Motor Control

elmos

EXPERTS FOR AUTOMOTIVE ICs

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.

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CORPORATE KEY FACTS

6 Elmos ICs

on average in every new car

6 product segments

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

16 locations worldwide

incl. 7 R&D centers, HQ located in Dortmund, Germany

35+ years of experience

in analog mixed signal IC solutions

~1,150 employees

thereof 350+ product developers & engineers

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WE ARE LOCATED ALL OVER THE WORLD

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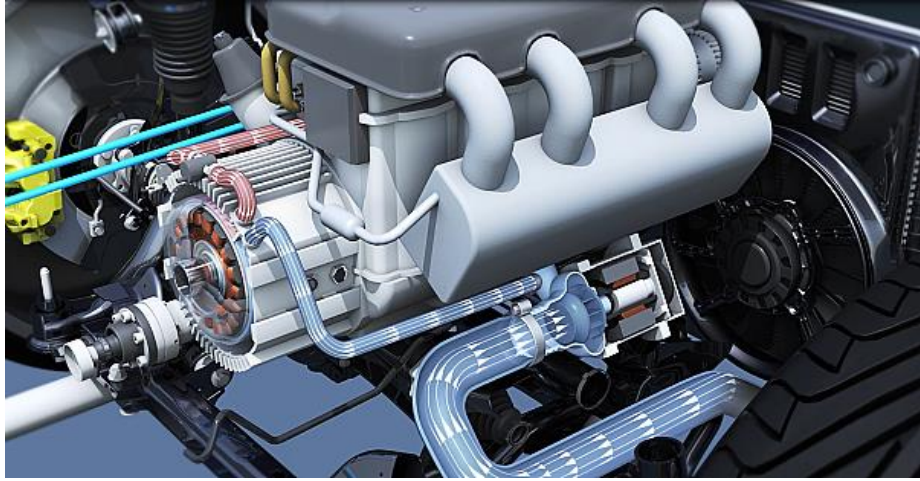
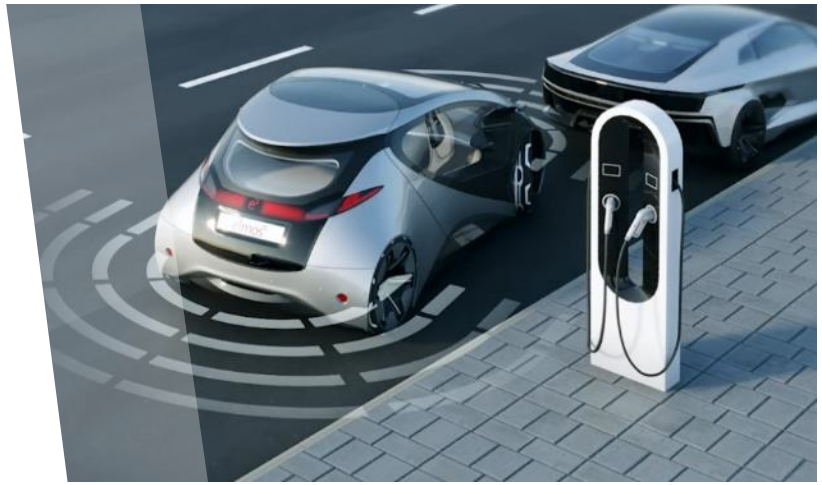
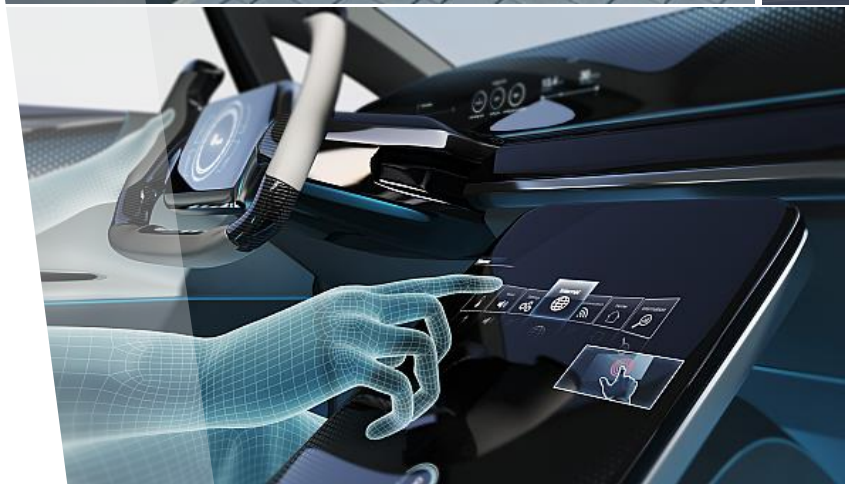
PRODUCT SEGMENTS

