Thin Film Precision Chip Resistor－AR Series

Features

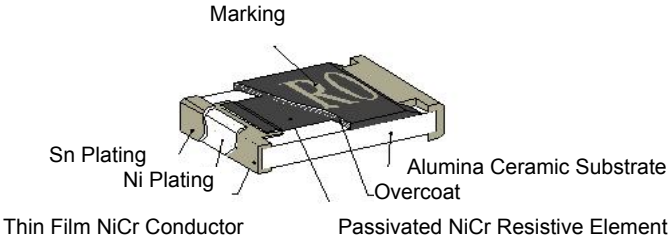
－Thin Film Passivated NiCr Resistor

－Very Tight Tolerance from ±0.01%~1%

－Extremely Low TCR from ±5~±50 PPM/℃

－Wide R-Value Range

Construction



Applications

-Medical Equipment

-Testing / Measurement Equipment

-Consumer Product

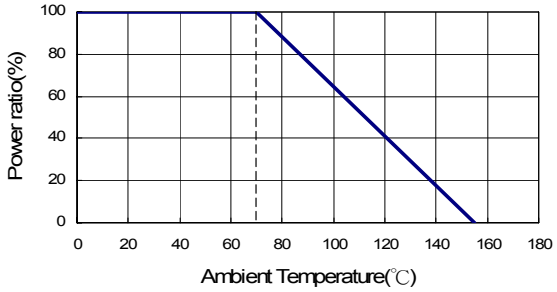
-Printer Equipment

-Automatic Equipment Controller

-Converters

-Communication Device, Cell phone, GPS, PDA

Derating Curve



Part Numbering

AR	03	T	T	D		1000	N
①	②	③	④	⑤	⑥	⑦	⑧

① Product Type

Product Type	
AR	Thin Film Precision Chip Resistor

②Dimensions (L×W)

Codes	Dimensions (LxW)	EIA
AR02	1.00×0.50mm	0402
AR03	1.60×0.80mm	0603
AR05	2.00×1.25mm	0805
AR06	3.00×1.50mm	1206
AR10	4.90×2.40mm	2010
AR12	6.30×3.10mm	2512

③Resistance Tolerance

Codes	Resistance Tolerance
T	±0.01%
A	±0.05%
B	±0.10%
C	±0.25%
D	±0.50%
F	±1.00%

④Packaging

Codes	Type
T	Taping Reel
B	Bulk

⑤TCR

Codes	Type
S	±5 PPM/℃
B	±10 PPM/℃
N	±15 PPM/℃
C	±25 PPM/℃
D	±50 PPM/℃

⑥ Higher Power Rating

Codes	Power Rating
	Standard / Special
U	1/2W
V	1/4W
W	1/8W
X	1/10W
T	1W

⑦Resistance

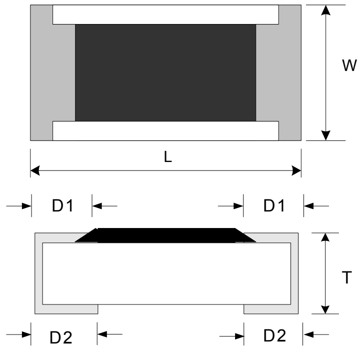
Codes	Type
0010	1Ω
4R70	4.7Ω
1000	100Ω
2201	2200Ω
1002	10000Ω
4992	49900Ω
1003	100000Ω

⑧Marking

Codes	Type
	Standard Marking for E96 / E24
N	No Marking

PDF compression, OCR, web-optimization with CVISION PDFCompressor

Dimensions



Unit: mm

Codes	L	W	T	D1	D2
AR02	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.20±0.10
AR03	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
AR05	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.25
AR06	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25
AR10	4.90±0.15	2.40±0.15	0.55±0.10	0.60±0.30	0.50±0.25
AR12	6.30±0.15	3.10±0.15	0.55±0.10	0.60±0.30	0.50±0.25

Standard Electrical Specifications

Item / Type	Power Rating at 70℃	Operating Temp. Range	Max Operating Voltage	Max Overloading Voltage	Resistance Tolerance	Resistance Range	TCR (PPM/℃)
AR02 (0402)	1/16W	-55 ~ +155℃	25V	50V	±0.10% ±0.25% ±0.50%	10Ω~205KΩ	±25 ±50
AR03 (0603)	1/16W	-55 ~ +155℃	50V	100V	±0.05%	4.7Ω~150KΩ	±25 ±50
					±0.10%	4.7Ω~1MΩ	
					±0.25% ±0.50%	2Ω~1MΩ	
AR05 (0805)	1/10W	-55 ~ +155℃	100V	200V	±0.05%	4.7Ω~500KΩ	±25 ±50
					±0.10%	4.7Ω~2MΩ	
					±0.25% ±0.50%	1Ω~2MΩ	
AR06 (1206)	1/8W	-55 ~ +155℃	150V	300V	±0.05%	4.7Ω~1MΩ	±25 ±50
					±0.10%	4.7Ω~2.5MΩ	
					±0.25% ±0.50%	1Ω~2.5MΩ	
AR10 (2010)	1/4W	-55 ~ +155℃	150V	300V	±0.05%	4.7Ω~1MΩ	±25 ±50
					±0.10%	4.7Ω~3MΩ	
AR12 (2512)	1/2W				±0.25% ±0.50%	1Ω~3MΩ	

