (0.25±0.2)	.016±.008 (0.4±0.2)	.020±.008 (0.5±0.2)	.024±.004 (0.6±0.1)	.020±.008 (0.5±0.2)	—	.016±.006 (0.4±0.15)	.006±.004 (0.15±0.1)	.031 (0.8)
2B10V	3	.252±.008 (6.4±0.2)	.122±.008 (3.1±0.2)	.014±.006 (0.35±0.15)	.022±.006 (0.55±0.15)	—	.024±.004 (0.6±0.1)	.024±.004 (0.6±0.1)	—	.024±.006 (0.6±0.15)	.006±.004 (0.15±0.1)	0.05 (1.27)
2B10	3											

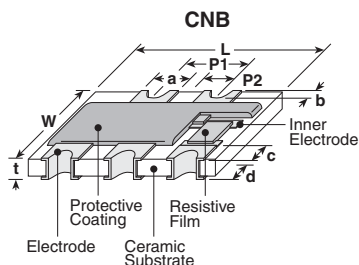
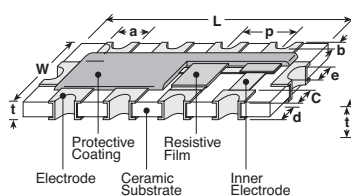
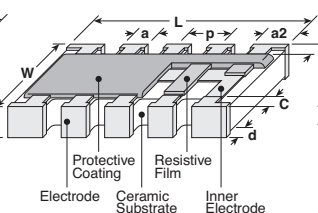


Figure 1



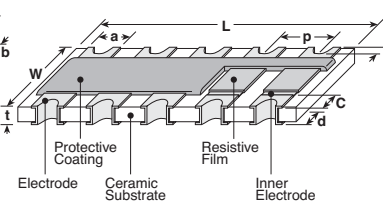
Concave

Figure 2



Convex

Figure 3



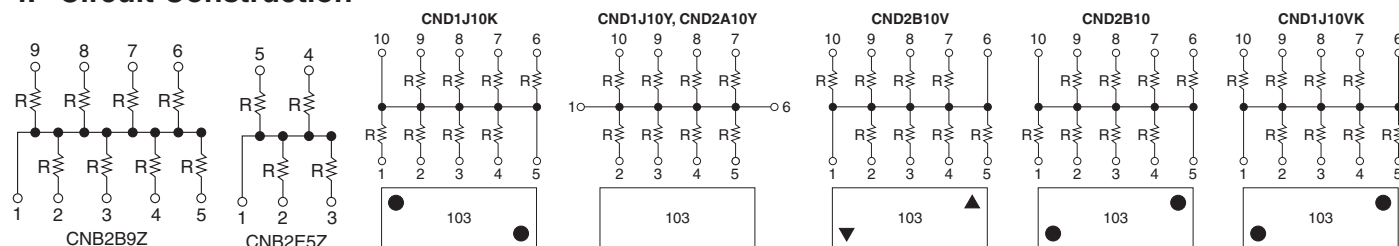
Concave

3. Type Designation

The type designation shall be the following form:

CNB	2B	9	Z	T	TE	103	J
Type	Size	Elements	Circuit Symbol	Termination Material	Packaging	Nominal Resistance	Tolerance
CNB CND	1J 2A 2B 2E	5 9 10	V: Reverse common electrode Y: Side electrode type Nil: Standard Z: for CNB	T: Sn (Other termination styles may be available, please contact factory for options)	TD: 7" Paper Taping TE: 7" Embossed Taping	2 significant figures + 1 multiplier	J: ±5%

4. Circuit Construction



5. Standard Applications

Part Designation	Power Rating @ 70°C (Per Element)	T.C.R. (ppm/°C) Max.	Resistance Range E-3*, E-12**	Resistance Tolerance	Absolute Maximum Working Voltage	Maximum Overload Voltage (5 Secs. Max.)	Operating Temperature Range
CNB2B9Z	1/16W (.063W)	±200	1KΩ - 470KΩ	J: ±5%	50V	100V	-55°C to +125°C
CNB2E5Z							
CND1J10VK	.031	±200	47Ω - 39kΩ	J: ±5%	25V	50V	-55°C to +125°C
CND1J10K			22Ω - 39KΩ				
CND1J10Y	.05						
CND2A10Y	.063		100Ω - 100KΩ				
CND2B10V							
CND2B10				50V	100V		

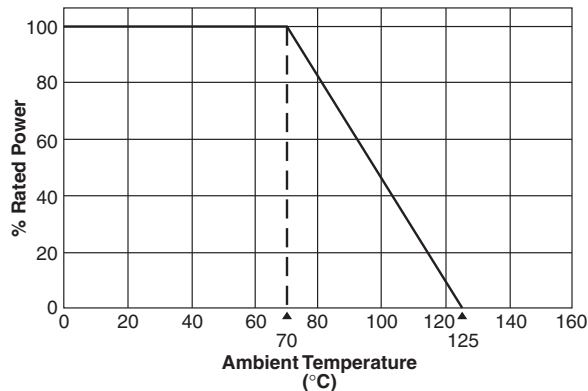
* E-3 significant figures (per decade) are 1.0, 2.2 and 4.7.

** E-12 CND only

6. Environmental Applications

For temperature in excess of 70°C, the load shall be derated in accordance with the following figure.