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



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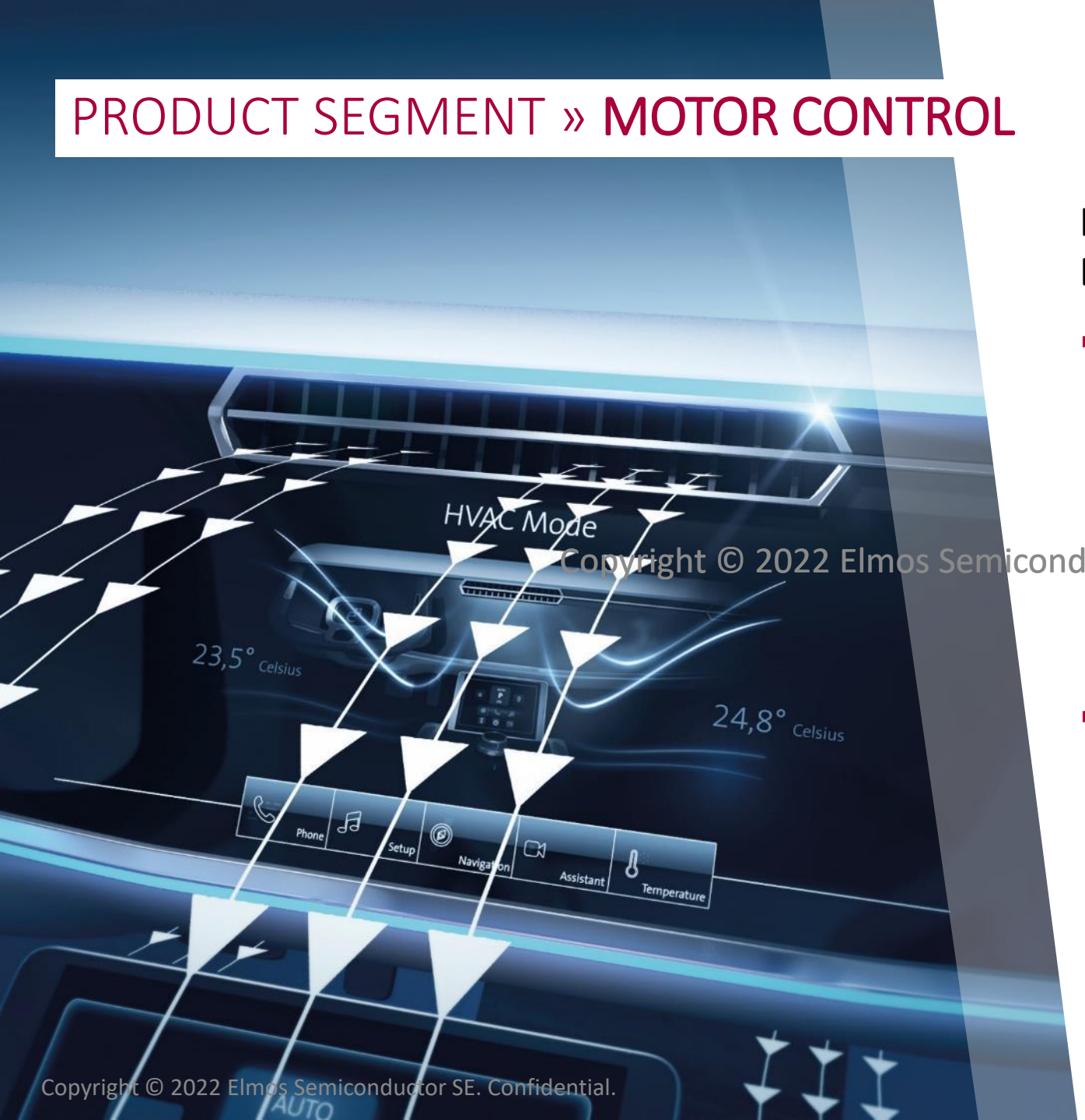
PRODUCT SEGMENT » MOTOR CONTROL



