

# Thin Film Precision Chip Resistor

## AR Series

**INTRON**

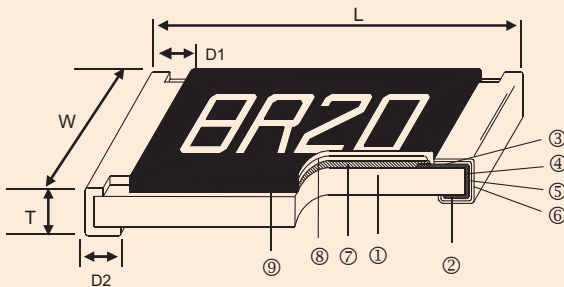
### Features

- Advanced thin film Technology
- Very Tight Tolerance down to  $\pm 0.01\%$
- Extremely Low TCR down to  $\pm 2\text{PPM}/^\circ\text{C}$
- Wide resistance range 1ohm ~ 3Mega ohm
- Miniature size 0201 available

### Applications

- Medical Equipment
- Testing / Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDA

### Construction



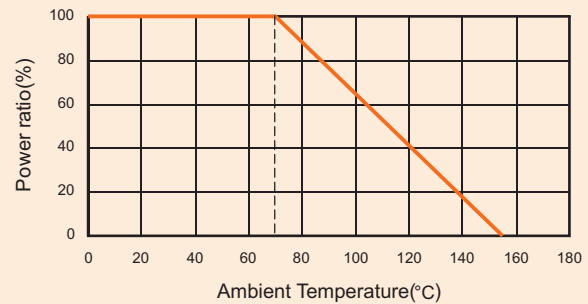
① Alumina Substrate	④ Edge Electrode (NiCr)	⑦ Resistor Layer (NiCr)
② Bottom Electrode (Ag)	⑤ Barrier Layer (Ni)	⑧ Overcoat (Epoxy)
③ Top Electrode (Ag-Pd)	⑥ External Electrode (Sn)	⑨ Marking

### Dimensions

Unit : mm

TYPE	Size (Inch)	L	W	T	D1	D2
AR01	0201	0.58±0.05	0.29±0.05	0.23±0.05	0.12±0.05	0.15±0.05
AR02	0402	1.00±0.05	0.50±0.05	0.30±0.05	0.20±0.10	0.20±0.10
AR03	0603	1.55±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
AR05	0805	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.20
AR06	1206	3.05±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25
AR13	1210	3.10±0.15	2.40±0.15	0.55±0.10	0.40±0.20	0.55±0.25
AR10	2010	4.90±0.15	2.40±0.15	0.55±0.10	0.60±0.30	0.50±0.25
AR12	2512	6.30±0.15	3.10±0.15	0.55±0.10	0.60±0.30	0.50±0.25

### Derating Curve



### Part Numbering

<b>AR</b>	<b>03</b>	<b>T</b>	<b>T</b>	<b>B</b>	<b>Y</b>	<b>1001</b>	<b>N</b>
<b>Product Type</b>	<b>Dimensions (L X W)</b>	<b>Resistance Tolerance</b>	<b>Packaging Code</b>	<b>TCR (PPM/°C)</b>	<b>Power Rating</b>	<b>Resistance</b>	<b>Marking Code</b>
	01:0201 02:0402 03:0603 05:0805 06:1206 13:1210 10:2010 12:2512	T : $\pm 0.01\%$ A : $\pm 0.05\%$ B : $\pm 0.1\%$ C : $\pm 0.25\%$ D : $\pm 0.5\%$ F : $\pm 1\%$	T : Taping Reel B : Bulk	X : $\pm 2$ O : $\pm 3$ S : $\pm 5$ B : $\pm 10$ N : $\pm 15$ C : $\pm 25$ N : $\pm 50$	: Standard Y : 1/16W X : 1/10W W : 1/8W M : 1/6W P : 1/5W V : 1/4W O : 1/3W U : 1/2W Q : 3/4W T : 1W	0010 : 1Ω 4R70 : 4.7Ω 1001 : 1KΩ 1004 : 1MΩ	: Standard Marking for E96 / E24 N: No Marking

