

Automotive Application Guide

We make cars clean, safe and smart.

Table of contents

Abstract	3
1 ADAS & autonomous driving	4
1.1 Domain controller for ADAS and autonomous driving	5
1.2 In-Cabin Monitoring System	6
2 Body electronics and power distribution	7
2.1 Automotive Power Distribution	8
2.2 Door Control Module	9
2.3 Smart Car Access	10
2.4 Smart power closure system	11
2.5 Zonal 48 V to 12 V DC-DC converter	12
2.6 Zone control unit	13
3 Chassis control & safety	14
3.1 Electro-mechanical braking system (EMB)	15
3.2 Steer by Wire	16
4 Electric vehicle (EV) drivetrain system	17
4.1 Automotive battery management system (BMS)	18
4.2 High-voltage DC-DC converter for electric vehicles	19
4.3 High-voltage DC-DC converter for commercial vehicles	20
4.4 On-board charging (OBC) for electric vehicles	21
4.5 OBC for commercial vehicles	22
4.6 EV traction inverter	23
4.7 Traction inverter for electric commercial vehicles	24
5 In-vehicle infotainment (IVI) & HMI	25
5.1 High-performance cockpit controller	26
5.2 Automotive USB-C power and data solution	27
6 Light electric vehicles	28
6.1 BMS solution for electric two- and three-wheelers	29
6.2 Smart instrument cluster for two- and three-wheelers	30
6.3 Traction inverter solution for electric two- and three-wheelers	31
7 Thermal management system	32
7.1 Automotive integrated thermal management system (ITMS)	33

Abstract

We make cars clean, safe and smart.

Infineon Technologies AG is a leading player and pioneer in automotive electronics. Our enduring success in this field is due to a clear strategic focus on automotive applications and standards, along with the understanding and insights that have emerged from over 40 years of dedicated experience and our ability to continually innovate this market with a broad portfolio of outstanding quality. Our sensors, microcontrollers and power semiconductors help automotive manufacturers achieve their increasingly challenging safety, affordability and efficiency targets. Above all, we are helping to create more sustainable mobility choices by lowering emissions and fuel consumption.

Paving the way for more sustainable mobility choices

In a more and more mobile society, carbon dioxide emissions are rising and fossil fuel reserves are dwindling. The automotive industry faces the challenge of powering today's mobile lifestyle while simultaneously reducing its carbon footprint. Electronic components play a key role in improving energy efficiency. The demand for alternative, more energy-efficient forms of mobility is increasingly geared toward electromobility. Drivetrain electrification, whether in hybrid electric vehicles or – ultimately – fully electric vehicles, has the advantages of higher energy efficiency and zero tailpipe emissions. As the world leader in automotive and advanced power electronics, with over ten years of experience in electromobility, Infineon delivers a broad suite of best-in-class microcontrollers, power semiconductors and sensors that are helping to solve today's electromobility challenges. As we transition toward greater electromobility, Infineon is also working with leading car manufacturers and system suppliers to improve the energy efficiency of combustion engines and the various subsystems in today's vehicles. We offer a range of dedicated products and solutions targeting hotspots such as demand-driven accessories, energy management and electric power distribution. These solutions embody Infineon's commitment to the exceptional quality and reliability that the world's leading vehicle manufacturers expect.

Reducing road fatalities

New Car Assessment Programs (NCAP) and governments all over the world have set ambitious road fatality reduction targets. The automotive industry actively contributes to road safety by developing and evolving technologies that reduce the likelihood or impact of accidents, for example by improving reactive airbag and stability control systems. Similarly, new active safety features include adaptive cruise control and lane departure warning, where the vehicle acts proactively before a crash occurs. Infineon is continuously optimizing chipsets that enable safety features designed to reduce the number of road accidents. With the most rigorous Euro NCAP in mind, we lead the field in many safety innovations for passive, active and preventive safety systems, such as RADAR technologies. Complying with functional safety requirements

The increasing number of electronic systems leads to ever more considerations regarding the functional safety of vehicle systems. Infineon has adopted the ISO Standard 26262 for designing the appropriate products but also for setting up the appropriate processes for the development of such products.

Meeting increased data security demands

As system complexity in cars increases, so does the volume of data to be processed and distributed. Therefore, automakers need to ensure that information is processed securely and protected against external access and manipulation (e.g. car tuning or counterfeit spare parts). Furthermore, new payment methods, such as parking fees or road tolls, require a secure flow of transaction data. Infineon can draw on years of expertise in chip card and identification systems to propel automotive data security to the next level.

1 ADAS & autonomous driving

Cutting-edge solutions to accelerate the future of driving

Towards autonomous driving with automotive ADAS technology. Excellent progress in advanced driver assistance systems (ADAS) - including lane departure warning, emergency braking and distance control - has put us on the fast track to fully autonomous cars.

Achieve ASIL classification with ISO 26262-compliant ADAS solutions

New devices include high-speed interfaces, integrated hardware acceleration, enhanced ECU validation, and instrumentation tools. All ADAS devices are designed according to the ISO 26262 safety methodology, meaning they are capable of making automatic decisions to assist the driver in use cases such as emergency braking.



1.1 Domain controller for ADAS and autonomous driving

Elevate advanced driver assistance system (ADAS) and autonomous driving (AD) design features with Infineon's automotive domain controller solutions. As a trusted partner for sensor fusion applications, Infineon's commitment to quality supports ASIL-D safety requirements, reduces CPU loads, and improves system reliability with dependable products ranging from scalable microcontrollers to radar chips, power components, and much more.

