



Application Note 114 RoHS at QP Semiconductor

RoHS (Reduction of Hazardous Substances)

Relative to manufacturing of semiconductor based hermetic integrated circuits; RoHS generally means a non-lead (Pb) based solderable lead finish. The other prohibited materials for RoHS (Cadmium (Cd), Mercury (Hg), Hexavalent Chromium (Cr⁶⁺), Polybrominated Biphenyls (PBBs) and Polybrominated Diphenyl Ethers (PBDEs)) are not used in the manufacturer of the product, and therefore exist only in background levels.

QP Semiconductor's primary market focus is High Reliability Systems, generally based on QML (Qualified Manufacturing Line) requirements from Mil-Prf-38535 and Mil-Std-883. These specifications require use of Pb/Sn solder systems and in some cases use of lead (Pb) in the sealing glass.

QP also manufactures parts intended for industrial and commercial applications. Here we offer both RoHS and non-RoHS products depending on customer need.

QP Semiconductor has packaging offerings to meet your requirements.

Package Element	Material	RoHS	QML
Pressed Ceramic Package Seal Glass	PbO 52%	No	Yes
	SnO2 22%		
	ZnO 12%		
	B2O3 8%		
Lead Finish	SiO2 5%	No	Yes
	Al2O3 1%		
	Sn 63%		
Lead Finish	Pb 37%	No	Yes
	Sn 95%		
Lead Finish	Pb 5%	No	Yes
	Au 99%		
Lead Finish	Au 99%	Yes	Yes
Lead Finish	Sn 100%	Yes	No
Lead Finish	Ni 93%	Yes	No
	Pd 5%		
	Au 2%		

Background:

There is considerable published data from the technical oversight agencies that are responsible for the QML specification system. This data indicates that there can be considerable risk of metal whiskers forming from the most common RoHS compliant lead finish used in industry (Pure Tin). And there is some evidence that some of the other alternative lead finish metals display similar behavior.

NASA has a large website to this issue: nepp.nasa.gov/WHISKER/background/index.htm

Because of this problem, our main target market has an extremely vocal opinion against non-lead (Pb) based lead finishes when tin is used. They back up their opinions with rigid specifications that prohibit reductions in lead (Pb) for many of

our lead finishes, that require a minimum of 3% lead (Pb) when tin is used as package body coating or as a lead finish. However, there has always been a RoHS compliant lead finish available in this rigid specification environment, Gold. And QP Semiconductor offers that finish, as well as both RoHS compliant or tin/lead (non RoHS) lead finishes on most of our product offerings.

Within RoHS requirements there are several areas that are exempt from RoHS, especially relative to reducing lead (Pb) in the lead finishes. This is to address the reliability issues with many RoHS friendly alternative lead finishes. The main obvious exemptions are Space Craft, Military Systems and Medical Equipment. Other manufacturing areas that

have received exemptions have been less obvious, like the exemption that many watch manufacturers have, because their product is extremely sensitive to tin whisker growth.

Key RoHS Exemption Areas:

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| • Batteries |
| • Military Equipment |
| • Aviation |
| • Some Mobile Phone Equipment (variable requirement/delay in requirement) |
| • Car Radios |
| • Medical Equipment |
| • Spare Parts |
| • “High End” storage/telecommunication Equipment |
| • “Stationary” Industrial Equipment |
| • Specific Petition for Exemption |

If your product requires a RoHS compliant integrated circuit, please contact our sales department to discuss the kind of solutions we have available.

And if you are purchasing products intended for high reliability applications, in space craft, military or medical systems, be assured that QP Semiconductor continues to offer appropriate solutions for these market areas, using lead (Pb) /tin (Sn) based lead finishes where required.

There is no single RoHS/WEEE regulation worldwide, each country, area and in some cases states have enacted their own requirements. QP Semiconductor does not maintain an expertise in regulations in all areas of the world. And considering the fast changing nature of environmental requirements, information can be outdated at any time.

QP Semiconductor does believe that the market areas that are listed as exempt are areas that technically need the exemption. This is based on the high risk to human life, the harsh environments of these markets and the very long lifetimes of the end equipment. Because the technical need is compelling, QP Semiconductor believes that these exemptions are likely to remain in place for many years.

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