

FAQ Page about Melexis conversion to Lead Free and “Green” Packaging Solutions for IC’s

May 2005

1/What is the reason to make these changes?

The European Union has established regulations concerning the presence of Hazardous materials in electronic and electrical devices. The two specific regulations are the Waste Electrical and Electronic Equipment Directive and the Restrictions on Hazardous Substances Directive. Both together have resulted in OEM’s requiring Lead free IC packages and IC packages without Hazardous Substances in their chemical formulations. Japanese OEM’s are also aggressively moving to eliminate lead in their manufacturing process in advance of possible regulations and the Chinese government is actively pursuing similar regulations for products sold in their markets. Currently there are no similar requirements for the US market as legislation on this issue was not adopted into law and is presently not under consideration.

The current deadlines for these conversions are July 1 2006 for RoHS compliance (lead free) and the deadline for member states to be in compliance with the WEEE is August 14, 2004.

This link references the Restriction on Hazardous Substances Directive

http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32002L0095&model=guichett

This link references the Waste Electrical and Electronics Equipment Directive

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2/Why not produce two versions of your products, why make users in countries not subject to regulation have to deal with this conversion?

The electronic component market is a global activity and the manufacturing process is such that making two versions of all products creates logistical and operational complexities that outweigh any financial incentive to offer both versions. It is for this reason that Melexis along with most other component suppliers will convert all products to be compliant with EU regulations by or before the deadline. Users with no explicit need to convert to a lead free solder process can still use traditional processes with the lead free components. These lead free components are compatible with existing processes.

3/What is the material that will be used in the new plating?

Melexis intends to use Matte Pure Tin (pure Sn) to replace the current tin lead (SnPb) plating. Matte Tin is being adopted by the majority of electronic component manufacturers. It is proven to be compatible with the different available Lead free solder processes and is forward and backward compatible.

While we can supply lead free components, they will only really make sense if subsequently PCB manufacturers use Pb-free solders. Since such solder typically melt about 30°C higher than the eutectic tin-lead (SnPb) composition, the lead-free soldering process degrades or may degrades the package in JEDEC moisture sensitivity level.

Melexis must therefore supply components that can withstand these higher reflow temperatures. Major package development is required and Melexis is currently qualifying all products.

4/What is the qualification process Melexis used to qualify the new plating?

To qualify the plating, solderability tests are performed acc. to JESD22-102.

As mentioned above, major concern is about the higher reflow temperature. Full package qualification according AEC-Q100 is running.

5/When will my Melexis product be converted to RoHS compliant version?

The conversion process is being done gradually as the resources do not exist to convert all products at one time. Many customers who have specific requirements have been prioritized accordingly. The Melexis Quality Group is currently managing the conversion process and can provide detailed timelines for specific packages. Melexis will follow its Quality system and will provide Process Change Notification (PCN) documents to customers currently registered as requiring change notification. Other customers who might buy through distributors or smaller quantities are encouraged to inquire with Melexis about any specific product. It is important to remember the new versions are compatible with all existing soldering processes.

6/When will we get supporting data?

Qualification data will be sent with the PCN to all customers. Different dates are planned according to the qualification results availability (see question 9)

7/How will lead free part be distinguished from earlier lead bearing versions?

Melexis will maintain traceability through its lot and date code information branded on the IC's. No special or specific marking will be added as all products are already marked by date code and the conversion process will occur at a given moment in time. Packing and shipping containers will be clearly marked with a green icon showing a tree with the elemental abbreviation "Pb" with a circle and slash to denote lead free and RoHS compliance.

Moisture sensitivity level and maximum peak reflow temperature is also mentioned on the logo.



After all products are converted, this mark will be deleted (no PCN will be sent for this change of marking)

8/Will Melexis provide a PPAP per device or package?

Melexis will provide Process Change Notification (PCN) documents according standard JESD46.

9/When will Melexis be qualified (per package)?

| Package Family | Planned end qualification |
|----------------|---------------------------|
| SOIC NB | Q2 2005 |
| SOIC WB | Q2 2005 |
| SSOP 209mil | Q2 2005 |
| QSOP 300mil | Q1 2006 |

10/When is our last time buy?

Last time buy should be issued within 6 months after receipt of PCN.

11/What is the storage specification for the new plating?

Storage conditions are mentioned on the stickers and should follow the J-STD 33 standard (related to the Moisture Sensitivity level)

<http://www.jedec.org/download/search/jstd033a.pdf>

12/What is the solder profile needed for the new plating?

Melexis advises that reflow profiles should conform to the JEDEC standard J-STD 20. The current revision C includes new standard peak reflow temperature.

<http://www.jedec.org/download/search/jstd020c.pdf>

13/What are the limits of the solder temperature profile?

See point 12

14/What is the moisture sensitivity level?

Each package family will have a moisture sensitivity level (MSL) defined after the reliability tests. The information will be clearly visible on the packing material (see question 7)

15/Do you have information about “tin whiskers”?

Whisker is a spontaneous columnar or cylindrical filament emanating from the surface of a plating finish.

There is no scientific consensus on whisker formation and growth fundamentals at this time. There is also no clear statement on which set of tests can accelerate whisker formation and growth with any reasonable degree of certainty.

Melexis is following the recommendation of their assembly subcontractors who performed the necessary tests to ensure the best quality.