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Marking, Symbols, and
Labels of Leaded and
Lead-Free Terminal
Finished Materials Used in
Electronic Assembly

Association Connecting Electronics Industries



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Marking, Symbols, and Labels of Leaded and Lead-Free Terminal Finished Materials Used in Electronic Assembly

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Marking, Symbols, and Labels of Leaded and Lead-Free Terminal Finished Materials Used in Electronic Assembly

Foreword

Directive 2011/65/EU supersedes 2002/95/EC of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment, commonly referred to as the “RoHS 2 Directive”, and other legislation are driving the electronics industry towards the use of lead-free (Pb-free) solders and components with Pb-free 2nd level interconnect terminal finishes and materials.

There are different Pb-free solders being used for the various soldering operations in electronics. Each of these solders may require different processing temperatures for assembly, rework, and repair. Some means of communicating the identity of the Pb-free or Pb-containing solder must be provided so that those performing assembly, rework and repair are aware of the temperature capabilities and limitations of these solders, and are able to distinguish between Pb-free and Pb-containing solders.

Marking of components and/or labeling their shipping containers are needed to identify and distinguish Pb-containing and Pb-free 2nd level interconnect terminal finishes and materials. Labeling electronic assemblies using Pb-free solder materials will facilitate end-of-life recycling of electronic equipment. This standard sets forth minimum requirements and includes options for the provision of additional information.

This paradigm shift to Pb-free electronics has created a need for identification of traditional Pb-containing coatings, finishes and solders. This standard can be utilized to identify the presence of Pb for those markets as described in Section 5 (Marking/Labeling Categories) and Section 8 (Marking and/or Labeling of Pb-Containing Components, PCBs, and PCB Assemblies).

This standard supersedes JESD97 and IPC-1066.

Marking, Symbols, and Labels of Leaded and Lead-Free Terminal Finished Materials Used in Electronic Assembly

(From JEDEC Board Ballot JCB-15-55, formulated under the cognizance of the JC-14.4 Subcommittee on Quality Processes and Methods.)

1 Scope

This standard applies to components and assemblies that contain Pb-free and Pb-containing solders and finishes. This standard describes the marking of components and the labeling of their shipping containers to identify their 2nd level terminal finish or material, and applies to components that are intended to be attached to boards or assemblies with solder or mechanical clamping or are press fit. This standard also applies to 2nd level terminal materials for bumped die that are used for direct board attach.

This standard applies to boards/assemblies, to identify the type of Pb-free or Pb-containing solder used. This standard documents a method for identifying board surface finishes and Printed Circuit Board (PCB) resin systems. This standard applies to PCB base materials and for marking the type of conformal coating utilized on Printed Circuit Board Assemblies (PCBAs). Material and their containers previously marked or labeled according to JESD 97, IPC-1066, or previous versions of this standard need not be remarked unless agreed upon by the supplier and customer.

Labeling of exterior surfaces of finished articles, such as computers, printers, servers, and the like, is outside the scope of this standard. However internal PCBs and PCBAs are covered by this standard. Labeling of retail packages containing electronic products is also outside the scope of this standard. Markings under this standard do not denote EU RoHS compliance, or any other regional substance restriction legislation addressing lead content.

1.1 Purpose

This standard provides a marking and labeling system that aids in assembly, rework, repair and recycling and provides for the identification of:

- (1) those assemblies that are assembled with Pb-containing or Pb-free solder;
- (2) components that have Pb-containing or Pb-free 2nd level interconnect terminal finishes and materials;
- (3) the maximum component temperature not to be exceeded during assembly or rework processing;
- (4) the base materials used in the PCB construction, including those PCBs that use halogen-free resin;
- (5) the surface finish of PCBs; and
- (6) the conformal coating on PCBAs.