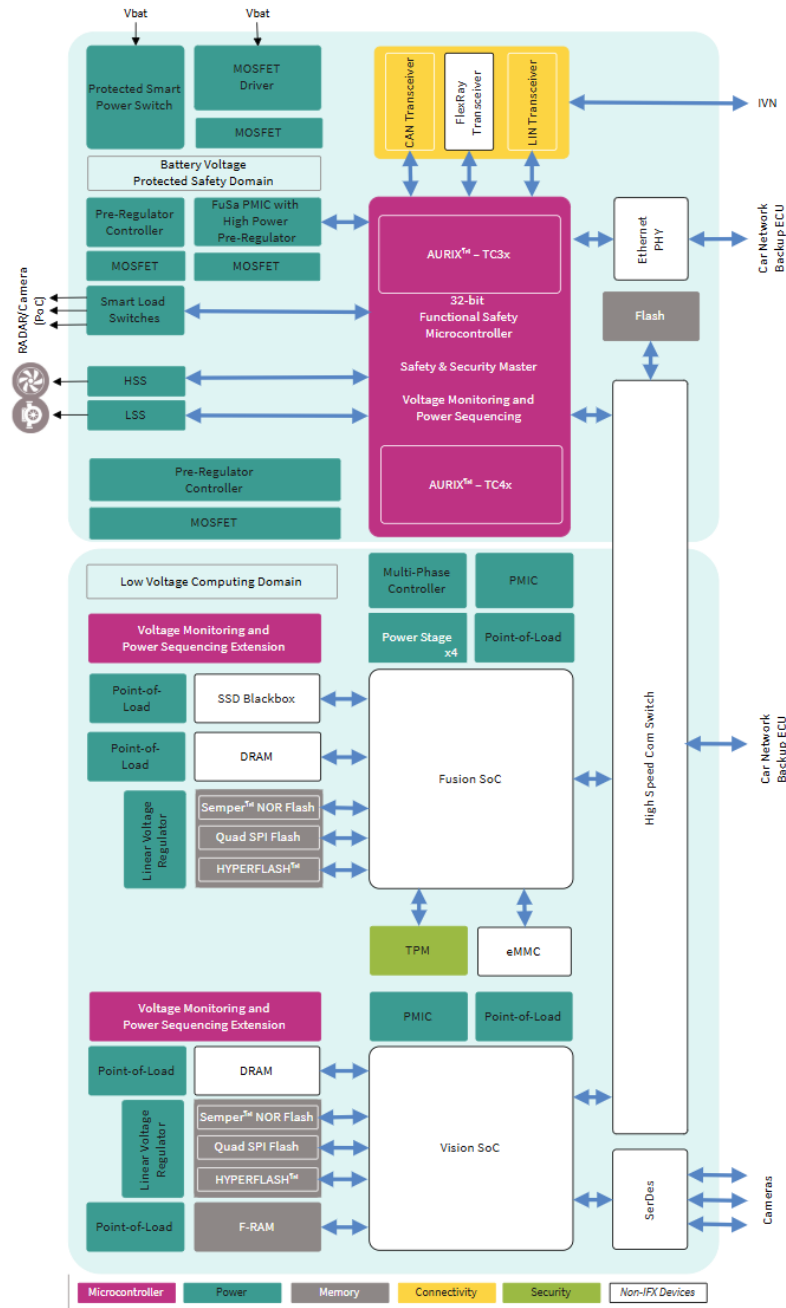


Table Suggested Products

Product Type	Descriptions
Memories	NOR Flash
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
MOSFET	Automotive MOSFET
Power	Gate driver ICs

1.2 In-Cabin Monitoring System

Technology advancements are propelling the need for sensors in advanced driver assistance systems (ADAS), vehicle automation, vehicle connectivity, and new mobility services. With highly automated drive levels, not only are exterior assistance systems being enhanced, the interior of vehicles are also being reshaped to provide a holistic in-vehicle experience using in-cabin sensing technology.

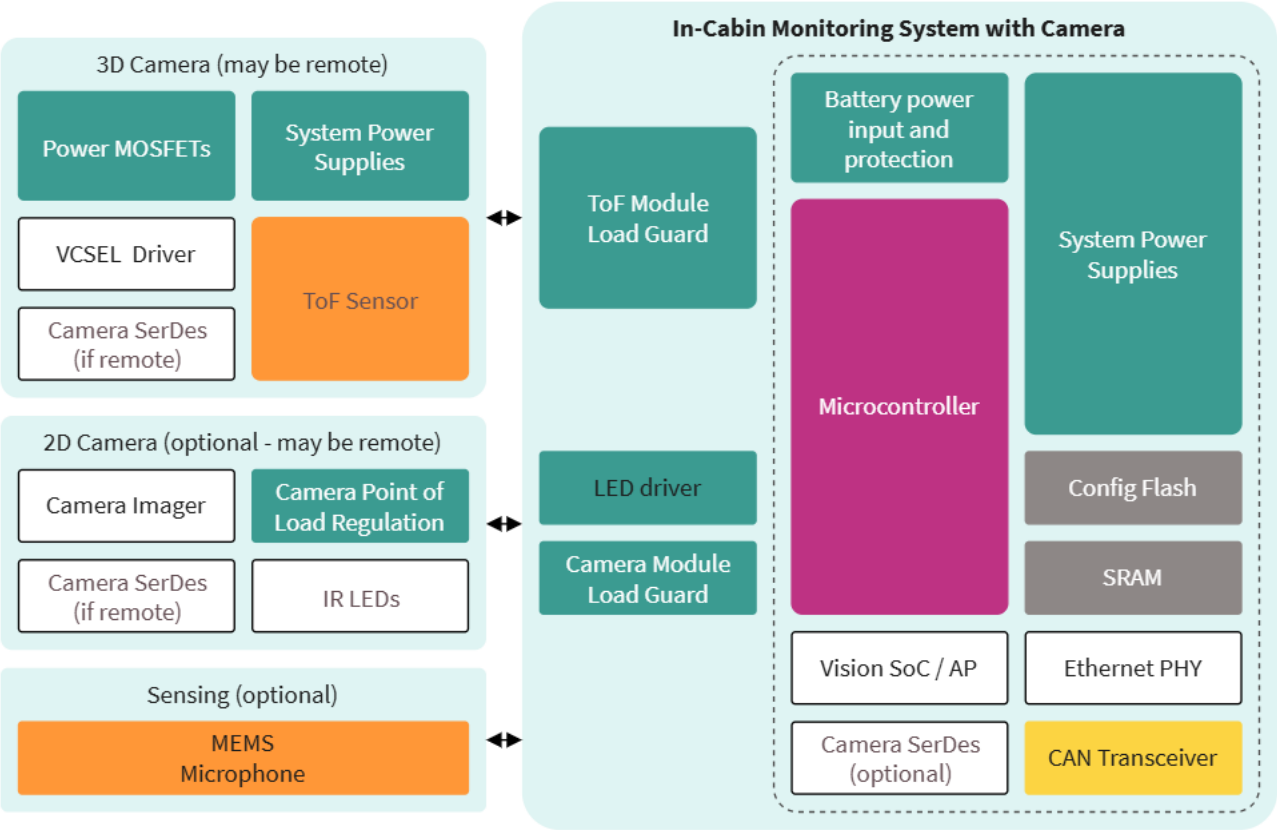


Table Suggested Products

Product Type	Descriptions
Memories	NOR Flash
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
MOSFET	Automotive MOSFET
Power	LITIX™ - Automotive LED Driver IC
Power	Power Supply ICs
Sensor	ToF 3D image sensors for automotive
Transceiver	Automotive Transceiver

2 Body electronics and power distribution

Scalable and flexible automotive body electronics allow you to quickly change your scope to meet new design requirements and follow trends

Automotive body electronics play a vital role in modern vehicles covering a wide spectrum of functions including motor control, body control modules (BCM), lighting, power distribution, and control of modules like doors or seats. With advancements in the automotive industry, automotive body electronics have evolved to not only enhance the existing functions mentioned above but also to encompass a wider range of applications, including the connected gateway and smart car access features.

In this dynamic landscape, the demand for automotive body electronics continues to grow, driven by the need for enhanced comfort, security, multiple functionalities, and seamless connectivity. To meet these ever-changing demands, trends, and requirements, scalability, flexibility, and integrity are key for your automotive body electronics.

For all your needs, explore Infineon's complete portfolio of scalable solutions. Featuring best-in-class products and a range of unique capabilities, Infineon also supports the development of your body applications with our complete system know-how.



2.1 Automotive Power Distribution

Discover the power of seamless energy control with Infineon's automotive power distribution solutions. Rigorously tested to meet the highest standards of performance and reliability across diverse applications, Infineon offers the broadest chipset portfolio for semiconductor-based power distribution units (PDUs). Our PROFET™ smart power switches, MOSFETs and corresponding gate drivers are best-in-class in terms of current scalability and adaptability. While the AURIX™ family enables integration of power distribution functions with high-end computing performance applications, such as zone controllers, the TRAVEO™ microcontrollers serve as a complementary low-end alternative for price-performance optimized power distribution. Complementing this lineup are Infineon's XENSIV™ sensors, OPTIREG™ power supply solutions and communication transceivers, creating a highly interoperable chipset with pin-to-pin compatibility where it matters. This ensures easy adaptation and migration for evolving power distribution unit requirements. Infineon's commitment to quality and innovation simplifies design challenges and accelerates your time-to-market.

