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Chemical Substances in Lattice Semiconductor Products

Recent trends in the semiconductor industry are driving toward more environmentally friendly materials. These changes are due to enhanced environmental awareness, and legislative restrictions of hazardous materials, such as the European Parliament's Directive 2002/95/EC on Restriction of Hazardous Substances (**RoHS**), China's Measures for the Administration of the Control of Pollution by Electronic Information Products and others. Lattice Semiconductor is fully committed to providing environmentally friendly processes, products, and shipping packages that meet our customers' needs and meet our corporate commitment to protect the natural environment.

Lattice currently offers the broadest line of **Pb-Free** products in the PLD marketplace. We have worked closely with our manufacturing partners to identify and rapidly eliminate the following list of substances from our products. As a result, all our devices are now RoHS compliant. The European parliament in 2011 recast the original RoHS as **Directive 2011/65/EU**. This recast is commonly referred to as **RoHS2**. In 2015, **Directive 2015/863** was published by the European parliament, which is known as **RoHS3**, adding 4 new substances to the list of restrictions. All of Lattice's packing materials meet EU-Directive **94/62/EC** (Packaging and Packaging Waste, PPW) and its amendments.

- Lattice Semiconductor Corporation represents that all ACTIVE** Lattice semiconductor devices, including Lattice's original packaging materials, are **Pb-free** and do not contain the chemical substances listed below:

  1. Lead (Pb) <1000 ppm
  2. Cadmium (Cd) <100 ppm
  3. Mercury (Hg) <1000 ppm
  4. Hexavalent chromium (CrVI) <1000 ppm
  5. Polybrominated Biphenyl (PBB) <1000 ppm
  6. Polybrominated Diphenyl Ethers (PBDE – including Deca-BDE) <1000 ppm

- Lattice Semiconductor Corporation further represents that all active Lattice parts, including Lattice's original packaging materials, do not contain the "**RoHS3**" Annex II chemical substances listed below:

  7. Bis (2-ethylhexyl) phthalate (DEHP) <1000 ppm
  8. Benzyl butyl phthalate (BBP) <1000 ppm
  9. Dibutyl phthalate (DBP) <1000 ppm
  10. Diisobutyl phthalate (DIBP) <1000 ppm

- In addition to being fully RoHS3 compliant, Lattice's packages designated as **Halogen Free** are manufactured to comply with the industry-accepted definition of Halogen-Free (or "Green"):

  1. Chlorine (Cl) <900 ppm
  2. Bromine (Br) <900 ppm
  3. Br + Cl <1500 ppm
  4. Antimony (Sb) <1000 ppm

- Lattice Semiconductor Corporation further represents that its (discontinued) plastic parts that are **not designated as Pb-free**** do not contain items 2 through 10 above, but may contain Lead (Pb)* in the indicated concentration:
  Nominal 15% Pb terminal plating / 37% Pb BGA solder ball
  *NOTE: This use of Pb (often referred to as "RoHS 5/6") corresponded to RoHS exemption 7(b); this exemption has expired as of June 2016.
  **NOTE 2: All remaining Lattice devices containing Pb were discontinued in 2015 per PCN#02A-15. Certain custom-built parts possibly deviate from this per specific customer requests.

Be assured that your business is valued greatly by Lattice Semiconductor and that we will do everything within our power to provide you with the highest level of service and support and with the broadest portfolio of innovative Field Programmable Gate Arrays (FPGAs), high-performance Programmable Logic Devices (PLDs), programmable Power Management, and Clock Management solutions.

Regards,

Melissa Clark

Melissa Clark
Customer Requirements Project Manager
Lattice Semiconductor Corp.
custreq@latticesemi.com