Derating Curve



6-2 Voltage Rating

Resistors shall have a rated direct-current (DC) continuous working voltage or approximate sine-wave root-mean-square (R.M.S.) continuous working voltage at commercial-line frequency and wave-form corresponding the power rating as determined from the following formula:

$$E = \sqrt{P \cdot R}$$

Where: E: Rated Voltage (V)
P: Power Rating (W)
R: Nominal Resistance (Ω)

However, if the rated voltage thus obtained surpasses the specified maximum working voltage, it shall be considered the rated voltage.

7. Performance

CNB

Parameter	Requirement $\Delta R \pm\%$	Limit	Typical	Test Method
Resistance	Within regulated tolerance	—	—	25°C
T.C.R.	Within specified T.C.R.	—	—	+25°C/-55°C, +25°C/+125°C
Overload (Short time)	±2.0%	±0.5%	—	Rated voltage x 2.5 for 5 seconds
Resistance to Solder Heat	±1.0%	±0.25%	—	260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature	±1.0%	±1.0%	—	-55°C (30 minutes), +125°C (30 minutes), 5 cycles
Moisture Resistance	±5.0%	±1.0%	—	40°C ± 2°C, 90 - 95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Endurance at 70°C	±5.0%	±0.5%	—	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Low Temperature Operation	±1.0%	±0.2%	—	-55°C, 1 hour
High Temperature Exposure	±1.0%	±0.2%	—	+125°C, 1000 hours

CND

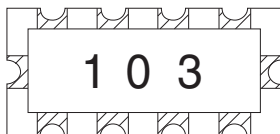
Parameter	Requirement $\Delta R \pm 1\%$	Limit	Typical	Test Method
Resistance	Within specified tolerance	—	—	25°C
T.C.R.	Within specified T.C.R.	—	—	+25°C/-55°C, +25°C/+125°C
Overload (Short time)	±2.0%	±0.5%	—	Rated voltage x 2.5 for 5 seconds
Resistance to Solder Heat	±1.0%	±0.25%	—	260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature	±1.0%	±0.25%	—	-55°C (30 minutes), +125°C (30 minutes), 5 cycles
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Endurance at 70°C	±5.0%	±1.0%	—	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Low Temperature Operation	±1.0%	±0.2%	—	-55°C, 1 hour
High Temperature Exposure	±1.0%	±0.2%	—	+125°C, 1000 hours

8. Body Color and Marking

Body Color: Black
Marking Color: White

103

Nominal resistance at 3-digit numbers



3-digit numbers

The first and the second numbers show 2 effective numbers, the third number shows a multiple of 10.

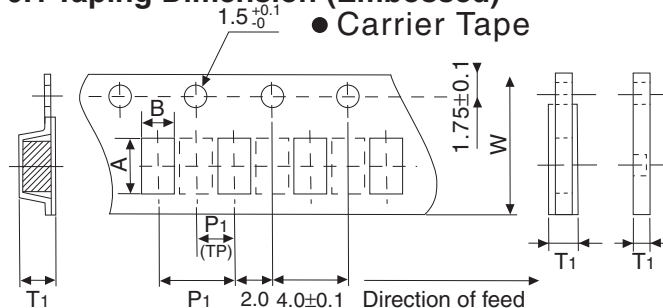
Example: 103 → 10,000Ω → 10kΩ
472 → 4,700Ω → 4.7kΩ

9. Taping

Tape material and quantity per reel

Tape material	Tape width	Quantity/Reel (pcs.)
Embossed	.472 in. (12 mm)	4,000

9.1 Taping Dimension (Embossed)

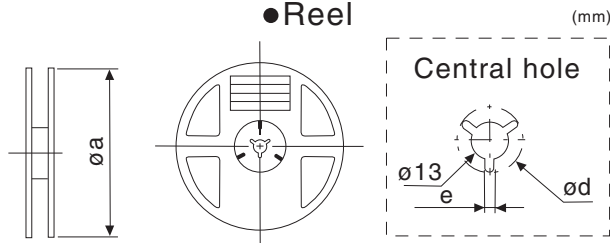


(Notes) Dotted lines are applicable to only "TP" and "TB."

Type		Component Size (mm)			Carrier Tape	Quantity/Reel (Pieces)	Taping (mm)					Reel Size
		L	W	T			A	B	W	P1	T1	
CND	2B10	6.40	3.1	0.6	TE	4000	6.6±0.2	3.4±0.2	12.0±0.1	4.0±0.1	1±0.15	178
	1J10	3.20	1.6	0.55	TD	5000	3.5±0.1	2.0±0.1	8.0±0.2	4.0±0.1	0.75±0.2/-0	178
	2A10	4.00	2.1	0.6	TE	4000	4.45±0.2	2.5±0.2	12.0±0.1	4.0±0.1	1±0.15	178
CNB	2B5Z	3.2	2.5	0.6	TE	4000	3.5±0.2	3.0±0.2	8.0±0.2	4.0±0.1	1±0.15	178
	2E9Z	6.40	3.2		TE	4000	6.7±0.2	3.5±0.2	12.0±0.1	4.0±0.1	1±0.15	178

10. Reel (Polystyrene Reel)

•Reel



Type	ød (mm)	e (mm)
All	21	2

(Notes) Reel holes, shapes and design are examples

11. Reel Marking

The reel must be marked as follows:

- (1) Type designation
- (2) Nominal resistance
- (3) Quantity
- (4) Production lot number
- (5) Manufacturer's name
- (6) Customer's code number
- (7) Order number

Lot Number

Lot number (8 digits)

23	12	8	001
Production year, month	Date	Factory	Continuous number
		8 KT & T factory	

11~22	January 2011 ~ December 2011
23~34	January 2012 ~ December 2012