

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Printed boards design, manufacture and assembly – Vocabulary –  
Part 1: Common usage in printed board and electronic assembly technologies**

**Conception, fabrication et assemblage de cartes imprimées – Vocabulaire –  
Partie 1: Usage commun des techniques d'assemblage des composants  
électroniques et des cartes imprimées**



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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
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INTERNATIONALE

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**PRINTED BOARDS DESIGN, MANUFACTURE AND ASSEMBLY –  
VOCABULARY –****Part 1: Common usage in printed board  
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International Standard IEC 60194-1 has been prepared by IEC technical committee 91: Electronics assembly technology.

This document, together with IEC 60194-2:2017, cancel and replace IEC 60194:2015. This edition constitutes a technical revision.

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

- a) exclusion of 32 general terms better served by other TCs;
- b) exclusion of 47 terms no longer used by the electronic assembly industry;
- c) inclusion of 14 new terms related with device embedded substrate technology;
- d) inclusion of 113 synonymous terms;
- e) removal of identification codes for terms and annexes.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 91/1688/FDIS | 91/1705/RVD      |

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

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## INTRODUCTION

The committee decided to split the revision of IEC 60194:2015 into two separate documents: IEC 60194-1 and IEC 60194-2. This document is the first part of the revision (IEC 60194-1). It is composed of terms and definitions closely related with TC 91 technology.

# PRINTED BOARDS DESIGN, MANUFACTURE AND ASSEMBLY – VOCABULARY –

## Part 1: Common usage in printed board and electronic assembly technologies

### 1 Scope

This part of IEC 60194 covers terms and definitions closely related with TC 91 technology.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary*

### 3 Terms and definitions

For the purposes of electronics assembly technology, the following terms and definitions apply.

#### 3.1 A

##### 3.1.1

##### **abrasion resistance**

ability of a material to withstand surface wear

##### 3.1.2

##### **absorption coefficient**

for a parallel beam of specified radiation in a given substance, the quantity  $\mu_{\text{abs}}$  describes the fraction of energy absorbed in passing through a thin layer of thickness  $\Delta x$

Note 1 to entry: The absorption coefficient is primarily energy dependent.

Note 2 to entry: According to whether the thickness  $\Delta x$  is expressed in terms of length, mass per unit area, moles per unit area or atoms per unit area, it is called the linear, mass, molar or atomic absorption coefficient.

Note 3 to entry: This entry was numbered 393-14-46 in IEC 60050-393:2003.

[SOURCE: IEC 60050-395:2014, 395-01-26]

##### 3.1.3

##### **absorptivity**

<infrared> ratio (or percentage) of the amount of energy absorbed by a substrate as compared with the total amount of incident energy

##### 3.1.4

##### **accelerated equivalent soak**

environmental soak of a component at a higher temperature for a shorter time (compared to the standard soak) to provide roughly the same amount of moisture absorption

Note 1 to entry: See also "soak"

### 3.1.5

#### **accelerated test**

test to check the life expectancy of an electronic component or electronic assembly in a short period of time by applying physically severe condition(s) to the unit under test

### 3.1.6

#### **access hole**

series of holes in successive layers of a multilayer board, each set having their centres on the same axis

SEE: Figure 1

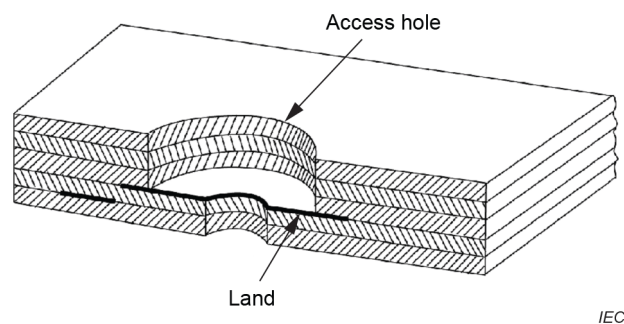


**Figure 1 – Access hole**

Note 1 to entry: These holes provide access to the surface of the land on one of the layers of the board.

### 3.1.7

#### **access protocol**

protocol, used at the user-network interface, to enable the user to employ the services and/or facilities of a telecommunication network

[SOURCE: IEC 60050-716:1995, 716-04-18]

### 3.1.8

#### **accordion contact**

type of connector contact that consists of a flat spring formed into a "Z" shape in order to permit high deflection without overstress

### 3.1.9

#### **acid flux**

solution of an acid and an inorganic, organic, or water-soluble organic flux

Note 1 to entry: See also "inorganic flux", "organic flux", and "water-soluble flux".

### 3.1.10

#### **acid number**

#### **acid value**

number of milligrams of potassium hydroxide (KOH) required to neutralize the acid components present in one gram of a liquid, under standardized conditions

[SOURCE: IEC 60050-212:2010, 212-18-15, modified – The term "acid value" has been used instead of the term "neutralization value".]

**3.1.11**

**acid-core solder**

wire solder with a self-contained acid flux

**3.1.12**

**acoustic microscope**

equipment that creates an image using ultrasound to view a specimen's surface or subsurface features, including defects and damage

**3.1.13**

**actinic radiation**

light energy that reacts with a photosensitive material in order to produce an image

**3.1.14**

**activated rosin flux**

mixture of rosin and small amounts of organic-halide or organic-acid activators

Note 1 to entry: See also "synthetic activated flux"

**3.1.15**

**activating**

**catalysing**

**initiating**

**seeding**

**sensitizing**

treatment that renders nonconductive material receptive to electroless deposition

**3.1.16**

**activating layer**

**seed layer**

layer of material that renders a nonconductive material receptive to electroless deposition

**3.1.17**

**activator**

substance that improves the ability of a flux to remove surface oxides from the surfaces being joined

**3.1.18**

**active desiccant**

desiccant that is either fresh (new) or has been baked according to the manufacturer's recommendations to renew it to original specifications

**3.1.19**

**active metal**

metal that has a very high electromotive force

**3.1.20**

**active trimming**

adjusting the value of a film circuit element in order to obtain a specified functional output from the circuit while it is electrically activated

**3.1.21**

**actual size**

measured size

**3.1.22****additive process****chemically deposited printed circuit****chemically deposited printed wiring**

process for obtaining conductive patterns by the selective deposition of conductive material on unclad base material

Note 1 to entry: See also "semi-additive process" and "fully additive process."

[SOURCE: IEC 60050-541:1990, 541-04-03, modified – Two terms "chemically deposited printed circuit" and "chemically deposited printed wiring", as well as a note to entry, have been added.]

**3.1.23****adhesion**

<pressure-sensitive tape> bond produced by contact between pressure-sensitive adhesive and a surface

**3.1.24****adhesion failure**

rupture of an adhesive bond such that the separation appears to be at the adhesive-adherent interface

**3.1.25****adhesion layer**

metal layer that adheres a barrier metal to a metal land on the surface of an integrated circuit

**3.1.26****adhesion promotion**

chemical process of preparing a surface to enhance its ability to be bonded to another surface or to accept an over-plate

**3.1.27****adhesive coated substrate**

base material upon which an adhesive coating is applied, for the purpose of retaining the conductive material (either additively applied or attached as foil for subtractive processing), that becomes part of a metal-clad dielectric

**3.1.28****adhesive transfer**

<pressure-sensitive tape> transfer of adhesive from its normal position on the pressure-sensitive tape to the surface to which the tape was attached, either during unwind or removal

**3.1.29****adhesive-coated catalyzed laminate**

base material with a thin polymer coating, which contains a plating catalyst, that is subsequently treated in order to obtain a microporous surface

**3.1.30****adhesive-coated uncatalyzed laminate**

base material with a thin polymer coating, which does not contain a plating catalyst, that is subsequently treated in order to obtain a micro-porous surface.

**3.1.31****adsorbed contaminant**

contaminant attracted to the surface of a material that is held captive in the form of a gas, vapour or condensate

### 3.1.32

#### **advanced statistical method**

statistical process analysis and control technique that is more sophisticated and less widely applicable than basic statistical methods

### 3.1.33

#### **aging**

#### **ageing**

change of a property (for example, solderability) with time

### 3.1.34

#### **air pollution**

#### **air contamination**

contamination of the atmosphere with substances that are toxic or otherwise harmful

### 3.1.35

#### **algorithm**

finite set of well-defined rules for the solution of a problem in a finite number of steps

[SOURCE: IEC 60050-171:2019, 171-05-07]

### 3.1.36

#### **alignment mark**

stylized pattern that is selectively positioned on a substrate material to assist in alignment

SEE: Figure 2

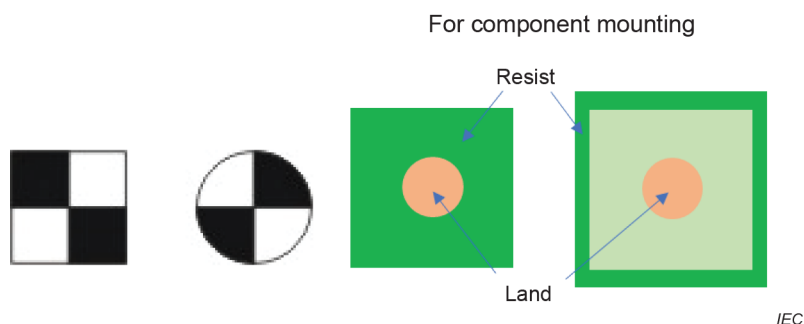


**Figure 2 – Alignment mark**

### 3.1.37

#### **aliphatic solvents**

"straight chain" solvents, derived from petroleum, of low solvent power

### 3.1.38

#### **alkaline cleaner**

material blended from alkali hydroxides and alkaline salts

### 3.1.39

#### **alloy**

#### **Sn-Bi**

<tin bismuth> alloy that is used as a lead-free solder and consisting of tin and bismuth as its main constituents

Note 1 to entry: Sn-Bi58 has a low melting point of 138 °C, but is not widely used because of its brittle properties.

