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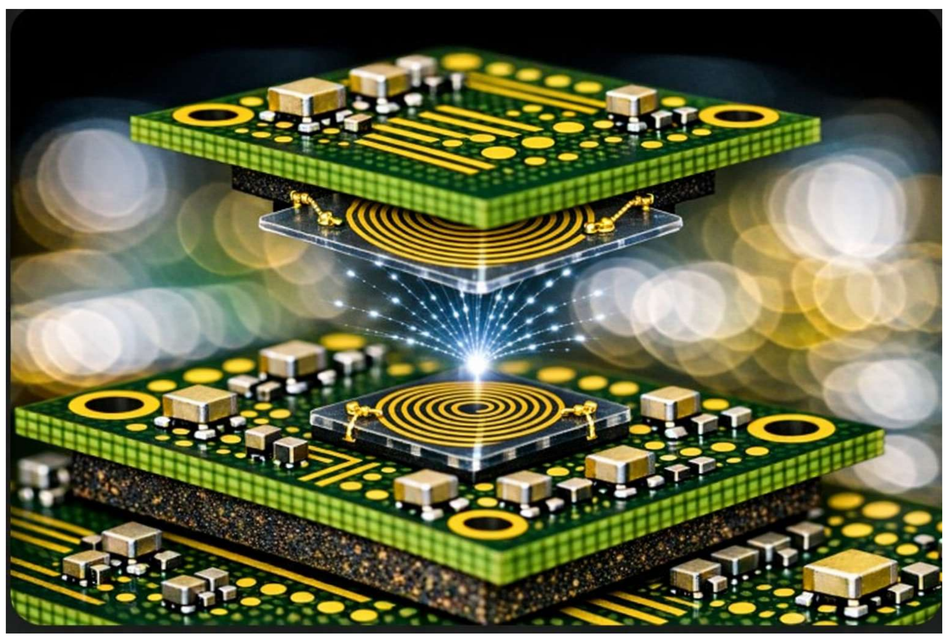
FLEXSTACK PLATFORM: FLEXIBLE AND DETACHABLE MULTILAYER MICROFABRICATION FOR ON-CHIP AND ON-PACKAGE FUNCTIONALITY

The FlexStack Platform is a planar, multilayer microfabrication process enabling flexible and detachable electronic structures based on electroplated copper conductors embedded in a polymer matrix (SU-8). The process is carried out on a silicon wafer and allows selected areas to be released, forming free-standing or hybrid rigid–flex structures.

The platform supports dual- and multi-layer conductor stacks with vias, enabling compact three-dimensional routing with low electrical resistance and elements such as microinductors. It is compatible with CMOS post-processing and supports heterogeneous integration with on-chip and on-package added functionality, including power management and wireless communication. The technology has been demonstrated through a flexible microantenna integrated into an overmoulded temperature-sensing NFC tag.

+ Key benefits

- Flexible, partially or fully free-standing electronic structures
- Compact multilayer routing with thick copper
- Robust performance under mechanical and thermal stress
- Reliable soldering and interconnect bonding
- Compatible with standard microfabrication and packaging flows



+ Suggested applications

- Smart integration solution for high-end integration and packaging
- Flexible and hybrid rigid–flex electronics
- On-chip and on-package power management
- Chiplet-to-chiplet energy and data transfer
- Integrated large microinductors and planar multi-layer antennas

+ Demonstrated use case:

Overmoulded temperature-sensing NFC (13.56 MHz) tag microantenna, with sub-20 μm line width and spacing and total thickness below 50 μm; microinductor with 2.32 μH, 12 Ω, and quality factor of 14; reliable operation from -40 °C to 90 °C, before and after encapsulation and industrial overmoulding (TRL 6).

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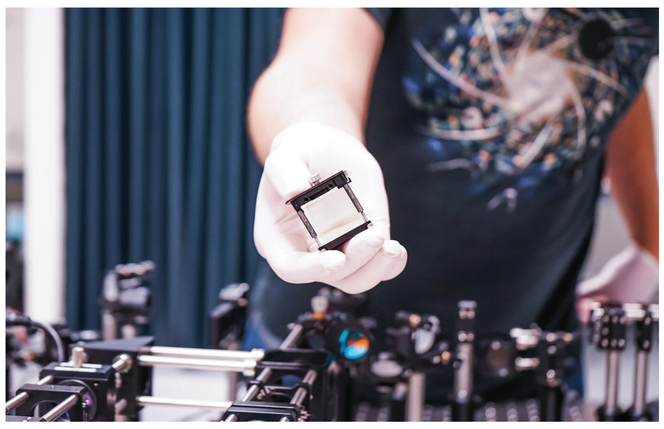

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