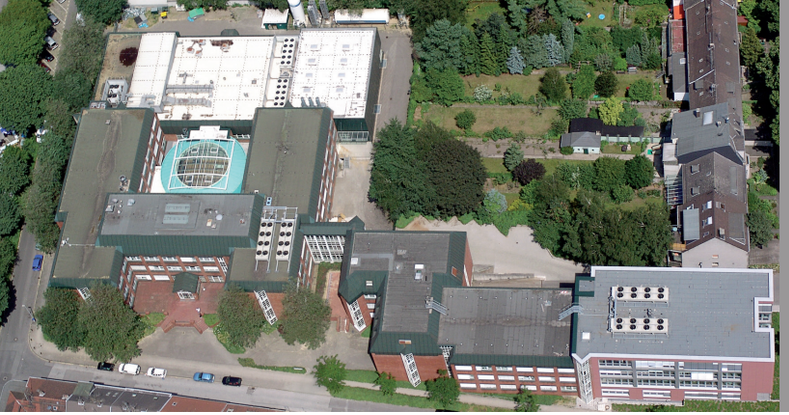

Fraunhofer
IMS

FRAUNHOFER INSTITUTE FOR
MICROELECTRONIC CIRCUITS
AND SYSTEMS IMS

FRAUNHOFER IMS

INNOVATIONS ON SILICON

The Fraunhofer IMS in Duisburg has more than 25 years experience and proven expertise in microelectronic circuit design and fabrication.

Our silicon solutions can be found in various application areas like satellites, aircrafts, medical implants, automotive, industrial, automation, and consumer electronics.

Full supply chain services provide a seamless path from the first idea through development to production according to highest quality and reliability levels. This includes long-term support considering our customers product lifetime requirements.

Beside internal and external state-of-the-art CMOS facilities, the Fraunhofer IMS offers solutions based on 250°C high-temperature Silicon-on-Insulator processes, MEMS-based sensor integration as well as advanced CMOS post-processing options.

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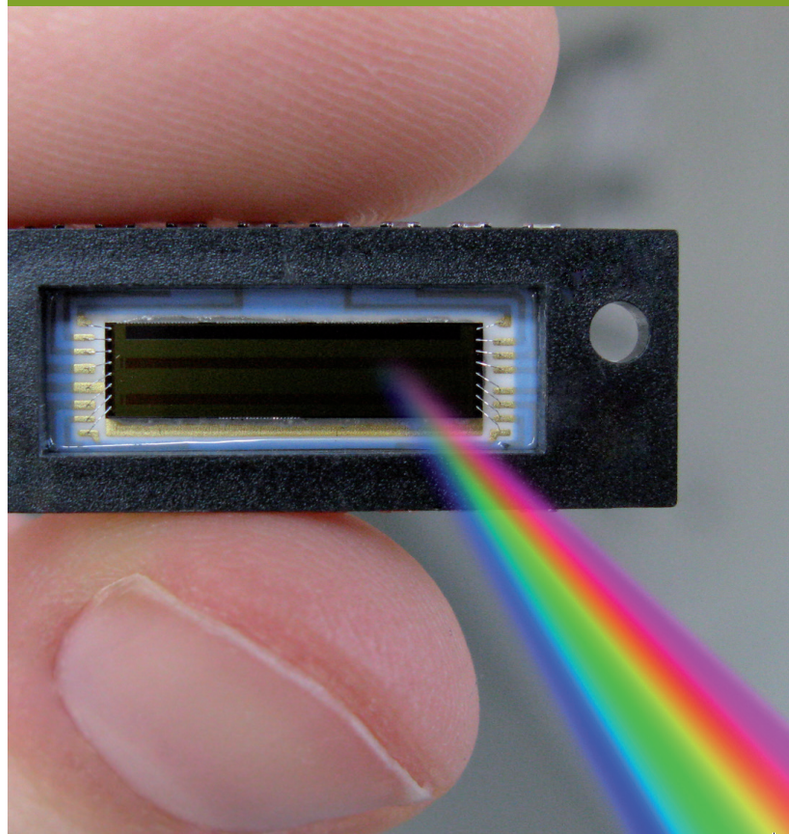
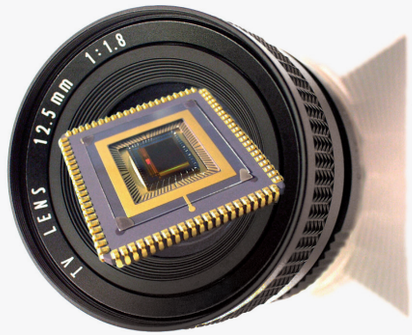
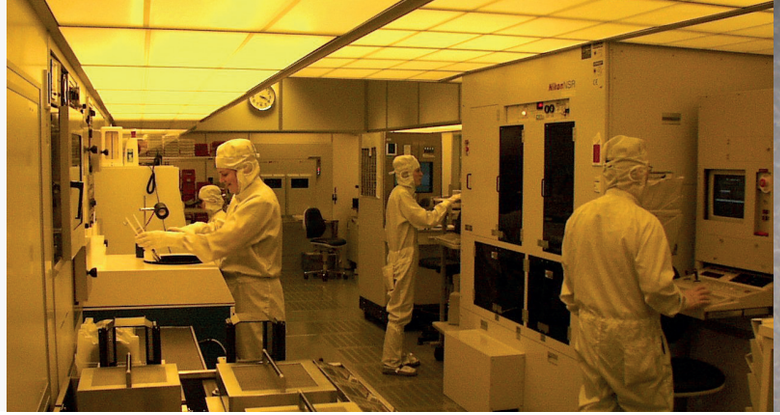
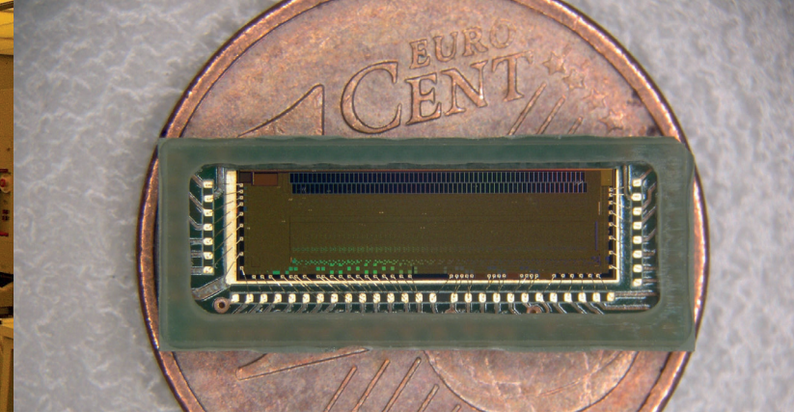
CMOS IMAGE SENSORS









