

Ohms law and resistors report example

[Environment](#), [Electricity](#)



Abstract

Ohm's law is used to relate the current through and voltage across a resistor by a proportionality constant known as resistance. Since the voltage supplied by a voltage source, such as a battery, is constant the current will change in magnitude depending on the number of resistors in the circuit. Resistance is also affected by temperature. The two quantities are directly proportional, and hence an increase the temperature results in an increase in resistance. This is due to an increase in collision of electrons hence a decrease in the smoothness of flow of electric current. This relationship is usually expressed as the temperature coefficient of resistance, and it changes from one material to another. However, for a variable voltage source the effect of changing the voltage on the current that flows can be easily observed.

Conclusion

Most resistors are manufactured to have constant resistance. This means that as voltage across such a resistor is increased the current through it will increase correspondingly. However, there is a limit beyond which the current will be extremely high (beyond the resistor's current rating). This may blow the resistor hence leading to permanent damage. As the filament heats up the electron collisions increase and there is a reduction in the smoothness of flow of electric current. This causes the resistance of the filament to increase, and hence the current reduces since the voltage source is constant. As such the filament can be said to have variable resistance and to be temperature dependent.

Resistors can be connected in series or parallel networks. As more resistors

are added to a series network, the net current reduces. This means a reduction in the current through each resistor since the same current flows through all the resistors, independent of the magnitude of resistance. However, for a parallel network an increase in the number of resistors will result in a decrease of the net current (though to a smaller extent as compared to the series network). The current flowing each resistor will be different and the smaller the value of resistance the higher the current that will flow through that resistor. Theoretical and calculated values differed slightly. This margin of error can be adduced to the tolerance values that are taken into consideration as the resistors are manufactured.