INSTITUTE OF COMPUTER TECHNOLOGIES

TYPES OF CONTACT PADS SURFACE FINISHES:

Surface finish type	Description	Thickness of coating
HASL SnPb	Coating based on tin-lead eutectic alloy. It is applied by reflow followed by hot air leveling. Excellent solderability, insufficient flatness, incompatibility with lead-free assembly	2,0...40,0 μm at the sites of the small size the thickness is not standardized
HASL Lead Free	Lead-free coating based on sub-eutectic alloy of tin. It is applied by reflow followed by hot air leveling. Satisfactory solderability, insufficient flatness. It complies with international directives RoHS. Application leads to a high risk of intermetallic compounds formation.	2,0...40,0 μm at the sites of the small size the thickness is not standardized
ENIG	Immersion gold over sublayer of galvanic nickel. It is used to provide a flat surface of contact areas and long preservation of PCB solderability . Excellent solderability, compatibility with all mounting technologies.	Au min 0,05 μм Ni 3..6 μм (IPC-4552)
ENEPIG	Immersion gold with sublayer of galvanic nickel and palladium. In comparison with ENIG has higher chemical resistance. Provides better maintainability of PCBs.	Au min 0,025 μм Pd 0,05..0,15 μм Ni 3..6 μм (IPC-4556)
Flash Gold	Galvanic gold over sublayer of galvanic nickel. It is used to provide a flat surface of contact pads and long preservation of PCB solderability. Good solderability, compatibility with all mounting technologies.	Au 0,025..0,05 μм Ni 3..5 μм
Hard Gold	Galvanic gold over sublayer of galvanic nickel. It is used as a topcoat of edge connectors' contacts (Gold Fingers technology). It can be used as a selective topcoat of wear-resistant elements of PCBs. It is characterized by the presence of dopant admixtures in its composition.	Au 0,2..2,0 μм Ni 3..5 μм

FINISHING OVERLAYERS

PRINTED CIRCUIT BOARDS

TYPES OF CONTACT PADS SURFACE FINISHES:

Surface finish type	Description	Thickness of coating
Immersion Tin	Provides a flat surface of pads, has a good solderability and a limited period of time for mounting. Its application leads to a high risk of intermetallic compounds formation.	min 1,00 μм (IPC-4554)
Immersion TinOm	Immersion tin on top of sublayer of organic metal. It provides a flat surface, has good solderability and long period of time for mounting. It reduces the risk of intermetallic compounds formation.	min 1,00 μм
Immersion Silver	It provides a flat surface, has good solderability and long period of time for mounting. The coating is sensitive to compounds of sulfur and halogen in atmosphere.	min 0,05 μм (IPC-4553)
Soft Gold	Galvanic gold over sublayer of galvanic nickel. It is intended for unwelding of chip pins on PCBs by the gold wire with using plasma welding.	Au 1,5..3,0 μм Ni 3..5 μм
OSP	Organic protective coating. Provides a flat surface of pads, has good solderability and low cost. The main disadvantages of the coating are short storage period, impossibility of repairing, risk of intermetallic compounds formation at lead-free technological process.	min 0,15 μм

Additional features:

- Peelable solder mask is applied for temporary protection of board areas during mounting, assembly, setting up and starting product operation. It is absent in finished products.
- Carbon coating is used to make contact pads of keyboards and other elements of PCBs that require high wear resistance. Thickness of coating is 0,10..0,40 μм.
- Graphite films are used as embedded resistive elements, heating elements.
- Items on silver paste basis are used to create additional conductive layers, function as webs. Field of application – one layer PCBs.

If you need advice on the selection of surface finish, please, contact the engineering department of IKT for free consultations.