

## THE FRAUNHOFER IIS DIFFERENCE

At design level, we are able to include our know-how from a variety of application areas and applied research.

Our expertise is in the fields of:

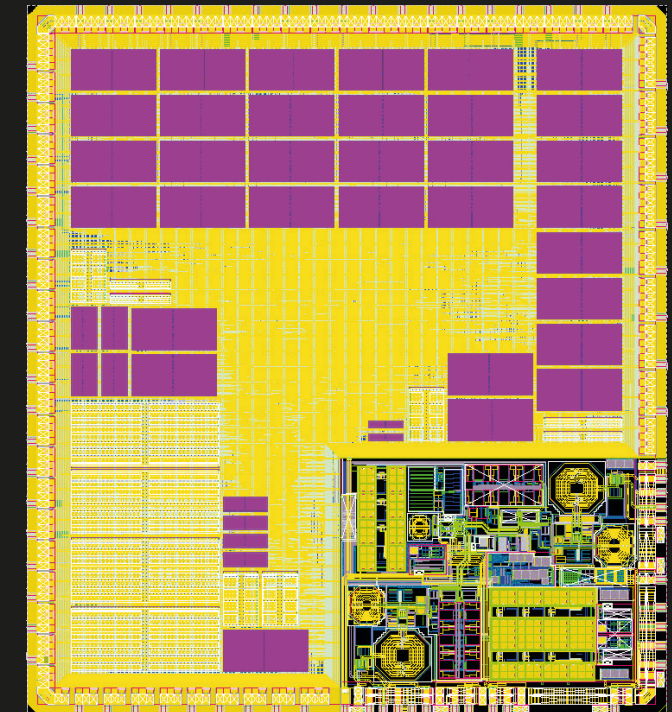
- Audio and video coding (e.g. MP3, AAC, AVC, JPEG2000)
- RF systems (e.g. football tracking, customized RFID solutions, antennas)
- Digital Broadcasting (e.g. XM-Radio, DAB, DRM)
- On-chip sensors and mixed-signal IP (e.g. 3D Hall-sensor, ADC, DAC, Serdes, PLL)
- Safety critical industrial control systems
- Automotive and aerospace systems
- Multi-standard multi-channel integrated satellite navigation systems (GPS, Galileo, etc.)
- Medical applications (e.g. Body Area Network) and many others. With over 20 years of experience in digital and mixed-signal IC design our engineers are able to handle challenging specifications and to bring your visions to reality.

## RESEARCH FOR THE FUTURE

The Fraunhofer IIS is committed to applied research and prepared to step into new fields of technology solving challenging problems.

We are constantly exploring further and smaller nanometer technologies as well as using reliable, lower cost technologies in order to be able to offer the optimum solution for your requirements.

