Optical Sensors - LiDAR
We have a broad expertise in analog mixed-signal integrated circuit design.

We deeply understand our customers’ application needs to create real system innovation.

We are a global player for automotive ASSPs and ASICs. We offer worldwide sales and application support.
CORPORATE KEY FACTS

~7 Elmos ICs
on average in every new car

6 product segments
Motor Control, Lighting, Safety/Power/Custom ICs, Ranging, Optical, Sensor ICs

15 locations worldwide
incl. 6 R&D centers, HQ located in Dortmund, Germany

~40 years of experience
in analog mixed signal IC solutions

1,200 employees
thereof 350+ product developers & engineers
WE ARE LOCATED ALL OVER THE WORLD
PRODUCT SEGMENTS

- RANGING
- OPTICAL
- SENSOR ICs
- MOTOR CONTROL
- LIGHTING
- SAFETY, POWER & CUSTOM ICs
TRANSFORMING USER EXPERIENCE

- Intuitive and robust: Pioneering in automotive gesture control with >50 million ICs in the field
  - Proximity and swipes
  - Object detection
  - Touchless door / trunk access

- Reliable and eco-friendly
  - Presence and motion detection
  - Rain and light sensing
  - Smoke detection

- Development of LiDAR key components
  - Highly efficient iToF and dToF imagers
  - LiDAR read-out ICs
  - Best in class laser diode driver
**OPTICAL SENSORS APPLICATIONS - EXTERIOR**

**HALIOS® CONTROLLER**
FOR PROXIMITY & GESTURE

- Super dynamic gestures and proximity
- Gesture control up to 30 cm, low resolution
- High ambient light immunity
- Cost efficient

**TOF IMAGER**
FOR 3D OBJECT RECOGNITION

- Static and dynamic gestures and object recognition
- Gesture control up to 200 cm, higher resolution
- Low power consumption
- Cost efficient

**SPAD IMAGER**
FOR SHORT/MID RANGE OBJECT AND GESTURE RECOGNITION

- 3D environmental mapping
- High resolution
- High ambient light immunity
- Cost efficient
ELMOS LIDAR FOCUS

Key components for short and mid range LiDAR

Use cases
- City pilot
- Collision avoidance
- Valet parking
- Robotics/Industrial

Elmos Concept
- Solid state solution
- Small sized and cost efficient solution
- Flexible configuration for every performance target
  - 30°, 60° or 120° horizontal field of view
  - Flash or scanning illumination
E527.40: SPAD Imager
- 256 x 80 spatial resolution
- 50m range
- 100kLux ambient light robustness
- Line scanning architecture

E527.50: Integrated Laser Driver
- 1ns ultra short pulses
- 50A high current
- Multi channel
- Compact die stack
- Integrated monitoring
E527.50 4CH ELMOS LASER DRIVER

Fully integrated and powerful IC for LIDAR systems

Key features

- Multichip die-stack for low parasitics
- Fully integrated pulse shaper and gate driver
- 1ns pulse width, 50A peak current at 40V
- 4-chn Laser Driver IC
- Each channel individually addressable
- Integrated Diagnostics
  - IC self-monitoring
  - External connections, laser and capacitor
- Usable with a variety of standard edge-emitting diodes (EELs) and vertical-cavity surface-emitting diodes (VCSELs)
- Automotive qualified

Engineering Samples: available in Q3/2023

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E527.40: 2\textsuperscript{ND} GEN ELMOS SPAD IMAGER

Full digital optical sensor for short range LIDAR

Key features

- Target-range: \textbf{50m} (@10\% reflectivity, 100kLux ambient, 60° vertical FoV)
- \textbf{256 x 80} resolution
- \textbf{On-Chip histogramming} (1MBit high bandwidth memory)
- Highly \textbf{robust against ambient light}
- Supports \textbf{various addressing modes}
  - Row-by-row rolling shutter
  - Line-sensor-mode
  - Digital alignment options
- Integrated \textbf{measurement controller}
- Programmable data-processing
  - Emulated in Software for engineering sample
  - Implemented in hardware for final product
- \textbf{Automotive qualified}

Engineering Samples available in Q2/2025
M404: ELMOS LIDAR STAMP CAMERA

Flash Illumination Solid State LiDAR Camera Demonstrator

System Features
- Fine distance resolution of 1cm
- Framerate up to 20 FPS
- 60 x 25° Field of View
- Range up to 10m

SPAD Detector Features
- 256 x 80 spatial resolution
- Solid State rolling shutter architecture
- Ambient light robust with on-chip histogram

4CH Laser Driver with VCSEL Features
- Power-Driver, gate driver and monitoring on single chip
- 1pcs Lumentum M53-100 400W/100A VCSEL
- Full flash illumination

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3D object recognition for simplified and intuitive operation of interior and exterior applications

- Allows to generate a 3d map of the environment

- Reliable detection of objects, such as hand and foot

- Distinction between persons and objects possible
ToF Imager – E527.31

- 3D information enables object **classification in real time**
- Good cost/performance ratio (**32 x 32 pixel**)
- **High sensitivity** due to large pixel size
- **Low power consumption**
  - Sleep Current: 14 µA
  - Full Operation Mode Current: 2.6 mA
- On board **temperature sensor** for temperature compensation
- **Programmable lightsource** and shutter delay
- **Programmable Q shutter times**
- Wavelength: 850nm to 940nm possible for LEDs, VCSEL and EEL
- **Demo codes** for foot detection and gesture recognition available
E527.31 ELMOS TOF IMAGER

Hand gesture recognition

Key Features

- Static and dynamic gestures and 3D object recognition
- Low power consumption
- Cost efficient
- Support different light sources (EEL, VCSEL, LED)

Application

- Intuitive gestures for controlling of infotainment system
- Skeleton-based detection by Motion Gestures
Innovation Matters
DISCLAIMER

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