Resistor Technology

AR-Series
Thin Film Chip Resistors
Sizes: 0201, 0402, 0603, 0805, 1206, 1210, 2010, 2512

Features:

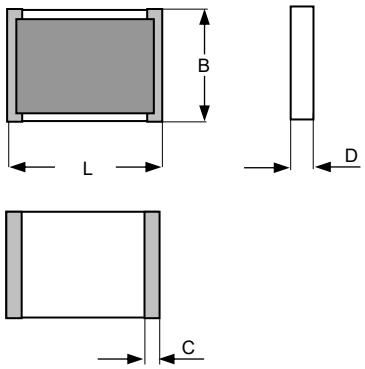
- Chip resistors in advanced thin film technology, passivated
- Tight tolerances – down to ± 0.01%
- Low TCR values down to ± 1 ppm/K
- Pb-free terminations - RoHS compliant
- AEC-Q200 compliant
- Anti-corrosive version with special passivation available (PR-series)
- Automotive grade version is available (AEC-Q200 compliant: AR … A)

RoHS / ELV conform 2011/65/EC 2000/53/EC

e3

Dimensions:

Size	L	B	D	C
0201	0.58 $^{\pm 0.05}$	0.29 $^{\pm 0.05}$	0.23 $^{\pm 0.05}$	0.15 $^{\pm 0.05}$
0402	1.00 $^{\pm 0.05}$	0.50 $^{\pm 0.05}$	0.30 $^{\pm 0.05}$	0.20 $^{\pm 0.10}$
0603	1.55 $^{\pm 0.10}$	0.80 $^{\pm 0.10}$	0.45 $^{\pm 0.10}$	0.30 $^{\pm 0.20}$
0805	2.00 $^{\pm 0.15}$	1.25 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	0.40 $^{\pm 0.20}$
1206	3.05 $^{\pm 0.15}$	1.55 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	0.35 $^{\pm 0.25}$
1210	3.10 $^{\pm 0.15}$	2.40 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	0.55 $^{\pm 0.25}$
2010	4.90 $^{\pm 0.15}$	2.40 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	0.50 $^{\pm 0.25}$
2010 (1/2 W)	4.90 $^{\pm 0.15}$	2.40 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	2.20 $^{\pm 0.25}$
2512	6.30 $^{\pm 0.15}$	3.10 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	0.50 $^{\pm 0.25}$
2512 (1W) ≤ 100R	6.30 $^{\pm 0.15}$	3.10 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	0.50 $^{\pm 0.25}$
2512 (1W) > 100R	6.30 $^{\pm 0.15}$	3.10 $^{\pm 0.15}$	0.55 $^{\pm 0.10}$	2.50 $^{\pm 0.25}$



L = length, B = Width, D = Thickness, C = Width bottom electrode (in mm)

Ordering Data:

Type – size – value – tolerance – TCR – (Power Rating) (If no requirements for TCR, the highest value in table will be supplied)
Example: AR 2010 2R2 ±0.5% TCR 25

Minimum order quantity **MOQ**: 1 Reel (see packaging)

Technical data - general:

Temperature range	-55°C ... +155°C
Climatic category acc. to EN 60068-1	55/155/56
Solderability acc. to MIL-STD-202 Meth. 208H	245°C, 3s
Max. soldering temperature acc. to MIL-STD-202 Meth. 210E (DIN EN 60068-2-58)	260°C, 10s

Long term stability	Tol. ≤ 0,05%	Tol. > 0,05%	High power rating
Load Life (70°C, power 1.5h on, 0.5h off, 1000h) acc. to MIL-STD-202 Meth. 108A [1)]	ΔR < 0.05%	ΔR < 0.1%	ΔR < 0.5%
Short time overload (2.5x rated power, 5s)	ΔR < 0.05%	ΔR < 0.1%	ΔR < 0.5%
High temperature (155°C, 1000h) acc. to MIL-STD-202 Meth. 108	ΔR < 0.5%	ΔR < 0.5%	ΔR < 0.5%
Resistance to soldering heat (260°C, 10s) acc. to MIL-STD-202 Meth. 210E	ΔR < 0.05%	ΔR < 0.1%	ΔR < 0.1%
Temperature cycling (-55°C … +125°C; 1000 cycles) acc. to JESD22 Meth. JA-104	ΔR < 0.2%		
Damp heat with load (40°C, 95%RH, 1000h) acc. to MIL-STD-202 Meth. 103B; Size 0201	ΔR < 0.3%		
Biased Humidity (85°C, 85%RH, 1000h) acc. to MIL-STD-202 Meth. 103; NOT for size 0201	ΔR < 0.1%		
Sulfur test (105°C, 1000h) acc. to ASTM-B-809-95 modified; NOT for size 0201	ΔR < 2%		

[1)] 0201: ΔR < 0.2% (<7k); ΔR < 0.5% (>7k)

Specifications subject to change without notice Issue 08-2024

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Technical data – depending on size and value:

Standard Specification

	Size	Power rating P_{70} (W)	Max. operating Voltage [2]	Max. overload Voltage [3]	TK (TCR) (ppm/K)	Resistance range					
						0.01%	0.05%	0.1%	0.25%	0.5%	1%
Standard Specification	**0201**	1/32	15 V	30 V	25 / 50			22R – 75K			
	0402	1/16	25 V	50 V	25 / 50		49R9 - 12k0	4R - 511K			
	0603	1/16	50 V	100 V	25 / 50		4R7 - 332k	1R - 1M			
	0805	1/10	100 V	200 V	25 / 50		4R7 - 1M	1R - 2M			
	1206	1/8	150 V	300 V	25 / 50		4R7 - 1M	1R - 3M			
	1210	1/4									
	2010	1/4	150 V	300 V	25 / 50		4R7 - 1M	1R - 3M			
	2512	1/2									