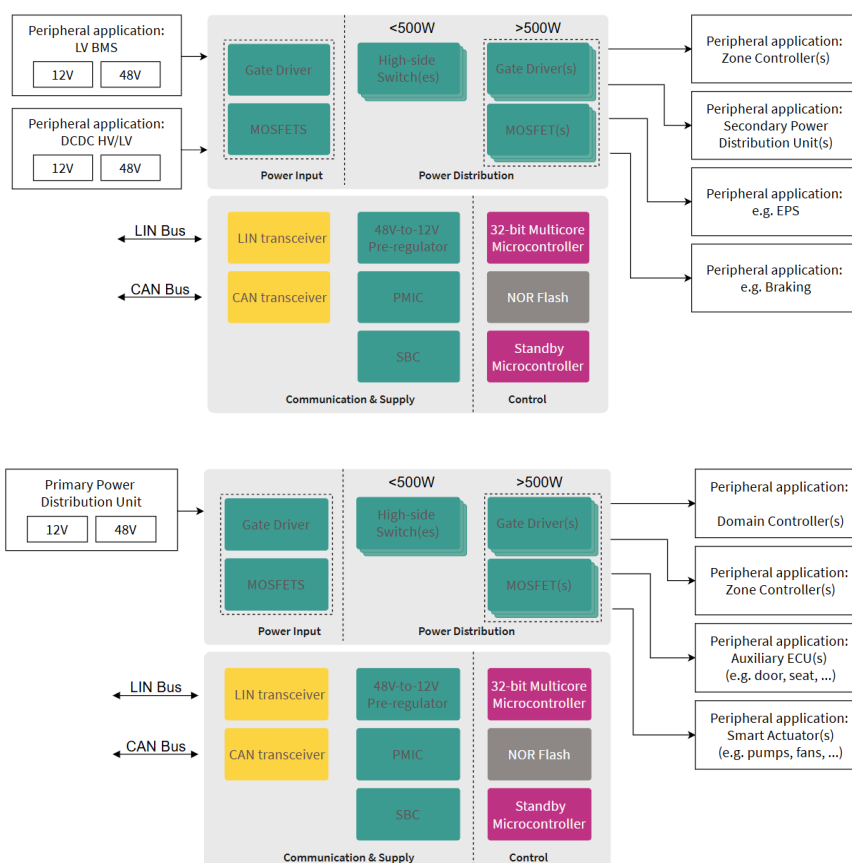


Table Suggested Products

Product Type	Descriptions
Memories	NOR Flash
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	Power Supply ICs
Transceiver	Automotive Transceiver

2.2 Door Control Module

Enhance your designs with a comprehensive door control unit (DCU) system for automotive applications, providing essential functions such as door lock, mirror adjustment, window lift with anti-pinch, and illumination. Rigorously tested to offer unparalleled performance and reliability, the Infineon range of door control module solutions integrates actuators, sensors, and switches for enhanced user experience and safety.

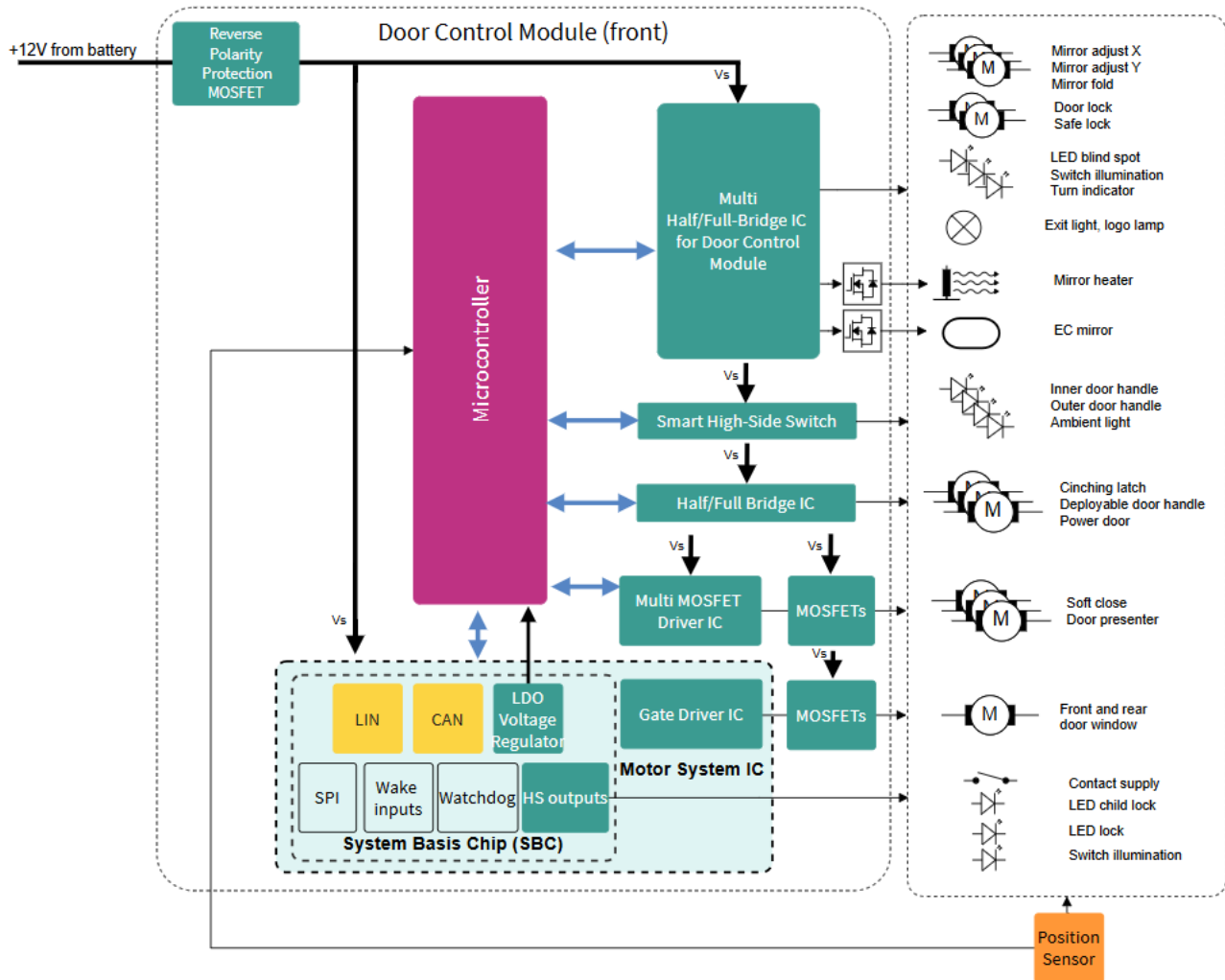


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	Smart power switches
Power	Motor control ICs
Power	Power Supply ICs
Sensor	Magnetic sensors
Transceiver	Automotive Transceivers

2.3 Smart Car Access

Transform vehicle accessibility with our innovative vehicle access solutions. These systems combine secure elements, wireless communication technologies, and energy-efficient computing to enable convenient and secure car access via smartphone, key fob, or NFC smart card. Moreover, the solution provides a secure foundation for advanced features like digital key sharing, multi-car access, subscription mobility, and customizable driving permissions.

