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SPECIFICATIONS

Thick Film Flat Chip

CNF-Serie

Version February 2022

Thick Film Flat Array Chip Resistor

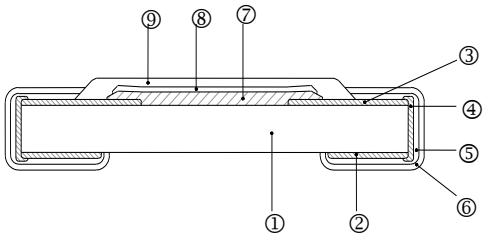
■Scope

—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

■Construction

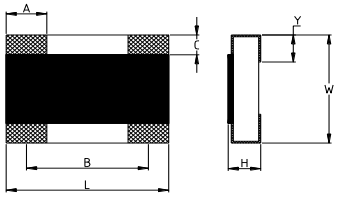


■Applications

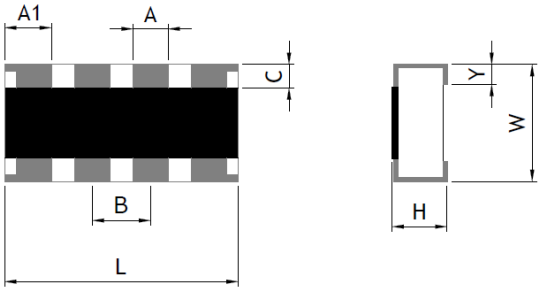
—Entertainment
—Computer & Related Products
—Communication Equipment
—Power Equipment
—Measuring Instrument

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



CNF22



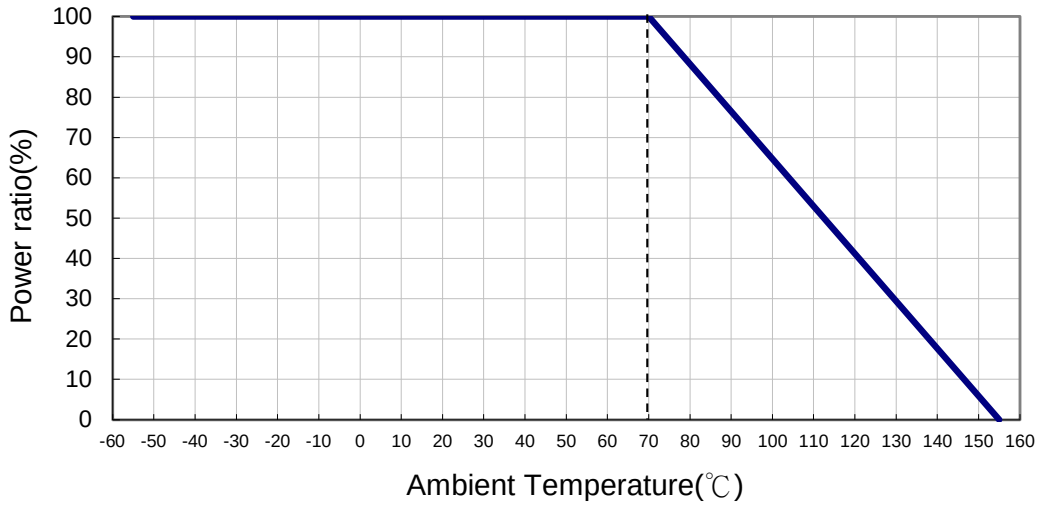
CNF42/CNF43

Type	Number of Resistors	L (mm)	W (mm)	H (mm)	A (mm)	A1 (mm)	B (mm)	C (mm)	Y (mm)	Weight (g) (1000pcs)
CNF22	2	1.20±0.10	1.00±0.10	0.35±0.10	0.43±0.1	-	0.82±0.05	0.22±0.10	0.30±0.15	1.6
CNF42	4	2.00±0.10	1.00±0.10	0.45±0.10	0.35±0.10	0.45±0.10	0.5±0.10	0.20±0.10	0.35±0.15	3.2
CNF43	4	3.20±0.10	1.55±0.10	0.55±0.10	0.45±0.15	0.60±0.10	0.8±0.05	0.20±0.10	0.47±0.15	10.2

