


What is a Resistor?

- The resistor is the most common and well-known of the passive electrical components. A resistor resists or limits the flow of electric current in a circuit. There are many uses for resistors: they are used to drop voltage, limit current, attenuate signals, act as heaters, act as fuses, furnish electrical loads and divide voltages.

 Resistor symbol (US and Japan)

 Resistor symbol (Europe)

What is Ohm's Law?

- Ohm's law is a simple equation that shows the relationship between resistance, voltage and current through a metal wire, or some other type of resistive material. In mathematical terms, Ohm's law is written as:

$$I = V/R,$$

where I is the current (amps), V is the voltage, and R is the resistance.

- Ohm's law can also show the relationship between resistance, voltage and power using the following equation:

$$P = V^2/R,$$

where P is the power (watts), V is the voltage, and R is the resistance.

P = Watts

$$\text{Watts} = \frac{\text{Volts}^2}{\text{Ohms}}$$

$$\text{Watts} = \text{Amperes}^2 \times \text{Ohms}$$

$$\text{Watts} = \text{Volts} \times \text{Amperes}$$

V = Volts

$$\text{Volts} = \sqrt{\text{Watts} \times \text{Ohms}}$$

$$\text{Volts} = \frac{\text{Watts}}{\text{Amperes}}$$

$$\text{Volts} = \text{Amperes} \times \text{Ohms}$$

I = Amperes

$$\text{Amperes} = \frac{\text{Volts}}{\text{Ohms}}$$

$$\text{Amperes} = \frac{\text{Watts}}{\text{Volts}}$$

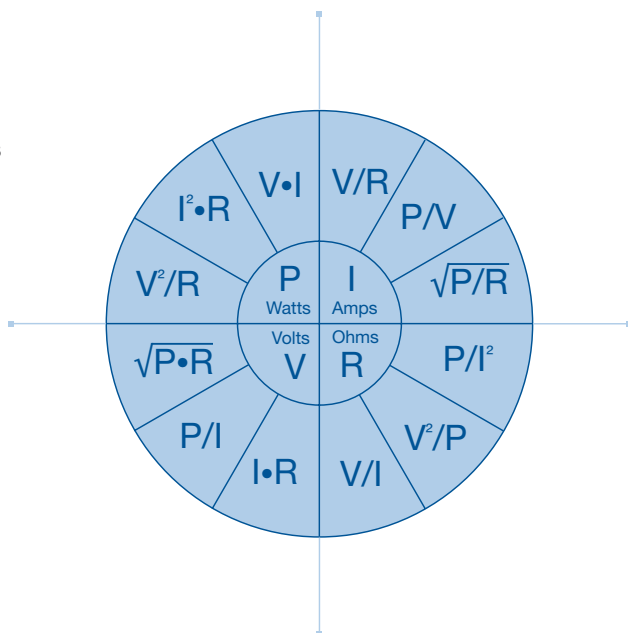
$$\text{Amperes} = \sqrt{\frac{\text{Watts}}{\text{Ohms}}}$$

R = Ohms

$$\text{Ohms} = \frac{\text{Volts}}{\text{Amperes}}$$

$$\text{Ohms} = \frac{\text{Volts}^2}{\text{Watts}}$$

$$\text{Ohms} = \frac{\text{Watts}}{\text{Amperes}^2}$$



Types of Resistors

Fixed Resistors

- A fixed resistor is one in which the value of its resistance cannot change.

Variable Resistors

- A variable resistor is a resistor whose value can be adjusted by turning a shaft or sliding a control. They are also called potentiometers or rheostats and allow the resistance of the device to be altered by hand.

Non-Linear Resistors

- A non-linear resistor is a resistor that has resistances that vary significantly with applied voltage, temperature or light. Types of non-linear resistors are varistors, thermistors and photoresistors.