2 Reference Documents

2.1 IPC

URL: www.ipc.org

IPC-T-50 *Terms and Definitions for Interconnecting and Packaging Electronic Circuits*

IPC-CC-830 *Qualification and Performance of Electrical Insulating Compound for Printed Wiring Assemblies (Conformal Coating)*

IPC-4101 *Specification for Base Materials for Rigid and Multilayer Printed Boards*

2.1.1 Additional Reference Materials Not Found in This Document

ANSI

URL: www.ansi.org/

ANSI 17-1981 *Character Set for Optical Character Recognition (OCR-A)*

GEIA

SAE-GEIA-STD-0005-1 *Performance Standards for Aerospace and High Performance Electronic Systems Containing Lead-free Solder*

SAE-GEIA-STD-0005-2 *Standard for Mitigating the Effects of Tin Whiskers in Aerospace and High Performance Electronic Systems*

SAE-GEIA-STD-0005-3 *Performance Testing for Aerospace High Performance Electronic Interconnects Containing Pb-free Solder and Finishes*

European Standards

NBN EN 50581 (2012) *Cenelec EU RoHS Recast CE Mark Technical Document Standard*

2.2 JEDEC

URL: www.jedec.org

JESD88 *JEDEC Dictionary of Terms for Solid State Technology*

2.3 IEC

URL: www.iec.ch

IEC 61249-2-21 *Materials for printed boards and other interconnecting structures - Part 2-21: Reinforced base materials, clad and unclad - Non-halogenated epoxide woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad.*

2.4 European Parliament

URL: http://ec.europa.eu/environment/waste/weee/index_en.htm

Directive 2011/65/EU of the European Parliament and of the Council on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

3 Terms and Definitions

Other than those terms listed below, the definitions of terms used in this standard are in accordance with IPC-T-50 and/or JESD88.

3.1 2D code label (matrix)

A label that contains data in two dimensions as either stack or matrix types.

3.2 2Li (or 2LI)

Abbreviation for 2nd level interconnect.

3.3 Second (2nd) level interconnect

The connection made by attaching a component to a printed circuit board. See Figure 3-1. This connection is external to the component, not internal.

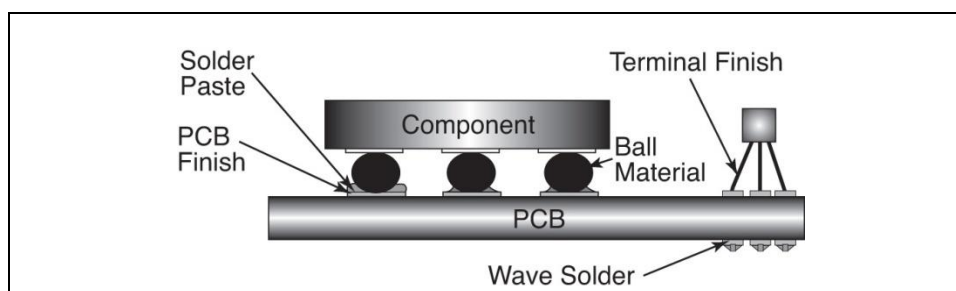


Figure 3-1 Examples of materials that comprise the 2nd Level Interconnect

3.4 Second (2nd) level interconnect component label

A label placed on boxes and bags that contain components with either Pb-containing or Pb-free terminal materials/ finishes. The label includes the material category and maximum component temperature (see 3.11 and 3.12). See Figure 4-3 for label formats for components with Pb-containing finishes/materials and Figure 4-4 and Figure 4-5 for components with Pb-free finishes/materials.

3.5 Second (2nd) level interconnect terminal finish or material

The material at the component 2nd level termination referred to in Figure 3-1. Depending on the component type this material could refer to the terminal finish or ball material.

3.6 Base materials

The laminates and/or the preregs used to fabricate the printed circuit board.

NOTE A prepreg is a sheet of material that has been impregnated with a resin cured to an intermediate stage, i.e., B-staged resin. (Ref: IPC-T-50)

3.7 Component

An individual part such as a connector, capacitor, integrated circuit, socket, multichip module, or hybrid circuit, etc.

3 Terms and Definitions (cont'd)

3.8 Halogen-free board

Printed board resins plus reinforcement matrix that contain maximum total halogens of 1500 ppm with less than 900 ppm bromine and less than 900 ppm chlorine (per IEC 61249-2-21).

