# Motor Control Product Portfolio

**elmos**

## VALUE PROPOSITION

- Broad application know-how
  - Support applications from 5W to 3kW
  - Focus on thermal management applications like pumps, fans and actuator (Air flap, EWV, EXV)
  - Benchmark for low noise and high efficiency
  - Innovative IPs for stall detection or adaptive torque

- Product development according FUSA: ISO 26262

- Implementing ARM® Cortex® MCUs for all new controllers

- Preparing production ready software frame work with
  - Software + Reference Boards
  - System level simulation
  - state of the art application development flow
  - integrated motor control algorithm (FOC, ..)
  - speed up design-in time at customers
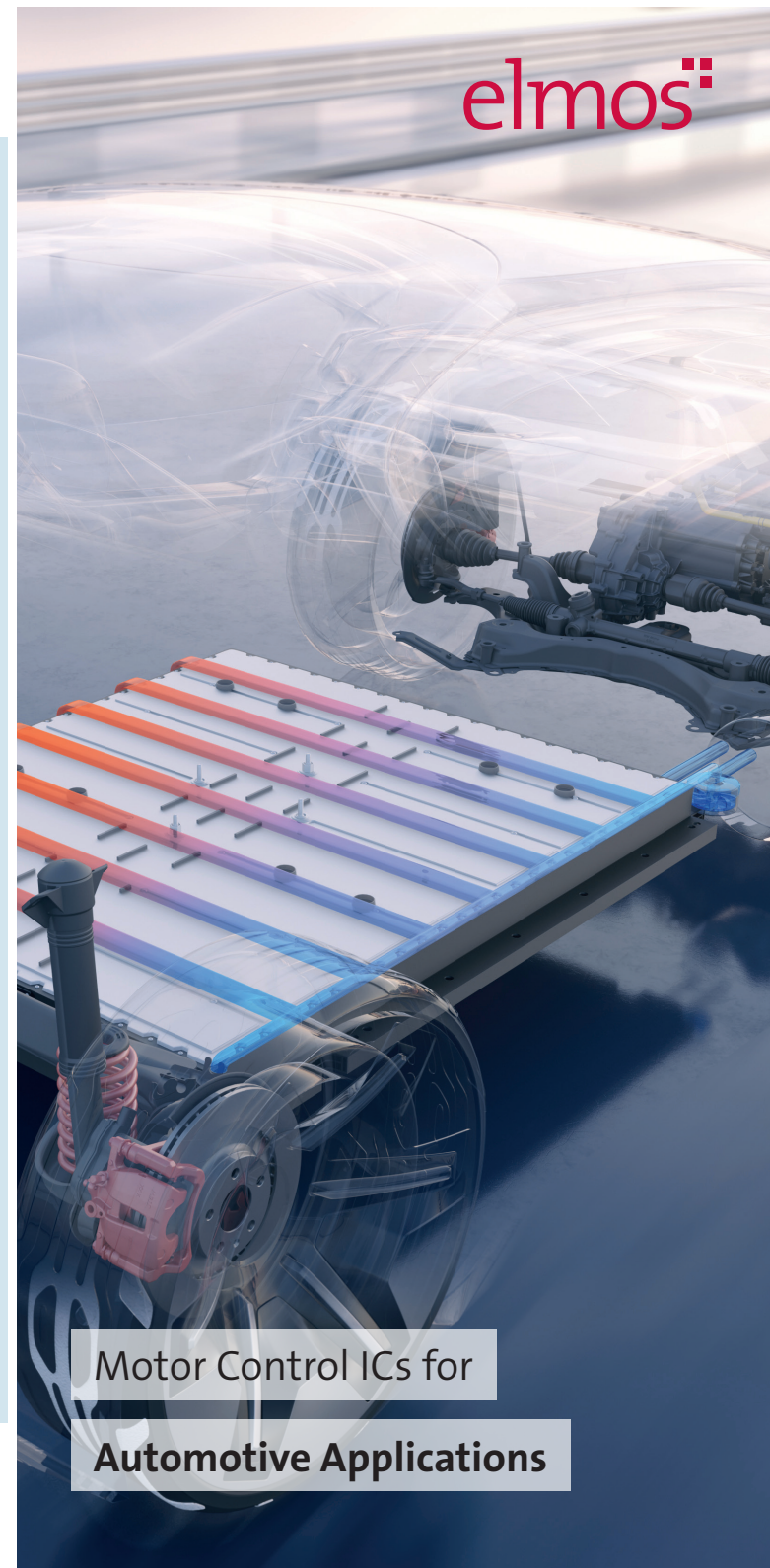  - model based design flow; ASPICE compliant