■Part Numbering

CNF	22	F	T	F	Y	1002
Product Type	Dimensions	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance
	22: 0402x2 42: 0402x4 43: 0603x4	F: ±1% J: ±5% or Jumper	T: Taping Reel	F: ±200 G: ±300 -: No specified (For Jumper)	Y: 1/16W X: 1/10W W: 1/8W	0030: 3Ω 1000: 100Ω 1002: 10KΩ 2201: 2.2KΩ 1003: 100KΩ 1004: 1MΩ R0R0: 0Ω

■Derating Curve

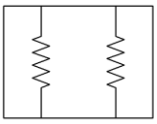


■Electrical Specifications

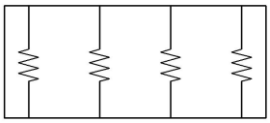
Item / Type	Power Rating at 70°C Jumper Rated Current	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Number of Resistors	Resistance Range		TCR (PPM/°C)
						±1% (E24,E96)	±5% (E24)	
CNF22	1/16W	-55 ~ +155°C	25V	50V	2	1Ω - 9.76Ω	1Ω - 9.1Ω	±500
						10Ω - 1MΩ	10Ω - 1MΩ	±200
	Jumper: 1A					-	0Ω (<50mΩ)	-
CNF42	1/16W	-55 ~ +155°C	50V	100V	4	1Ω - 10MΩ	1Ω - 10MΩ	±200
	Jumper: 1A					-	0Ω (<50mΩ)	-
CNF43	1/10W 1/8W	-55 ~ +155°C	50V	100V	4	1Ω - 10MΩ	1Ω - 10MΩ	±200
	Jumper: 1A					-	0Ω (<50mΩ)	-

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

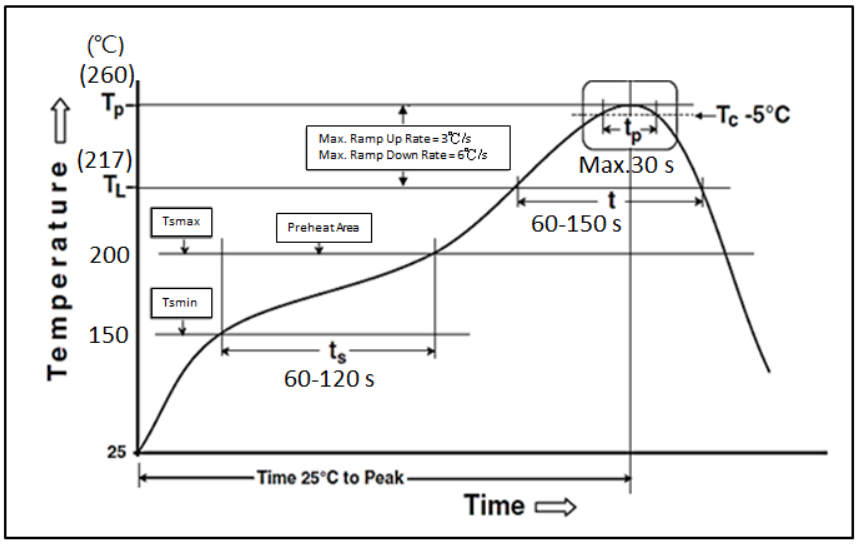


CNF22



CNF42/CNF43

■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)	±(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	**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	**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)	<50mΩ	**JIS-C-5201-1 4.23** **IEC-60115-1 4.23.2** at +155°C for 1000 hrs