**3.1.40****alloy****Sn-Cu**

<tin copper> alloy that is used as a lead-free solder consisting of tin and copper considered to be applicable for wave or reflow soldering

**3.1.41****alloy****Sn-Ag**

<tin silver> alloy that is used as a lead-free solder, consisting of tin and silver as its main constituents, and used as a high-temperature solder

**3.1.42****alloy****Sn-Ag-Bi**

<tin silver bismuth> alloy that is used as a lead-free solder and consisting of tin, silver and bismuth as its main constituents

Note 1 to entry: The Bi in Sn-Ag-Bi alloy reduces the melting temperature. The higher the Bi content, the higher the mechanical strength, but with poorer elongation capability. There is a limit to Bi content.

**3.1.43****alloy****Sn-Ag-Cu**

<tin silver copper> alloy that is used as a lead-free solder consisting of tin, silver and copper as its main constituents

**3.1.44****alloy****Sn-Zn**

<tin zinc> alloy that is used as a lead-free solder and consisting of tin and zinc as its main constituents

Note 1 to entry: Zn09 alloy has the melting point of 199 °C, closest to the melting point of Sn-Pb alloy among lead-free solders, which allows soldering work at present soldering temperatures, but tends to form a stable oxide film, causing difficulty in securing a good solder wetting.

**3.1.45****alpha error****producer's risk**

size of a Type I error or the probability of rejecting a hypothesis that is true

**3.1.46****alternative hypothesis**

supposition that a significant difference exists between the desired results of two comparable populations

Note 1 to entry: See also "null hypothesis" and "statistical hypothesis."

**3.1.47****alumina substrate**

aluminium oxide used as a ceramic substrate material

**3.1.48****amorphous polymer**

polymer with a random and unstructured molecular configuration

### 3.1.49

#### **anchoring spur**

extension of a land on a flexible printed board that extends beneath the cover layer to assist in holding the land to the base material

SEE: Figure 3

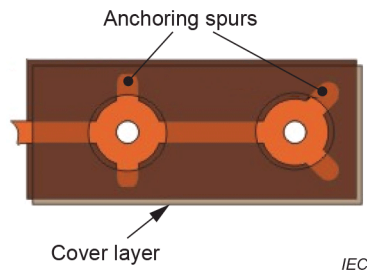


**Figure 3 – Lands with anchoring spurs**

### 3.1.50

#### **angled bond**

series of bonds for which the last one or several atoms are not aligned with the first ones

### 3.1.51

#### **anisotropic conductive contact**

electrical connection using an anisotropic conductive film or paste wherein conductive particles of gold, silver, nickel, solder, etc. are dispersed

Note 1 to entry: When it is compressed, an electrical connection is attained only in the direction of compression.

### 3.1.52

#### **annealed wire**

wire that has been heated and slowly cooled to remove the effects caused by cold working

### 3.1.53

#### **annotation**

text, notes, or other identification, constructed by a computer-aided system, intended to be inserted on a drawing, map or diagram

### 3.1.54

#### **annular ring**

#### **annular width**

portion of conductive material that completely surrounds a hole

SEE: Figure 4

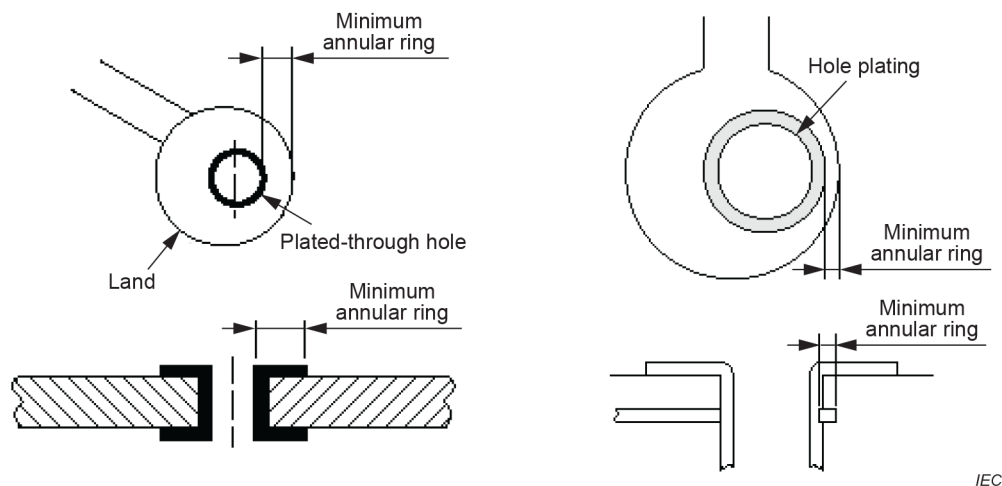


**Figure 4 – Annular ring (annular width)**

### 3.1.55

#### **anodic cleaning**

#### **reverse current cleaning**

electrolytic cleaning in which the work is the anode

### 3.1.56

#### **antipad**

established clearance in the plane to accommodate a hole and its corresponding pad stack

### 3.1.57

#### **aperture**

<stencil> opening in the stencil-foil

### 3.1.58

#### **apparent field-of-view angle**

angular subtense of the field-of-view in the image space of an optical system

### 3.1.59

#### **arc resistance**

#### **tracking resistance**

resistance of a material to the effects of a high-voltage, low-current arc (under prescribed conditions) passing across the surface of the material

Note 1 to entry: The resistance is stated as a measure of total elapsed time at that voltage required to form a conductive path on the surface; material carbonized by the arc.

### 3.1.60

#### **architecture**

structure of a computer's functional elements that enables it to possess specific maximum and minimum capabilities

### 3.1.61

#### **area array**

bonding pattern in which edge and additional pads on the inner surface area of the chip are addressed in the bonding scheme

SEE: Figure 5

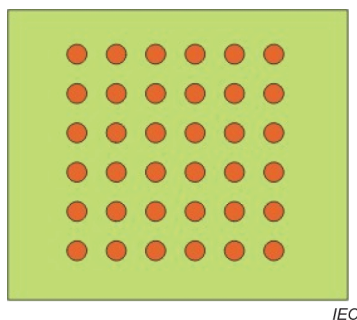


**Figure 5 – Area array**

### **3.1.62**

#### **area array tape automated bonding**

tape automated bonding where some carrier tape terminations are made to lands within the perimeter of the die

### **3.1.63**

#### **area ratio**

ratio of the area of aperture opening to the area of aperture walls

### **3.1.64**

#### **array**

group of elements or circuits arranged in rows and columns on a base material

### **3.1.65**

#### **artificial intelligence**

capacity of a machine to perform functions that are normally associated with human intelligence

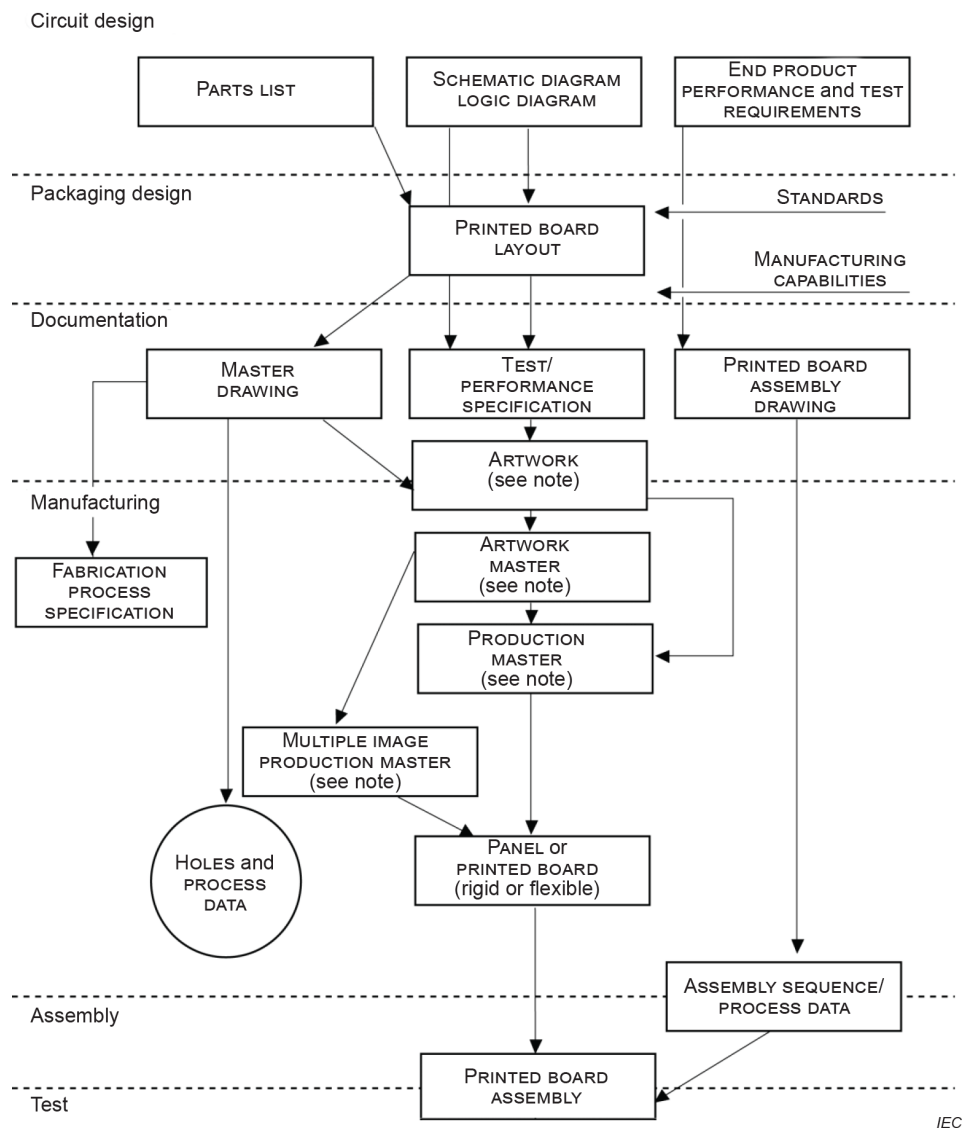
EXAMPLE Reasoning and learning.