Special Specification

	Size	Power rating P_{70} (W)	Max. operating Voltage [2]	Max. overload Voltage [3]	TCR (ppm/K)	Resistance range					
						0.01%	0.05%	0.1%	0.25%	0.5%	1%
Special Specification	**0402**	1/16	50 V	100 V	1 / 2 / 3	49R9 - 4K99					
					5	49R9 - 20K					
					10 / 15	49R9-20k		49R9 – 100k			
	0603	1/16	50 V	100 V	1 / 2 / 3	24R9 - 15k					
					5	24R9-60k					
					10 / 15	24R9-100k	4R7-332k	4R7 … 511k			
	0805	1/10	100 V	200 V	1 / 2 / 3	24R9 - 30k					
					5	24R9 - 150k					
					10 / 15	24R9-200k	4R7-1M				
	1206	1/8	150 V	300 V	1 / 2 / 3	24R9 - 49k9					
					5	24R9 - 300k					
					10 / 15	24R9-499k	4R7 - 1M5				
	1210	1/4	150 V	300 V	1 / 2 / 3	24R9 - 49k9					
					5	24R9-300k					
					10 / 15	24R9-499k	4R7 - 1M				
	2010	1/4	150 V	300 V	1 / 2 / 3	24R9 - 100k					
					5	24R9 - 300k					
					10 / 15	24R9-499k	4R7 - 1M				
	2512	1/2	150 V	300 V	1 / 2 / 3	24R9 - 100k					
					5	24R9 - 300k					
					10 / 15	24R9-499k	4R7 - 1M				

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High Power Rating Specification

Size		Power rating P_{70} (W)	Max. operating Voltage [2]	Max. overload Voltage [3]	TCR (ppm/K)	Resistance range					
						0.01%	0.05%	0.1%	0.25%	0.5%	1%
Higher Power Rating Specification	**0201**	1/20	25V	50V	25 / 50			22R – 75K			
	0402	1/10	50 V	100 V	1 / 2 /3	49R9 - 4k99					
					5	49R9 - 20k					
					10 / 15	49R9 - 12k		49R9 - 100k			
					25 / 50		49R9 - 12k	4R7 - 255k			
	0603	1/10	75 V	150 V	1 / 2 /3	24R9 - 15k					
					5	24R9 - 60k					
					10 / 15	24R9 - 100k	4R7 - 332k	4R7 - 511k			
					25 / 50			1R - 1M			
		1/6	100 V	150 V	25 / 50		10R - 332k				
	0805	1/8	150 V	300 V	1 / 2 /3	24R9 - 30k					
					5	24R9 - 150k					
					10 / 15	24R9 - 200k	4R7 - 511k	4R7 - 1M			
					25 / 50			1R0 - 2M			
		1/4	150 V	300 V	25 / 50		10R - 499k				
	1206	1/4	200 V	400 V	1 / 2 /3	24R9 - 49k9					
					5	24R9 – 300k					
					10 /15	24R9-499k	4R7 - 1M				
					25 / 50		1R - 1M	1R - 3M			
		1/3	200 V	400 V	25 / 50		10R - 1M				
	1210	1/3	200 V	400 V	1 / 2 /3	24R9 - 49k9					
					5	24R9 – 300k					
					10 /15	24R9-499k	4R7 - 1M				
					25 / 50		1R - 1M	1R - 3M			
	2010	1/3	200 V	400 V	1 / 2 /3	24R9 - 49k9					
					5	24R9 – 300k					
					10 /15	24R9-499k	4R7 - 1M				
					25 / 50		1R - 1M	1R - 3M			
		1/2	200 V	400 V	10 /15	24R9-2k	4R7 - 1M		1R - 1M		
					25 / 50		4R7 - 1M	4R7 - 3M	1R - 3M		
	2512	3/4	200 V	400 V	10 /15	24R9-2k	4R7 - 2k		1R - 2k		
					25 / 50	24R9-2k	4R7 - 2k	4R7 – 3M	1R - 3M		
		1	200 V	400 V	10 /15	24R9-2k	4R7 - 1M		1R - 1M		
					25 / 50	24R9-2k	4R7 - 1M	4R7 - 3M	1R - 3M		

[2] Operating voltage: U = √(P*R) or max. op. voltage listed above

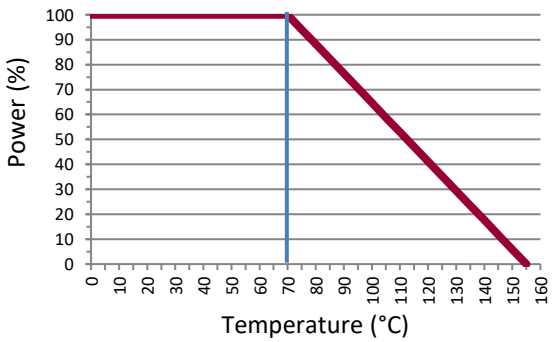
[3] Overload voltage: U = 2.5 √(P*R)

Packaging:

Reel diameter 7" (178 mm)

Size	Pieces per reel	Type of tape
0201	10000	8mm Paper
0402		
0603	5000	
0805		
1206		
1210		
2010	4000	12mm Emb. Plastic
2512		

Derating curve:



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