

Printing process of 01005 components using NanoWork stencil

Characteristics and Guidelines for Secure Printing Process of Passive Components of 01005 in Size Using Nano-Coated Stencils

In the assembly and interconnection technology for electronic devices miniaturization is the key driver and leads to highly integrated systems. In the field of passive components miniaturization has induced the introduction of 01005 components with dimensions of 400 * 200 microns in size. Despite numerous publications in the last years focusing the technology of 01005 components, no suitable process window for the economical processing of this component size can be derived in a mixed assembly based on the available literature. In addition the comprehensive evaluation of major variables on the production quality is missing.

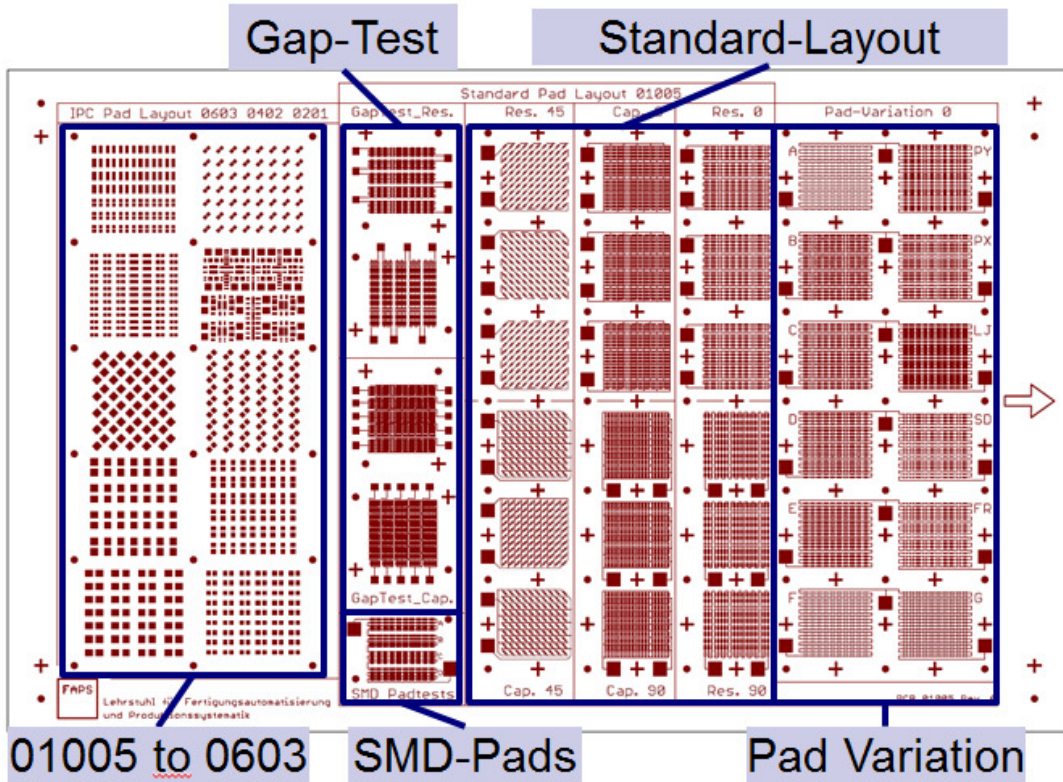
Especially the stencil printing process offers enormous potential for optimization. This process step is responsible for a large number of manufacturing defects in the surface mount technology. This is induced by complexity of the printing process with the variety of influences and existing interactions. The use of systems for Solder Paste Inspection (3D-SPI) enables the holistic evaluation of the printing process. Thereby defined quality characteristics, such as transfer efficiency, can be controlled and used for closed loop applications of the process chain.

For our investigations, a double-sided FR4 printed circuit board was developed that allows numerous variations within the entire process chain of assembly and interconnection technology. Effects of various aperture geometries and different thicknesses of the used stencil will be focused. In previous investigations the used solder paste was identified as a major effect, therefore different solder paste materials will be evaluated. The alloy of the solder paste is a standard lead-free tin/silver/copper (SAC305) of type 4 as well as type 5. The used stencils are laser-cutted and nano-coated and are proved for small aperture geometries and aspect ratio, respectively. **Results are shown on our booth: 1415**

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