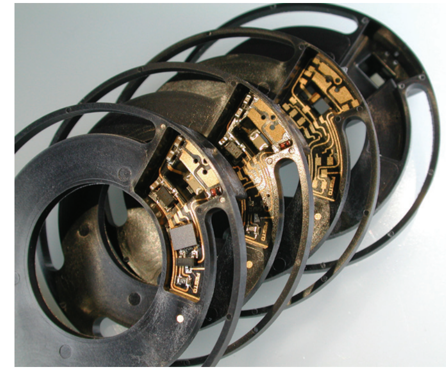
Laser MID Technology

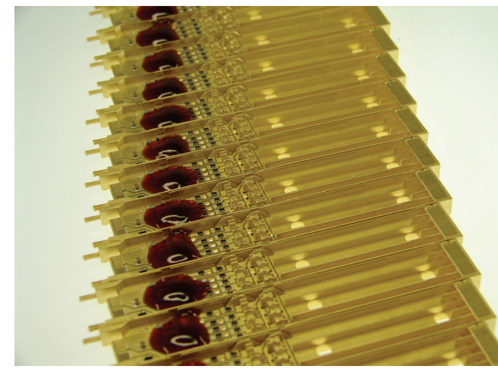
Hahn-Schickard-Gesellschaft
Institute of Micro Assembly Technology

BACKGROUND and BASICS



- Multifunctional polymer 3D-packages based on Moulded Interconnect Devices (MID) combine miniaturization and high functionality for e.g. medical and communication technology, automotive applications, mechanical engineering and automation. MID not only provide the package for SMD and IC assembly, they are also well suited to integrate functional interfaces e.g. sensors, membranes, fluidic channels or plug connectors.
- HSG-IMAT is a leading expert in MID technology supporting industrial partners in the realization of innovative products.

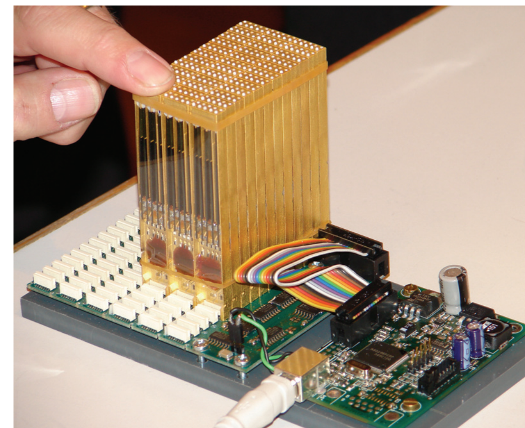
CONCEPT and SOLUTION



- Laser based MID technologies enable conductor lines with line widths down to 100 µm as well as large area structures for e.g. electrodes or shielding on 3D thermoplastic parts. Assembly technologies for SMD with lead free solder and conductive adhesive as well as wire bonding and flip chip assembly of bare dies on MID substrates are available.
- At HSG-IMAT the LPKF-LDS® technology and the semi additive LSA technology are available for prototypes and small scale production.

STATUS and OUTLOOK

- The semi additive LSA technology is currently used in HSG-IMAT for the fabrication of novel modules for a graphic capable interactive braille display of the METEC AG. 10 braille pins are assembled in each module which are driven by piezo actuators at a voltage of 200 V. Furthermore in each module a touch sensor is integrated which enables blind people the mouse click function for internet using. The electronic circuit for controlling the actuators and the touch sensor requires two bare die ASICs and several SMD components which are assembled by isotropic conductive adhesive, aluminium wire bonding and encapsulation. 720 single modules are needed for a braille display unit.
- The key benefit of the additive LPKF-LDS® technology is the fast laser patterning process and the wide availability at MID manufacturers. High 3D capability and flexibility enable innovative product solutions for e.g. rotary encoders and sensor packages.
- New research activities target on printing technologies to realize multilayer structures and passive components e.g. resistors directly on laser MID.



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