3.9 intct (or INTCT)

Alternative abbreviations for the word “interconnect.”

3.10 Linear bar code label

A label that gives information in a code consisting of parallel bars and spaces.

3.11 Material category

Solder paste, lead/terminal finish, or terminal material/alloy of the solder balls used to make the 2nd level interconnect.

3.12 Maximum component temperature

The temperature that a component should not exceed during assembly as measured on the top of the component body.

3.13 Pb-free; lead free

Having a maximum Pb concentration value of 0.1% by weight in PCB surface finishes, component terminal finishes (terminal finish, bump or ball material) and attachment solders.

NOTE Component and end-product suppliers may desire to clarify this important distinction (between 0% and 0.1% Pb) with their customers.

3.14 Pb-free symbol

A symbol that can be used in place of the phrase “Pb-free” or “lead-free.” See Figure 4-2.

4 Symbols, Labels, and Marks

4.1 Material Category Symbol

This symbol (see Figure 4-1) is used to identify a terminal finish or material listed in 5.3.



NOTE 1 If the Materials Category is used without a circle, ellipse, parentheses or underline, it must be made clear that the marking defines the category [e.g. “Category = e2”, or “Solder = e2”]

NOTE 2 The letter “e” would be replaced with a “b” for identifying surface finish material listed in 5.2 for PCBs.

Figure 4-1 — Example of mark indicating material category 2 and the optional circle, ellipse, underline or parentheses

4.1.1 Size and Location

The size and location are discretionary, but **shall** be legible to corrected, unmagnified vision.

4.1.2 Color

The color for the ‘e’ and category number should be selected to provide sufficient contrast to be legible to corrected, unmagnified vision. The color red should be avoided as red suggests a personal hazard.

4.1.3 Font

The font style should be “Arial”, “OCR-A” or equivalent.

4.2 Pb-free Symbol

This symbol (see Figure 4-2) can be used in addition to, or instead of, the phrase “Pb-free.”



Figure 4-2 — Pb-free Symbol

4.3 Second (2nd) Level Interconnect Component Label

This label (see Figure 4-3, Figure 4-4, and Figure 4-5) is used to indicate the 2nd level interconnect terminal finish or material category (Clause 5) and maximum component temperature. The Pb-free symbol (See 4.2) may be appended after the terms “2nd Level Interconnect” as indicated in Figure 4-5. This use of the Pb-free symbol applies only to the 2nd level interconnect and should not be interpreted as an indication that any other part of the component is Pb-free.

This label, if used, is placed/printed on the lowest level shipping container and any “ESD”, “Dry pack” or other bag/box, excluding tubes, trays, reels or other carriers, within the lowest level shipping container.

<p>2nd Level Interconnect</p> <p>1. Category <u> e0 </u> If blank, see adjacent bar code label</p> <p>2. Maximum component temp <u> </u> °C If blank, see adjacent label</p>

Figure 4-3 — Example of 2nd Level Interconnect Component Label indicating a Pb-containing material

<p>2nd Level Interconnect</p> <p>1. Category <u> e2 </u> If blank, see adjacent bar code label</p> <p>2. Maximum component temp <u> 260 </u> °C If blank, see adjacent label</p>
--

Figure 4-4 — Example of 2nd Level Interconnect Component Label indicating a Pb-free e2 material with a maximum component temperature of 260°C


<p>2nd Level Interconnect is </p> <p>1. Category <u> e1 </u> If blank, see adjacent bar code label</p> <p>2. Maximum component temp <u> 220 </u> °C If blank, see adjacent label</p>

Figure 4-5 — Example of 2nd Level Interconnect Component Label utilizing the Pb-free symbol indicating both Pb-free material with category and maximum component temperature indicated on adjacent label

4.3 Second (2nd) Level Interconnect Component Label (cont'd)

4.3.1 Size

It is recommended that the label be a minimum of 75 mm by 50 mm.

4.3.2 Color

The label **shall** be black letters/symbols on a white or contrasting background.