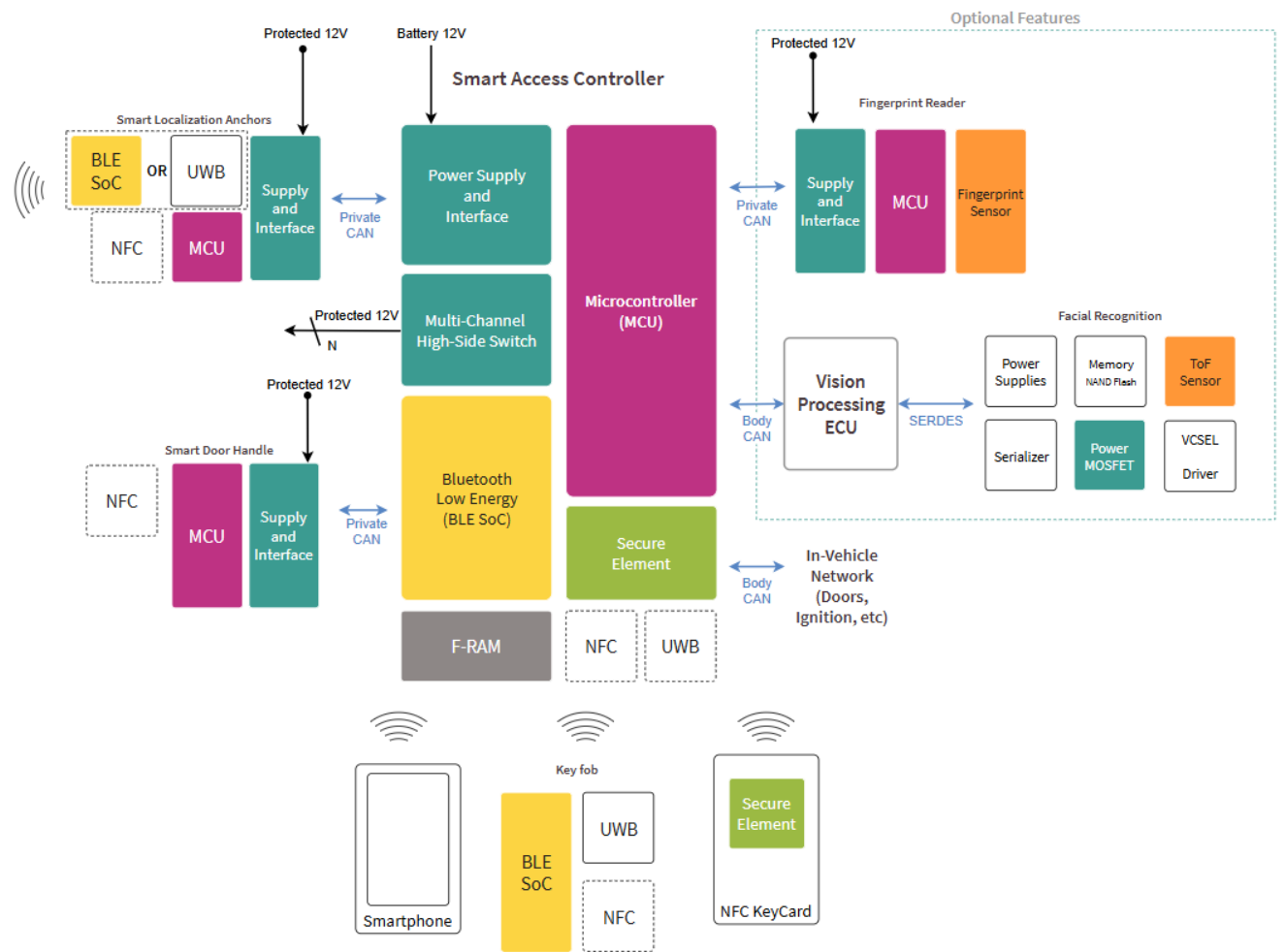


Table Suggested Products

Product Type	Descriptions
Memories	F-RAM (Ferroelectric RAM)
Microcontroller	Automotive PSOC™ 4 Arm® Cortex®-M0/M0+
Power	Smart power switches

2.4 Smart power closure system

Enhance your designs and overall user experience with smart power modules that include vehicle closure features like power lift gates, power sliding doors, power doors, power tailgates, and power convertible tops. Tested to ensure the highest levels of performance, Infineon offers integrated solutions for efficient and compact smart power closure modules that address challenges in EMC emissions control and support scalable design variants.

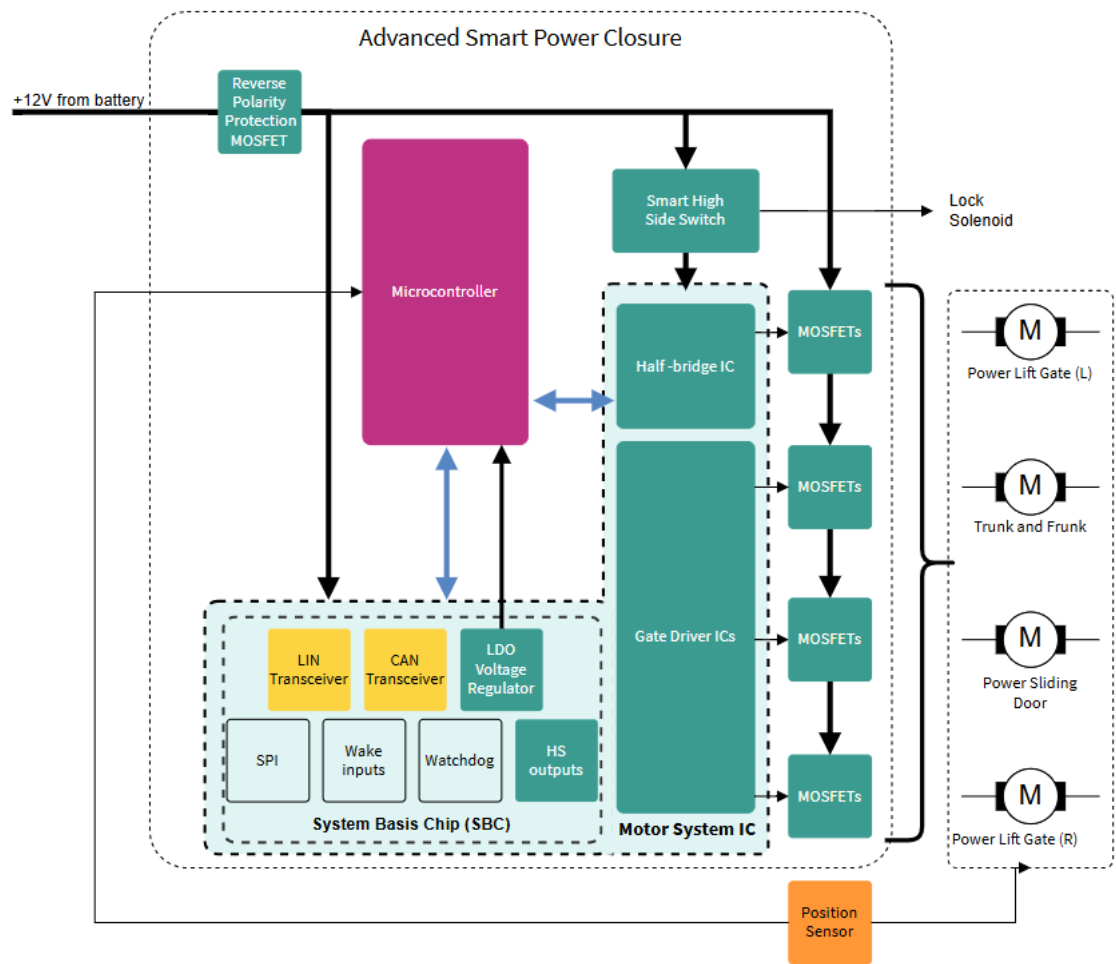


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	Smart power switches
Power	Motor control ICs
Sensor	Magnetic sensors
Transceiver	Automotive Transceiver

2.5 Zonal 48 V to 12 V DC-DC converter

Innovating to 48 V: Lower cost and reduced wiring harness weight are some of the potential values of implementing 48 V as the third voltage rail in electric vehicles. Infineon supports you with tailored zonal 48 V to 12 V DC-DC converter solutions based on Si and future GaN technologies to realize these 48 V-related system cost potentials.

