Resistor colour code

Read the bands on 4-band and 5-band resistors, plus every E12 value.

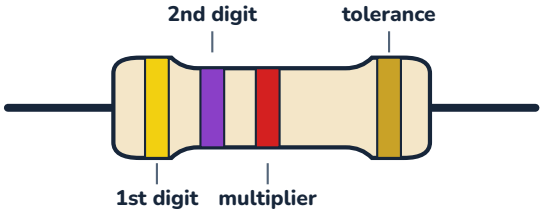
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CHEAT SHEET

What each colour means

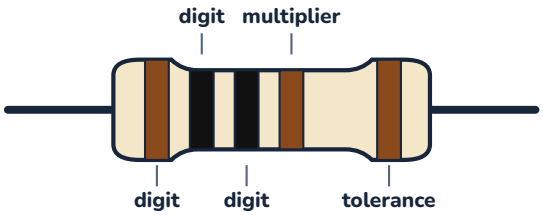
COLOUR	DIGIT	MULTIPLIER	TOLERANCE
Black	0	× 1	
Brown	1	× 10	±1%
Red	2	× 100	±2%
Orange	3	× 1,000	
Yellow	4	× 10,000	
Green	5	× 100,000	±0.5%
Blue	6	× 1,000,000	±0.25%
Violet	7	× 10,000,000	±0.1%
Grey	8		±0.05%
White	9		
Gold		× 0.1	±5%
Silver		× 0.01	±10%

To remember the order: **B**etter **B**e **R**ight **O**r **Y**our **G**reat **B**ig **V**enture **G**oes **W**rong.

Reading the bands



Yellow, violet, red, gold: 47 × 100 = **4,700 Ω = 4.7 kΩ**, ±5%, so anything from 4,465 to 4,935 Ω is in spec.



Brown, black, black, brown, brown: 100 × 10 = **1,000 Ω = 1 kΩ**, ±1%. A third digit suits precise parts.

How to read one

1. **Turn it** so the gold or silver band, a little apart from the rest, is on the right.
2. **Read the digits** from the left: two bands, or three on a 5-band resistor.
3. **Multiply** by the next band: it's how many zeros to add.
4. **The last band** is the tolerance: how far the real value may be from the printed one.

Try these

- Brown, black, orange, gold
- Orange, orange, brown, gold
- Red, red, brown, gold
- Yellow, violet, gold, gold

Answers: 10 kΩ, 330 Ω, 220 Ω and 4.7 Ω, all ±5%.

Red, orange and brown look alike under yellow light. Not sure? Measure it with a multimeter.

Standard E12 values and their bands

Kits carry these 12 values in every decade. Find the first two bands on the left and the multiplier band at the top.

Bands 1 and 2	Black	Brown	Red	Orange	Yellow	Green
10	10 Ω	100 Ω	1 kΩ	10 kΩ	100 kΩ	1 MΩ
12	12 Ω	120 Ω	1.2 kΩ	12 kΩ	120 kΩ	1.2 MΩ
15	15 Ω	150 Ω	1.5 kΩ	15 kΩ	150 kΩ	1.5 MΩ
18	18 Ω	180 Ω	1.8 kΩ	18 kΩ	180 kΩ	1.8 MΩ
22	22 Ω	220 Ω	2.2 kΩ	22 kΩ	220 kΩ	2.2 MΩ
27	27 Ω	270 Ω	2.7 kΩ	27 kΩ	270 kΩ	2.7 MΩ
33	33 Ω	330 Ω	3.3 kΩ	33 kΩ	330 kΩ	3.3 MΩ
39	39 Ω	390 Ω	3.9 kΩ	39 kΩ	390 kΩ	3.9 MΩ
47	47 Ω	470 Ω	4.7 kΩ	47 kΩ	470 kΩ	4.7 MΩ
56	56 Ω	560 Ω	5.6 kΩ	56 kΩ	560 kΩ	5.6 MΩ
68	68 Ω	680 Ω	6.8 kΩ	68 kΩ	680 kΩ	6.8 MΩ
82	82 Ω	820 Ω	8.2 kΩ	82 kΩ	820 kΩ	8.2 MΩ