

**Guidance for the Lead-Free Marking of
Materials, Components and Mounted boards
used in Electronic and Electric Equipment**

September 5, 2004

Lead-free marking guidance project group

Technical Standardization Committee on Electronic Assembly Technology

JEITA

(Japan Electronic and Information Technology Industries Association)

Terms and Definitions

Lead-Free

The state that the content of lead (Pb) in solders, the relevant part of an electronic component including terminals and leads is less than 0.1% in weight.

Note:

The threshold value (proposed) of (Pb) content described in both of the Lead-Free Roadmap of JEITA and in the RoHS Directive is 0.1% in weight.

Phase of lead-free adoption

Phase	Electronic Component	Assembled Board(with Lead-Free Solder)
Phase 1	Electronic Components containing lead (Exclude Phase 2 and 3A)	Assembled by components containing lead
Phase 2	Terminals with which the device is mounted on a board, and the electrodes of a device are lead-free	Surface treatment of board, solder print and solder bath are lead-free at the level of board of board assembly, and lead (Pb) is eliminated in the interconnections of devices to the board (Include Phase 2 components)
Phase 3A	All the internal connections, constructing components and the materials used in a device are lead-free excluding the materials listed in exemption list of the RoHS	Assembled board excluding the materials listed in the exemption list of the RoHS (Consist of Phase 3A and Phase 3 components)
Phase 3	Lead is completely eliminated from interconnections, all the components and materials used in the device	Lead is completely eliminated at the level of an assembled board (Consist of Phase 3 components)

General items in the Marking of Lead-Free products

- 1.The size is not specified.
- 2.The color is basically mono-color.
- 3.If there is an agreement between user and supplier on the content of the marking, the agreed items should be observed.

Lead-Free Marking for materials of solders

- 1.The element symbols to describe the alloy composition or the composition symbols (as shown in Table 1)

Table 1 Examples of designation of lead-free solders

Solder	Element designation	Composition symbol
Sn96.5Ag3Cu0.5	SnAgCu	A30C5
Sn89Zn8Bi3	SnZnBi	Z80B30

Lead-Free Marking for electronic devices (Components)

1. The size of marking is not specified. Marking is required to be eligible.
2. The font and position of marking is arbitrary but should be in one place of label.
3. The surrounding by square of a mark is for easy reading and arbitrary.

Table 2 Marking for Lead-Free phases

Phases of lead-free	Marking
Phase 1	Pb
Phase 2	FTPb
Phase 3A	R-Pb *
Phase 3	NoPb or F-Pb
Note * [R] and [Pb] are connected by [-] to make into one word.	

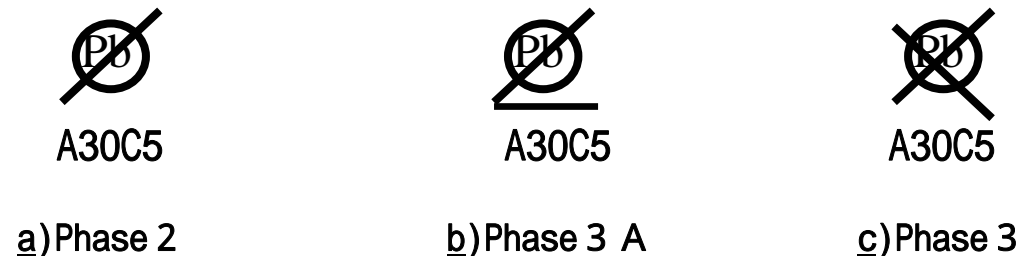
Lead-Free Marking on assembled board

1. The designation of the solder composition is required. The designation should be made as specified IEC 61190-1-3 and given in the table 3 as composition symbol .
2. A Logo mark to denote the phase are arbitrary.
3. The design of the logo mark should follow Figure 1 .
4. When more than two types of solders are used in assembly process, marks for all the solders used are to be designated on the board (both front and back surface) . An example of marking should follow as below.
5. These (Composition symbol, Logo) should be made on one place.

Table 3 Composition symbols and abbreviated designation of solders

Solder	Composition symbol
Sn96.5Ag3Cu0.5	A30C5
Sn99.3Cu0.7	C7
Sn89Zn8Bi3	Z80B30
Sn88In8Ag3.5Bi0.5	N80A35B5