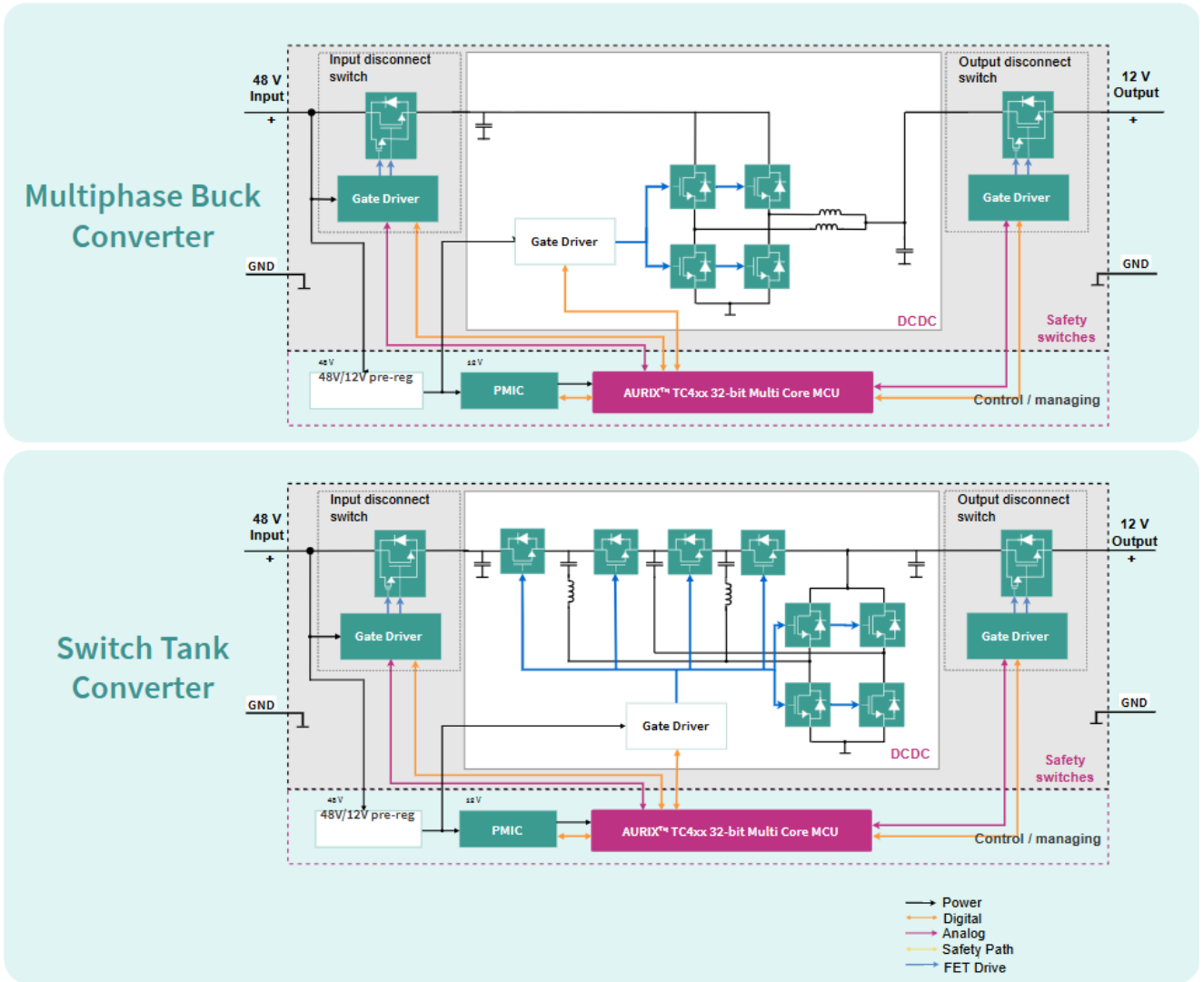


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Power	Gate Driver ICs
Power	Power Supply ICs

2.6 Zone control unit

Efficient aggregation of power distribution, gateway, and multiple load actuations - discover our scalable and flexible zone controller solutions.

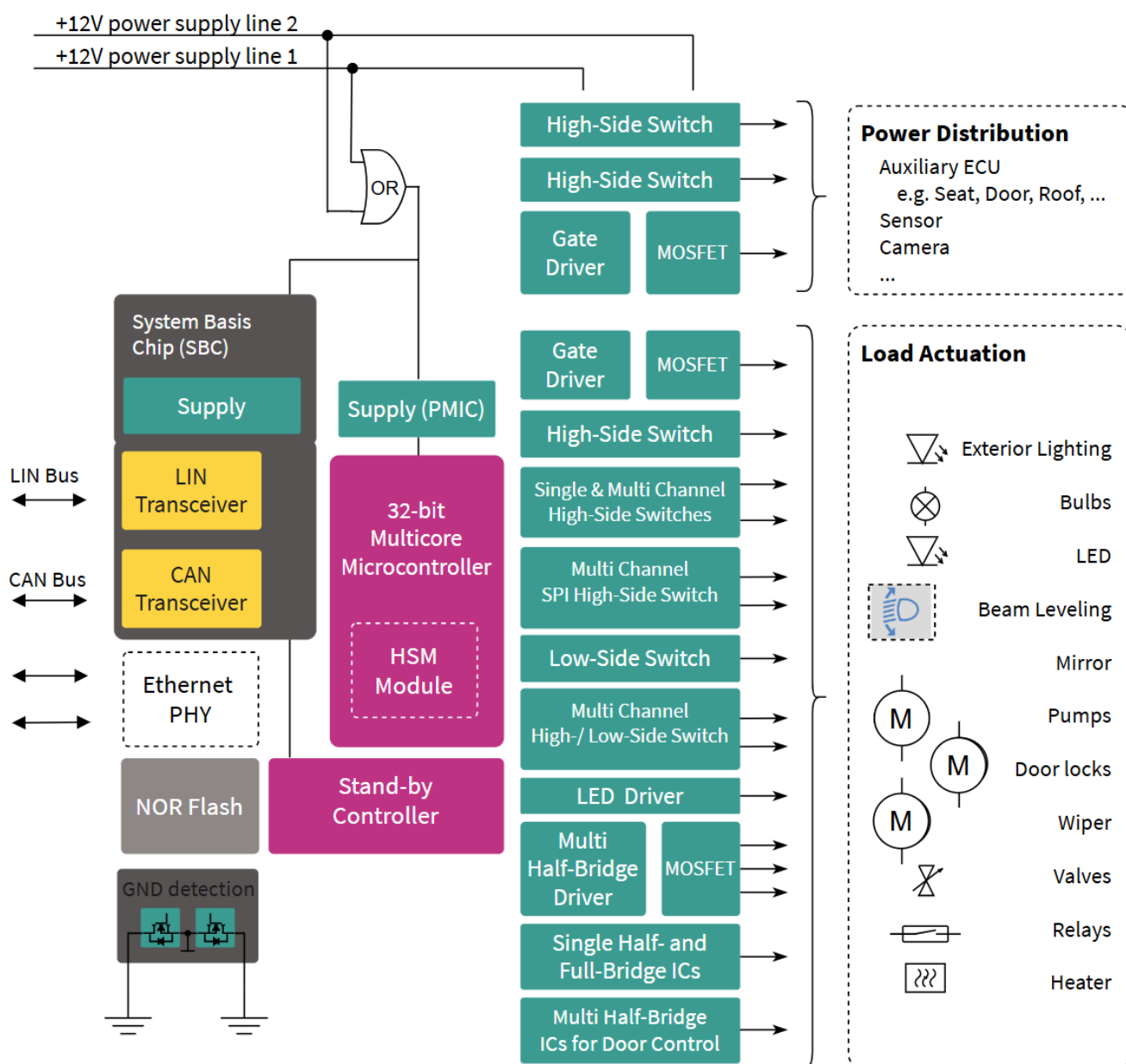


Table Suggested Products

Product Type	Descriptions
Memories	NOR flash
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	Smart power switches
Transceiver	Automotive Transceiver