**MotCoS**
Motor Control System

| | Embedded MCU / SoC | Without MCU |
|---|---|---|
| **Gate driver type** | **E523.06/52**<br>High Performance BLDC Controller<br>E523.06 – 12V<br>E523.52 – 24/48V | **E523.01/50**<br>Smart BLDC Driver<br>E523.01 – 12V<br>E523.50 – 24/48V |
| | **E533.06**<br>Next Generation BLDC Controller<br>**arm** | |
| **Full integrated type** | **E523.42**<br>Integrated Controller for 3ph BLDC (1A)<br>**arm** | **E520.0x**<br>Universal Low Side DriverFamily |
| | **E523.30**<br>Integrated Controller for Bipolar Stepper (800mA) | **E523.39**<br>SPI Driver for Bipolar Stepper(1.2A) |
| | **E523.62/63**<br>Next Generation Universal Integrated Controller Family<br>**arm** | |

**Elmos Semiconductor SE**

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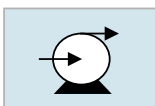
Motor Control ICs for

## Automotive Applications

**Power Range** (3kW → 5W)

## Applications

- Engine Cooling Fans
- HVAC Blowers
- Coolant Pumps
- Seat Ventilation
- Valves
- Active Grille Shutter
- Air Vent & Flaps

- First BLDC driver in 2006
- Evolution from driver to highly integrated solutions
- >250 million ICs since 2009

**Gate Driver**
- MCU
- Gate Driver
- External MOSFETs

Supporting a wide range of applications with two motor driver product families

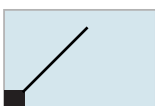**Fully Integrated Drivers**
- MCU
- Gate Driver
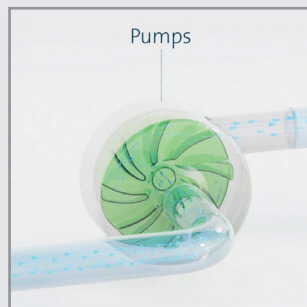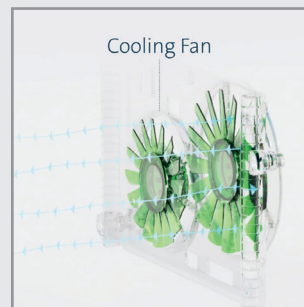- Integrated MOSFETs

- >20 years experience
- Co founder of AK "Klima-Standardaktuator"
- >750 million ICs since 2003



Pumps

Cooling Fan

HVAC Blower

## High performance BLDC driver and controller

### Key Differentiators

- Unique BLDC motor control family for 12V, 24V and 48V board net architecture
- Optimized Motor Control architecture for silent and efficient sensor-less motor algorithm
- Low total system cost of ownership for sensor-less single shunt solution

### Where we are successful

- Applications: HVAC Fan, ECF, Water Pumps, Actuators, others
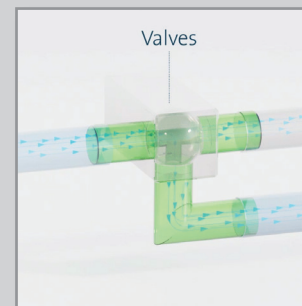- In production at OEMs: Daimler, VW, Audi, GM, Renault, JLR, FCA, other

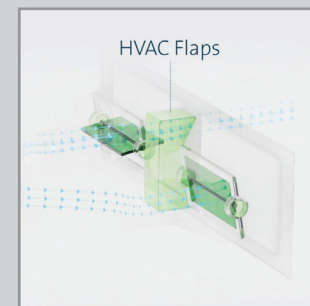## Fully integrated motor driver and controller

### Key Differentiators

- Deep understanding of architecture and system requirements for smart actuator
- Highest integration level for optimized system cost
- LIN auto-addressing
- High performance & silent motor control
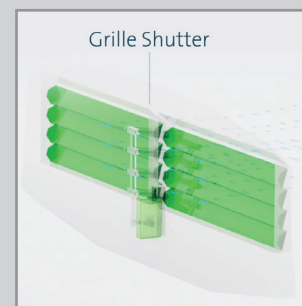
### Where we are successful

- High market share for smart LIN actuator control
- #1 for smart LIN HVAC flaps actuator control
- In production with Active Grill Shutters and Electrical Water Valves at major OEMs

Valves

HVAC Flaps

Grille Shutter