Lead-free Component and Board Identification Standard

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Acknowledgements

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- JEDEC
- NEMI
- IPC

Agenda

- Background
- Scope
- Timeline
- Proposed Marking Scheme
- Open Marking Related Issues
- Next Steps
- Questions

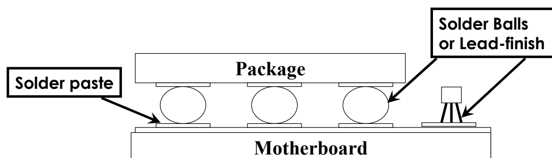
Background

- Conversion to Pb-free electronics has begun
  - ⇒ Several products are already in the market.
- Need to distinguish SnPb and Pb-free components and board products during the transition
  - ⇒ Prevent product mixing in manufacturing/ inventory
  - ⇒ Different process temperature
  - ⇒ Process compatibility
- Marking schemes are inconsistent
  - ⇒ Some developed for initial products – narrow scope
  - ⇒ Process and real-estate constraints are key influence
- There is no proposal for industry standard marking
  - ⇒ No existing standard/ standard body to cover this scope

Considerations

- An industry standard marking scheme for lead-free component and board products
  - ⇒ Simple enough to minimize chances for administrative errors
  - ⇒ No major changes to existing marking infrastructure
  - ⇒ Common scheme for both Boards and Components
- Focus on 2nd level interconnect only
  - ⇒ Solders that impact board assembly process
  - ⇒ Identify impact on manufacturing
  - ⇒ Keep scope manageable

Marking Proposal Scope



WHAT IS INCLUDED:

- Component and board lead-free products marking

Out of Scope

WHAT IT NOT INCLUDED:

- Is not a "Branding" scheme!
- Is not a way to identify Pb-free products!
- 1st level interconnect materials are not identified
  (e.g. flip chip bump, pin attach, multi-chip substrate attach).
- Does not include Halogen-free marking
  - ⇒ Does not impact solder joint performance
- It is not an endorsement for a particular lead-free option
  - ⇒ Consideration give to interaction of various solders in board assembly process

Marking Standard Development Timeline

- Agreement with several consortia bodies to develop the proposal
  - ⇒ NEMI, JEDEC, HDPUG, IPC etc..
- Proposed timeline

⇒ Initial proposal	Feb 2003
⇒ Obtain industry feedback	March to May 2003 ⇐
⇒ JEDEC Standard draft	April 2003
⇒ Final Proposal	May 2003
⇒ Share Proposal with JEITA etc.	Timing TBD
⇒ JEDEC Ballot	June 2003
⇒ Standard Release	December 2003

Proposed Marking Scheme

Solder Material Marking Matrix

Identification of Interconnect Material Differences

2nd Level Interconnect Materials – for packages and boards.

Proposed Mark	Categorization	Material Type !
No Mark	Not "ROHS" Compliant	Contains lead
(e1)	SnAgCu family	e.g.: Sn3-4%Ag0.5-0.9%Cu
(e2)	Contains Bismuth	e.g.:SnZnBi, SnBi
(e3)	Other lead free materials	e.g.: SnZn, SnZn-x, Pure-Sn, NiPd, NiPdAu, SnAu, SnSb etc.

! Solder balls, lead-finish and solder paste materials only!

Proposed Marking Scheme

Process Step / Mark Location	Laser or Ink Mark	Printed on Box/ Container	Shipping Label
Components and Boards	e_x (circled)	n/a	n/a
Moisture Label	n/a	Pb-Free	None
Moisture Bag	n/a	None	None
Intermediate Box, Tape & Reel Box	n/a	None	Pb-Free
Outer Carton	n/a	None	None
Sleeve	n/a	None	None
OEM (POS) Box	n/a	None	"Complies with EU ROHS Directive"

Scope of this proposal

Open Marking Related Issues

- **Wave, rework, board surface finish solder material, are not identified**
  - ⇒ Not considered critical– no viable proposals offered
- **Additional marking on small parts is difficult**
  - ⇒ Not a new issue. Use current method – no Pb-free mark on small package body and use the mark on container labels.
- **Why not identify other solders in use**
  - ⇒ The three marking categories cover all solders
  - ⇒ Identifying all combinations may increase chance of administrative errors
  - ⇒ More detailed information can be included in the manufacturer data sheets or material declaration documents

Open Marking Related Issues

- **Proposal includes "Pb-free" to be marked. How do you define "Pb-free?"**
  - ⇒ The word "Pb-free" are excluded from the POS box. This is not intended to characterize the product per a definition/ criteria
  - ⇒ See scope definition – as it excludes any branding intention
- **Why not use date code to identify Pb-free parts**
  - ⇒ Industry inputs is against using date code. Feedback indicates the need for a special mark.
- **Why part numbering scheme not included**
  - ⇒ Recommendation is to use separate part numbers for Pb and Pb-free SKUs
  - ⇒ Not considered in the scope of industry standard as different manufacturers utilize different part numbering schemes

Next Steps

- Get industry inputs
- Jedec ballot
- Standard release
- Alignment of international standard bodies

Questions??