***Viking is capable of manufacturing the optional spec based on customer's requirement.**

Special Electrical Specifications

Item / Type	Power Rating at 70℃	Operating Temp. Range	Max Operating Voltage	Max Overloading Voltage	Resistance Tolerance	Resistance Range	TCR (PPM/℃)
AR02 (0402)	1/16W	-55 ~ +155℃	25V	50V	±0.01% ±0.05% ±0.10%	49.9Ω~3KΩ	±5
						49.9Ω~12KΩ	±10 ±15
AR03 (0603)	1/16W	-55 ~ +155℃	50V	100V	±0.01% ±0.05% ±0.10%	25Ω~15KΩ	±5
						25Ω~100KΩ	±10 ±15
					±0.10%	4.7Ω~332KΩ	±10
AR05 (0805)	1/10W	-55 ~ +155℃	100V	200V	±0.01% ±0.05% ±0.10%	25Ω~30KΩ	±5
						25Ω~200KΩ	±10 ±15
					±0.05% ±0.10%	4.7Ω~500KΩ	±10
AR06 (1206)	1/8W	-55 ~ +155℃	150V	300V	±0.01% ±0.05% ±0.10%	25Ω~50KΩ	±5
						25Ω~500KΩ	±10 ±15
					±0.10%	4.7Ω~1MΩ	±10
AR10 (2010)	1/4W	-55 ~ +155℃	150V	300V	±0.01% ±0.05% ±0.10%	25Ω~100KΩ	±5
						25Ω~500KΩ	±10 ±15
					±0.10%	4.7Ω~1MΩ	±10
AR12 (2512)	1/2W	-55 ~ +155℃	150V	300V	±0.01% ±0.05% ±0.10%	25Ω~100KΩ	±5
						25Ω~500KΩ	±10 ±15
					±0.10%	4.7Ω~1MΩ	±10

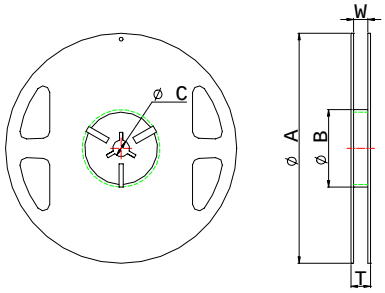
PDF compression, OCR, web optimization with CVISION's PdfCompressor

Higher Power Rating Electrical Specifications

Item / Type	Power Rating at 70℃	Operating Temp. Range	Max Operating Voltage	Max Overloading Voltage	Resistance Tolerance	Resistance Range	TCR (PPM/℃)
AR03 (0603)	1/10W	-55 ~ +155℃	50V	100V	±0.10% ±0.25% ±0.50%	10Ω~332KΩ	±25 ±50
AR05 (0805)	1/8W	-55 ~ +155℃	150V	300V	±0.10% ±0.25% ±0.50%	4.7Ω~1MΩ	±25 ±50
AR06 (1206)	1/4W	-55 ~ +155℃	200V	400V	±0.10% ±0.25% ±0.50%	4.7Ω~1MΩ	±25 ±50

Packaging

Packaging Quantity & Reel Specifications

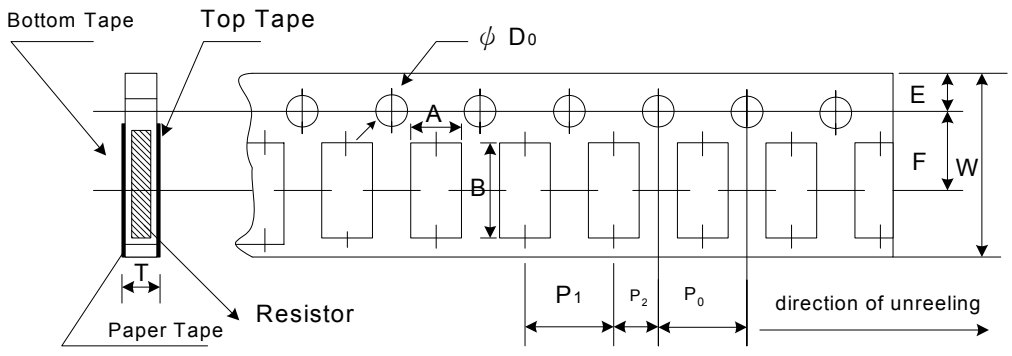


Unit: mm

Codes	ΦA	ΦB	ΦC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
AR02	178±1	60.0+0.5	13.0±0.20	9.00±0.50	12.0±0.15	10,000	-
AR03	178±1	60.0+0.5	13.0±0.20	9.00±0.50	12.0±0.15	5,000	-
AR05	178±1	60.0+0.5	13.0±0.20	9.00±0.50	12.0±0.15	5,000	-
AR06	178±1	60.0+0.5	13.0±0.20	9.00±0.50	12.0±0.15	5,000	-
AR10	178±1	60.2±0.5	13.0±1.00	13.2±1.50	16.0±0.20	-	4,000
AR12	178±1	60.2±0.5	13.0±0.50	13.2±1.50	16.0±0.20	-	4,000

