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INTERNATIONAL STANDARD

Electronic assembly, design and circuit boards – Vocabulary – Part 2: Common usage in electronic technologies as well as electronic assembly technologies

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INTERNATIONAL STANDARD

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRONIC ASSEMBLY, DESIGN AND CIRCUIT BOARDS – VOCABULARY –

Part 2: Common usage in electronic technologies as well as electronic assembly technologies

FOREWORD

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IEC 60194-2 has been prepared by IEC technical committee 91: Electronics assembly technology. It is an International Standard.

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) exclusion of 116 terms transferred to IEV;
b) inclusion of 9 new terms related to printed electronics and packaging technology;
c) revision of definitions of 23 terms reflecting current technology;

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d) three "printed wiring" terms were removed;

e) reintroduction of identification codes for terms.

The text of this International Standard is based on the following documents:

Draft	Report on voting
91/1996/FDIS	91/2014/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60194 series, published under the general title *Electronic assembly, design and circuit boards*, can be found on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
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ELECTRONIC ASSEMBLY, DESIGN AND CIRCUIT BOARDS – VOCABULARY –

Part 2: Common usage in electronic technologies as well as electronic assembly technologies

1 Scope

This part of IEC 60194 covers terms and definitions related to circuit board and electronic assembly technologies as well as other electronic technologies.

The terms have been classified according to the decimal classification code (DCC) and this DCC number appears just below the defined term. The DCC numbering is fully explained in Annex A.

A list of terms in alphabetical order with code number is provided in Annex B.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

In order to avoid two ID numbers, the usual practice of numbering every paragraph (every term and definition) in front of the paragraph has not been followed in this document. The official IEC number is the number which follows the DCC and the period (e.g., 21.xxxx).

3.1 Engineering and design for electronic packaging

3.1.1
ground plane
20.1413
conductor layer, or portion thereof, that serves as a common reference for electrical circuit returns, shielding, or heat sinking

Note 1 to entry: See also "signal plane" and "voltage plane" in IEC 60194-1:2021.

3.1.2
analogue circuit
21.0037
electrical circuit that provides a continuous relationship between its input and output

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3.1.3
attenuation
21.0061
decrease of the energy of an electromagnetic wave during its propagation, represented quantitatively by the ratio of the power flux densities at two specified points

Note 1 to entry: Attenuation is generally expressed in decibels.

[SOURCE: IEC 60050-705:1995, 705-02-05]

3.1.4
capacitive coupling
21.0174
electrical interaction between two conductors that is caused by the capacitance between them

3.1.5
characteristic impedance
21.0194
capacitive coupling quantity defined for a mode of propagation at a given frequency in a specific uniform transmission line or uniform waveguide by one of the three following relations:

$$Z_1 = S / |I|^2 \quad (1)$$

$$Z_2 = |U|^2 / S \quad (2)$$

$$Z_3 = U / I \quad (3)$$

where

Z is the complex characteristic impedance,

S is the complex power, and

U and I are the values, usually complex, respectively of a voltage and a current conventionally defined for each type of mode by analogy with transmission line equations.

EXAMPLE 1 For a parallel-wire transmission line, *U* and *I* can be uniquely defined, and the three equations are consistent. If the transmission line is lossless, the characteristic impedance is real.

EXAMPLE 2 For a waveguide, the conventional definitions for U and I depend on the type of mode and generally lead to three different values of the characteristic impedance.

EXAMPLE 3 For a circular waveguide in the dominant mode TE_{11}, U = the RMS voltage along the diameter where the magnitude of the electric field strength vector is a maximum, I = the RMS longitudinal current.

EXAMPLE 4 For a rectangular waveguide in the dominant mode TE_{10}, U = the RMS voltage between midpoints of the two conductor faces normal to the electric field strength vector, I = the RMS longitudinal current following on one surface normal to the electric field strength vector.

