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MICROPRINCE H2020 PROJECT

Coordinator:

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Pilot Line for micro-transfer-printing of functional components on wafer level



General Project Information

- Project reference: 737465
- Project start and duration: 01/04/2017 for 36 month
- EC funding: EUR 3.340.035,74
- 13 Partners from 4 different European countries
- Mission: to create a pilot line for heterogeneous integration of smart systems by micro-transfer-printing (µTP) in a semiconductor foundry manufacturing environment
- Website: <u>www.microprince.eu</u>



Project Goals (I)

- Transfer of the µTP-technology for microelectronics application from laboratory to an industrial environment
- Bridging the "Valley-of-Death" to industrialization
- Creation, installation and demonstration of a pilot line for the µTP in manufacturing environment for open access
- Development of design rules (DR) and its implementation in Process-Design-Kits (PDK)



Project Goals (II)

- Technology demonstration for five defined target applications for magnetic and optical sensing and photonic systems
- Development of processes for heterogeneous system integration for CMOS and MEMS wafers
- Realization of printing processes on 200 (150) mm silicon wafers

Key Application Areas

WP 8: Project- and Innovation Management

WP Interaction

WP7: Dissemination, Communication, Exploitation and Standardization (Lead: IMWS)

Strengthen European Electronics and MEMS Industry

WP2:

Micro-Transfer-Printing for High Sensitivity Magnetic Sensors

(Lead: MLX TLO)

WP3:

Micro-Transfer-Printing for Optical Sensors

(Lead: XFAB)

WP4:

Micro-Transfer-Printing for Silicon Photonics

(Lead: HUA)

WP5:

Micro-Transfer-Printing of LED Devices

(Lead: MLX DE)

WP6:

Micro-Transfer-Printing for Biomedical Implant Applications

(Lead: IMEC)

Smart Mobility

Smart Society

Smart Energy

Smart Health

Smart Production

WP1: Design and installation of the μTP pilot line (Lead: XMF)

- Specification, set-up and installation of the pilot line for high volume production in a MEMS foundry environment
- Development and providing of general process for manufacturing

Essential capabilities:

Semiconductor
Manufacturing, Technology,
Equipment, Design
technologies, Smart system
integration

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IMPACT

- Strengthen the industrial competitiveness of the involved industrial partners
- Worldwide first open access foundry process for heterogeneous integration by μTP -> will lead to a stable and sustainable growth of business in Europe.
- Enable next generation sensors for future markets
- Base for significantly improved magnetic sensor systems -> enabling superior miniaturization desired by the market.
- Integration of silicon photonics with smaller form factors, lower power consumption and lower cost
- Technology base for life science applications, where photonic integrated sensors can be made so cheap that they can be considered as disposables (e.g. for medical tests) and can be miniaturized.

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MICROPRINCE Consortium

- Consortium: 13 partners from 4 different countries
- Duration: 36 month (3 years) 01.04.2017 31.03.2020

Germany

- X-FAB-MEMS Foundry GmbH (XMF)
- X-FAB Semiconductor Foundries AG (XFAB)
- Melexis GmbH (MLX DE)
- Optics Balzers Jena GmbH (OBJ)
- Fraunhofer Gesellschaft zur F\u00f6rderung der angewandten Forschung E.V. (FhG)
- Technische Universität Dresden (TUD)

Switzerland

Melexis Technologies SA (MLX BEV)

Belgium

- Melexis Technologies NV (MLX TLO)
- Melexis NV (MLX NV)
- Huawei Technologies Research & Development Belguim (HUA)
- Interuniversitair Micro-Electronica Centrum (IMEC)

Ireland

- X-Celeprint Limited (X-CEL)
- University College Cork National University of Ireland, Cork (TYN)



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