3 Chassis control & safety

Discover Infineon's reliable, scalable, and energy-efficient automotive chassis solutions

Best-in-class solutions for automotive chassis systems. Safety has long been a key topic in the automotive industry with a growing list of requirements. Today's automotive chassis systems must be highly reliable and must comply with an increasing number of ISO standards, while conforming to tight budgets. Ideally, chassis control and safety systems should be scalable, allowing integration into both entry-level and luxury cars. In addition, automotive chassis safety applications should feature a high degree of energy efficiency to reduce fuel consumption.

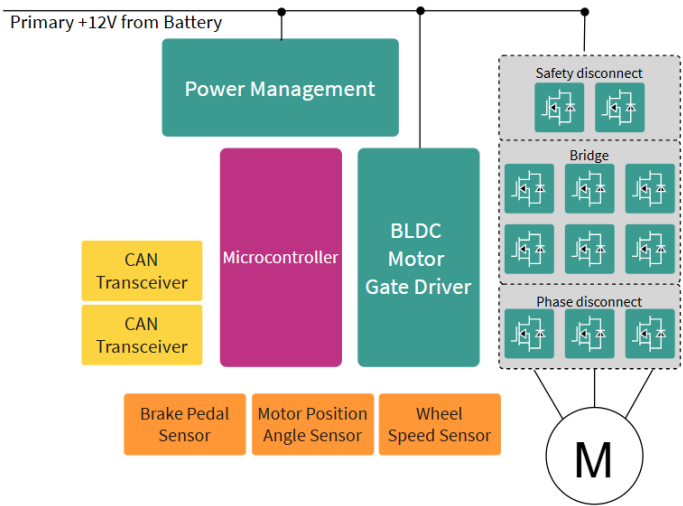
Besides conventional chassis control and safety systems, ADAS has become increasingly important in today's car industry. Infineon is pleased to support you in the development of all these kinds of automotive applications with its proven in-house know-how and experience.



3.1 Electro-mechanical braking system (EMB)

An electromechanical braking system (EMB) is a type of braking system that uses electrical and mechanical components to slow or stop a vehicle. It does this by using an electric motor or actuator to apply the brakes instead of hydraulic pressure, as in traditional hydraulic braking systems. The electric motor receives braking commands from the brake pedal ECU (driver input) or other systems such as a central computer (e.g., stability control).

Fail-safe Electro-Mechanical Braking (EMB)



Fail-operational Electro-Mechanical Braking (EMB)

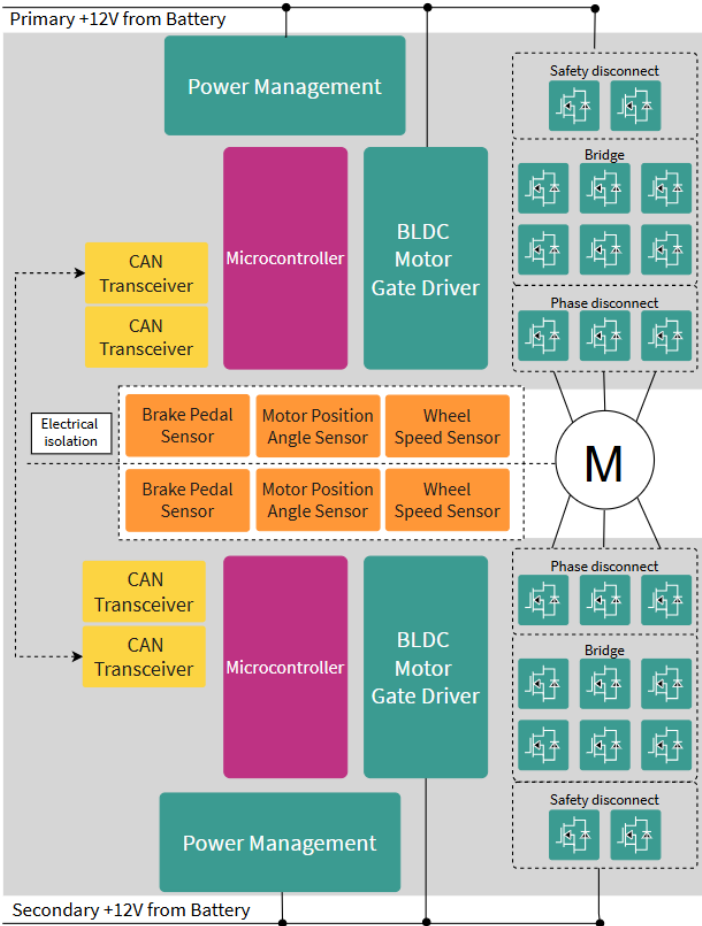


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Power	Motor control ICs
Power	Power Supply ICs
Sensor	Magnetic sensors
Transceiver	Automotive Transceiver

3.2 Steer by Wire

Steering is a safety critical system that requires the highest level of steering availability, especially when transitioning to a steer by wire system. Infineon can meet this requirement with a dependable motor control chipset. This means a seamless integration of hardware and software solutions to easily get started.

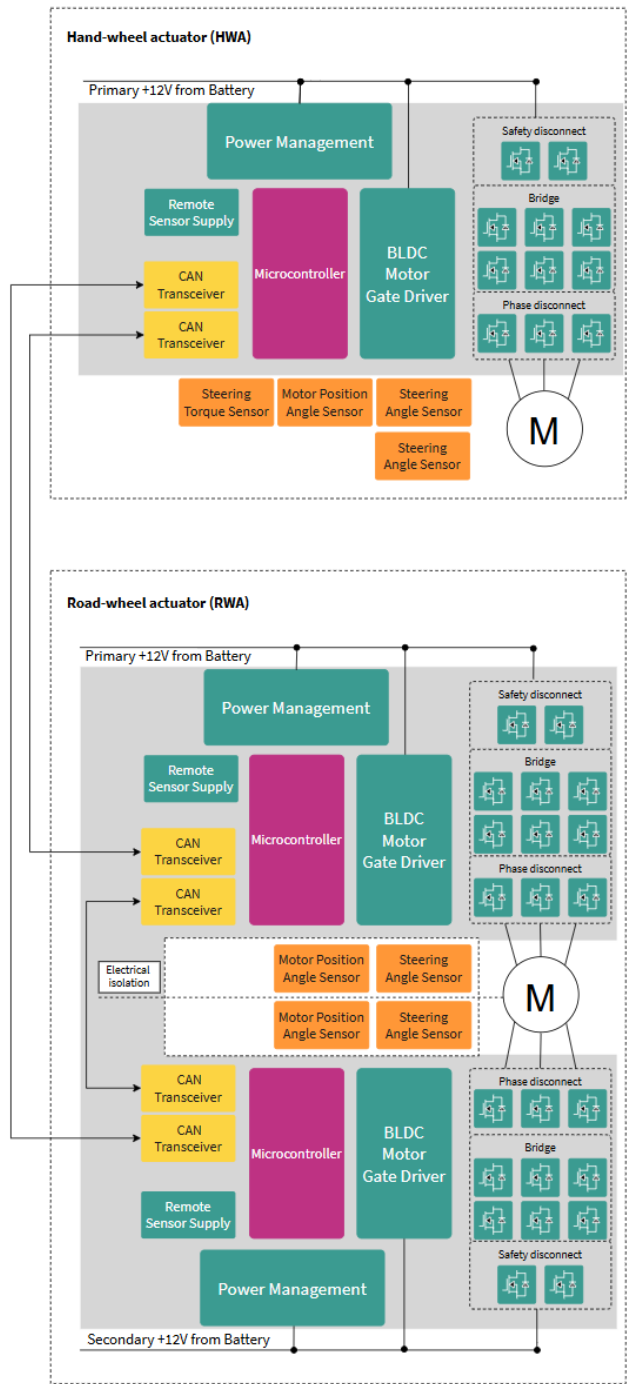


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Power	Power Supply ICs
Transceiver	Automotive Transceiver

