Circuits And System 1

CSE103L Circuits & Systems-I Lab

LAB REPORT # 1

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"On my honour, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

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Department of Computer Systems Engineering

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"FINDING RESISTANCE OF UNKNOWN RESISTOR USING COLOR CODING METHOD"

OBJECTIVES:

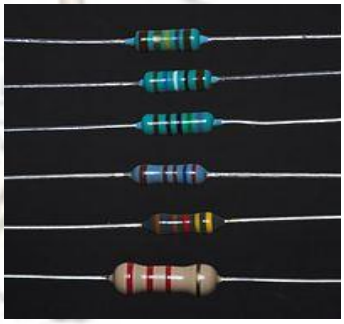
To be familiar with:

- Resistance
- Resistor
- Unit
- Colour coding method
- Colour coding table
- Experimental result

RESISTANCE:

The electrical resistance of an electrical conductor is a measure of the difficulty of passing an electric current through the conductor. It explains the relationship between voltage (amount of electrical pressure) and the current (flow of electricity).

The electrical resistance of a circuit component or device is defined as the ratio of the voltage applied to the electric current which flows through it: If the resistance is constant over a considerable range of voltage.



MATHEMATICALLY:

According to Ohm's law,

I = V/R

RESISTOR:-

A resistor is an electrical component that limits or regulates the flow of electrical current in an electronic circuit. All other factors being equal, in a direct-current (DC) circuit, the current through a resistor is inversely proportional to its resistance, and directly proportional to the voltage across it.

FOR EXAMPLE:-

In a light bulb there is a resistor made of tungsten which converts the electrons into light.[2]

Resistors can be linked in various combinations to help make a circuit:

- **Series** - Where the resistors are linked one after another.
- **Parallel** - Where the resistors are linked over one another.

UNIT:

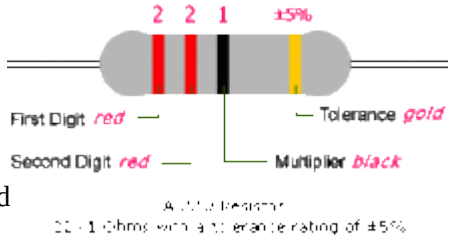
Resistance is measured in **ohms**, symbolized by the Greek letter omega **(Ω)**. Ohms are named after Georg Simon Ohm (1784-1854), a German physicist who studied the relationship between voltage, current and resistance.

The formula for Ohm's law, **V=I*R,** states that the voltage drop across a component is equal to the product of the current flowing in the component multiplied by the resistance of the component. When using Ohm's law, you are able to switch the formula around if needed to find a different outcome: **I=V/R** or **R=V/I**

COLOUR CODING METHOD:

Resistor's values are rated by the colours. The coloured bands that are used on the sides of a resistor are **black**, **brown**, **red**, **orange**, **yellow**, **green**, **blue**, **purple**, **grey**, and **white**. Each colour represents a different number. The black band represents the number **0**, brown band represents the number **1**, red is **2** and so on all the way to white which is the number **9**. These numbers are very important in the electronic field.

BANDS OF COLOR:



A resistor can have multiple bands of colour on its side. The most common have **four** but they can range all the way up to **6** per resistor. On a **four** band resistor, the **last** band is gold or silver. The **gold** band represents a positive or negative **5%** tolerance. The **silver** band on a resistor represents a positive or negative **10%** tolerance.

Hold this band on the right side, and read the colours from left to right. The first **two** bands are read as the numbers that they represent in the colour code. The third band acts as a multiplier for the other bands,

FOR EXAMPLE:

If the third band was an orange band which is a 3, it would mean you multiply the two numbers by 1000. In short you add the value of the colour in zeros at the end, so add three zeros

COLOR CODING METHOD TABLE:

COLOR	1ST BAND	2ND BAND	3RD BASE (MULTIPLER)	4TH BASED (TOLERANCE)
Silver			10^{-2}	+ 10
Gold			10^{-1}	+ 5%
Black	0	0	10^{0}	
Brown	1	1	10^{1}	+ 1%
Red	2	2	10^{2}	+ 2%
Orange	3	3	10^{3}	
Yellow	4	4	10^{4}	
Green	5	5	10^{5}	
Blue	6	6	10^{6}	
Violet	7	7		
Grey	8	8		

White	9	9		

EXPERIMENTAL RESULTS:

RESISTOR'S	1ST BAND	2ND BAND	3RD BAND	4TH BAND	RANGE	VERFICATION
1	1	0	x 10^2	±5	950-1050	1017 Ω
2	3	3	x 10^3	±5	31350-34650	32.8 K
3	1	0	x 10^3	±5	9500-10500	9840 Ω
4	1	0	x 10^1	±5	95-105	97 Ω
5	1	0	x 10^2	±5	950-1050	9700 Ω