Power Components
CoEv Magnetics
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CoEv Magnetics Lead-Free/RoHS Initiative

May 27, 2004

Drivers

Since early 2003 CoEv Magnetics has been researching the requirements, planning the implementation and executing the conversion of lead based products to lead-free products. The three main drivers for lead-free are the following European Union Directives:

- RoHS (Restriction of the use of Certain Hazardous Substances) EU Directives 2002/95/EC and 2003/11/EC
  - Bans the sale of products containing lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and/or polybrominated diphenyl ether (PBDE) by July 1, 2006.
- WEEE (Waste from Electrical and Electronic Equipment) EU Directive 2002/96/EC
  - Component, material and substance re-use and recycling must be increased to a minimum of 65% by an average weight per appliance with separate disposal for certain materials mandated.
- ELV (End of Life Vehicles) EU Directive 2000/53/EC
  - ELV limits the lead content in solder to 60g per car sold after July 1, 2003.

While the WEEE and ELV directives may only affect CoEv Magnetics components indirectly, the RoHS directive does directly affect the components that we manufacture for the electronics industry. The RoHS directive clearly bans a number of substances, but the banning of lead in the same directive can be confusing for two reasons: first, “lead-free” is left undefined; and second, there are a number of exceptions allowing lead for high-temperature applications and for certain high-reliability markets such as aviation and military.

Four Levels of Compliance

As products built by CoEv Magnetics can be used in multiple markets, we assume that our products will be sold into those markets that restrict the use of lead. However where high-temperature lead solder is required in our products, it will be used and clearly identified as using such solder on the specification sheet. All new designs as of July 1, 2004 will have one of the four graphics placed on the specification sheet to delineate between lead-free, RoHS compliant and products containing lead. Lead-free and RoHS compliant designs already are including these graphics on their specification sheet

Graphics on Specification Sheet	Meaning
	RoHS Compliant and Lead Free
	RoHS Compliant but Contains High Temperature Lead Solder
	Lead Free but NOT RoHS Compliant
	Contains Lead

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Lead-Free Solder Used

CoEv Magnetics uses a Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%) alloy as our standard lead-free solder.

RoHS Compliant Definition

RoHS compliant products produced by CoEv do not contain intentional additions of lead, hex chrome, cadmium, mercury, PBB or PDBE, except that:

- Lead may exist as alloying element in Cu alloys (e.g. bronze, brass) to 4% by weight
- Lead may exist as alloying element in steel to 0.35% by weight
- Lead may exist as alloying element in Al to 0.4% by weight

Also, these products do not contain unintentional additions of lead, mercury, hex chrome, PBB, or PBDE that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, platings, etc.).

While CoEv is verifying with component suppliers that they do not intentionally add any of the RoHS banned substances, CoEv is not requiring from suppliers nor providing concentration level (PPM) analysis.

Terminal Platings

At present CoEv Magnetics has decided on four primary platings that will be used on all standard lead-free products:

- Hot Solder-Dipped SnAgCu
- Hot Solder-Dipped SnAgCu over Nickel
- Matte Tin over Nickel
- Gold Flash over Nickel

Typically all of these platings are over a phosphor bronze base material.

Maximum Reflow Temperatures

The maximum withstand reflow temperature, is another factor being determined by CoEv Magnetics for all of our lead-free products. While the goal would be to meet the requirements of the JEDEC-STD-020B standard on all products we do have two issues to deal with. First the JEDEC standard is currently in draft mode and second, not all components will be able to withstand the 260°C temperature for 10 seconds that is required.

At CoEv Magnetics we have developed three different reflow profiles of various intensities that we test our products to. All of our lead-free products will be rated on the product specification sheet per one of the three maximum temperature ratings for a duration of 10 seconds; 260°C, 250°C or 240°C.

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Time Frames

While we will do our best to meet all customer requirement dates for samples, prototypes and production quantities, we are scheduling lead-free and ROHS compliance for the majority of our products as follows:

- July 1, 2004 Samples Available
- October 1, 2004 Prototype Quantities Available
- December 31, 2004 Production Quantities Available

If you have requirements for lead-free products please communicate your request through your normal sales channels. Typically, compliant designs are treated as new designs and are assigned a new part number. We will however, try to accommodate our customers' requests and will consider any requests for retention of an existing part number on a case-by-case basis.

For More Information

If you have further questions or need more information, please contact your sales representative or the Lead-Free Program Manager, Dean E. Huumala, at (605) 886-3326.