5 Marking/Labeling Categories

These categories are for the technical purposes of this standard and are not to be used for determining regulatory compliance.

5.1 PCB Base Material Categories

The PCB base materials may be identified by using the classification system found in IPC-4101, where a unique Specification Sheet ("slash-sheet") number identifies a specific grade of material. Some of the common base materials expected to be used on PCBs are given. However, other grades of base materials are possible. These base materials have an epoxy resin system with woven-glass reinforcement, plus distinguishing properties.

- a) / 92: Phosphorous flame retardant; Tg 110 °C to 150 °C
- b) / 95: Aluminum Hydroxide flame retardant; Tg 150 °C to 200 °C
- c) / 99: Bromine flame retardant; contains inorganic fillers; Tg 150 °C min.
- d) / 126: Bromine flame retardant; contains inorganic fillers; Tg 170 °C min.

For PCBs made with more than one grade of materials, mark or label with the slash-sheet number of the material with the lowest temperature rating.

5.1.1 Halogen-free Base Material

If the base materials used in making the bare printed board are halogen-free, the label/marking "HF" shall be noted on the bare printed circuit board. If no "HF" is present, a halogen-containing base resin and reinforcement matrix are assumed. This marking applies only to the PCB base material and is not to be interpreted as an indication of a halogen-free (HF) assembly.

5.2 PCB Surface Finish Categories

The following categories describe the predominant surface finish on the bare board (prior to assembly).

5.2.1 Pb-containing

b0 – contains Pb, traditional tin-lead (SnPb), hot air solder level (HASL) or solder reflow.

5.2 PCB Surface Finish Categories (cont'd)

5.2.2 Pb-free

- b1 Pb-free HASL [tin (Sn) alloys with no bismuth (Bi) nor zinc (Zn)]
- b2 immersion silver (Ag)
- b3 tin (Sn) (electrolytic or immersion)
- b4 gold (Au) (immersion or electrolytic), electroless nickel immersion gold (ENIG), nickel gold (NiAu), or electroless nickel electroless palladium immersion gold (ENEPIG)
- b5 screened carbon (carbon ink)
- b6 organic solderability preservative (OSP)
- b7 Unassigned
- b8 Unassigned
- b9 Unassigned

5.3 Second (2nd) Level Interconnect Categories

The following categories describe the 2nd level interconnect (see Figure 3-1) terminal finish (terminal finish, bump or ball material) of components or the solder paste/solder used in board assembly.

5.3.1 Pb-containing

e0 – contains intentionally added Pb¹ (need to change footnote # to 1)

5.3.2 Pb-free

Category e8 was added in this revision and **shall** be applied to the labeling and marking of all new items. Previously marked items need not be remarked to comply with this standard. Items previously labeled or marked as e1 or e2 may now be described by the definitions of categories e1, e2, or e8 depending on silver content.

- e1 tin-silver-copper (SnAgCu) with silver content greater than 1.5% and no other intentionally added elements
- e2 tin (Sn) alloys with no bismuth (Bi) nor zinc (Zn), excluding tin-silver-copper (SnAgCu) alloys in e1 and e8
- e3 tin (Sn)
- e4 precious metal (e.g., silver (Ag), gold (Au), nickel-palladium (NiPd), nickel-palladium-gold (NiPdAu) (no tin (Sn)))
- e5 tin-zinc (SnZn), tin-zinc-other (SnZnX) (all other alloys containing tin (Sn) and zinc (Zn) and not containing bismuth (Bi))
- e6 contains bismuth (Bi)
- e7 low temperature solder (≤ 150 °C) containing indium (In) [no bismuth (Bi)]
- e8 tin-silver-copper (SnAgCu) with silver content less than or equal to 1.5%, with or without intentionally added alloying elements. This category does not include any alloys described by e1 and e2 or containing bismuth or zinc in any quantity.
- e9 symbol - unassigned.

See Annex A and Annex B for examples of Pb-free e-code applications and e-code selection.

