

A. Resistor Values and Measurements

The value of the resistor is normally provided by a four or five band colour scheme on the body of the resistor.

Shown below is a resistor with a four band colour scheme, where the first two bands indicate the first two digits in the resistance value and the third band indicate the multiplier.

See in the sketch below how the colour of the band indicate the numeric value.

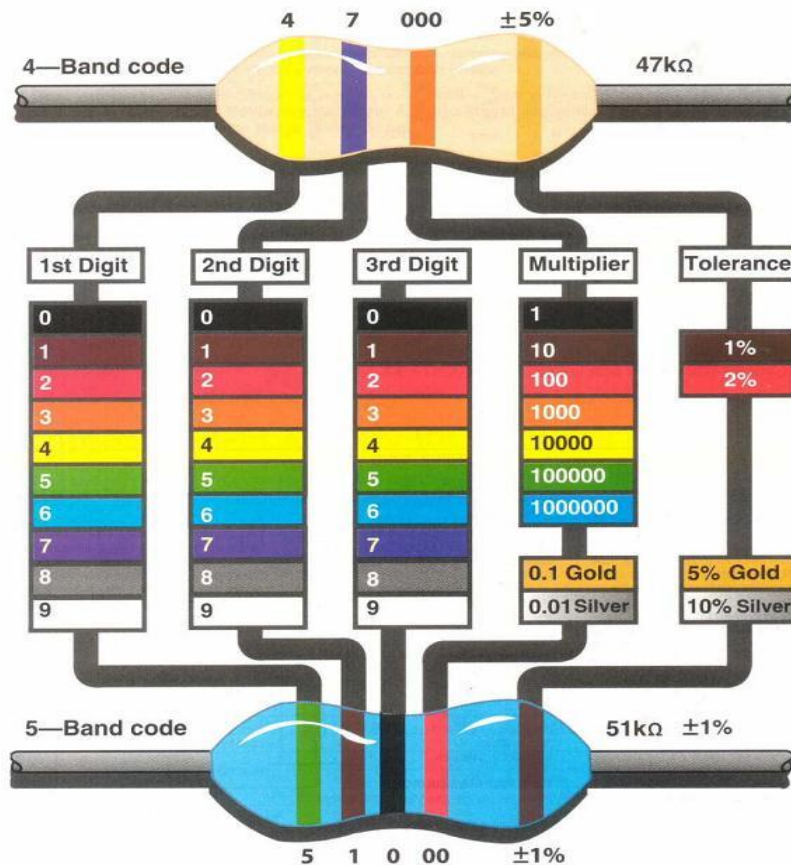


Figure 1: Resistor values as based on colour codes

Every decade of resistor values (0.1 to 1 Ω, 1 to 10 Ω, 10 to 100 Ω, ...) should contain 12 resistor values.

For example, the decade from 1 kΩ to 10 kΩ should contain the following resistor values: 1.0 kΩ, 1.2 kΩ, 1.5 kΩ, 1.8 kΩ, 2.2 kΩ, 2.7 kΩ, 3.3 kΩ, 3.9 kΩ, 4.7 kΩ, 5.6

kΩ, 6.8 kΩ, 8.2 kΩ, this follows by 10 kΩ which will be the first resistor in the next decade.

B. Tolerances of Resistor

The last band (4th or 5th) will indicate the tolerance in the resistor value that can be expected.

A silver band will then indicate that the real value of the resistor should be within ±10% of the marked value.

C. Power Rating of Resistor

Every resistor (as is true for every electronic component!) will also have a maximum power rating, indicating the maximum power that it should be able to dissipate before starting to overheat.

The size of a resistor is a good indication of the amount of power it can dissipate, with larger resistors being able to handle larger powers.

The lab resistors we use are normally ¼ W resistors, meaning we should stay below 0.25 W unless we want to run into problems.

D. Resistor Series (E12) Values

The following table outlines the resistor values for E12 standard type.

		Band 3							
Band 1	Band 2	Gold	Black	Brown	Red	Orange	Yellow	Green	Blue
Brown	Black	1R0	10R	100R	1K0	10K	100K	1M0	10M
Brown	Red	1R2	12R	120R	1K2	12K	120K	1M2	12M
Brown	Green	1R5	15R	150R	1K5	15K	150K	1M5	15M
Brown	Grey	1R8	18R	180R	1K8	18K	180K	1M8	18M
Red	Red	2R2	22R	220R	2K2	22K	220K	2M2	22M
Red	Violet	2R7	27R	270R	2K7	27K	270K	2M7	27M
Orange	Orange	3R3	33R	330R	3K3	33K	330K	3M3	33M
Orange	White	3R9	39R	390R	3K9	39K	390K	3M9	39M
Yellow	Violet	4R7	47R	470R	4K7	47K	470K	4M7	47M
Green	Blue	5R6	56R	560R	5K6	56K	560K	5M6	56M
Blue	Grey	6R8	68R	680R	6K8	68K	680K	6M8	68M
Grey	Red	8R2	82R	820R	8K2	82K	820K	8M2	82M