### **3.1.66**

#### **artwork**

accurately scaled configuration that is used to produce the "artwork master" or "production master"

SEE: Figure 6



NOTE The term "original" can be used to preface any of the drafting and photographic-tooling terms used in this figure. The "original" is not usually used in manufacturing processes. If a "copy" is made, the copy is of sufficient accuracy to meet its intended purpose if it is to take on the name of any one of the terms used in this figure. Other adjectives can also be used to help describe the kind of copy, i.e., "nonstable", "first generation," "record," etc.

**Figure 6 – Simplified flow chart of printed board design/fabrication sequence**

### 3.1.67 artwork master photomaster

accurate configuration the scale of which is chosen as required to provide the necessary accuracy, and which is used to produce the original production master

SEE: Figure 6

[SOURCE: IEC 60050-541:1990, 541-03-01, modified – The term "photomaster" and "SEE: Figure 6" have been added.]

### 3.1.68 as-fired

condition of thick-film components or the surface condition of ceramic base materials after having been processed in a firing furnace and prior to trimming or polishing

### 3.1.69

#### aspect ratio

<film> ratio of the length of a film component to its width

### 3.1.70

#### aspect ratio

<hole> ratio of the length or depth of a hole to its preplated diameter

SEE: Figure 7

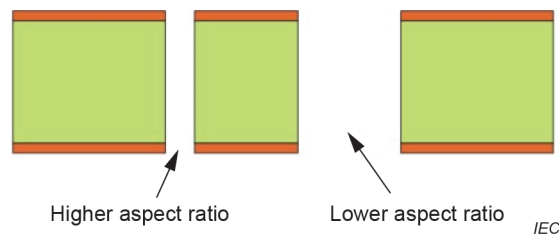


**Figure 7 – Aspect ratio (hole)**

### 3.1.71

#### aspect ratio

<stencil> ratio of aperture width to stencil thickness

### 3.1.72

#### assembly

#### assembled board

number of parts, subassemblies or combinations thereof joined together

Note 1 to entry: This term can be used in conjunction with other terms, for example, "printed circuit board assembly."

### 3.1.73

#### assembly drawing

document that depicts the physical relationship of two or more parts, a combination of parts and subordinate assemblies, or a group of assemblies required to form an assembly of a higher order

### 3.1.74

#### assembly language

machine-oriented language whose instructions are usually in one-to-one correspondence with machine instructions and that can provide facilities such as the use of macroinstructions

Note 1 to entry: An assembly language generally uses symbolic naming of operations and locations.

[SOURCE: IEC 60050-171:1992, 171-05-15]

### 3.1.75

#### assembly manufacturer

individual, organization, or company responsible for the assembly process and verification operations necessary to ensure full compliance of assemblies

### 3.1.76

#### asymmetric stripline

#### dual-strip line

stripline signal conductor that is embedded between two reference planes, but not centred between them

SEE: Figure 8

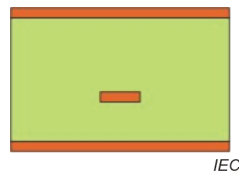


**Figure 8 – Asymmetric stripline**

Note 1 to entry: The asymmetric stripline is also called "dual stripline".

### 3.1.77

#### **attachment density**

average number of surface mount or through-hole solder joints, based on pitch and land size, that can be accommodated in a prescribed unit area (for example, cm<sup>2</sup>), considering land size within the unit area to accommodate the solder joint attachment

### 3.1.78

#### **attributes data**

qualitative data that can be counted for recording and analysis purposes

### 3.1.79

#### **automated component insertion**

act or operation of assembling discrete components to printed boards by means of electronically controlled equipment

### 3.1.80

#### **automatic component placement**

software that automatically optimizes the layout of components on a printed board

### 3.1.81

#### **automatic conductor routing**

software that automatically determines the placement of interconnections on a printed board

### 3.1.82

#### **automatic dimensioning**

computer-aided drafting function that automatically generates dimensions, leaders, arrowheads, etc., that make up a complete set of documented dimensions

### 3.1.83

#### **automatic test equipment**

equipment that automatically analyses functional or static parameters in order to evaluate performance

### 3.1.84

#### **automatic test generation**

computer generation of a test program based solely on circuit topology with little or no manual programming effort

### 3.1.85

#### **axial lead**

lead wire extending from a component or module body along its longitudinal axis

SEE: Figure 9



**Figure 9 – Axial lead**

### 3.1.86

#### **azeotropic mixture**

#### **azeotrope**

liquid mixture of two or more substances that behaves like a single substance

Note 1 to entry: The vapour produced by partial vaporization of the liquid has the same composition as the liquid.

## 3.2 B

### 3.2.1

#### **back annotation**

process of extracting appropriate information from a completed printed board design and inserting it on the boards schematic diagram

### 3.2.2

#### **back bonding**

#### **back mounting**

attaching a die to a base material with its circuitry facing away from the base material

SEE: Figure 10

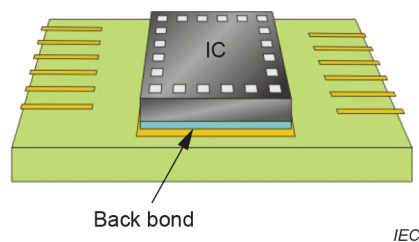


**Figure 10 – Back bonding**

### 3.2.3

#### **back taper**

constant decrease in diameter along the length of the body of a drill from the tip to the bottom of the drill

### 3.2.4

#### **back-bared land**

land in flexible printed wiring that has a portion of the side normally bonded to the base dielectric material exposed by a clearance hole

SEE: Figure 11

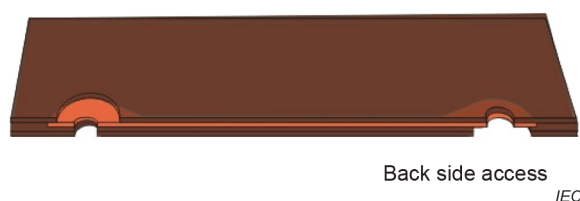


**Figure 11 – Back-bared land**

**3.2.5****backdriving**

in-circuit testing technique that drives digital circuitry outputs to a given logic level, by supplying pulses of sufficient electrical current magnitude in parallel with the outputs, in order to overdrive the logic state conditions of the next digital device inputs

**3.2.6****background**

<artwork> non-functional area of a phototool

**3.2.7****background variable**

parameter of no experimental interest that is not held at a constant value

**3.2.8****backlighting**

viewing or photographing by placing an object between a light source and the eye or recording medium

**3.2.9****backup pin**

supporting pin that is located under a printed board to prevent deflection of the board during component mounting

**3.2.10****bake out**

subjecting of a product to an elevated temperature in order to remove moisture and unwanted gases prior to certain steps in the printed board manufacturing process or prior to final coating

**3.2.11****ball array**

group of balls arranged in rows and columns

**3.2.12****ball bond**

nailhead bond

welded connection of a bond wire to the bond pad of an integrated circuit die

Note 1 to entry: The bond wire is melted to form a ball and the ball is bonded by use of thermo-compression or thermo-sonic techniques.

**3.2.13****ball lift**

category of ball bond failure in which the ball lifts off the surface of the integrated circuit die bond pad metallization or lifts the metallization from the surface of the underlying oxide or silicon

**3.2.14****bar**

dark element of a barcode

**3.2.15****barcode printer**

printer with the ability to print barcoded labels and forms

### 3.2.16

#### **barcode scanner**

#### **barcode reader**

device used for machine reading of a barcode

Note 1 to entry: Readers may be hand-held wands, fixed optical beams, or moving optical beams.

