RoHS Fast Facts

Understanding ON Semiconductor's Environmental Strategy

What does RoHS stand for?

RoHS is the acronym for **R**estriction **o**n the use of **H**azardous **S**ubstances in Electronics and Electrical Equipment.

What is it?

RoHS is a directive of the European Parliament (Directive 2002/95/EC; 27 January 2003) that, as its name implies, calls for manufacturers to restrict the use of hazardous substances in electrical equipment. The goal is to reduce human exposure to these materials through the ordinary use of products and to reduce the amount of hazardous material introduced to the environment when the products are eventually recycled or disposed of.

The directive is legally binding on any company that wishes to sell product within the EU. Practically speaking, it applies to all EOEMs and all products world wide as most will not wish to design and manufacture Europe-only products. Many OEMs have, in turn, made it binding on their suppliers if they want to sell to them.

What are the materials?

Beginning July 1, 2006 the following metals and chemicals are excluded from use in electrical equipment:

- Lead
- Mercury
- Cadmium
- Hexavalent Chromium
- Poly Brominated Biphenyl (PBB)
- Poly Brominated Diphenyl Ethers (PBDE)
  - Penta BDE
  - Octa BDE

What does WEEE stand for?

WEEE is an acronym for **W**aste of **E**lectrical and **E**lectronic **E**quipment.

What is WEEE?

WEEE is a directive of the European Parliament (Directive 2002/96/EC; 27 January 2003) that, as its name implies, calls for a producer to be responsibility for collection and recycling systems, recycling costs and retailer take-back systems in place from 13 August 2005. ON Semiconductor is not considered a producer but a supplier to producers. So, our obligation is to provide RoHS compliant parts to our customers so that they can assure that the products that they have to recycle do not contain any hazardous substances.

What is the difference between RoHS compliance and Lead Free (Pb-free)?

Pb-free is a subset of the RoHS directive (see list above). The reason Pb-free is so important for ON Semiconductor is that the use of lead was widespread in our plating processes, whereas the use of the other banned materials was not.

What are ON Semiconductor's position vis-à-vis RoHS and Pb-free?

We, of course, intend to be fully compliant with the directive for all of the parts for which it makes business sense to do so. In other words, we will be offering Pb-free versions of all of the parts for which there is sufficient demand. We will also continue to

offer all of these parts in a standard Tin-Lead (SnPb) lead finish until market conditions necessitate a change in direction.

All of our G-suffix packages are certified to be Pb-free and RoHS compliant.

Important note: When we – and most companies – refer to a product being "Pb-free", it is specifically in relation to the lead finish. Pb-free means there is no lead (Pb) in the lead finish. RoHS allows Pb in high temperature internal die-attach used to adhere the chip to the package substrate. Efforts are being made in the industry to come up with alternative die attach materials, but until such time as they are available, we will continue to use Pb in high temperature die attach applications.

Where can I find a list of Pb-free products?

The list of Pb-free products can be found on the ON Semiconductor website at:

http://www.onsemi.com/PowerSolutions/content.do?id=1282

This list is updated as new packages are qualified and new parts are added.

Are there any processing differences for leaded vs. Pb-free devices?

Yes, there are internal process changes to ON Semiconductor manufacturing and to our customer board assembly processes. The impact that Pb-free has to ON Semiconductor is in our plating processes. We have changed our plating material to matte Sn (tin) and increased the plating thickness from 5μm to 7.5μm minimum. We have also added a post plate anneal in order to mitigate a phenomena called tin whisker growth.

Our customers are impacted by the conversion to Pb-free at their reflow process. The temperatures for Pb-free reflow are substantially higher than the current reflow temperatures. We qualify our Pb-free parts at 260°C to prove reliability at the higher temperatures.

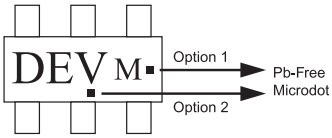
I hear a lot about "backward compatibility" on products. What is that and why does it matter?

Backward compatibility is the capability for our customers to take one of our Pb-free products and mount it on their PC board and reflow it using solder containing lead (Pb). This would happen if we are ahead of them in the conversion to Pb-free. If we provide them Pb-free parts and they have not yet converted their reflow process to Pb-free, they may be concerned about solderability. We have conducted reflow tests of Pb-free parts using leaded solder reflow temperatures andprocesses to simulate this condition. We have conducted these tests at 210 to 230°C and are sure that they will not have solderability issues. Please note: this does not apply to BGA, bumped die or Flip Chip devices; if the parts are Pb-free they need to use a Pb-free reflow process.

Will there be special marking on products to connote Pb-free status?

Yes. RoHS compliant/Pb-free lead finish products will be identified by the addition of a "G" suffix to the end of the device name. All current parts that convert to Pb-free and all new Pb-free parts will take on the "G" suffix. Parts for which there is no lead free version will not have their part number changed in any way.

If the device is too small to accommodate the "G" suffix, the part will be marked with a microdot as shown below:



What about shipping labels?

Per the labeling requirements of JEDEC standard JESD97, all of our standard shipping labels on both intermediate and outer boxes will clearly show whether or not the products inside are RoHS compliant/Pb-free.

Custom shipping labels will also be clearly marked.

The marking on standard labels will look like this:

The 2Li stands for second-level interconnect and officially signifies the lead finish does not contain lead.

Who can I contact if I have more questions?

Marji Baumann at 602-244-7173
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Other useful links:

RoHS

http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00190023.pdf

WEEE

http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00240038.pdf

ON Semiconductor Pb-free (External Site)

http//www.onsemi.com/pbfree

FAQs

http://www.onsemi.com/pbfree-faq

Where to Find More Information. . .

To Locate a Sales Representative Near You...

www.onsemi.com/salessupport

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www.onsemi.com/tech-support

To Order Additional Sample Kits or Other Literature...

www.onsemi.com/orderlit

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 61312, Phoenix, Arizona 85082-1312 USA
Phone: 480-829-7710 or 800-344-3860 Toll Free N.A.
Fax: 480-829-7709 or 800-344-3867 Toll Free N.A.
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N. American Technical Support: 800-282-9855 Toll Free USA/Canada

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Phone: 81-3-5773-3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

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