4 Electric vehicle (EV) drivetrain system

Infineon's next-generation electric drivetrain semiconductor solutions offer optimum power density, cost efficiency, and environmental sustainability.

At the core of all these electric vehicle technologies is the electrified powertrain. Infineon supports developers to meet current and future environmental legislation and customer requirements. Our power semiconductor solutions and smart control ICs enable multi-target optimization for system cost reduction, increased power density, higher application efficiency, and modular systems supporting your preferred topology. Dedicated software and design houses support you with intelligent solutions for electric car drivetrains to achieve even more efficiency through a software design that is precisely tailored to your use case.



4.1 Automotive battery management system (BMS)

Our BMS platform guarantees up to ASIL D safety level for hardware and software, and supports diverse applications such as industrial, energy storage, commercial and agricultural vehicles (CAVs), low-speed electric vehicles, and electric two and three wheelers. The BMS platform covers 12 V to 24 V, 48 V to 72 V, and high-voltage applications, including 400 V, 800 V, and 1200 V battery systems.

	12V-24V Battery	48V-72V Battery	100V-1200V Battery
Communication		Transceiver Power Supply CAN Transceiver	CAN Transceiver
Battery Controlling Unit	PMIC with Safety Watchdog Microcontroller MCAL	PMIC with Safety Watchdog Microcontroller Application Level SW Complex Device Driver (CDD) MCAL	PMIC with Safety Watchdog Microcontroller Complex Device Driver (CDD) MCAL
Event Logging	Memory	Memory	Memory Authentication
Isolated Communication			Iso UART Transceiver Digital Isolators Wireless Transceiver
Cell Monitoring & Balancing Unit	Cell Monitoring & Balancing IC	Cell Monitoring & Balancing IC	Cell Monitoring & Balancing IC
Current Sensing & Coulomb Counting	Hall Sensor Shunt Current Sensing IC	Hall Sensor Shunt Current Sensing IC	Hall Sensor Shunt Current Sensing IC
Pack Monitoring	Thermal Runaway Detection Sensor	Thermal Runaway Detection Sensor	Isolated Power Supply Thermal Runaway Detection Sensor
Battery Protection & Disconnection Unit	MOSFET Gate Driver	MOSFET Gate Driver	MOSFET Gate Driver HiTfET™ PROFET™

Table Suggested Products

Product Type	Descriptions
Memories	F-RAM (Ferroelectric RAM)
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	Gate Driver ICs
Transceiver	Automotive Transceiver

4.2 High-voltage DC-DC converter for electric vehicles

Transform your designs with automotive-qualified products that offer high power density with minimum space, bi-directional power flow, and wide voltage ranges for a variety of EV conversion topologies. Utilizing advanced Si, SiC, and GaN power technologies, our HV-LV DC-DC converter solutions deliver optimal performance and efficiency while meeting the highest standards of reliability, ensuring seamless integration with your existing systems.

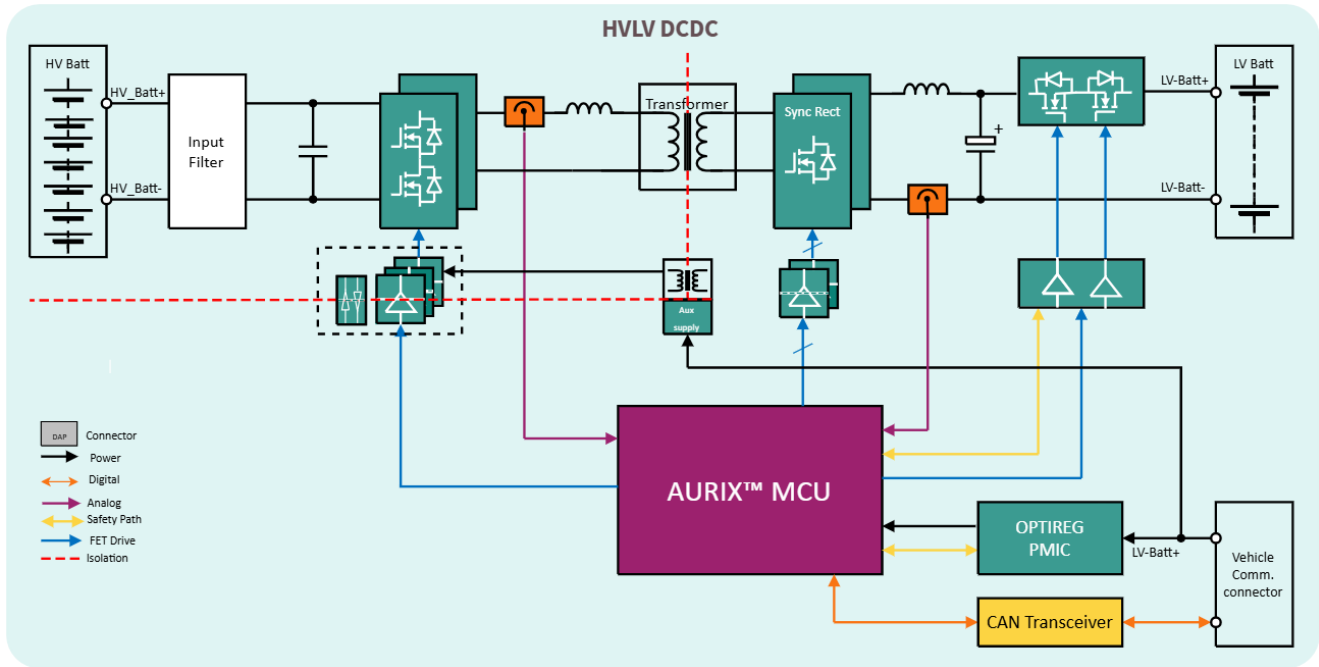


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
MOSFET	Automotive MOSFET
Power	Gate Driver ICs
Power	Power Supply ICs
Transceiver	Automotive Transceiver

4.3 High-voltage DC-DC converter for commercial vehicles

Accelerate efficiency and performance with our wide range of automotive and industrial-qualified products that support diverse conversion topologies in electric agricultural vehicles. Rigorously tested to ensure design requirements, such as bidirectional power flow and wide voltage ranges are met, our compact designs leverage advanced Si, SiC, and GaN power technologies, ensuring our range of HV-LV DC-DC converters meet your demanding needs.