### 3.2.17

#### **bare board**

unassembled (unpopulated) printed board

### 3.2.18

#### **barrel crack**

crack of the plated metal on the internal wall of a through-hole

SEE: Figure 12

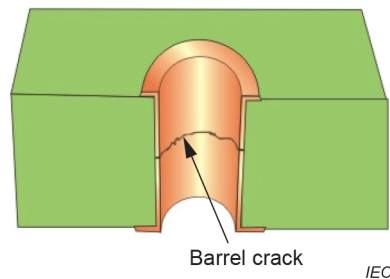


**Figure 12 – Barrel crack**

### 3.2.19

#### **barrier metal**

metal used to seal the semiconductor-die lands

### 3.2.20

#### **base metal**

basis metal

<coating> metal upon which coatings are deposited

### 3.2.21

#### **base metal**

basis metal

<solder> underlying metal surface to be wetted by solder

### 3.2.22

#### **base solderability**

ease with which a metal or metal alloy surface can be wetted by molten solder under minimum realistic conditions

### 3.2.23

#### **baseline dimensioning**

dimensioning of feature positions from the origin of the coordinate system

SEE: Figure 13

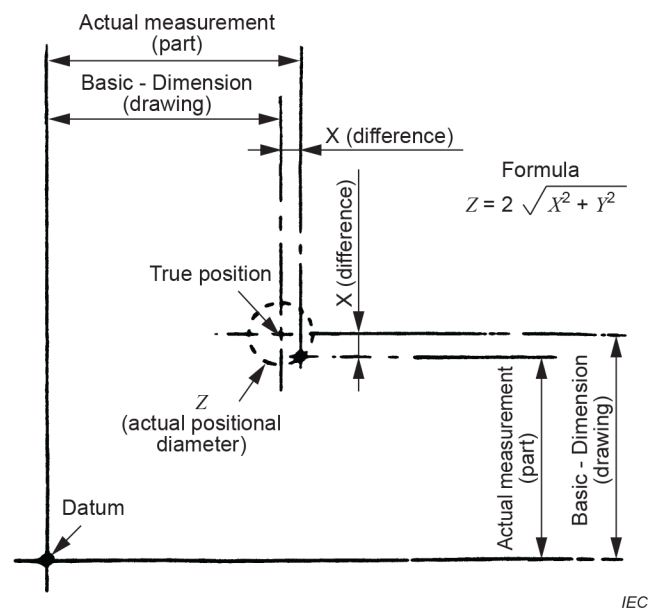


**Figure 13 – Example of feature location using baseline dimensions**

Note 1 to entry: In this system, the maximum variation of the feature position from the true position is equal to the root of the sum of squares of the two tolerances on the dimensions in  $x$ - and  $y$ -directions as shown in Figure 13.

### 3.2.24

#### **basic dimension**

numerical value used to describe the theoretical exact location of a feature, for example, a hole

Note 1 to entry: It is the basis from which permissible variations are established given in notes or as feature control symbols.

### 3.2.25

#### **basic statistical method**

application of a theory of variation through the use of basic problem-solving techniques and statistical process control

Note 1 to entry: This includes control and capability analysis for both variables' and attributes' data.

### 3.2.26

#### **basic wettability**

ease with which a metal or metal alloy can be wetted by molten solder

### 3.2.27

#### **basis material**

material upon which coatings are deposited

### 3.2.28

#### **batch oven**

large temperature-controlled oven that is used to heat clean rolls of fabric

### 3.2.29

#### **batch processing**

executing a computer-aided program without human input

### 3.2.30

#### **bathtub curve**

plot of failure rates versus time, having high failure rates at the beginning and at the end of service life

SEE: Figure 14

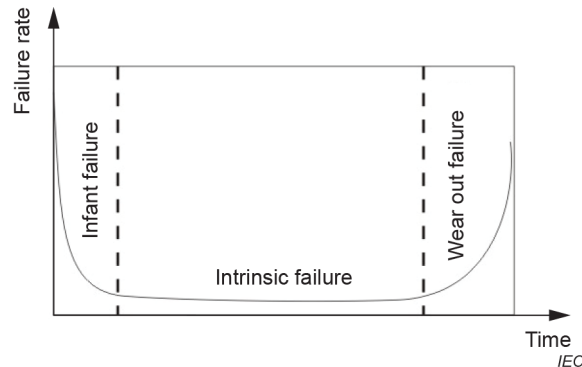


**Figure 14 – Bathtub curve**

### 3.2.31

#### **Baumé scale**

scale on aerometer for measuring the density of liquids

Note 1 to entry: This scale is named after the French chemist Baumé.

### 3.2.32

#### **bead**

<discrete wiring> external (surface) annular ring of copper plating around a plated through-hole on a fully additive circuit board which functions to conduct heat and promote solder wicking during the soldering of components

### 3.2.33

#### **beam lead**

component terminal in the form of a long metallic structural member that is not supported along its length

### 3.2.34

#### **beaming**

operation in which yarn from several section beams is combined on the final warp beam

### 3.2.35

#### **beam-lead device**

active or passive chip component with beam leads to enable interconnection to lands on a base material

SEE: Figure 15

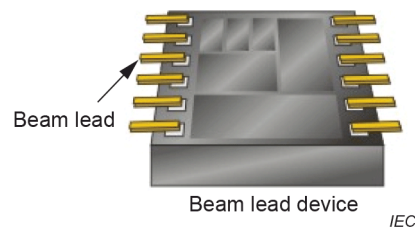


**Figure 15 – Beam-lead device**

### 3.2.36

#### **bed-of-nails fixture**

test fixture consisting of a frame and a holder containing a field of spring-loaded pins that make electrical contact with a planar test object

### 3.2.37

#### **bellmouth**

raised portion at the front and/or back of the wire barrel crimp that provides a gradual entrance and exit for the wire strands without causing damage

### 3.2.38

#### **bellows contact**

type of connector contact that consists of a flat spring that has been folded to provide a very uniform spring rate over the full range of contact with the mating part

### 3.2.39

#### **benchmark**

<computer> standard measure of the performance of computers relative to each other, including set-up time, program generation, and data processing capability

### 3.2.40

#### **benchmark**

<testing> standard measure of the performance of testers relative to each other, including set-up time, test program generation, and fixturing

### 3.2.41

#### **BiCMOS**

transistor fabrication technology, resulting in the creation of both bipolar and CMOS devices

### 3.2.42

#### **bifurcated contact**

type of connector contact that usually consists of a flat spring that has been slotted lengthwise in order to provide independent contact points with the mating part

### 3.2.43

#### **bifurcated solder terminal**

solder terminal with a slot or slit opening, through which one or more wires are placed prior to soldering

SEE: Figure 16

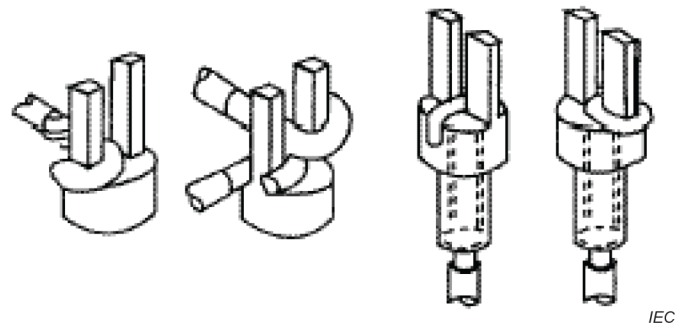


**Figure 16 – Bifurcated solder terminal**

### 3.2.44

#### **bilateral tolerance**

tolerance in which variation is permitted in both directions from the specified dimension

### 3.2.45

#### **binder**

material added to thick-film compositions and unfired base materials to give them additional strength for pre-fire handling

Note 1 to entry: See also "glass binder".

### 3.2.46

#### **binomial distribution**

distribution which provides the probability that an event  $A$  occurs at  $n$  independent tests for  $m$  times when  $p$  is the probability of occurring of the event  $A$  at each test

### 3.2.47

#### **biochemical oxygen demand**

quantity of oxygen required to decompose organic contamination contained in water, used as a measure of contamination of water

### 3.2.48

#### **biocide**

general name for any substance that kills or inhibits the growth of micro-organisms

### 3.2.49

#### **birdcage**

stranded wire whereby the strands in the stripped portion between the covering of an insulated wire and a soldered connection, or an end-tinned lead, have separated from the normal lay of the strands

### 3.2.50

#### **bismaleimide**

resin that has the generic chemical structure of an aromatic chemical group that is attached to two (or "bis") maleimide groups

### 3.2.51

#### **bismaleimide triazine**

resin that contains a mixture of bismaleimide and triazine resins

### 3.2.52

#### **bit**

straight or shaped rotary cutting tool used in a power router to cut, trim or shape materials by rotary action

**3.2.53****blank**

unprocessed or partially processed piece of base material or metal-clad base material, that has been cut from a sheet or panel, that has the rough dimensions of a printed board

Note 1 to entry: See also "panel".