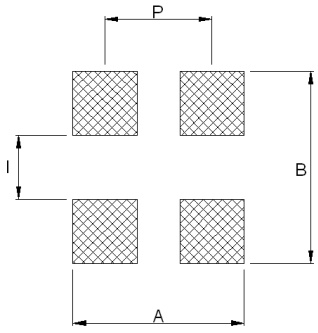
Item	Requirement			Test Method
	±1%	±5%	Jumper	
Bending Strength	±(1.0%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	**JIS-C-5201-1 4.33** **IEC-60115-1 4.33** Bending once for 60 seconds with 3mm
Solderability	95% min. coverage			**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** 245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	±(1.0%+0.05Ω)	<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 ≦5% Total leaching area ≦ 10%			**JIS-C-5201-1 4.18** **IEC-60068-2-58 8.2.1** 260±5°C for 30 seconds
Rapid Change of Temperature	±(0.5%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	**JIS-C-5201-1 4.19** **IEC-60115-1 4.19** -55°C to +155°C, 5 cycles

RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

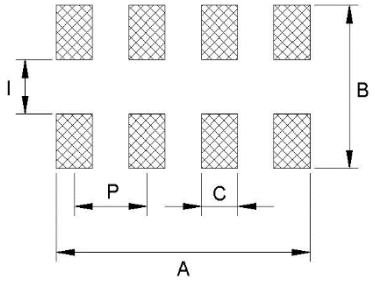
■Storage Temperature: 15~28°C; Humidity < 80%RH

■Shelf Life: 2 years from production date.

■Recommend Land Pattern



CNF22

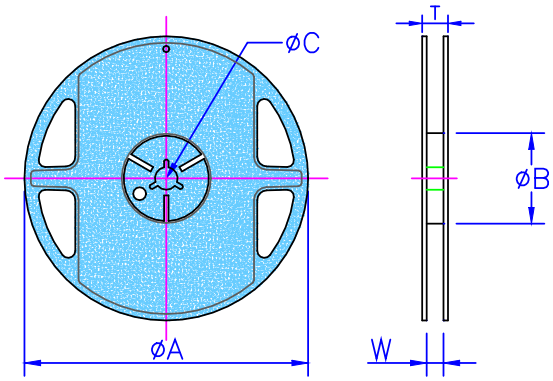


CNF42/CNF43

Type	A (mm)	B (mm)	C (mm)	I (mm)	P (mm)
CNF22	1.50	1.25	-	0.35	0.80
CNF42	2.10	1.80	0.30	0.50	0.50
CNF43	3.10	2.85	0.45	0.80	0.80

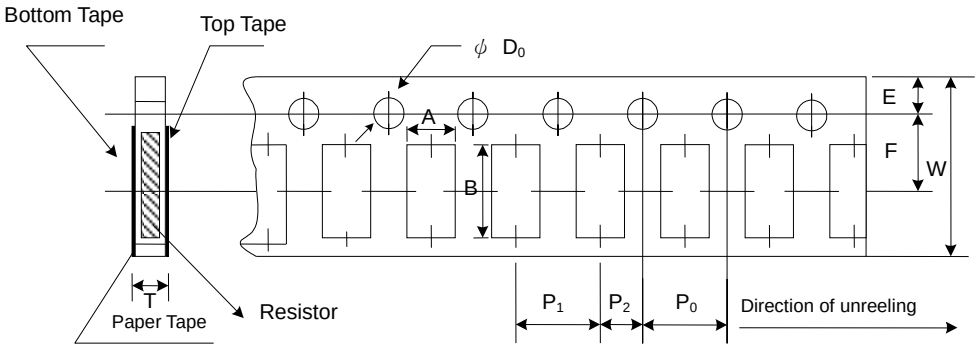
■Packaging

Reel Specifications & Packaging Quantity



Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
CNF22	Paper	10K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±0.5
CNF42	Paper	10K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±0.5
CNF43	Paper	5K	8mm	7 inch	178.5±1.5	$60^{+1/-0}$	13.0±0.2	9.0±0.5	12.5±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)
CNF22	1.20±0.1	1.45±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	0.43±0.1
CNF42	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
CNF43	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 CNF22

Jumper for CNF42/CNF43: Letter “0”

1% for CNF42/CNF43: 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 CNF42/CNF43: 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1^{st} and 2^{nd} are E24 code and 3^{rd} 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 A	Jan 20, 2022	-	- New product release
Version A1	Feb 15, 2022	-	- Derating Curve changes the temperature range