CMOS IMAGE SENSORS

The Fraunhofer IMS has more than 20 years of experience in CMOS photodetector design, processing, and characterization. Our customers benefit from our standard CMOS and SOI-CMOS processes with a feature size down to 0.35 µm optimized for photosensing applications. Furthermore, we offer CMOS post-processing which involves deposition of color filters and microlenses, development of anti-reflection coatings, stitching, wafer thinning, MEMS, or flip-wafer and flip-chip bonding. Our R&D activities cover the spectrum ranging from X-ray over UV, the visible range up to near-infrared, time-gated measurements, 3D imaging, and single-photon counting.

We offer custom designs of photodetectors and image sensors that meet the requirements of specific applications. We provide the complete development of optical sensors, their electrooptical characterization, pilot fabrication, and post-processing.

SERVICE AND KNOW-HOW

- Design of customized image sensors and dedicated optical sensors
- Development and qualification of novel photodetector devices using process and device simulation tools
- Characterization of »test inserts« to extract and monitor device parameters (capacitance, dark current, spectral response, etc.) on wafer and on device level
- Characterization in accordance to EMVA1288 standard on device level
- Testing of CMOS image sensors on wafer and on device level
- Full service from design to fabrication

IMS 0.35 µm CMOS Opto Process Features:

- Stitching
- UV transparent silicon nitride passivation
- Color filter deposition & microlenses

IMS 0.35 µm CMOS Opto Devices:

- Pinned photodiodes (low noise, low dark current)
- Lateral drift-field photodetectors (LDPD)
- High-temperature photodiodes
- Single photon avalanche diodes (SPAD)

REFERENCE PROJECTS

- LDPD-based linear sensor for time-correlated spectroscopy
- Time-of-Flight-based 3D imaging using lateral drift-field pixel structures and pulsed laser illumination
- High-speed RGB line-scan sensor with 600 klines/s
- CMOS single photon avalanche diode sensor array with lowest dark count rates
- UV enhanced HDTV high frame rate CMOS image sensor: 200 fps full frame, flexible ROI readout and UV transparent passivation down to 200 nm wavelength
- High-temperature image sensor: 778 mm^2 chips with 256 × 256 pixels operating in a temperature range between -40 °C and +110 °C
- Triangulation linear sensor designed for high-speed ranging in industrial environment
- Low-power image sensor for eye-tracker: 380 × 288 pixels (CIF) and 400 fps