**3.2.54****blanking**

cutting of a sheet of material into pieces to the specified blank design

**3.2.55****bleeding**

condition in which a product or a part (for example, a plated hole of a printed board) discharges water, process materials or solutions from crevices or voids, or a condition in which a resist or paint migrates beyond the image area

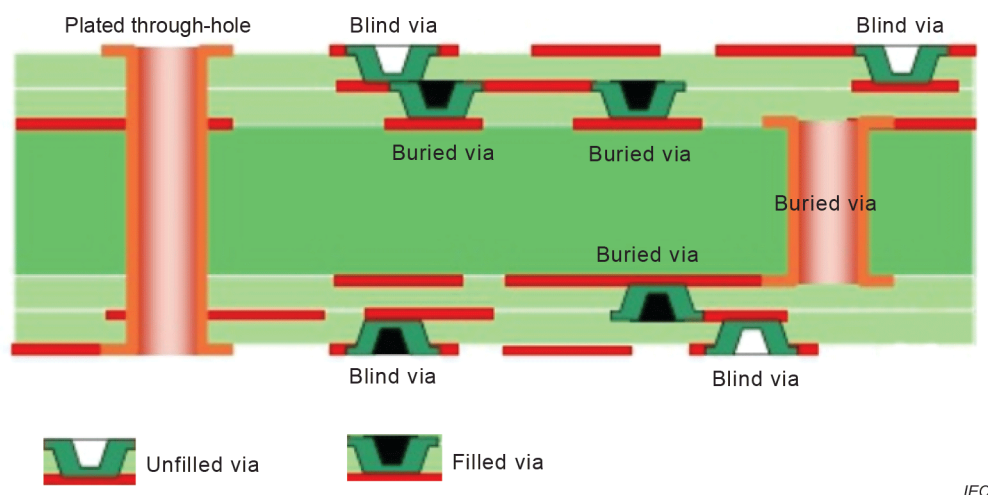
**3.2.56****blends**

mixture of different substances or different types of the same substance (for example, a mixture of resins in board manufacturing)

**3.2.57****blind via****interstitial via**

via extending only to one surface of a printed board

SEE: Figure 17



IEC

**Figure 17 – Buried via and blind via**

**3.2.58****blister**

delamination in the form of a localized swelling and separation between any of the layers of a lamination base material, or between base material and conductive foil or protective coating

**3.2.59****blocking variables**

relatively homogeneous set of conditions within which different conditions of primary variables are compared

**3.2.60**

**blow hole**

void caused by outgassing

**3.2.61**

**blow through**

location where the mould material migrates through the connector insert or contacts

**3.2.62**

**board fabricator**

individual, organization, or company responsible for the fabrication of the bare printed board, including all process and verification operations necessary to ensure full compliance with customer requirements

**3.2.63**

**board thickness**

thickness of the metal-clad base material or printed wiring board including the conductive layer

**3.2.64**

**body land clearance**

portion of a drill, where the diameter is decreased compared with the minor cutting edge in order to provide a clearance behind the margin

**3.2.65**

**bond deformation**

plastic-flow change in the form of a lead caused by a bonding tool during a termination process

**3.2.66**

**bond enhancement treatment**

treatment or coating on a metal foil surface used for improving the bondability of the metal foil to the resin surface to which the foil is to be attached

**3.2.67**

**bond envelope**

range of termination parameters within which acceptable bonds can be formed

**3.2.68**

**bond interface**

common area between a lead and a land to which it has been terminated

**3.2.69**

**bond lift-off**

failure mode whereby a bonded lead separates from the surface to which it has been joined

**3.2.70**

**bond schedule**

values of termination machine parameters

**3.2.71**

**bond separation**

distance between the termination points of the first bond and the second bond

**3.2.72**

**bond site**

portion of the bonding area where the actual termination takes place

**3.2.73****bondability**

ability of a metal surface of being bonded

Note 1 to entry: Bondability depends to a certain degree on the surface cleanliness and qualities of the connection area.

**3.2.74****bonding**

terminating process that uses heat and pressure to make a joint between a termination and a feeding wire

**3.2.75****bonding area****bond land****bond surface****bonding island**

area defined by the extent of a land or portion of a terminal to which a lead is to be bonded

**3.2.76****bonding layer**

adhesive layer used in bonding together other discrete layers of a multilayer printed board during lamination

**3.2.77****bonding time**

time duration from the commencement of the thermo heat-up until the reflow profile is completed

**3.2.78****bonding tool**

instrument used to position leads or discrete wires over a land and to impart sufficient energy to complete the termination

**3.2.79****bond-to-bond distance**

distance from the bonding site on a die to the corresponding bonding site on a lead frame, interconnecting base material, etc.

**3.2.80****bond-to-die distance**

distance from the heel of a beam lead to the die

**3.2.81****boot**

<wire termination> form placed around wire termination of a connector to contain the liquid potting compound before it hardens

**3.2.82****boot**

<housing> protective housing usually made from a resilient material to prevent entry of moisture into a connector

Note 1 to entry: A boot can also be preformed, heat shrinkable and can be purchased with self-adhesive or bonded with an adhesive.

### 3.2.83

#### **border**

peripheral tensioned mesh, either polyester or stainless steel, which keeps the stencil foil flat and taut

Note 1 to entry: The border connects the foil to the frame.

### 3.2.84

#### **border area**

region on a base material that is external to that in which the end-product is being fabricated

### 3.2.85

#### **border data**

patterns that appear in the border area, such as tooling features, test patterns, and registration marks

### 3.2.86

#### **boss**

<connector> raised section on a connector that fits into a specific slot in the positive polarization or keying feature of a mating connector

### 3.2.87

#### **bottom side**

<device embedded substrate> side of a device embedded substrate connected to a board by mounting

### 3.2.88

#### **bounce pad**

<discrete wiring> isolated area in a copper plane that acts solely as a stop for the laser drilling operation

### 3.2.89

#### **bow**

<sheet, panel, or printed board> deviation from flatness of a board characterized by a roughly cylindrical or spherical curvature such that, if the product is rectangular, its four corners are in the same plane

SEE: Figure 18

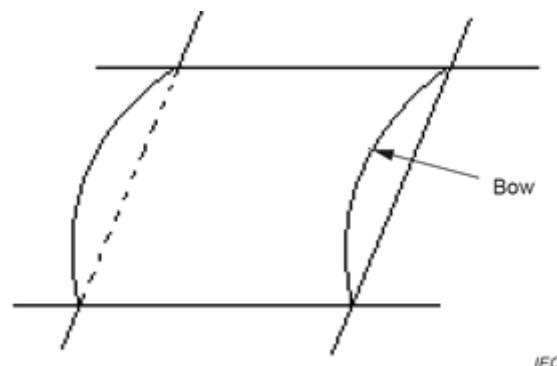


**Figure 18 – Bow**

Note 1 to entry: See also "twist".

**3.2.90****braid**

fabric of bare metallic or tinned copper wire used as shielding for wires and cables and as ground wire for batteries or heavy industrial equipment

**3.2.91****braid angle**

smaller of two angles formed by the shielding strand and the axis of the cable being shielded

**3.2.92****braid carrier**

spool or bobbin on a braider which holds one group of strands or filaments consisting of a specific number of ends

Note 1 to entry: The carrier revolves during braiding operations.

**3.2.93****braid ends**

number of strands used to make up one carrier

Note 1 to entry: The strands are wound side by side on the carrier bobbin and lie parallel in the finished braid.

**3.2.94****braid fold back**

portion of the braid that is folded back to allow a solder connection between the braid and another conductor

**3.2.95****brainstorming**

generation of a list of potential causal factors or ideas that may be possible contributors to improve/change problems including in processes

**3.2.96****breakaway**

function of excising printed boards or printed board assemblies from their panel structure after all processing has been completed

SEE: Figure 19

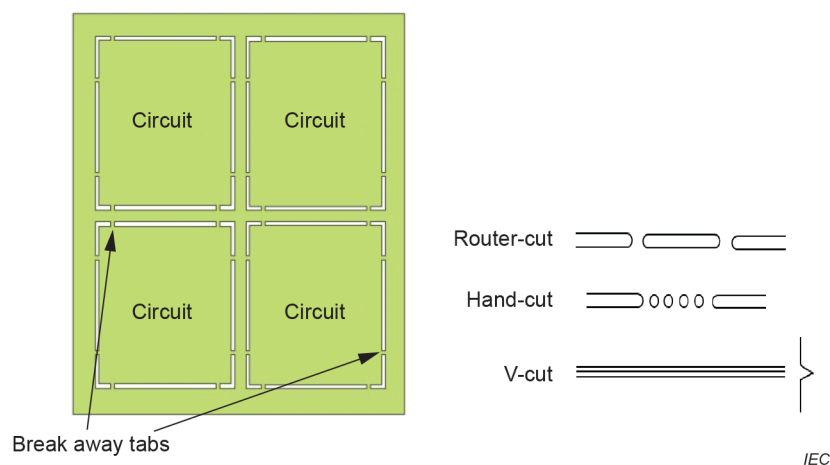


**Figure 19 – Breakaway**

**3.2.97**

**breakout**

point at which a conductor or group of conductors is separated from a multiconductor cable or wiring harness to complete circuits at other points

Note 1 to entry: See also "hole breakout".

**3.2.98**

**broken pick**

filling yarn that is missing from a portion of the width of a fabric

**3.2.99**

**brominated epoxy**

epoxy resin containing chemically bound bromine which is added to act as a flame retardant

**3.2.100**

**brown streak**

**brown thread**

<base materials> thin vein or stain seen in the reinforcement that can range from light amber to nearly chocolate brown

Note 1 to entry: It usually runs within a fibre bundle for 3 mm to 13 mm (0,13 in to 0,512 in). It is most commonly found in the warp yarns and can appear singly or in multiples, or in a pattern. It is due to the remnants of the glass binder agent, which the weaver did not remove.