¹ For Pb-containing 2nd level interconnect terminal finishes and materials, the Pb content for e0 is typically greater than or equal to 3 percent by weight. For Pb-containing solder, solder paste, and wave solder alloy, the Pb content is typically greater than 3 percent by weight and usually is 37 percent by weight.

5.4 Conformal Coating Categories

The following categories (per IPC-CC-830) shall describe the conformal coating, if used.

ER – Epoxy Resin
UR – Urethane Resin
AR – Acrylic Resin
SR – Silicone Resin
XY – Paraxylylene

6 Component Marking and Labeling

6.1 Component Marking

If space permits, the individual component **shall** be marked (per 5.3) on its topside with the Material Category designation enclosed within a circle, ellipse, underlined, or in parentheses (See 4.1). See Figure 6-1 for an example.

If the 2nd level interconnect termination finish or material is removed and replaced on a component, the original 'e' code marking on that physical component **shall** be obliterated and the component **shall** be remarked with the applicable 'e' code in accordance with this standard.



Figure 6-1 — Example of Component Marking

6.2 Lowest Level Shipping Container Labeling

The Material Category and the maximum component body temperature **shall** be indicated on the lowest level shipping container utilizing the 2nd level interconnect component label (See Figure 4-4). The use of the 2nd level interconnect component label is not required if the following information is included in human readable form on the bar code (linear or 2D) label or other nearby label:

- a) the words “2nd level interconnect” or equivalent abbreviation
- b) the appropriate materials category from 5.3, and
- c) the maximum component body temperature.

The 2nd level interconnect component label applies only to components.

7 PCB/Assembly Marking and Labeling

7.1 PCB Marking

Any printed circuit board surface finish with Pb >0.1% **shall** be marked with the Pb category b0 (see 5.2).

Space permitting, the printed circuit board finish may be marked with the material categories defined in 5.2.

In addition, the base PCB material may also be marked with the material categories defined in 5.1. If space permits, the IPC base material specification number may be added before the slash sheet number if the specification is other than IPC4101. If specified by the purchaser, the PCB fabricator may be required to mark the PCB with the applicable category for solders (see 5.3) and/or conformal coating (see 5.4) to be used by the assembler.

7.1.1 PCB Shipping Container Labeling

The label on the lowest level PCB shipping container **shall** contain the information that is applicable to the bare board marking.

7.2 Assembly Marking

The solder paste/solder used **shall** be identified on an assembly, as defined in 5.3. If used, the conformal coating used **shall** be identified on an assembly, per 5.4. If the PCB was previously marked with the applicable category for solders (see 5.3) and/or conformal coating (see 5.4) and the sequence written does not match the materials used during assembly, the PCBA **shall** be remarked in accordance with 7.10.

7.2.1 Assembly Shipping Container Labeling

The label on the lowest assembly level shipping container **shall** contain the information applicable to the assembly marking.

7.3 Solder Category Marking Sequence

If two or more solder alloy categories are used the category of the solders used **shall** be shown in the following sequence: Reflow, wave and other. For repair materials, refer to 7.10.

7.4 Location

The preferred location for marking the material categories on the board/assembly is on PCB layer 1 (topside) at the lower right-hand segment or next to the part/serial number on the board, or next to the company logo. The marking sequence **shall** be clearly identifiable and separate from other board markings. For instance, the marking sequence may be entirely within brackets or parentheses. See example in Figure 7-1. Alternative locations may be specified in procurement documentation.

7.5 Size

The size of the mark is optional but **shall** be legible to corrected, unmagnified vision.

7.6 Color

The color for the 'e' and category number **shall** be selected to provide sufficient contrast to be legible to corrected, unmagnified vision.

7.7 Font

The font style should be “Arial,” “OCR-A” or equivalent.

7.8 Method

The methods for marking of the board (e.g., screen print, etch, laser, label, modification of existing bar code, etc.) are optional but **shall** be legible to corrected, unmagnified vision.

7.9 Marking Sequence

The sequence of marking, as required, **shall** be as follows:

- a) base material slash sheet number (see 5.1)
- b) halogen-free (see 5.1.1)
- c) PCB surface finish (see 5.2)
- d) reflow, wave and other solders (see 5.3)
- e) conformal coating (if applicable, see 5.4)

Figure 7-1 shows an example of board/assembly markings.