Packaging

Paper Tape Specifications

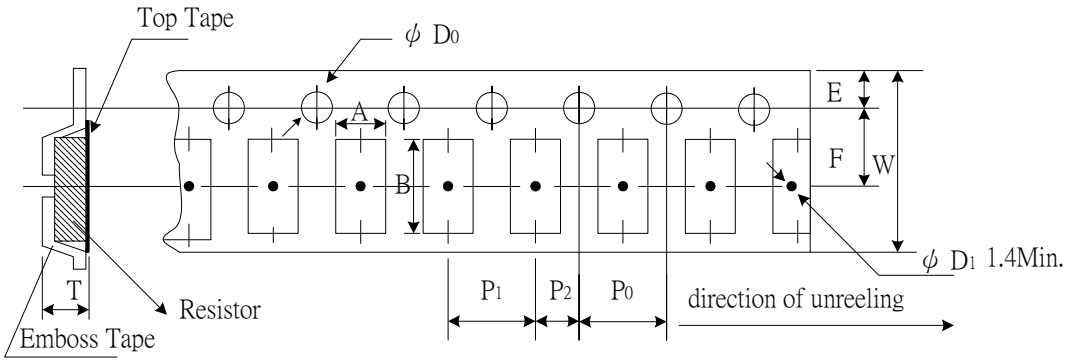


Unit: mm

Codes	A	B	W	E	F	P0	P1	P2	ΦD0	T
AR02	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
AR03	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
AR05	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
AR06	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05

PDF compressed with CVISION PDFCompressor

Emboss Plastic Tape Specifications



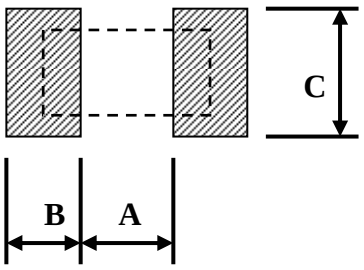
Unit: mm

Codes	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
AR10	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20
AR12	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20

Recommend Land Pattern

Unit：mm

Codes	A	B	C
AR12	4.90	1.60	3.10±0.2
AR10	3.60	1.40	2.50±0.2
AR06	2.00	1.15	1.70±0.2
AR05	1.00	1.00	1.35±0.2
AR03	0.80	1.00	0.90±0.2
AR02	0.50	0.50	0.60±0.2



Environmental Characteristics

Test Item	Specification		Test Method
	Tol. ≦0.05%	Tol.>0.05%	
Temperature Coefficient of Resistance	As Spec		**MIL-STD-202F Method 304** +25/-55/+25/+125/+25℃
Short Time Overload	ΔR±0.05%	ΔR±0.5%	**JIS-C-5202-5.5** RCWV*2.5 or Max Overloading Voltage，5 seconds
	ΔR±0.5% for high power rating		
Dielectric Withstand Voltage	By type		**MIL-STD-202F Method 301** Apply Max Overload Voltage for 1 minute
Insulation Resistance	>1000MΩ		**MIL-STD-202F Method 302** Apply 100V_{DC} for 1 minute
Thermal Shock	ΔR±0.05%	ΔR±0.25%	**MIL-STD-202F Method 107G** -55℃~150℃,100 cycles
Load Life	ΔR±0.05%	ΔR±0.2%	**MIL-STD-202F Method 108A** RCWV，70℃，1.5 hours ON，0.5 hours OFF, total 1000~1048 hours
	>7kΩ ΔR±0.5%		
	ΔR±0.5% for high power rating		
Humidity（Steady State）	ΔR±0.05%	ΔR±0.3%	**MIL-STD-202F Method 103B** 40℃，90~95%RH,RCWV 1.5 hours ON,0.5 hours OFF, total 1000~1048 hours
	ΔR±0.5% for high power rating		
Resistance to Dry Heat	ΔR±0.05%	ΔR±0.2%	**JIS-C-5202-7.2** 96 hours @ +155℃ without load
Low Temperature Operation	ΔR±0.05%	ΔR±0.2%	**JIS-C-5202-7.1** 1 hours,-65℃,followed by 45minutes of RCWV
	ΔR±0.5% for high power rating		
Bending Strength	ΔR±0.05%	ΔR±0.2%	**JIS-C-5202-6.1.4** Bending Amplitude 3mm for 10 seconds
Solderability	95%min coverage		**MIL-STD-202F Method 208H** 245℃±5℃, 2±0.5 (sec)
Resistance to Soldering Heat	ΔR±0.05%	ΔR±0.2%	**MIL-STD-202F Method 210E** 260±5℃, 10±1 seconds

＊ **Storage Temperature :25±3℃; Humidity <80%RH**