**3.2.101**

**B-stage**

intermediate state in the curing process of a thermosetting resin, in which the material is only partly polymerized so that there is still some room for further curing

Note 1 to entry: See also "C-staged resin".

**3.2.102**

**B-staged resin**

thermosetting resin that is in an intermediate state of cure

Note 1 to entry: See also "C-staged resin".

**3.2.103**

**bubble effect**

entrapment of air, solvent or moisture bubbles in a protective coating

**3.2.104**

**bubble**

spherical void in a moulded material

**3.2.105**

**buffer material**

resilient material that is used to protect a crack-sensitive component from the stresses generated by a conformal coating

**3.2.106**

**bugging height**

distance between a land and the lower surface of a beam lead caused by the deformation of the lead during bonding

**3.2.107****build-up process**

swelling of a printed board that is usually caused by internal delamination or separation of fibres

**3.2.108****bulge**

swelling of a printed board that is usually caused by internal delamination or separation of fibres

**3.2.109****bulk conductance**

conductance between two points of a homogeneous material

**3.2.110****bulk reflow**

reflow of multiple components, with simultaneous attachment, by an infrared (IR), convection/IR, convection, or vapour phase reflow (VPR) process

**3.2.111****bulls-eye**

stylized pattern located in the border area in order to aid in alignment

**3.2.112****bump**

means of providing a (electrical) connection to the terminal area of a device

Note 1 to entry: A small mound is formed on the device or substrate pads and is used as a contact for face-down loading.

**3.2.113****bump**

<die> raised metallised area on the die that is used for temporary or permanent electrical connection

**3.2.114****bump array**

group of bumps arranged in rows and columns

**3.2.115****bump contact**

contacting pad that rises substantially above the surface level of the chip

**3.2.116****bumped tape**

carrier tape with raised metal features that facilitate inner-lead bonding

**3.2.117****bumped wafer**

semiconductor wafer with raised metal feature on its die lands that facilitate inner-lead bonding

**3.2.118****buried via**

via that does not extend to the surface of a printed board

**3.2.119****burr**

small lumps or masses with an irregular shape, convex to a surface, which is the result of a machine process such as drilling or gouging

### 3.2.120

#### **bus**

one or more conductors used for transmitting data signals or power

### 3.2.121

#### **bus bar**

type of conduit, such as a component or conductor on a printed board, that is used to distribute electrical energy

Note 1 to entry: See also "plating bar".

### 3.2.122

#### **butt leads**

<SMT> leads extending horizontally from about the centre of a component body, formed down at a 90° angle and ending immediately below the component body without additional bends

Note 1 to entry: Lead form used in surface-mount technology.

### 3.2.123

#### **butt plating joint**

joint between two or more conductors of a printed board, at the end of one or both, and either at right angles or oblique to the grain of the conductors, with no overlap of the conductors

### 3.2.124

#### **butt plating joint**

#### **wrap plating**

consequent via structure of a surface interconnect termination with the absence of wrap plating

SEE: Figure 20

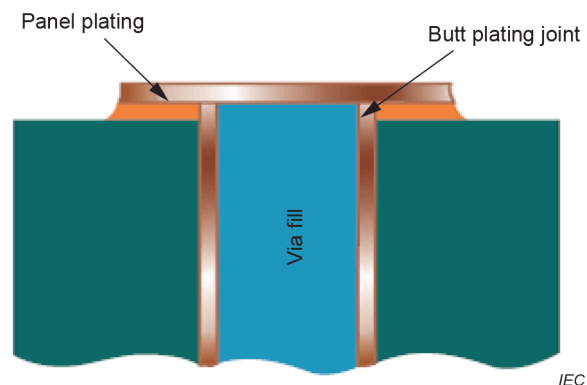


**Figure 20 – But plating joint (wrap plating)**

### 3.2.125

#### **butt splicer**

device for joining conductors by butting them end to end

### 3.2.126

#### **butter coat**

increased amount of resin on the outer surface of a base material

### 3.2.127

#### **button plating**

process of plating only in the holes and on pads

SEE: Figure 21

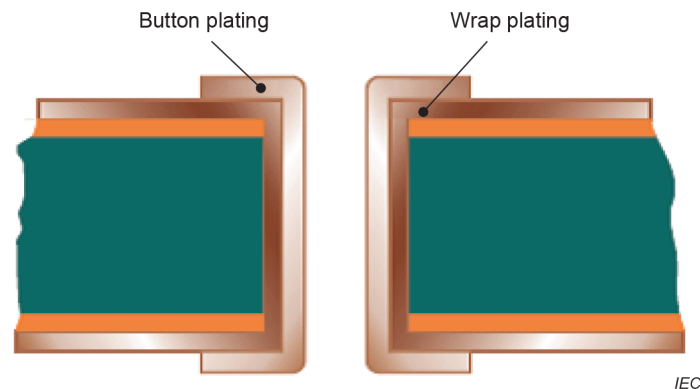


**Figure 21 – Button plating**

### 3.3 C

#### 3.3.1

##### **camber**

planar deflection of a flat cable or flexible laminate from a straight line

#### 3.3.2

##### **cap lamination**

process to produce multilayer printed boards using one-sided metal clad base material for the external layers

Note 1 to entry: See also "foil lamination".

#### 3.3.3

##### **capability detail specification**

##### **CapDS**

document that establishes the specific requirements, noted in a detailed specification, in order to establish the level of capability that a manufacturer possesses when he/she has demonstrated that he/she has met those requirements

Note 1 to entry: This note applies to the French language only.

#### 3.3.4

##### **capability performance index**

##### **Cp**

capability index

ratio of the measured performance of a process compared to specified limits

Note 1 to entry: This note applies to the French language only.

#### 3.3.5

##### **capability performance**

##### **Cpkl**

<lower> measure of the relationship between the performance of a process and the lower specification limit

Note 1 to entry: See also "capability performance <upper>".

#### 3.3.6

##### **capability performance**

##### **Cpku**

<upper> measure of the relationship between the performance of a process and the upper specification limit

Note 1 to entry: See also "capability performance <lower>".

### **3.3.7**

#### **capability test board**

##### **CTB**

printed board specifically designed to act as a capability qualifying component (CQC), or to be used by a manufacturer to evaluate process variation, process control, or continuous improvement procedures

### **3.3.8**

#### **capability test segment**

##### **CTS**

segment or portion of a capability test board (CTB), containing a set or group of individual test patterns (ITP), intended to be used to demonstrate a specific level of printed board complexity or manufacturing capability

### **3.3.9**

#### **capacitance density**

amount of capacitance available per unit of the conductor area

### **3.3.10**

#### **capillary**

tube with a very small inner diameter space or a hollow, often used in assembly to guide wire to the bonding site and used to apply pressure during the bonding cycle

Note 1 to entry: See also "wedge tool".

### **3.3.11**

#### **capture land**

land where the microvia starts which varies in shape and size based on use (i.e., component mounting, via entrance, and conductor)

### **3.3.12**

#### **carrier**

container that directly holds components, such as a tray, tube, or tape and reel

### **3.3.13**

#### **carrier**

<foil> temporary support medium that facilitates the handling of thin and soft-metal foils

### **3.3.14**

#### **carrier tape**

##### **tape**

carrier for conductors used in tape-automated bonding

Note 1 to entry: See also "multilayer carrier tape," "single-layer carrier tape," "two-layer carrier tape" and "three-layer carrier tape".

### **3.3.15**

#### **carry-out**

curved back portion of the flute of a drill

### **3.3.16**

#### **cartridge**

container for components that facilitates the loading and unloading of them

**3.3.17****castellation**

recessed metallised feature on the edge of a leadless chip carrier that is used to interconnect conducting surface or planes within or on the chip carrier

SEE: Figure 22

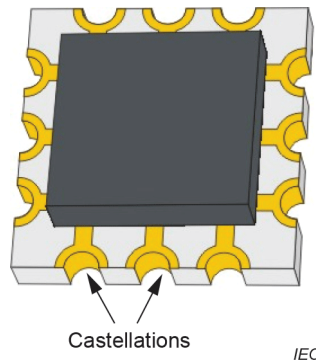


**Figure 22 – Castellation**

**3.3.18****catalyst****accelerator**

<resin> chemical that is used to initiate the reaction or increase the speed of the reaction between a resin and a curing agent

**3.3.19****cathodic cleaning****direct cleaning****direct current cleaning**

electrolytic cleaning in which the work is the cathode

**3.3.20****cationic reagent**

surface-active substances that have the active constituent in the positive ion

**3.3.21****cause-and-effect diagram****fishbone diagram**

problem solving tool that uses a graphic description of various process elements in order to analyse potential sources of process variation

**3.3.22****cavity structure**

structure to have a space within a board to embed a device

**3.3.23****centring force**

force required by the pick-up tooling to centre a surface-mounting device in its proper location on a substrate

**3.3.24****central line**

line on a control chart that depicts the average or median value of the items being plotted

**3.3.25**  
**centre-to-centre spacing**  
**spacing**

nominal distance between the centres of adjacent features on any single layer of a printed board

SEE: Figure 23

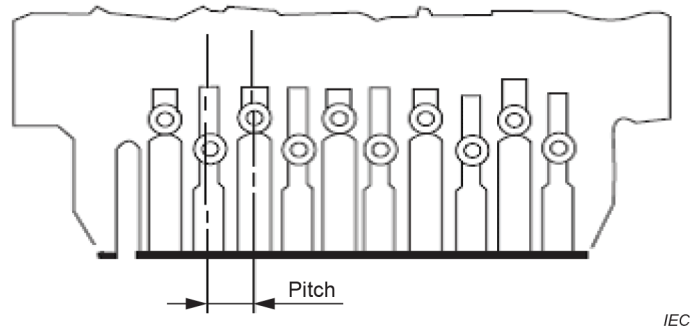


**Figure 23 – Centre-to-centre spacing (pitch)**

Note 1 to entry: See also "pitch".