[SOURCE: IEC 60050-726:1982, 726-07-01]

3.1.6
circuit
21.0213
number of electrical elements and devices that have been interconnected to perform a desired electrical function

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3.1.7
compensation circuit
21.0231
electrical circuit that alters the functioning of another circuit to which it is applied to achieve a desired performance

3.1.8
crosstalk
21.0327
spurious signal
21.1006
undesirable transfer of electrical energy between neighbouring conductors (coupling) by mutual inductance and capacitance

Note 1 to entry: See also "backward crosstalk" and "forward crosstalk".

3.1.9
digital circuit
21.0380
electrical circuit that provides two (binary) or three distinct relationships (states) between its input and output

3.1.10
electromagnetic compatibility
EMC
21.0427
ability of equipment or a system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment

[SOURCE: IEC 60050-161:1990, 161-01-07]

3.1.11
electromagnetic interference
EMI
21.0431
degradation of the performance of a piece of equipment, transmission channel or system caused by an electromagnetic disturbance

Note 1 to entry: In French, the terms "perturbation électromagnétique" and "brouillage électromagnétique" designate respectively the cause and the effect and should not be used indiscriminately.

Note 2 to entry: In English, the terms "electromagnetic disturbance" and "electromagnetic interference" designate respectively the cause and the effect, but they are often used indiscriminately.

[SOURCE: IEC 60050-161:1990, 161-01-06]

3.1.12
electrostatic discharge
ESD
21.1716
transfer of electric charge between bodies of different electrostatic potential in proximity or through direct contact

[SOURCE: IEC 60050-161:1990, 161-01-22]

3.1.13
electrostatic discharge sensitive device
21.0441
device with known sensitivity or susceptibility to ESD

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3.1.14
far-end crosstalk
21.0473
forward crosstalk
21.1406
noise induced into a adjacent line, as seen at the end of the adjacent line that is the farthest from the signal source, because the adjacent line has been placed next to an active line

3.1.15
leakage current
21.0699
electric current in an unintended conductive path under normal conditions

[SOURCE: IEC 60050-161:1990, 195-05-15]

3.1.16
line coupling
21.0711
interaction between two transmission lines that is caused by their mutual inductance and capacitance

3.1.17
load capacitance
21.0713
capacitance seen by the output of a logic circuit or other signal source

3.1.18
microwave integrated circuit
21.0762
integrated circuit that performs at microwave frequencies

3.1.19
near-end crosstalk
21.0795
backward crosstalk
21.1332
noise induced into an adjacent line, as seen at that end of the adjacent line which is closest to the signal source, when this line has been placed near an active line

3.1.20
logic circuit
21.1005
functional digital circuit used to perform computational functions

3.1.21
conductor
22.0254
electrical path
20.0837
single conductive path in a conductive pattern

[SOURCE: IEC 60050-161:1990, 541-01-20]

3.1.22
printed contact
22.0915
element of a conductive pattern that serves as one part of a contact system

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3.1.23
signal conductor
22.0934
individual conductor that is used to transmit an impressed electrical signal

3.1.24
signal line
22.0935
conductor used to transmit a signal from one part of a circuit to another

3.1.25
conductive pattern
22.1362
configuration formed by the electrically conductive material of a circuit board

3.1.26
primary side
22.1484
side of a packaging and interconnecting structure that is defined as such on the master drawing

3.1.27
secondary side
22.1517
side of a packaging and interconnecting structure that is opposite the primary side

3.1.28
base material thickness
22.1604
thickness of the base material excluding conductive foil or material deposited on the surfaces

3.1.29
termination
22.1773
end of a conductor that connects the conductor to a terminal, distributing frame, switch or matrix

3.2 Components for electronic packaging

3.2.1
active device
30.0016
electronic component whose basic character changes while operating on an applied signal

Note 1 to entry: This includes diodes, transistors, thyristors, and integrated circuits that are used for the rectification, amplification, switching, etc., of analogue or digital circuits in either monolithic or hybrid form.