Examples:

Multifunctional epoxy, halogen-free FR-4.1 laminate PCB with immersion silver (Ag) surface finish; assembly used tin-silver-copper (SnAgCu) solder for reflow and a tin (Sn) alloy with no bismuth (Bi) or zinc (Zn) excluding SnAgCu for wave attachment; no conformal coating.

/95 HF b2 e1 e2 or /95-HF-b2-e1-e2 or /95/HF/b2/e1/e2

Halogen containing epoxy FR-4 laminate PCB with Pb-containing surface finish; assembled with Pb-containing solder; epoxy conformal coating.

/99 b0 e0 ER or /99-b0-e0-ER or /99/b0/e0/ER

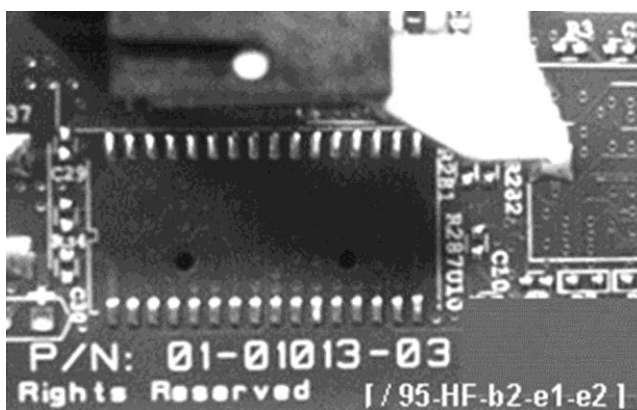


Figure 7-1 — Example of Board/Assembly Markings

7.10 Re-marking Changes in PCBA Materials

If changes, rework, or repair to assemblies are made with a material finish category code different than marked, then the marking sequence in 7.3 **shall** be appended with the material code (See 7.3) for the rework or repair solder and/or conformal coating used.

8 Marking and/or Labeling of Pb-Containing Components, PCBs, and PCB Assemblies

The use of any markings, labels, or symbols that contain the phrase “Pb-free” or the Pb-free symbol shown in Figure 4-2 for this section is prohibited.

8.1 Marking and Labeling of Components

Suppliers whose customers require labeling and marking to indicate Pb content in 2nd level interconnect finishes and materials **shall** utilize the Material Category code established in 5.3 (e0). The alternate 2nd level interconnect component label as shown in Figure 4-3 **shall** be used unless the following information is included on the bar code (2D or linear) or other nearby label, in human readable form.²

- a) the words “2nd level interconnect” or equivalent abbreviation
- b) the appropriate materials category from 5.3, and
- c) the maximum component body temperature.
- d) The 2nd level interconnect component label applies only to components.

8.2 Marking and Labeling of PCBs

Suppliers whose customers require labeling and marking of PCBs to indicate Pb content in PCB surface finishes **shall** utilize the Material Category code(s) as established in 5.2 (b0). Solders to be used in assembly may be marked with category code (e0) on the PCB if specified by purchaser.

8.3 Marking and Labeling of PCB Assemblies

Suppliers whose customers require labeling and marking of the PCB assembly to indicate Pb content in assembly solders **shall** utilize the Material Category code e0 as established in 5.3.

² If the required information is included on another label, the use of the 2nd level interconnect label becomes optional.

9 Summary of Marking and Labeling Requirements

Table 9-1 summarizes the marking and labeling requirements detailed previously in this standard.