**3.3.26**  
**centrewire break**

failure mode in a wire pull test whereby the wire fractures at approximately its midspan

**3.3.27**  
**chain dimensioning**

dimensioning of drawing in the way that a second measure starts at the end of the first measure, and so on

Note 1 to entry: In this system, the maximum variation of the last feature of the chain will be the sum of the tolerances of the features before.

**3.3.28**  
**chalking**

<cured solder mask> degraded solder mask such that fine particles can be removed from the surface

**3.3.29**  
**chamfer**

<drill> angle at the end of a drill shank

**3.3.30**  
**char**

**charred**, adj  
result of excess heat causing a charcoal/carbon residue of base material

**3.3.31**  
**character**

letter, digit, or other special form that is used to represent data in a barcode symbol

Note 1 to entry: See also "barcode symbol".

### 3.3.32 characteristic curve D curve

plot of photographic product optical-density data versus the logarithm of the exposure used to characterize the response of the material to exposure and development

SEE: Figure 24

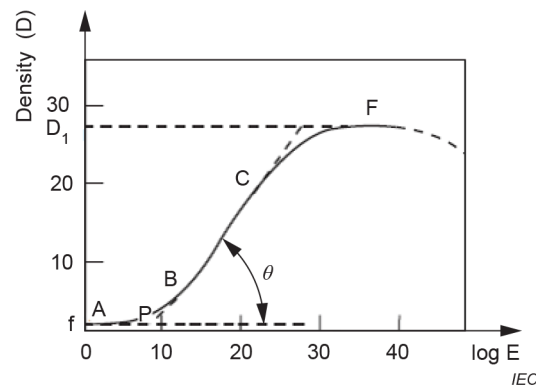


**Figure 24 – Typical characteristic curve**

### 3.3.33 checklist

compilation of the specified criteria that may be evaluated during an audit or inspection

### 3.3.34 check plot

interim drawing used for graphical data verification

### 3.3.35 check sheet

form that is used for data collection

### 3.3.36 chelate compound

compound in which metal is contained as an integral part of a ring structure

### 3.3.37 chelating agent

compound capable of forming a chelate compound with a metal ion

### 3.3.38 chemical conversion coating

protective coating produced by the chemical reaction of a metal with a chemical solution

### 3.3.39 chemical resistance

resistance of an insulating material to the degradation of surface characteristics, such as surface roughness, swelling, tackiness, blistering or colour change, beyond the specified allowance, by exposure to chemicals such as acids, alkalis, salts, or solvents

### 3.3.40 chemical wire stripping

process of removing insulation from wire using chemical compounds

**3.3.41**

**chemisorption**

formation of bonds between the surface molecules of a metal, or other material of high surface energy, and another gas or liquid substance in contact with it

**3.3.42**

**chessman**

disk, knob or lever used to manually control the position of a bonding tool with respect to land

**3.3.43**

**chip-and-wire**

assembly method that uses discrete wires to interconnect back-bonding die to lands, lead frames, etc.

**3.3.44**

**chip-in-board**

**CIB**

electronic component where a chip is inserted into an opening of a ceramic or glass-epoxy substrate and bonded by wire bonding or TAB techniques

Note 1 to entry: The object of the TAB technique is to reduce the thickness of the COB assembly.

Note 2 to entry: The chip may be covered by a resin after bonding.

**3.3.45**

**chip-on-board assembly**

printed board assembly using a combination of uncased chips and other devices

Note 1 to entry: The silicon area density is less than 30 %.

**3.3.46**

**chipped point**

condition whereby the amount of chips on the leading edge of a drill point exceeds an allowable value

**3.3.47**

**chipping**

piece of a panel or board that has broken away

**3.3.48**

**chisel**

tool used for wedge and ultrasonic bonding

**3.3.49**

**chisel-edge angle**

angle between two facing cutting edges at the chisel-edge of a drill

**3.3.50**

**chopped bond**

bond generated in chopped mode in which excessive deformation can easily occur which greatly diminishes the bond

**3.3.51**

**circuit density**

average quantity of electronic components (prefabricated or part of the interconnecting structure) on a unit area of a printed board considering one or both sides for component mounting

**3.3.52****circuitry layer**

layer of a printed board containing conductors, including ground and voltage planes

**3.3.53****circumferential crimp**

final configuration of a terminal barrel carried out when crimping dies completely surround the barrel and form symmetrical indentations

**3.3.54****circumferential separation**

crack or void in the plating extending around the entire circumference of a plated through-hole, a solder fillet around lead wire or eyelet, or the interface between a solder fillet and a land

**3.3.55****circumferential thermodes**

contact tool used for inner-lead and outer-lead gang bonding

**3.3.56****clad, adj**

condition of the base material to which a relatively thin layer or sheet of metal foil has been bonded to one or both of its sides (for example, a metal-clad base material)

**3.3.57****classification temperature****T<sub>c</sub>**

<plastic encapsulated SMDs> maximum body temperature at which the component manufacturer guarantees the component MSL (moisture sensitivity level) as noted on the caution and/or barcode label

**3.3.58****clearance hole**

hole in a conductive pattern that is larger than, and coaxial with, a hole in the base material of a printed board

SEE: Figure 25

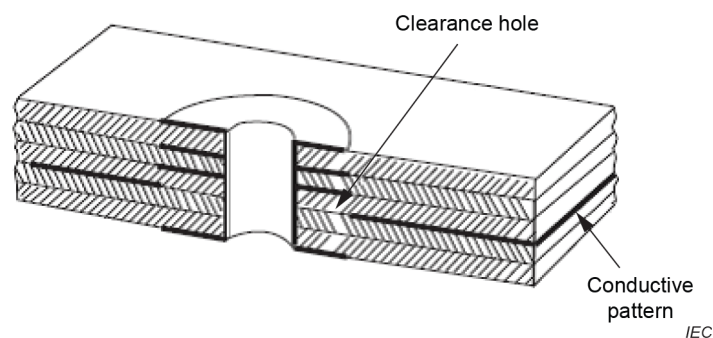


**Figure 25 – Clearance hole**

**3.3.59****clinched lead**

component lead that is inserted through a hole in a printed board and is then formed in order to retain the component in place and in order to make metal to metal contact with a land prior to soldering

Note 1 to entry: See also "partially clinched lead".

### 3.3.60

#### **clinched-wire through connection**

#### **clinched-wire interfacial connection**

connection made by a bare wire that has been passed through a hole in a printed board and subsequently formed (clinched) and soldered to the conductive pattern on each side of the board

SEE: Figure 26

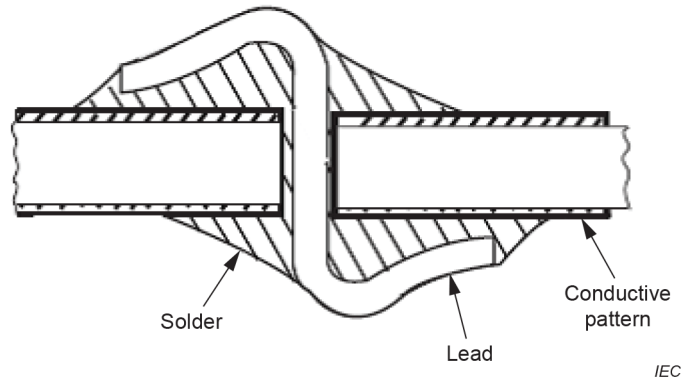


**Figure 26 – Clinched-wire through connection**

### 3.3.61

#### **closed-entry contact**

type of female connector contact that prevents the entry of an oversized mating part

Note 1 to entry: See also "open-entry contact".

### 3.3.62

#### **code 39**

type of barcode so named because it contains nine elements (bars and spaces) with three wide elements and six narrow elements

### 3.3.63

#### **code density**

number of characters per unit length in a barcode symbol

### 3.3.64

#### **coefficient of thermal expansion**

#### **CTE**

#### **thermal coefficient of expansion**

relative linear change of a material per unit change in temperature

Note 1 to entry: See also "thermal mismatch".

### 3.3.65

#### **co-firing**

simultaneous firing of thick-film circuit elements during one firing cycle

### 3.3.66

#### **cohesion**

<pressure-sensitive tape> ability of a pressure sensitive adhesive to resist splitting

**3.3.67****cohesion failure**

rupture of an adhesive bond in such way that the separation appears to be within the adhesive

**3.3.68****coined lead**

end of a round lead that has been formed to have parallel surfaces that approximate the shape of a ribbon lead

**3.3.69****cold flow**

<pressure sensitive tape> deformation of the insulation as a result of mechanical force or pressure

Note 1 to entry: The deformation is not due to heat softening.

