



## Basic Electronics Series

### Lesson Two: Terms & Definitions

**Matter** - A physical substance which occupies space and possesses mass.

**Atom** - An atom is a particle of matter that uniquely defines a chemical element.

**Periodic Table of elements** - The periodic table of elements, is a tabular display of the chemical elements, which are arranged by atomic number, electron configuration, and recurring chemical properties.

**Nucleus** - The positively charged central core of an atom, consisting of protons and neutrons and containing nearly all its mass.

**Neutron** - An elementary atomic particle having no charge, mass slightly greater than that of a proton.

**Proton** - A positively charged elementary atomic located in the atom's nucleus.

**Atomic Number** - The number of positive charges or protons in the nucleus of an atom of a given element, and therefore also the number of electrons normally surrounding the nucleus.

**Electron Shell** - Electrons are arranged around the nucleus in specific orbits called electron shell.

**Energy Band** - Energy Bands refer to discrete levels of energy that electrons possess. The energy of outer shell electrons is in the valence band. In Conductors, by adding energy to these electrons they will jump into the conduction band making them free electrons.

**Valence Shell** - Outer shell electrons.

**Polarity** - A property of electric charge and voltage. Negative polarity is an excess of electrons. Positive polarity is a deficiency of electrons.

**Coulomb** - The SI unit of electric charge, equal to the quantity of electricity conveyed in one second by a current of one ampere. The charge of  $6.25 \times 10^{18}$  electrons.

**Law of Charges** - Things that are negatively charged and things that are positively charged attract each other. Things that have the same charge repel each other).

**Conductor** - A conductor is a material that allows the flow of charge (electrical current) in one or more directions. Conductor material atoms have fewer than four valence electrons.

**Free Electrons** - An electron that is not attached to an atom or molecule and is free to respond to outside forces.

**Ion** - An electrically charged atom or group of atoms formed by the loss or gain of one or more electrons.

**Semiconductor** - A substance, as silicon or germanium with electrical conductivity intermediate between that of an insulator and a conductor. Semiconductor Atoms have four valence electrons.

**Insulator** - A material of such low conductivity that the flow of current through it is negligible. Insulator atoms have more than four valence electrons.

**Dielectric** - A material that has the ability to store a charge on its outer surface.

**Electro Static Discharge** - ESD, the sudden flow of electricity between two electrically charged objects caused by contact, an electrical short, or dielectric breakdown.

**Voltage** - Electrical pressure or difference in potential expressed in volts, electromotive force.

**Current** - Charge in motion; Electron flow from negative to or positive charge moving from positive to negative measured in amperes.

**Resistance** - Opposition to current flow measured in ohms.