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HIGHLY INTEGRATED MOTOR CONTROL ICs: BEST PERFORMANCE AND LOW SYSTEM COST

- Broad product portfolio for DC, Stepper and BLDC motors
  - Unique BLDC motor control family for 12V, 24V and 48V board net architecture for typical 5W up to 3000W motors
  - Advanced motor control algorithms for sensor-less drives
- Innovative ICs for motor driven HVAC systems
  - #1 for smart HVAC actuators
  - 500+ million ICs delivered
  - Benchmark for low noise and high efficiency

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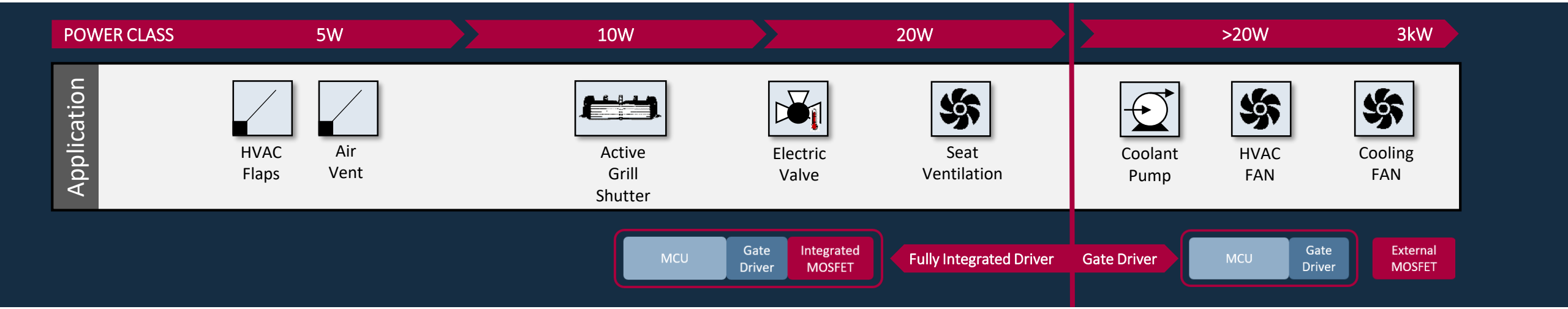
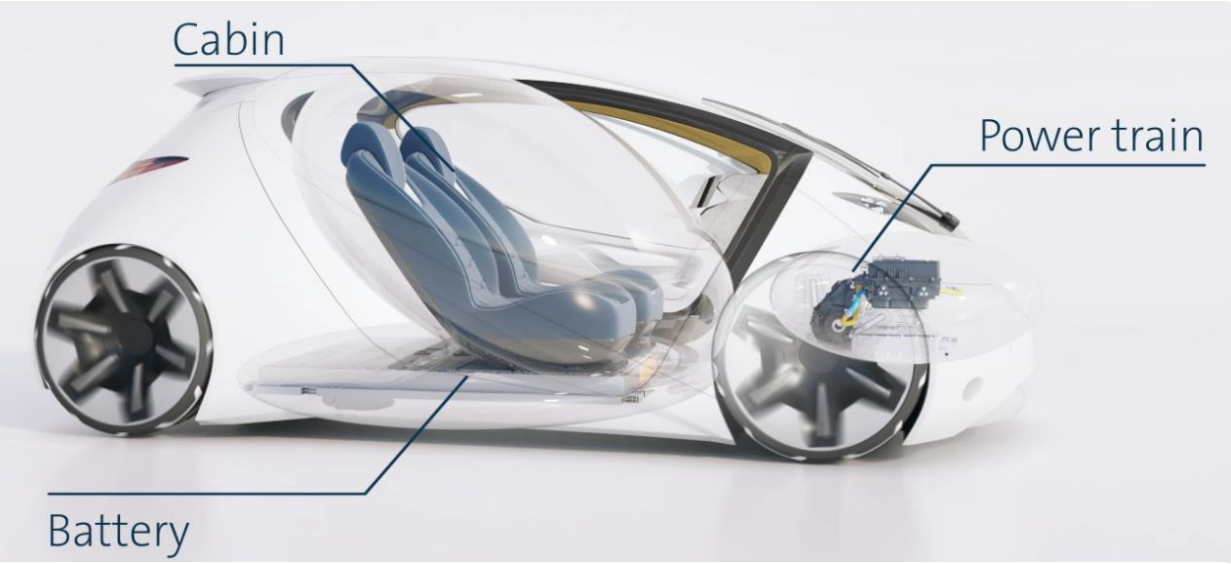
MOTOR CONTROL FOR THERMAL MANAGEMENT





- Elmos provides high integrated motor control solution for all kind of Thermal Management applications:
  - High Power BLDC Drivers/Controllers for Pumps, Fans and HVAC Blowers
  - Small/Medium Power Integrated Drivers for HVAC Flaps, Grille Shutters, Valves, Seat Ventilation and Small Pumps
- Supporting power range from 1W to ~3kW

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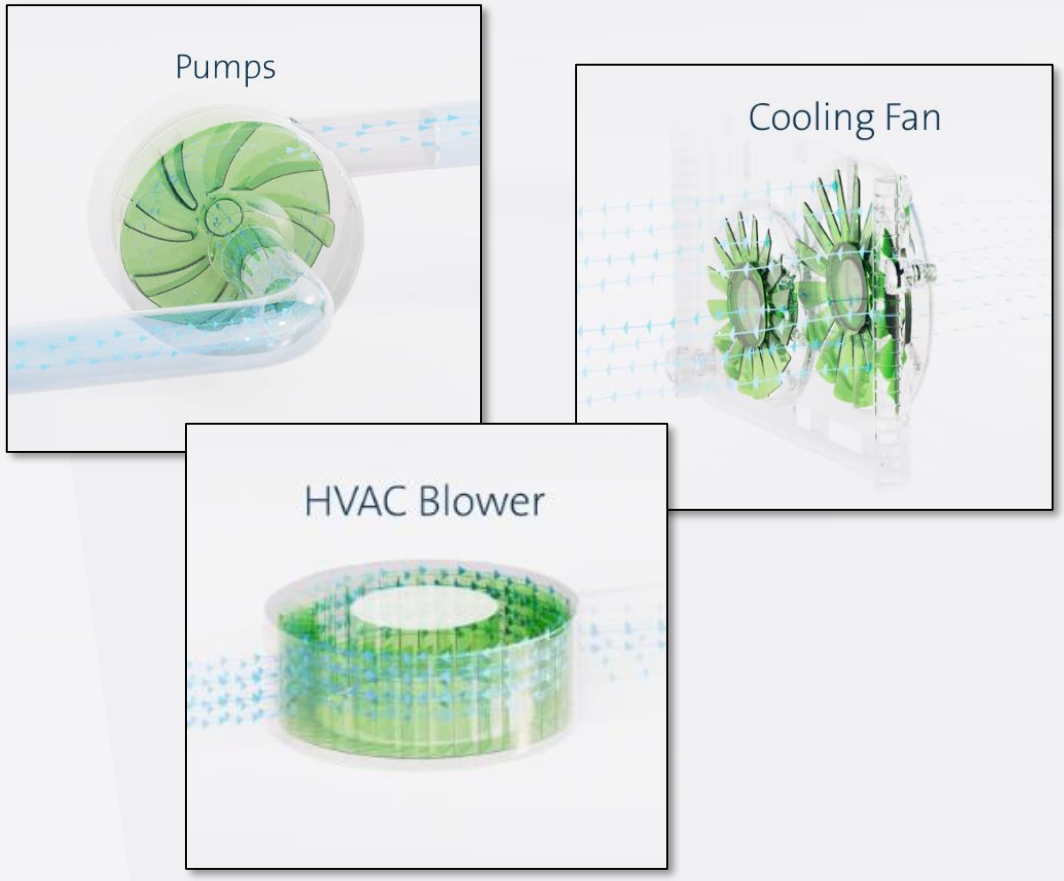
HIGH PERFORMANCE BLDC DRIVERS/CONTROLLERS FOR ROTARY DRIVE

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

- Thermal management applications:
  HVAC Fan, ECF, Water Pumps, other
- In production at OEMs:
  Daimler, VW, Audi, GM, Renault, JLR, FCA, other



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E523.06/52

High Performance BLDC Controller

Key features

- Modular concept to support 12/48V applications with same architecture
  (E523.06 – 12V; E523.52 – 48V)

- Fully integrated and optimized peripherals for sensor less FOC operation
  (fast Op-Amp; PWM/ADC accelerators)
- Embedded 16bit MCU with Hybrid Memory Concept:
  32kB Flash + 24/16kB ROM (including LIN stack)
- Dedicated SW knowhow and support from Elmos and proven partners

AVAILABLE!

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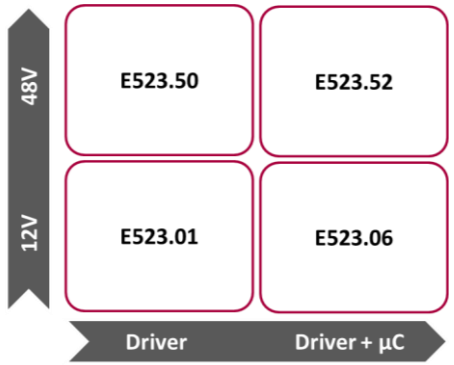
E523.01/50

Smart BLDC Driver

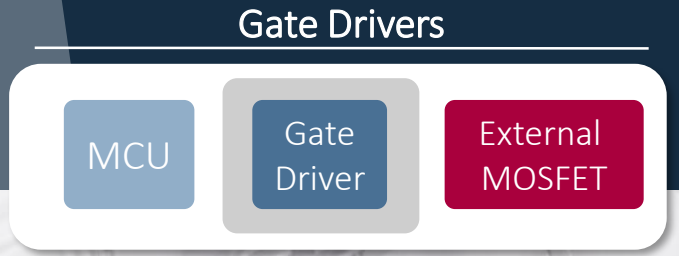
Key features

- Push-pull gate driver for B6-NMOS Bridge

- Modular concept to support 12/48V applications
  E523.01 – 12V
  E523.50 – 48V



- Fast current sense amplifier
- Integrated BEMF Interface
- Programmable dead time



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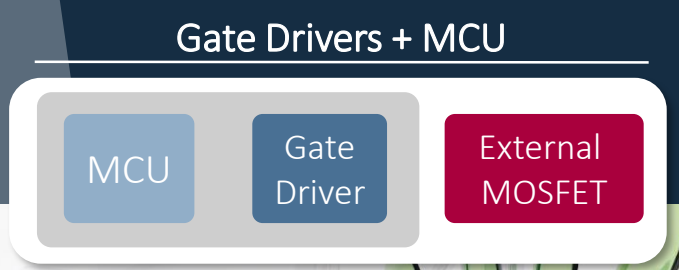
E533.06

Next Generation BLDC Controller

Key features

- High performance ARM Cortex M4 @40MHz with 96kB Flash and no memory wait states
- Optimized measurement unit with fast Op-Amp, and ADC & PMW HW accelerators
- Developed according FUSA: ISO 26262 compliance
- Optional software frame work MotCoS including a high efficient motor control algorithm and a standardized application interface

- E533.06 enables best in class system efficiency, acoustic performance and cost of ownership for embedded sensor-less single shunt solution



IN DEVELOPMENT

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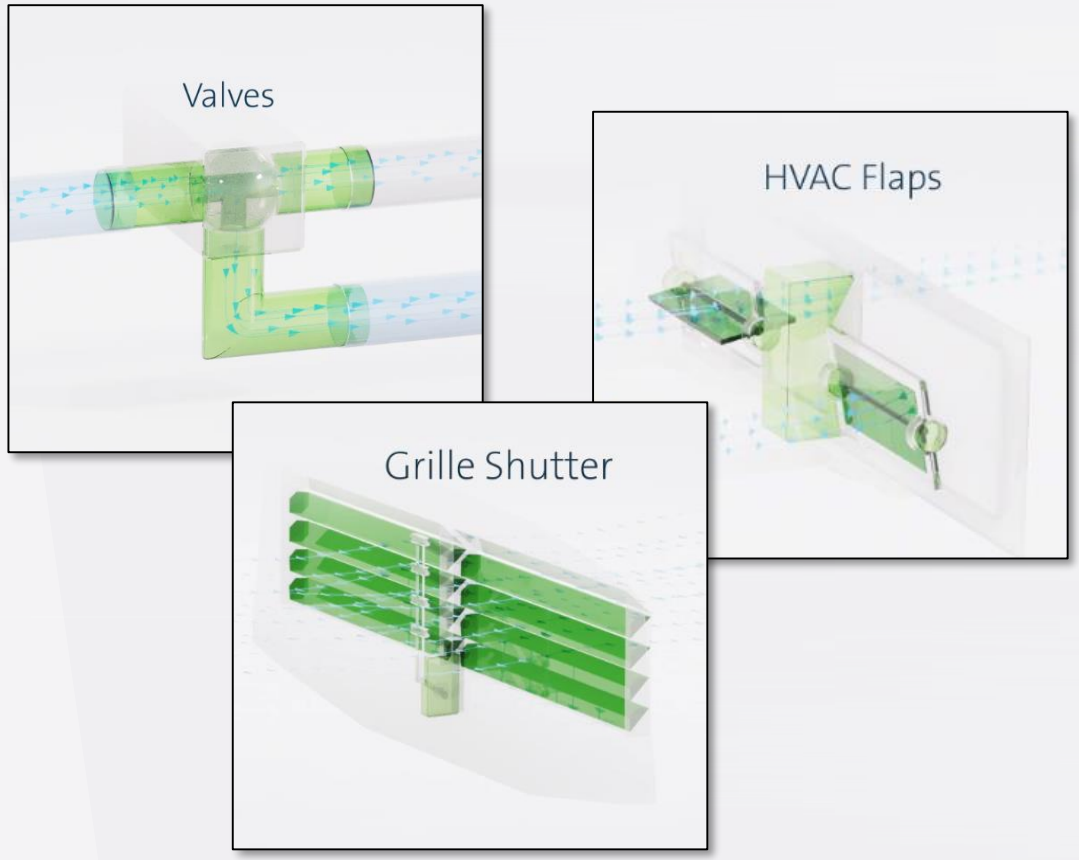
INTEGRATED DRIVERS FOR ACTUATOR DRIVE

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 HAVC flaps actuator control
- In production with Active Grill shutter and Electrical Water Valves at major OEMs



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E523.42

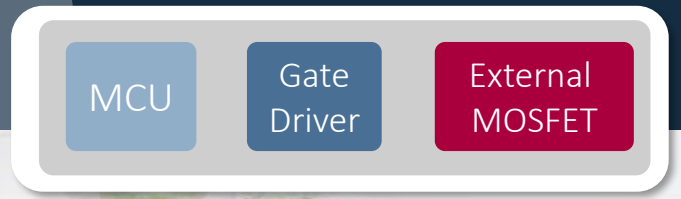
Integrated Controller for 3 phase BLDC

Key features

- Internal current/voltage/temperature sensing (no shunt needed)
- High resolution & fast ADC for precise measurement
- PWM generator can trigger core independent configurable measurements
- Supports sensor-less FOC operation
- Embedded ARM Cortex M0 core with 32kB OTP Program Memory and 24kB ROM
- Flexible GPIO and power supply block

- E523.42 provides the most complete set of internal functions for motor control

Integrated Drivers



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E523.39

Smart SPI Stepper Driver

Key features

- Optimized for:
  - very silent motor run
  - low number of external components
- Fully integrated Stall Detection function with complete post processing
- Unique Fail Current Detection which detects changing motor parameters before the motor stops working.

- E523.39 enables the implementation of innovating feature such as adaptive holding torque with programmable brake force or adaptive run currents.

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E523.71

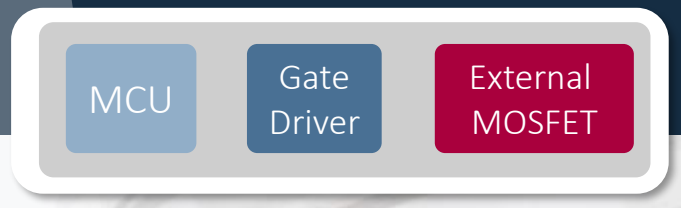
New Smart LIN Driver for Brushed DC actuators

Key features

- Integrates all needed components to support a Smart LIN Brushed DC Actuator
- Enables optimized PCB size by small package SO8
- Supports up to 700mA output current and smooth speed control by PWM.
- Analog input for sensor based position detection
- Includes integrated motor control and standard actuator application firmware

- E523.71 enables lowest total system cost of ownership due to full integration and reduced need for external components.

Integrated Drivers



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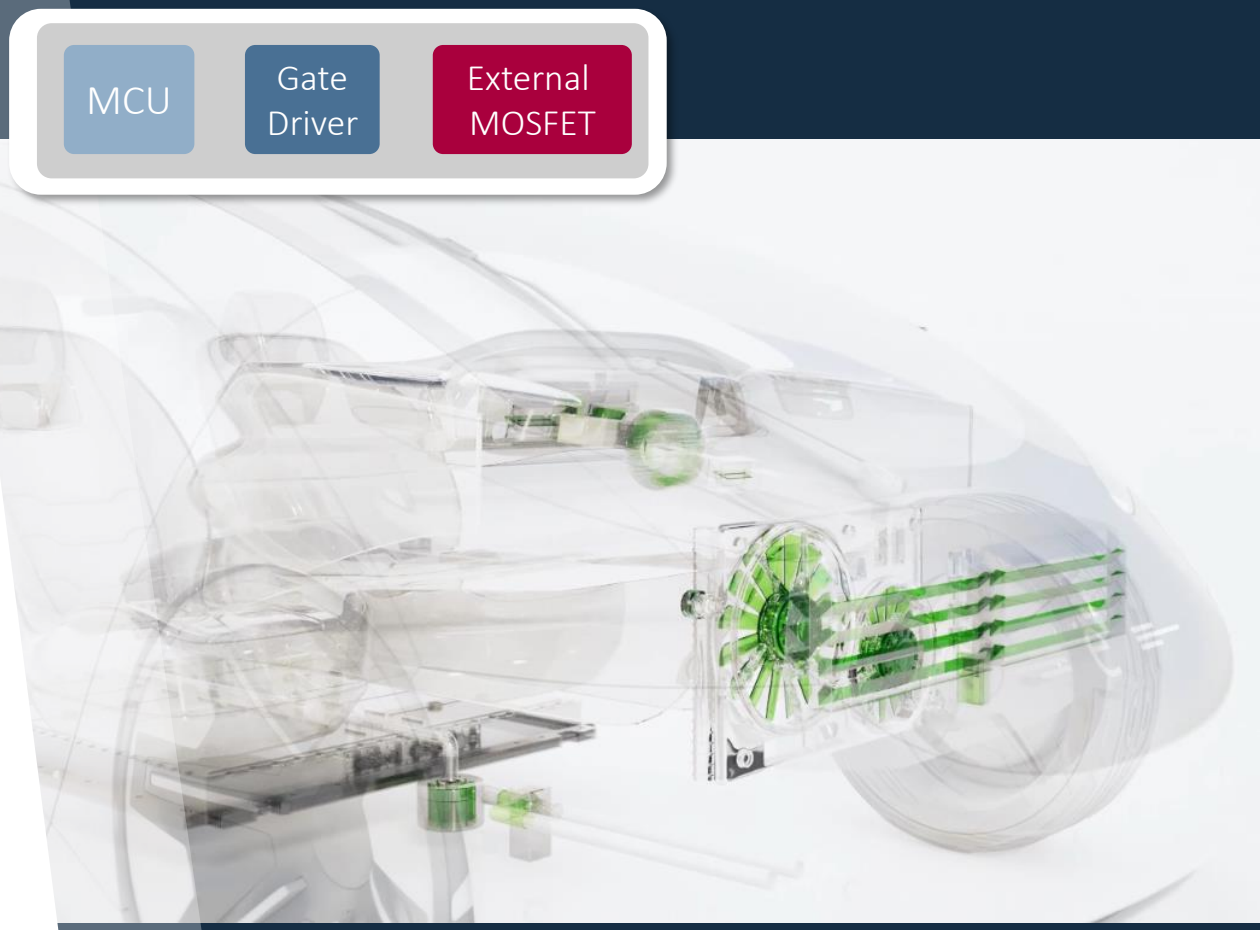
E523.62/63/64

Next Generation Universal Smart LIN Motor Controller

Key features

- Family concept to support large power range (400mA, 1000mA, 2000mA)
- Continuous 3phase sensing by integrated current mirrors
- LIN 2.x compliant to SAE J 2602, ISO17987 incl. LIN AA+
- Optional software frame work MotCoS including a high efficient motor control algorithm and a standardized application interface

- E523.62/63/64 enables lowest total system cost of ownership for Smart actuators driven by Brushed DC, Bipolar Stepper Motors or BLDC motors.



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Innovation Matters

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