## Standard Electrical Specifications

Type	Item	Power Rating at 70°C	Operating Temp. Range	Max Operating Voltage	Max Overload Voltage	Resistance Range					TCR (PPM/°C)
						±0.05%	±0.1%	±0.25%	±0.5%	±1%	
AR01 (0201)		1/32W	-55 ~ +155°C	15V	30V	-					±25 ±50
AR02 (0402)		1/16W	-55 ~ +155°C	25V	50V	49.9Ω - 12KΩ	10Ω - 255KΩ	4.7Ω - 511KΩ			±25 ±50
AR03 (0603)		1/16W	-55 ~ +155°C	50V	100V	4.7Ω - 332KΩ	4.7Ω - 1MΩ	1Ω - 1MΩ			±25 ±50
AR05 (0805)		1/10W	-55 ~ +155°C	100V	200V	4.7Ω - 1KΩ	4.7Ω - 2MΩ	1Ω - 2MΩ			±25 ±50
AR06 (1206)		1/8W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	4.7Ω - 2.49MΩ	1Ω - 2.49MΩ			±25 ±50
AR13 (1210)		1/4W									
AR10 (2010)		1/4W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	4.7Ω - 3MΩ	1Ω - 3MΩ			±25 ±50
AR12 (2512)		1/2W									

## Special Electrical Specifications

Type	Item	Power Rating at 70°C	Operating Temp. Range	Max Operating Voltage	Max Overload Voltage	Resistance Range					TCR (PPM/°C)
						±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	
AR02 (0402)		1/16W	-55 ~ +155°C	25V	50V	49.9Ω - 4.99KΩ					±2 ±3
						49.9Ω - 12KΩ					±5
						49.9Ω - 12KΩ					±10 ±15
AR03 (0603)		1/16W	-55 ~ +155°C	50V	100V	24.9Ω - 15KΩ					±2 ±3
						24.9Ω - 15KΩ					±5
						24.9Ω - 100KΩ					±10 ±15
AR05 (0805)		1/10W	-55 ~ +155°C	100V	200V	24.9Ω - 30KΩ					±2 ±3
						24.9Ω - 30KΩ					±5
						24.9Ω - 200KΩ					±10 ±15
AR06 (1206)		1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ					±2 ±3
						24.9Ω - 49.9KΩ					±5
						24.9Ω - 499KΩ					±10 ±15
AR13 (1210)		1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ					±2 ±3
						24.9Ω - 49.9KΩ					±5
						24.9Ω - 499KΩ					±10 ±15
AR10 (2010)		1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ					±2 ±3
						24.9Ω - 100KΩ					±5
						24.9Ω - 499KΩ					±10 ±15
AR12 (2512)		1/2W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ					±2 ±3
						24.9Ω - 100KΩ					±5
						24.9Ω - 499KΩ					±10 ±15

## High Power Rating Electrical Specifications

Type	Item	Power Rating at 70°C	Operating Temp. Range	Max Operating Voltage	Max Overload Voltage	Resistance Range					TCR (PPM/°C)
						±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	
AR03 (0603)	1/10W	-55 ~ +155°C	75V	150V	24.9Ω - 15KΩ					±2 ±3	
					24.9Ω - 15KΩ					±5	
					24.9Ω - 100KΩ					±10 ±15	
AR05 (0805)	1/8W	-55 ~ +155°C	150V	300V	4.7Ω - 332KΩ					±25 ±50	
					4.7Ω - 1MΩ					±25 ±50	
					10Ω - 332KΩ					±25 ±50	
AR06 (1206)	1/4W	-55 ~ +155°C	200V	400V	24.9Ω - 30KΩ					±2 ±3	
					24.9Ω - 30KΩ					±5	
					24.9Ω - 200KΩ					±10 ±15	
AR13 (2010)	1/3W	-55 ~ +155°C	200V	400V	4.7Ω - 511MΩ					±10 ±15	
					4.7Ω - 1MΩ					±25 ±50	
					4.7Ω - 1MΩ					±25 ±50	
AR10 (2010)	1/3W	-55 ~ +155°C	200V	400V	1Ω - 1MΩ					±25 ±50	
					10Ω - 499KΩ					±25 ±50	
					-					±25 ±50	
Ar12 (2512)	3/4W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ					±2 ±3	
					24.9Ω - 49.9KΩ					±5	
					24.9Ω - 499KΩ					±10 ±15	
Ar12 (2512)	1W	-55 ~ +155°C	200V	400V	24.9Ω - 49.9KΩ					±2 ±3	
					24.9Ω - 49.9KΩ					±5	
					24.9Ω - 499KΩ					±10 ±15	
Ar12 (2512)	1W	-55 ~ +155°C	200V	400V	4.7Ω - 2KΩ					±10 ±15	
					4.7Ω - 2KΩ					±25 ±50	
					-					±25 ±50	
Ar12 (2512)	1W	-55 ~ +155°C	200V	400V	4.7Ω - 100KΩ					±25 ±50	
					4.7Ω - 100KΩ					±25 ±50	
					-					±25 ±50	

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