Figure 1 Examples of designation of lead-free phase for assembled board



A example of marking for more than two types of solders

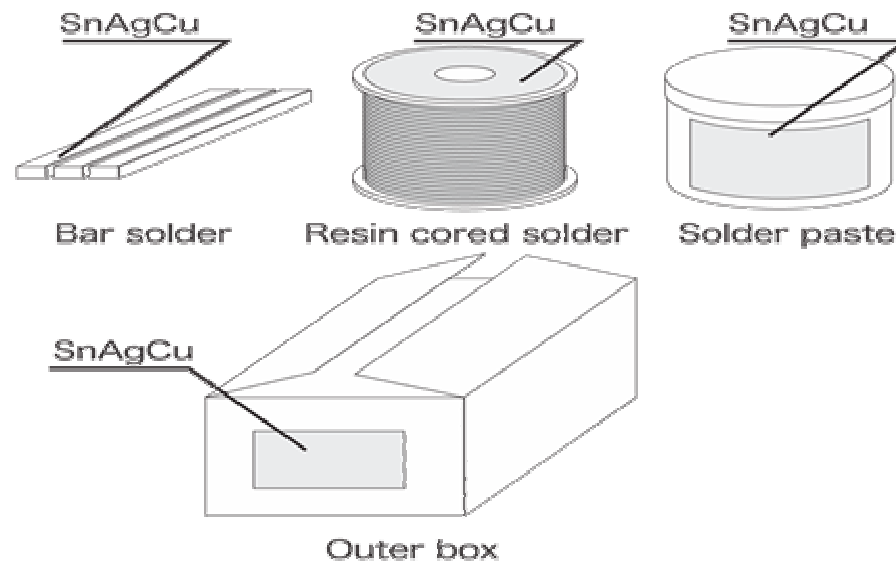
A30C5 / N80A35B5/C7 or A30C5, N80A35, C7
 (front) (back) (flow soldering) (front) (back) (flow soldering)

Package Unit for Marking for solder and its position

Table 4 unit for Lead-Free Marking and position of Marking for solders

Type of solder	Marking unit	Position	Arrangement	Remarks
Bar solder	Rod itself, or minimum packaging unit	Arbitrary	Arbitrary	-
Resin cored solder	Spool (bobbin), minimum packaging unit	On label of spool (bobbin)	Arbitrary	Also applicable to wire solder
Solder paste	Container	On label of container	Arbitrary	Also applicable to solder ball

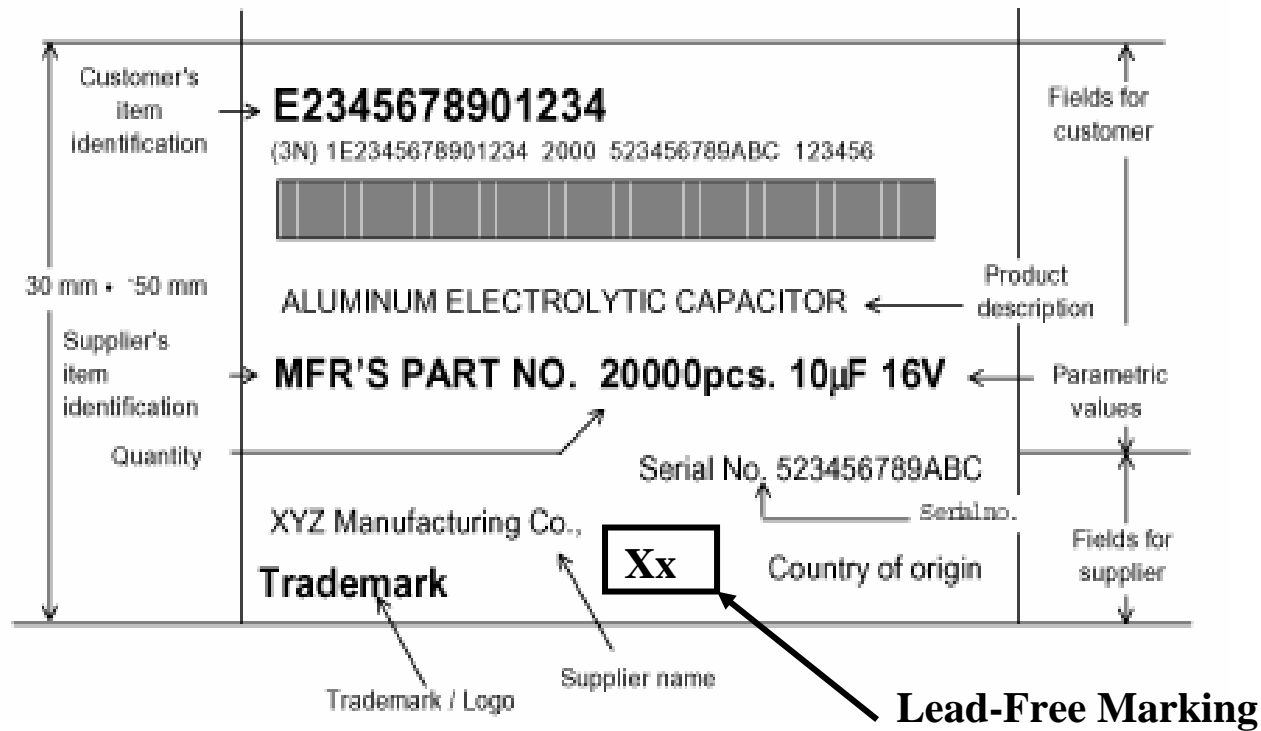
Figure 2 Example of designation of Marking for solders



Unit for lead-free Marking for electronic devices and position of Marking

The package unit of electronic devices and the position for marking are as specified in table 2 in the space available on a label of the minimum package unit.

Figure 3 Example of designation of lead-free phase for electronic devices



Unit for Lead-Free Marking for assembled board and position of marking

1. The marking should be made on an arbitrary position of the assembled board on a place easily identifiable.
2. The marking should be made on more than 10cm² size board.
3. When two more boards are connected by soldering, the marking should be made as one unit.
4. When the phases of the multiple boards connected by soldering into one unit are different, marking should be made as the lowest lead-free phase.

Figure 4 Example of positions for designation of lead-free phase for assemble board