**3.3.70****cold hand cleaning**

cleaning with a soft brush and rinsing in a small open tank of non-chlorinated solvent or isopropanol (propan-2-ol)

**3.3.71****cold machine cleaning**

cleaning with a non-chlorinated solvent and an inline brush or wave cleaner

**3.3.72****cold solder connection**

solder connection that exhibits poor wetting, and that is characterized by a greyish porous appearance

Note 1 to entry: This is due to excessive impurities in the solder, inadequate cleaning prior to soldering, and/or the insufficient application of heat during the soldering process.

Note 2 to entry: See also "rosin solder connection".

**3.3.73****colour selectivity**

preferential absorption of thermal radiation in the visible band with wavelengths from 0,39 microns to 0,78 microns

**3.3.74****colour temperature****system colour temperature**

measure of temperature of a solid surface which generates a radiant energy having the same spectral distribution generated from a blackbody of the same temperature

Note 1 to entry: Colour temperature is expressed in kelvins (K).

Note 2 to entry: See also "effective colour temperature".

**3.3.75****comb pattern**

set of interdigitated comb-like arrays of uniformly-spaced conductors

SEE: Figure 27

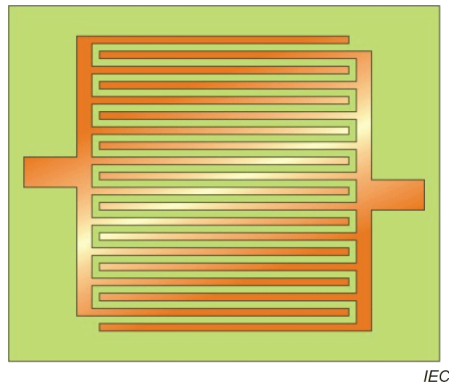


**Figure 27 – Comb pattern**

### **3.3.76**

#### **combination mask**

type of screen mask composed of two areas where one is located in the centre of the screen mask and is made of a metal screen mesh with a printing image, and the other is located in the periphery of the screen mask and is made of a thin elastic material

### **3.3.77**

#### **comment record**

record that provides, or refers to, additional descriptive material that further clarifies the control of a data set

### **3.3.78**

#### **common cause**

source of variation that affects all the individual values of the output of a process

### **3.3.79**

#### **compensated artwork**

production master or artwork data that has been enlarged or reduced in order to meet the needs of subsequent processing requirements

### **3.3.80**

#### **compiler**

software module that analyses and converts programs from a high-level language to binary machine codes

### **3.3.81**

#### **complex ion**

ion composed of two or more ions or radicals that are capable of an independent existence

### **3.3.82**

#### **compliant bond**

bond that uses an elastically and/or plastically deformable member to impart the required energy to the lead

### **3.3.83**

#### **component density**

quantity of components on a unit area of a printed board

**3.3.84****component hole**  
**lead mounting hole**  
**terminal hole**

hole used for the attachment of component terminations to the printed board as well as for any electrical connection to the conductive pattern

[SOURCE: IEC 60050-541:1990, 541-03-02, modified – The terms "lead mounting hole" and "terminal hole" have been added.]

**3.3.85****component lead**  
**lead wire**

solid or stranded wire or formed conductor that extends from a component to serve as a mechanical or electrical connector, or both

Note 1 to entry: See also "component pin".

**3.3.86****component mounting**

act of attaching components to a printed board and/or the manner in which they are attached

**3.3.87****component mounting orientation**

direction in which the components on a printed board or other assembly are lined up with respect to the polarity of polarized components, with respect to one another, and/or with respect to the board outline

**3.3.88****component pin**  
**lead pin**

component lead that is not readily formable without being damaged

Note 1 to entry: See also "component lead".

**3.3.89****component thermal mass**

quantity of heat energy that a component is able to absorb or retain

Note 1 to entry: This quantity depends on the size and the mass of a component.

Note 2 to entry: The ability of a part to absorb or retain heat energy is usually relative to its overall size and weight.

**3.3.90****composite**

<phototool> photograph that consists of a combination two separate (aligned) images

**3.3.91****composite record**

collection of records that make up an electrical pattern that is used repeatedly in a design

Note 1 to entry: The definition and relationship of these records are covered and referred to as "subroutine definition" and "subroutine definition call".

**3.3.92****composite test pattern****CTP**

grouping of individual test patterns into specific arrangements, to reflect control and precision capability of a manufacturer or manufacturing process

**3.3.93**

**compound die set**

set consisting of a punch and matching die used to punch holes, details or outlines of panels and/or printed wiring boards

**3.3.94**

**computer numerical control  
CNC**

system that utilizes a computer and software as the primary numerical control technique

Note 1 to entry: See also "numerical control".

**3.3.95**

**computer-aided engineering  
CAE**

interactive use of computer systems, programs, and procedures in an engineering process wherein, the decision-making activity rests with the human operator and a computer provides the data manipulation function

**3.3.96**

**computer-aided manufacturing  
CAM**

interactive use of computer systems, programs, and procedures in various phases of a manufacturing process wherein, the decision-making activity rests with the human operator and a computer provides the data manipulation functions

**3.3.97**

**concentration polarization**

polarization of an electrolytic component near an electrode caused by ion concentration change at the metal environmental interface due to passing current through the body

**3.3.98**

**conditional end-of-test**

command in a test program to stop the execution of the program when a particular condition, or set of conditions, is reached

**3.3.99**

**conducting salt**

salt added to a plating solution in order to increase its conductivity

**3.3.100**

**conductive anodic filament  
CAF**

phenomenon of the electrochemical migration (ECM) which occurs along the monofilament of reinforcing material such as glass cloth in an inner layer part of a printed wiring board

**3.3.101**

**conductive foil**

thin sheet of metal that is intended for forming a conductive pattern on a base material

**3.3.102**

**conductive paint**

paint with a suspended powder of an electrically conductive material

**3.3.103****conductive paste**

conductive material used to make conductive patterns and through-holes on a base material consisting of silver, copper, nickel, carbon, etc. in a cream-like form

**3.3.104****conductor base spacing**

spacing between conductor at the plane of the surface of a base material

SEE: Figure 28

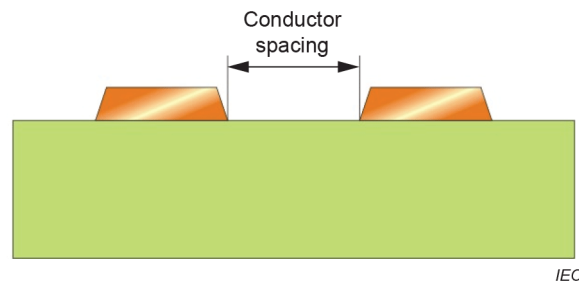


**Figure 28 – Conductor base spacing**

Note 1 to entry: See also "design spacing of conductors".

**3.3.105****conductor base width**

width of a conductor at the plane of the surface of a printed board

Note 1 to entry: See also "conductor width" and "design width of conductors".

**3.3.106****conductor layer**

plane of a multilayer printed board with a conductive pattern, including ground or voltage plane

**3.3.107****conductor layer No. 1**

first conductive layer (external layer) of a multilayer printed board

Note 1 to entry: The first inner layer is layer No. 2, and so on.

**3.3.108****conductor nick**

reduction in a conductor cross-sectional area (internal or external) which can or not expose the base material

**3.3.109****conductor pitch**

distance between the centres of adjacent conductors

**3.3.110****conductor protrusion****protrusion of conductor**

random extension of a conductor pattern that reduces the conductor spacing below the minimum requirement

### 3.3.111

#### **conductor side**

side of a single-sided printed board that contains the conductive pattern

### 3.3.112

#### **conductor spacing**

#### **edge-to-edge spacing**

#### **space**

observable distance between adjacent edges (not centre-to-centre spacing) of isolated conductive patterns in a conductor layer centre

SEE: Figure 29

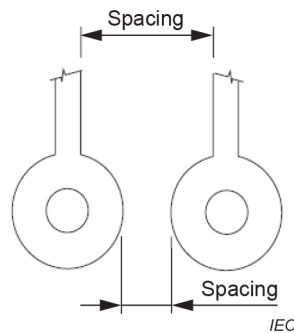


**Figure 29 – Conductor spacing**

Note 1 to entry: See also "centre-to-centre spacing".

### 3.3.113

#### **conductor thickness**

thickness of a conductor including additional metallic coatings, but excluding non-conductive coatings

### 3.3.114

#### **conductor trace**

single conductive linear entity (element) which has length, width and thickness

### 3.3.115

#### **conductor width**

observable width of a conductor at any point chosen at random on a printed board as viewed from directly above unless otherwise specified

Note 1 to entry: See also "design width of conductor" and "conductor base width".

### 3.3.116

#### **confidence interval**

range covering above and below the mean value of a measurement in which the true value exists with a specified statistical certainty

### 3.3.117

#### **confirmation run**

test of the results that are obtained during an experimental design in order to prove if the results are reproducible in an actual application