



UNIT I

RESISTOR



DC CIRCUITS



WHAT IS RESISTOR ??

- **A RESISTOR IS A PASSIVE TWO - TERMINAL ELECTRICAL COMPONENT THAT IMPLEMENTS ELECTRICAL RESISTANCE AS A CIRCUIT ELEMENT.**
- **THE RATIO OF THE VOLTAGE APPLIED ACROSS A RESISTOR'S TERMINALS TO THE INTENSITY OF CURRENT THROUGH THE CIRCUIT IS CALLED RESISTANCE.**
- **THIS RELATION IS REPRESENTED BY OHM'S LAW:**

$$V = I R$$



UNIT AND SYMBOL

- **THE OHM (SYMBOL: Ω) IS THE SI UNIT OF ELECTRICAL RESISTANCE, NAMED AFTER GEORG SIMON OHM.**
- **AN OHM IS EQUIVALENT TO A VOLT PER AMPERE**
- **OTHER DERIVED UNITS ARE MILLIOHM ($1 \text{ m}\Omega = 10^{-3} \Omega$), KILO OHM ($1 \text{ k}\Omega = 10^3 \Omega$), AND MEGA OHM ($1 \text{ M}\Omega = 10^6 \Omega$).**



FIXED RESISTOR



VARIABLE RESISTOR



TYPES OF RESISTOR

RESISTOR

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graph TD; A[RESISTOR] --- B[FIXED RESISTOR]; A --- C[VARIABLE RESISTOR]
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FIXED RESISTOR

VARIABLE RESISTOR



VARIABLE RESISTOR

FIXED RESISTOR

➤ CARBON COMPOSITE RESISTOR

➤ FILM RESISTOR

➤ WIRE WOUND RESISTOR

➤ RESISTANCE WIRE

➤ RHEOSTAT

➤ POTENTIOMETER

➤ THERMISTOR

➤ HUMISTOR

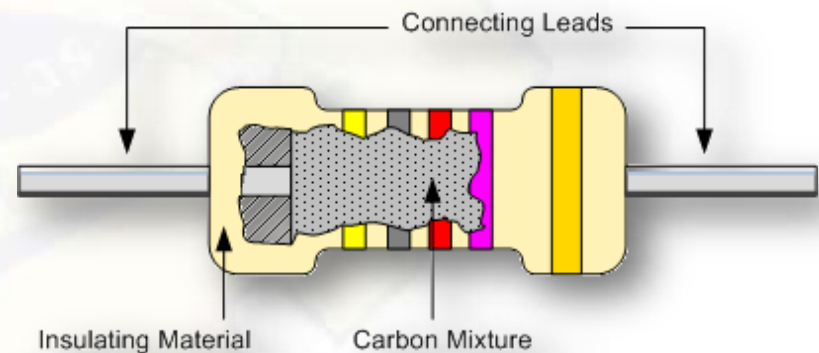
➤ VARISTOR

➤ PHOTORESISTOR



CARBON COMPOSITE RESISTOR

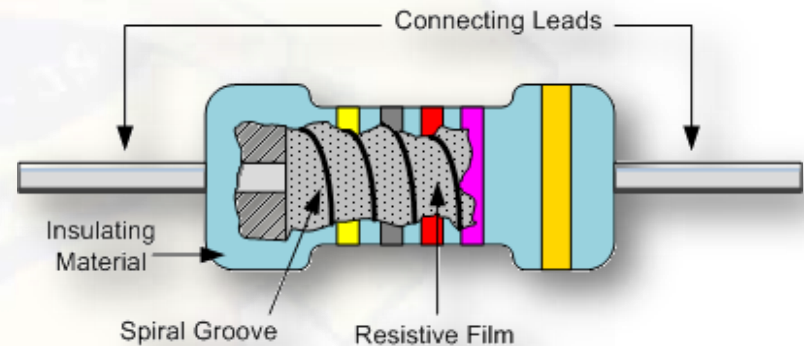
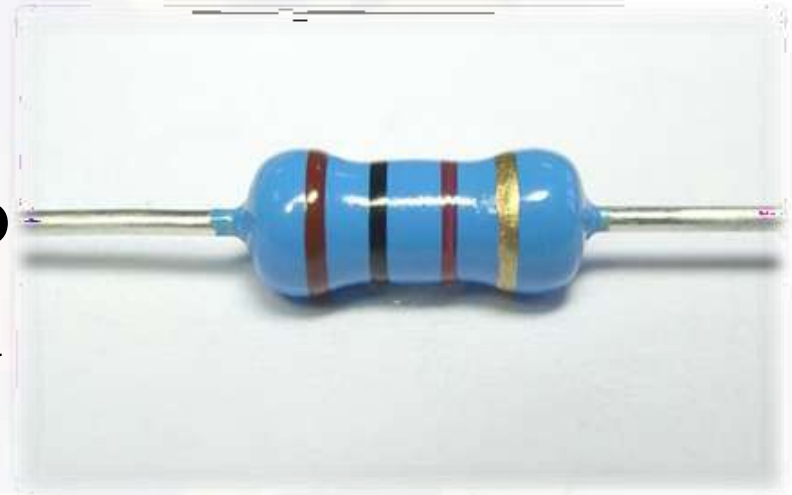
- **LOW INDUCTANCE**
- **IDEAL FOR HIGH FREQUENCY APPLICATIONS**
- **VERY CHEAP TO MAKE**
- **HAVE VERY LARGE TOLERANCES**





FILM RESISTOR

- THE RESISTIVE VALUE OF THE RESISTOR IS CONTROLLED BY INCREASING THE DESIRED THICKNESS OF THE DEPOSITED FILM.
- RESISTANCE UPTO $10\text{M}\Omega$ CAN BE OBTAINED.
- HAVE TOLERANCE 1% OR LESS

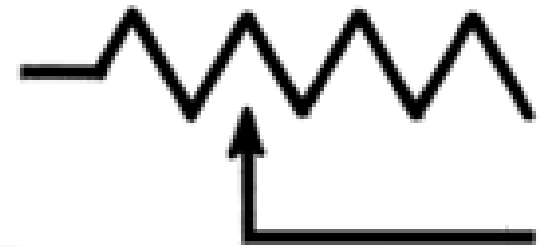




POTENTIOMETER

➤ A POTENTIOMETER IS, A POT, IN ELECTRONICS TECHNOLOGY IS A THREE-TERMINAL RESISTOR WITH A SLIDING CONTACT THAT FORMS AN ADJUSTABLE VOLTAGE DIVIDER.

➤ POTENTIOMETERS ARE COMMONLY USED TO CONTROL ELECTRICAL DEVICES SUCH AS VOLUME CONTROLS, JOYSTICKS ETC.





HUMISTOR

- **A HUMISTOR IS A TYPE OF RESISTOR WHOSE RESISTANCE VARIES SIGNIFICANTLY WITH HUMIDITY**
- **A HUMIDITY SENSOR MEASURES THE HUMIDITY LEVEL BY MEASURING THE CHANGE IN THE RESISTANCE OF AN ELEMENT**

