



Łukasiewicz Research Network – Institute of Electron Technology

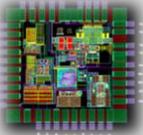
Department of Integrated Circuits and Systems Design

The Department

- Has a unique experience in Poland in the field of Application Specific Integrated Circuits (**ASIC**) design and Systems development, with an access to ASIC MPW prototyping services lead worldwide by Europractice provided at reasonable, low prices.
- Uses EDA-CAD tools (Cadence, Synopsys, Mentor Graphics etc.) in academic licensing scenario with the privilege of commercialization.
- Uses commercial license on configurable D32PRO microcontroller IP synthesis and project application for high TRL products
- Conducts R&D and participates in various projects fund by national grants on high level of competence with focus on:
 - *Design of analog, digital and mixed Application Specific Integrated Circuits (ASICs),*
 - *Design of readout modules for non-typical detectors developed in ITE and externally by technology partners such as MEMS, MOEMS, Photonic, THz – single channel (pixel) and multichannel (matrix) sensors,*
 - *IC design migration between different fabrication technologies for existing ASIC solutions,*
 - *Integrated Circuit design, up to System on Chip (SoC) complexity,*
 - *Thermo-electro-mechanical simulation of heterogeneous systems,*
 - *Design of innovative, networked and standalone measurement of devices and systems.*

Sample developments

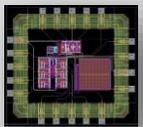
SPO2 the specialized integrated circuit **ASIC** (UMC 130nm) oximeter chip has been developed for noninvasive blood oxygen saturation measurement has been developed as a part of the system for human vital signals monitoring. The oximetry operation principle is the wavelength sensitive light absorption difference for various levels of blood oxygenation. Prototype product phase.



Low noise readout the multichannel, application specific integrated circuit (**ASIC**) developed in AMSC 0.35 μm technology and several of-the-shelf components. The system for ensures the signal registration and processing of very small DC voltage signals and does not require expansive and sometimes troublesome phase sensitive detection lock-in technique. The system is composed of the Prototype product phase.



Vagus Nerve Neuroimplant the specialized integrated ASIC circuit (AMS C35) chip for neuro-stimulation has been designed for in-vivo measurements of vagus nerve activity. The aim was to determine the optimum parameters set for an electro modulator. Circuit detects pulses in nerve signal and automatically sets the detection level according to the input signal. Neurostimulation is expected to be an effective tool in abatement with obesity. Research product phase.



Cryptographic processor the specialized integrated ASIC circuit (0.8 μm) chip has been developed for real-time encryption/decryption of the hard drive data stream. The processor implemented in hardware 168 bit DES3, operation in ECB or CBC mode, 17,8 MB/sec encryption/decryption rate @ 40 MHz clock. Fabrication technology: 0.8 μm process. The product introduced to the market (MCY74C069)



System APRIL-Luminaire – adaptive presence driven integrated, tunable lighting system developed in collaboration with LARS – the polish SME. The system controls and setups light intensity and white balance. It wirelessly drives and configures devices grouped in big area spaces, offices ungrouped and individual applications.



Cooperation:

