



## Application brief

# Seat Control Module

The seat and its functions are an essential part of cabin comfort and safety and as one of the direct interfaces to the driver and passengers, it is an important contributor to the user experience and a differentiator for the car-makers. Today, high-end seats combine **applications** for:

- › **Seat adjustment or seat movement**, e.g., the setting of position, height, length, width, angle, back angle, and also headrest position and angle
- › **Seat comfort**, e.g. dynamic bolsters, lumbar support, massage, heating, cooling and/or ventilation, “air-scarf”, entry aid, and individualized adjustment memory

As modern seat modules take on additional functions, they have a comparable complexity to body control modules with similar challenges in meeting requirements for supply, communication, sense, actuation and control, and quiescent current targets. To manage seat control modules in the smallest space and with the lowest power dissipation and low quiescent current, **integration** of functions is one of the key factors for design.

The Infineon product portfolio here is best prepared and offers many product families with high integration:

- › OPTIREG™ **SBC** (System Basis Chip) gathers in one product a system supply, communication interface, diagnosis, switching functions, and failsafe output with best-in-class quiescent current
- › MOTIX™ **DC Motor System IC** combines supply, communication, diagnosis, switching functions, and failsafe output along with half-bridge gate drives
- › MOTIX™ **Multi MOSFET Driver IC** to control up to eight Half-Bridges (with external MOSFETs) with best-in-class quiescent current
- › MOTIX™ **single half-bridge IC (NovalithIC™)**, low ohmic protected single Half-Bridge Switch (with integrated MOSFETs)
- › OptiMOST™ MOSFET Family offers a broad portfolio designed to help you reduce system costs and size

As with many power motor control designs, one of the critical aspects is controlling **EMC emissions** during PWM operation. The Infineon MOTIX™ products here ([Single half-bridge IC \(NovalithIC™\)](#), [Multi MOSFET Driver IC](#) and [DC Motor System IC](#)) include features (e.g. Adaptive MOSFET Control) that avoid the compromise between EMC performance and power dissipation.

An additional challenge for the seat module designer is the increasing number of configurable variants driven by a car manufacturer’s platform strategy. To easily support the diverse variants with a single PCB design, **scalability** within product families has become necessary. Infineon’s [TRAVEO™ T2G](#) MCU family has a range of memory and I/O capabilities to support a flexible platform design, and the [PROFET™](#) family of smart high side power switches, for example, has the most scalable portfolio of high side switches in the market.

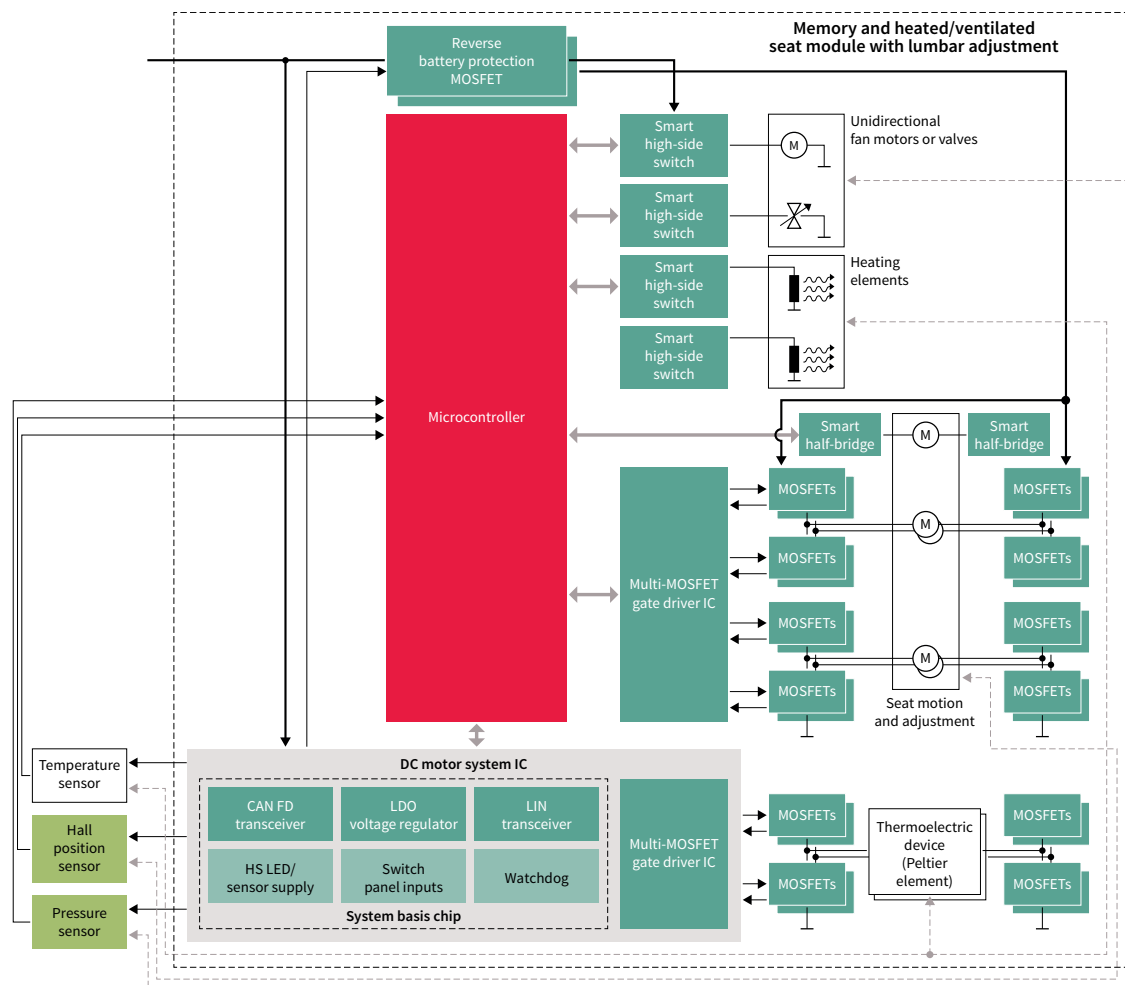
The monitoring functions of the seat control are found off-board, outside of the main ECU, such as XENSIV™ [Hall sensors](#) for tracking seat position, or XENSIV™ [absolute pressure sensors](#) which indicate the state of air bladders used in lumbar adjustment, massage or active bolster control.

### System benefits

- › **Energy Efficiency:** Best in class q-current and operating currents with Infineon’s smart power devices and TRAVEO™ T2G µC with low power standby and operation modes.
- › **Scalability & Flexibility:** Power devices, sharing one package to support scalable Seat Control Unit designs, enabling change of devices with low impact. Modular & flexible TRAVEO™ T2G µC family.
- › **Reliability & Robustness:** Extremely low ppm rate. Qualification according AEC-Q100 with additional measures beyond the standard.



## Seat Control Unit



## Suggested products

Product type	Description
Supply & Communication	OPTIREG™ Linear, CAN and LIN Transceivers and OPTIREG™ System Basic Chip
Microcontroller	TRAVEO™ T2G Family
DC Motor Control IC	MOTIX™ Motor System IC (half-bridge drivers with supply & communication)
High Side Switches	PROFET™ +2 Smart High Side Switches
Single Half-Bridge IC	MOTIX™ Smart Half-Bridge (NovalithIC™)
Multi MOSFET Gate Driver IC	MOTIX™ Multi MOSFET Driver IC
MOSFET	OptiMOS™ 6 40 V normal level MOSFET in SSO8 package
Sensor	XENSIV™ Hall Sensors and Pressure Sensors



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Published by  
Infineon Technologies AG  
Am Campeon 1-15, 85579 Neubiberg  
Germany

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Date: 01/2022

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