

WILEY ELECTRICAL AND ELECTRONICS ENGINEERING DICTIONARY

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Lexicographer



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diamond-like carbon An artificially-prepared form of carbon, with a structure similar to that of diamond. Although its properties are not quite as defined as that of diamond, it has many applications in electronics, including its use in capacitors, in optical windows for bar-code readers, in disk-drive heads, and in semiconductors.

diamond needle Same as **diamond stylus**.

diamond stylus A phonograph pickup whose tip is a ground diamond. Also called **diamond needle**.

diaphragm 1. A vibrating membrane in a speaker. It produces a sound-wave output in response to its electric input. Cones and domes are examples of commonly utilized diaphragms in speakers. Also called **speaker diaphragm**, or **loudspeaker diaphragm**. 2. A vibrating membrane in a microphone. It produces an electric output in response to its sound-wave input. Also called **microphone diaphragm**. 3. A pressure-sensitive element in some sensors, such as certain barometers. 4. A membrane, disk, adjustable opening, or other device or mechanism which serves to restrict or regulate the passage of a waves and/or matter, such as light waves or electrolytes.

diathermy The use of high-frequency radio waves for therapeutic purposes. Used, for example, to generate localized heat in body tissues.

diatomic Occurring as, pertaining to, or consisting of two atoms. For example, molecular oxygen, whose chemical formula is O_2 .

DIB 1. Abbreviation of **device-independent bitmap**. 2. Abbreviation of **Directory Information Base**.

dibit Any of the four possible combinations of two consecutive bits, which are 00, 01, 10, and 11. Used, for instance, in differential phase-shift keying when four states are represented.

diborane A colorless and reactive gas whose chemical formula is B_2H_6 . It is used as a semiconductor dopant.

dice Plural form of **die** (1), or **die** (2).

dichotomizing search A search technique in which the desired item is compared to a list to determine in which half it is located, the other half being discarded. Then, within this half, a similar search is performed. This process of pinpointing the half that contains the item is continued successively until the search is complete. Also known as **binary search**.

dichotomy 1. Characterized by branching into two divisions, such as a routine into two subroutines. 2. Characterized by continued branching into two divisions. For example, two branches, each forming two, for a total of four, then those four forming eight, and so on.

dichroic mirror A mirror which reflects light of given frequencies, while transmitting the rest. Used, for instance, in color TV cameras.

dichroism 1. A property of some crystals, in which different colors are exhibited when viewed from different axes. 2. A property of some substances or materials, in which different colors are exhibited when viewed through different thicknesses. Occurs, for instance, in some solutions.

dichromate cell An electrolytic cell with a carbon electrode immersed in an approximately 12% potassium dichromate solution, and a zinc electrode immersed in an approximately 9% sulfuric acid solution.

dicing The cutting of a semiconductor material into **dice**.

DID Abbreviation of **direct inward dial**, or **direct inward dialing**.

die 1. A piece of semiconductor material or dielectric upon which one or more electrical components may be mounted, etched, or formed. Used, for instance, for fabrication of repetitive units in semiconductor manufacturing. Its plural form is **dice**. Also called **chip** (2), or **semiconductor die**

(1). 2. A piece of semiconductor material or dielectric upon which one or more electrical components has been mounted, etched, or formed. Its plural form is **dice**. Also called **chip** (3), or **semiconductor die** (2). 3. To cease functioning. 4. A tool, device, or mold which serves to impart a desired shape and/or finish to a molten or semisolid material. It may consist, for instance, of a mold into which a molten metal is forced.

die attach The attachment of a **die** (1) to a substrate. An epoxy resin, for instance, may be used for such bonding. Also called **die attachment**, or **die bonding**.

die attachment Same as **die attach**.

die bonding Same as **die attach**.

dielectric A material which is an electric insulator. An electric field may be applied through such a material with little or no energy loss. Dielectrics are used, for instance, to separate the plates in a capacitor, or between the conductors of a cable. Examples of dielectrics include air, oil, glass, paper, rubber, and various plastics and ceramics. A vacuum is a perfect dielectric. Also known as **dielectric material**.

dielectric absorption A property of certain dielectrics, in which electric polarization is retained after removal of the electric field. Such an effect can last up to several years, and it is the basis for electrets. Also called **dielectric hysteresis**, or **electric hysteresis** (1).

dielectric amplifier An amplifier circuit whose active component is a ferroelectric capacitor whose capacitance varies as a function of the applied voltage. Also called **capacitor amplifier**.

dielectric antenna An antenna whose radiating elements are partially or completely composed of a dielectric, such as ceramic.

dielectric breakdown An abrupt increase in the electric current flowing through a dielectric, when the applied voltage exceeds a given critical value. Such a breakdown is usually destructive. Also called **electric breakdown** (2).

dielectric breakdown voltage For a given dielectric, the voltage at which **dielectric breakdown** occurs. Also called **electric breakdown voltage**.

dielectric constant For a given material, the property which determines the electrostatic energy that can be stored per unit volume for a unit potential gradient. This is equivalent to the ratio of the capacitance of a capacitor using the material in question as a dielectric, to the capacitance of a capacitor using a vacuum as a dielectric. The dielectric constant of a vacuum is defined as 1, and for most calculations air is also considered to have this value. Also known as **relative dielectric constant**, **permittivity**, **relative permittivity**, **specific inductive capacity**, or **inductivity**.

dielectric current The current flowing at any given instant through the surface of a dielectric which is in a changing electric field.

dielectric displacement A vector quantity pertaining to the charge displaced by an electric field within a given medium. It is equal to the electric field strength multiplied by the permittivity of the medium, and is usually expressed in coulombs per square meter. Also known by various other names, including **dielectric strain**, **dielectric stress**, **displacement** (2), **electric displacement**, **electric displacement density**, and **electric field induction**.

dielectric fatigue A property of some dielectrics, which have been subjected to a sustained continuous voltage, where there is a reduction in the resistance to breakdown.

dielectric flux density Same as **dielectric displacement**.

dielectric heating The heating of a dielectric, such as a plastic, by applying a high-frequency electric field to it. This is usually accomplished by placing the material between the electrodes of a two-electrode capacitor, and applying an alternating electric field. Dielectric losses produce the heat.