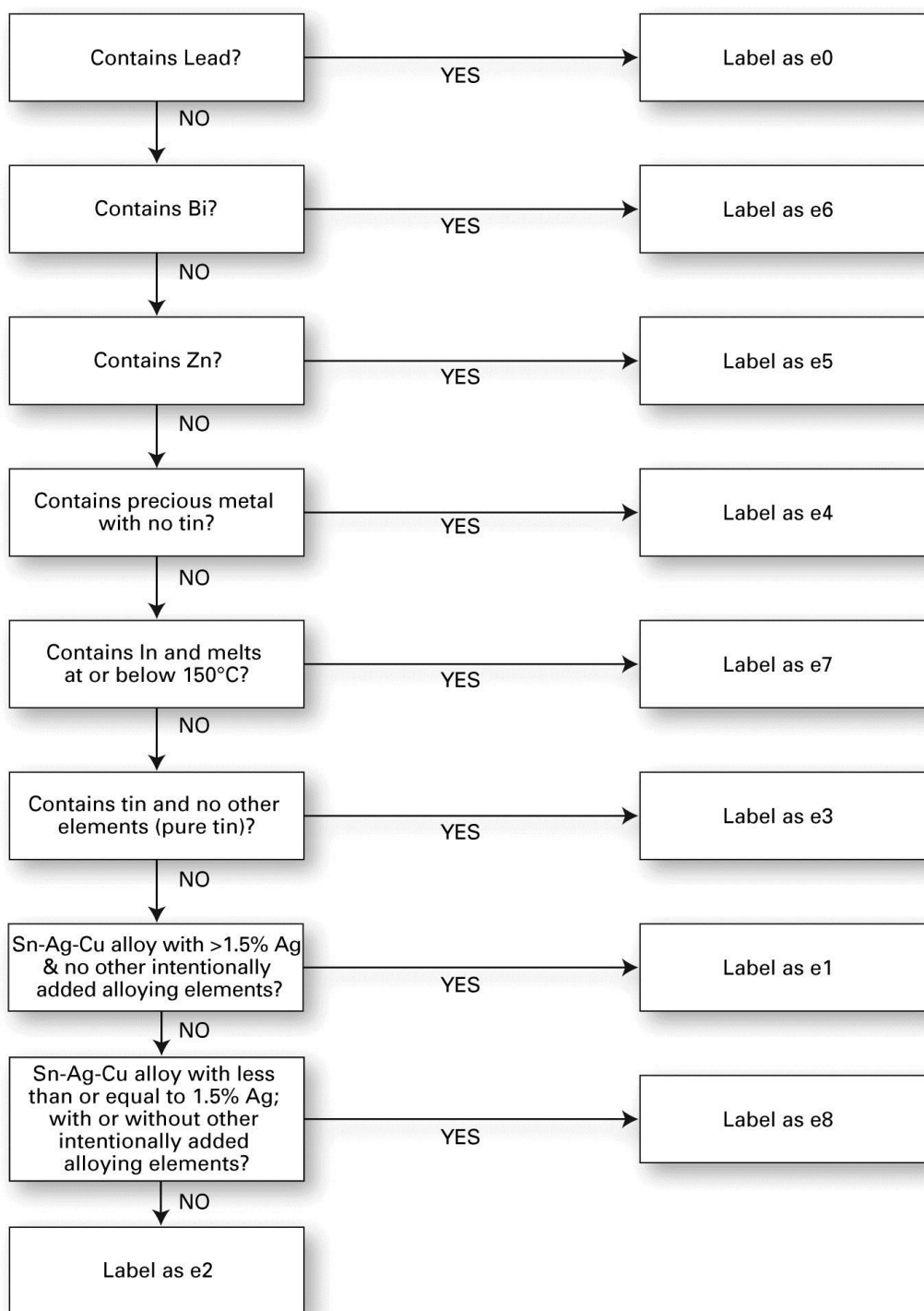
Table 9-1 — Marking and Labeling Summary