## SoC & ASIC DESIGN



### *Fraunhofer Institute for Integrated Circuits IIS*

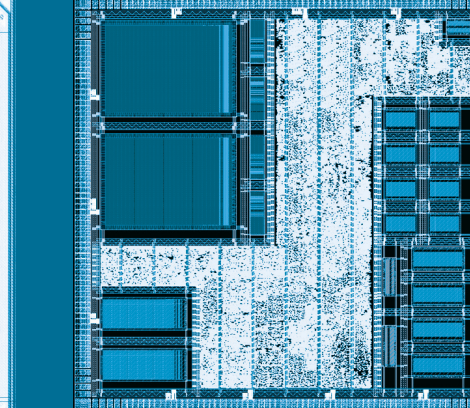
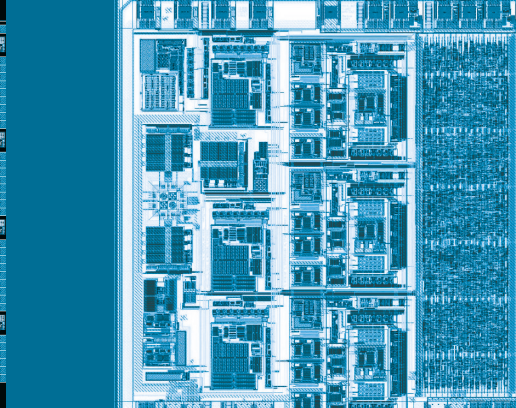
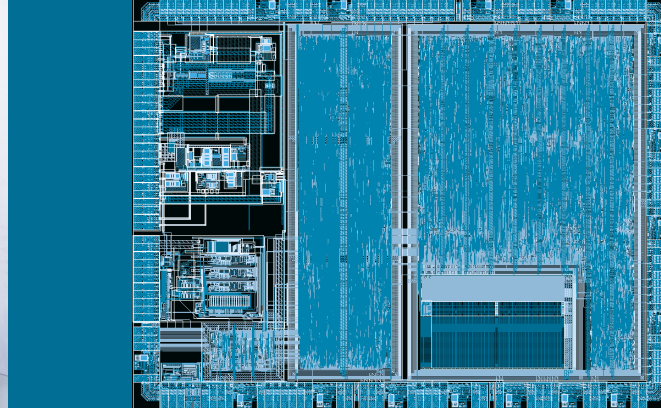
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## Our Offerings

Fraunhofer IIS is prepared to transform your ideas into silicon. Using state of the art EDA tools, proven and flexible design flows and industry best practices we achieve:

- Your design goals concerning timing, power, area and cost in complex digital and mixed signal designs in nanometer technologies (350 to 14 nm)
- Fast turn-around time
- Predictable and reliable results
- Embedded single- or multi-core processor and IP support
- Single- and multi-chip solutions
- Specification to chip delivery flow

Our expertise is front end, physical or turn-key design with the following characteristics:

- Hierarchical or flat design
- Multi-voltage design
- Complex mixed-signal design
- Flexible production test solutions
- Multi-project wafer prototyping with optional evaluation
- ASIC production, packaging and test in volume or low volume

## Our Services

- System modeling and simulation
- Architecture and micro-architecture design
- Digital and analog hardware and software partitioning
- Design hierarchy and complexity analysis for early floor planning, e.g. for different technologies or multi-voltage domains
- Complex mixed-signal design and verification
- RTL code review, quality checks
- Low power optimization of RTL or analog components
- FPGA-based rapid prototyping and evaluation
- ASIC-library quality checks
- Package selection and floor planning
- Analysis of timing constraints for completeness and correctness
- Design for test (Scan, JTAG, Memory & Logic-BIST, ECC, etc.) with ATPG generation and verification
- Synthesis to target technology with timing, power, IR-drop and margin analysis
- IP quality check and IP integration (digital and analog)
- Place & Route (P & R)
- Physical verification (DRC, LVS) and parasitic extraction (PEX)
- Signal integrity and crosstalk analysis
- GDSII-Tape-out to wafer fab

## Direct Access to MPW-Prototyping and Volume Production Services

- Chip delivery in various ASIC-technologies (350, 180, 130, 65, 40, 28 and 14 nm) at GLOBALFOUNDRIES, TSMC, ams, X-FAB, TowerJazz, IHP, OnSemi
- Packaging service for prototypes and volume
- Production test

## Reference IC Designs

- Complex SoCs for high end multimedia applications with embedded microprocessors (e.g. H.264; JPEG2000)
- Automotive grade transmitter/receiver chipsets for multi-Gbit/s (3, 6, 12 Gbit/s) data transmission in 180 to 55 nm ASIC technologies (APIX- and Fraunhofer IIS-Technologies)
- ASICs and SoCs exploiting very low power techniques e.g. with integrated battery management, sensor interfaces or RF blocks (IoT, tags, wearables, RFID, REDFIR)
- Safety critical industrial grade ASICs with "TÜV"-certification (IEC 61508)
- Automotive control and sensor ASICs (optional with ISO 26262 flow)
- Several digital broadcasting and satellite navigation applications
- Image sensor and processing developments