

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 Pb-free products. As a result, these products are now RoHS compliant. The European parliament has recently recast the original RoHS as **Directive 2011/65/EU**, adding new substances to the list of restrictions. This recast is commonly referred to as "**RoHS2**".

- Lattice Semiconductor Corporation represents that all Lattice **Pb-free** plastic parts, including Lattice's original packaging materials, do not contain the chemical substances listed below:

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

- Lattice Semiconductor Corporation further represents that all Lattice plastic parts do not contain the "**RoHS2**" chemical substances listed below (<1000 ppm):

- | | |
|--|---------------------------------|
| 7. Hexabromocyclododecane (HBCDD) | 9. Butyl benzyl phthalate (BBP) |
| 8. Bis (2-ethylhexyl) phthalate (DEHP) | 10. Dibutyl phthalate (DBP) |

- Lattice Semiconductor Corporation further represents that its 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") corresponds to RoHS exemption 7(b).

- In addition to being fully RoHS2 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 | 3. Br + Cl <1500 ppm |
| 2. Bromine (Br) <900 ppm | 4. Antimony (Sb) <1000 ppm |

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,



Chris Leonhard
Sr. Customer Requirements Administrator
Lattice Semiconductor Corp.
custreq@latticesemi.com