Item	Preferred Location	Marking or Labeling Content Requirements		
		Required	Optional	Comments
Component Marking (Clause 6)	Component body, topside	- Material category for component terminal finish (terminal finish, bump or ball material) (5.3)	- Maximum component body temperature (3.12) -	Space permitting
Component Container Label (Clause 6)	Lowest level shipping container AND any “ESD”, “Dry Pack” or other bag or box within the shipping container	- Material category for component terminal finish (terminal finish, bump or ball material) (5.3) - Maximum component body temperature (3.12)	- Pb-free symbol or the phrase ‘Pb-free’ (4.2) - 2 nd Level Interconnect Component Label (4.3)	
PCB Marking (7.1)	Topside, lower right-hand corner; or next to part/serial number or company logo	- PCB surface finish containing lead (Pb) (5.2) - Halogen-free mark [HF] if applicable (5.1.1) - Solders and conformal coating to be used by assembler if specified by purchaser	- IPC 4101 slash-sheet number (5.1) - Pb-free PCB surface finish - Alternative IPC specification number if other than IPC4101	Sequence: Space permitting IPC spec. number, slash-sheet no, [HF], PCB finish, solders, [conformal coating] (7.9)
PCB Container Label (7.1.1)	Lowest level container holding PCBs	- Mark or label with the information applicable to the PCB	- Halogen-free mark [HF] if applicable (5.1.1)	
PCBA Marking (7.2)	Topside, lower right-hand corner; or next to part/serial number, or company logo	- Mark with material category for assembly solder type(s) used (5.3) in the order of application (7.3) - Conformal Coating, if any (5.4)		Pb-free symbol marking or label cannot be used on PCBA if any PCB surface finish, solder or component terminal finish (terminal finish, bump or ball material) is not Pb-free (i.e., <0.1% Pb, per 3.13)
PCBA Container Label (7.2.1)	Lowest level container holding PCBAs	Mark or label with the information applicable to the PCBA		

Annex A (informative) Example Alloys and Associated Material Codes

Alloy Composition	e-code
Sn-2.0Ag-0.5Cu (SAC205)	e1
Sn-3.0Ag-0.5Cu (SAC305)	e1
Sn-4.0Ag-0.5Cu (SAC405)	e1
Sn-3.8Ag-0.9Cu (SAC387)	e1
Sn-3.5Ag	e2
Sn-3.7Ag	e2
Sn-4.0Ag	e2
Sn2Ag0.5Cu+0.05Ni	e2
SAC 305+0.05Ni+0.5In	e2
Sn-2.5Ag-0.5Cu+0.5Co	e2
Sn-3.5Ag + 0.05-0.25La	e2
Sn-0.7Cu	e2
Sn-3.0Ag-0.5Cu + 0.019Ce	e2
Sn-2.5Ag-0.8Cu-0.5Sb	e2
Sn-0.7Cu-0.05Ni	e2
Sn-0.7Cu-0.05Ni + Ge (SN100C)	e2
Sn- 58Bi	e6
Sn- 57Bi-1.0Ag	e6
Sn-0.3Ag-0.7Cu+Bi (SACX)	e6
Sn-0.3Ag-0.7Cu+Bi+Ni+Cr (SACX)	e6
Sn-1.0Ag-0.5Cu + 0.02Ti	e8
Sn-1.0Ag-0.7Cu+0.1Ge	e8
Sn-1.2Ag-0.5Cu+0.05Ni (LF35)	e8
Sn-1.0Ag-0.5Cu (SAC105)	e8
Sn-1.0Ag-0.1Cu+0.02Ni+0.05In	e8

Annex B Material Code Flow Chart



NOTE Additional markings beyond those listed above will be required per Section 7, clause 7.1 and Section 8, clause 8.1



Standard Improvement Form**JEDEC J-STD-609B**

The purpose of this form is to provide the Technical Committees of JEDEC with input from the industry regarding usage of the subject standard. Individuals or companies are invited to submit comments to JEDEC. All comments will be collected and dispersed to the appropriate committee(s).

If you can provide input, please complete this form and return to:

JEDEC
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3103 North 10th Street
Suite 240 South
Arlington, VA 22201-2107

Fax: 703.907.7583

1. I recommend changes to the following:

☐ Requirement, clause number _____

☐ Test method number _____ Clause number _____

The referenced clause number has proven to be:

☐ Unclear ☐ Too Rigid ☐ In Error

☐ Other _____

2. Recommendations for correction:

3. Other suggestions for document improvement:

Submitted by

Name: _____

Phone: _____

Company: _____

E-mail: _____

Address: _____

City/State/Zip: _____

Date: _____