3.2.2
add-on component
30.0019
discrete or integrated packaged or chip components that are attached to a film circuit in order to complete the circuit's function

3.2.3
package cover
30.0053
cover that encloses the contents In the cavity of a package in the final sealing operation

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3.2.4
CMOS
complementary metal oxide semiconductor
30.0221
complementary metal oxide semiconductor devices wherein N type and P type transistors are connected together for switching

3.2.5
discrete component
30.0392
separate part of a circuit board assembly that performs a circuit function

EXAMPLE resistor, capacitor, transistor.

3.2.6
heatsink
30.0594
mechanical device that is made of a high thermal- conductivity and low specific- heat material that dissipates heat generated by a component or assembly

3.2.7
microcircuit
30.0727
relatively high-density combination of equivalent circuit elements that are interconnected so as to perform as an indivisible electronic circuit component

3.2.8
microelectronics
30.0759
field of science and engineering that deals with highly miniaturized electronic circuits and their use

[SOURCE: IEC 60050-161:1990, 521-10-01]

3.2.9
monolithic integrated circuit
30.0777
integrated circuit in the form of a monolithic structure

3.2.10
package cap
30.0821
cuplike package cover

3.2.11
package lid
30.0822
flat package cover

3.2.12
perimeter sealing area
30.0844
surface on the perimeter of a package cavity that is used as an attachment to the package cover

3.2.13
semiconductor
30.1289
solid material, such as silicon, that has a resistivity that is midway between that of a conductor and of a resistor

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3.2.14
quad flat J-lead
QFJ
30.1400
generic rectangular component package, containing an electronic device, with leads on all four sides that are formed in a "j" shape

3.2.15
quad flat no-lead
QFN
30.1402
generic rectangular component package outline wherein the metal pad terminations are formed on four sides of the bottom of a package

3.2.16
integrated circuit
30.1426
combination of inseparable associated circuit elements that are formed in place and interconnected on or within a single base material to perform a particular electrical function

3.2.17
passive component
30.1468
<element> discrete electronic device whose basic character does not change while it processes an applied signal

3.2.18
very large scale integration
VLSI
30.1559
integrated circuits with more than 80 000 transistors on a single die that are interconnected with conductors that are 1 µm or less in width

3.2.19
wafer level packaging
30.1564
technique of partial encapsulation and protection of die while still on the wafer and before the wafer is divided into singulated dies

3.2.20
hermetic
30.1867
<sealing> condition of sealing a component from incoming gases to a specific of inward diffusion normally less than 1×10^{-6} cm^3/s

3.2.21
base plane
30.2011
plane that includes the lowest point of the mounting surface of the package, except for packages using stand-offs

3.2.22
through hole package
THP
31.0858
electronic package for pin insertion assembly type of components or devices

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3.2.23
single-inline package
SIP
31.0942
component package with one straight row of pins or wire leads

3.2.24
leaded chip carrier
31.1224
chip carrier whose external connections consist of leads that are around and down the side of the package

Note 1 to entry: See also "leadless chip carrier".

3.2.25
dual inline package
DIP
31.1387
basically, rectangular component package that has a row of leads extending from each of the longer sides of its body that are formed at right angles to a plane and parallel to the base of its body

3.2.26
ceramic dual inline package
CERDIP
31.1611
package that has a body of ceramic material, is hermetically sealed by a glass and that has two parallel rows of pins

3.2.27
ceramic pin grid array
ceramic PGA
31.1612
pin grid array package (PGA) made of ceramic material, hermetically sealed by metal that has pin-type leads in a matrix of rows and columns; terminals may be missing from some row-column intersection

3.2.28
pin grid array
PGA
31.1965
square or rectangular component package with pins protruding from the bottom surface with a pitch perpendicular to the plane of the package

SEE: Figure 1

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