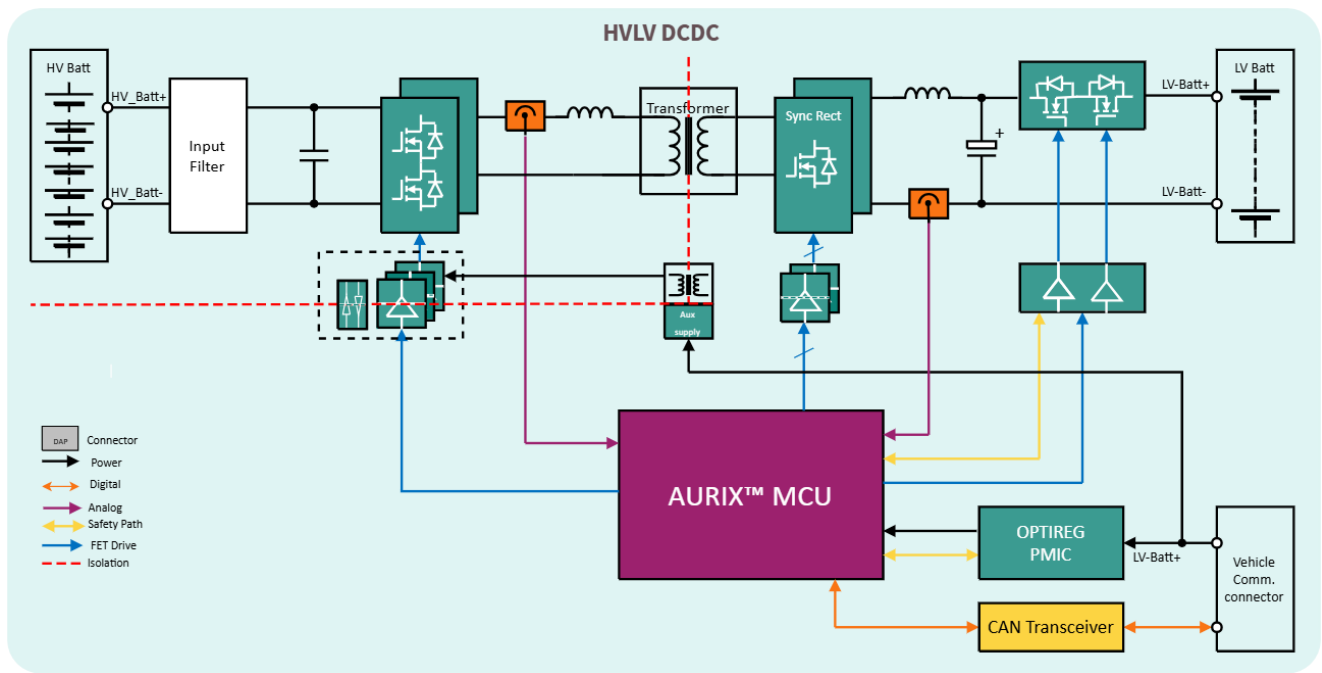


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
MOSFET	Automotive MOSFET
Power	Gate Driver ICs
Power	Power Supply ICs
Transceiver	Automotive Transceiver

4.4 On-board charging (OBC) for electric vehicles

Transform your designs with complete and complementing chipsets to develop modular and scalable on-board battery chargers (OBC). Leveraging our expertise in power electronics and semiconductors, our OBC solutions use Si, SiC, and GaN power technologies to meet automotive quality and safety standards. Wide band gap chips enable future trends like V2L, V2H, and V2G. Scalable full system solutions speed time-to-market and bring full optimization.

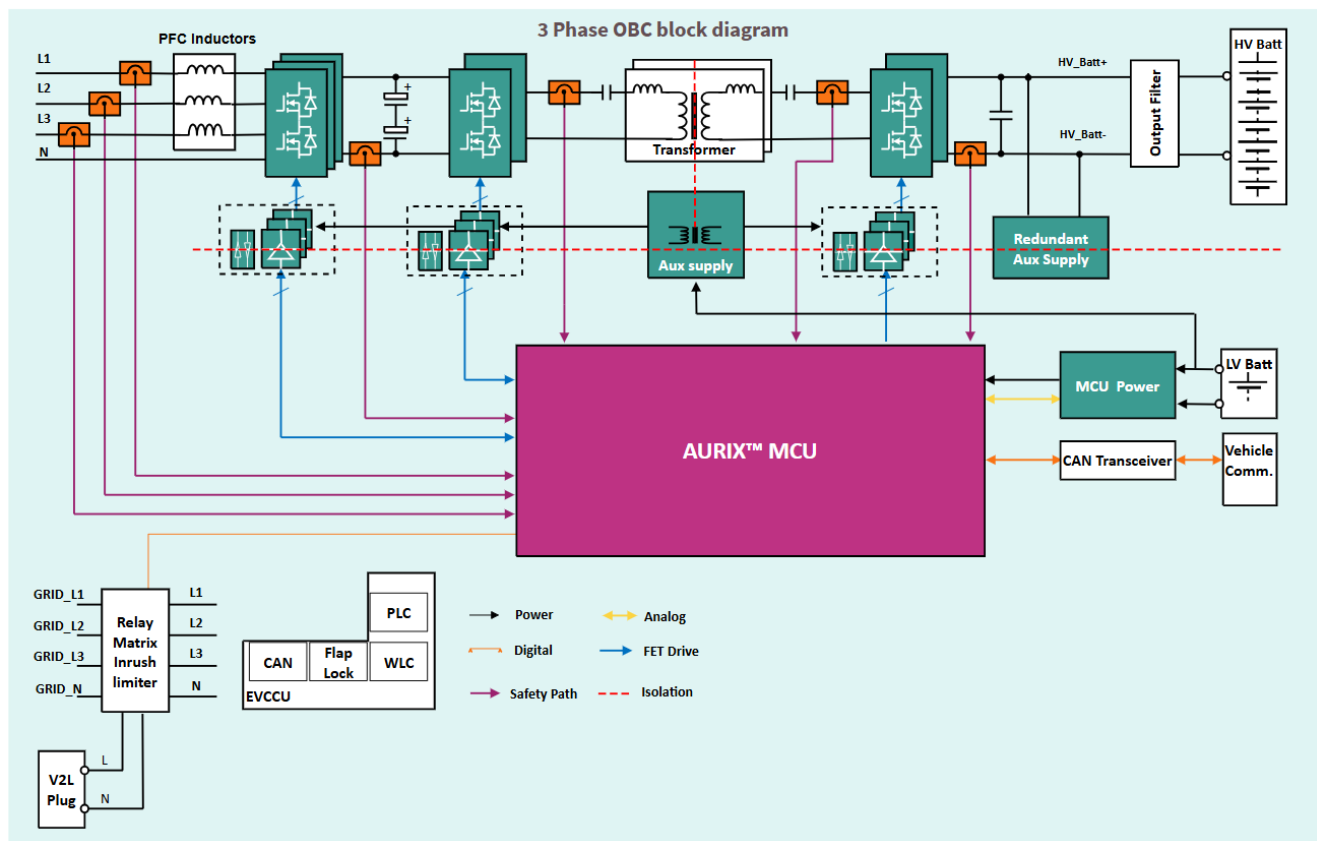


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
MOSFET	Automotive MOSFET
Power	Silicon Carbide CoolSiC™ MOSFETs
Transceiver	Automotive Transceiver

4.5 OBC for commercial vehicles

Elevate your commercial vehicle solutions with our comprehensive range of chipsets, designed to facilitate the development of adaptable and expandable on-board battery chargers (OBC). Infineon's OBC solutions unleash the power of Si, SiC, and GaN, leveraging our deep expertise in power electronics and semiconductor technology while maintaining the highest quality and safety standards in the automotive industry.

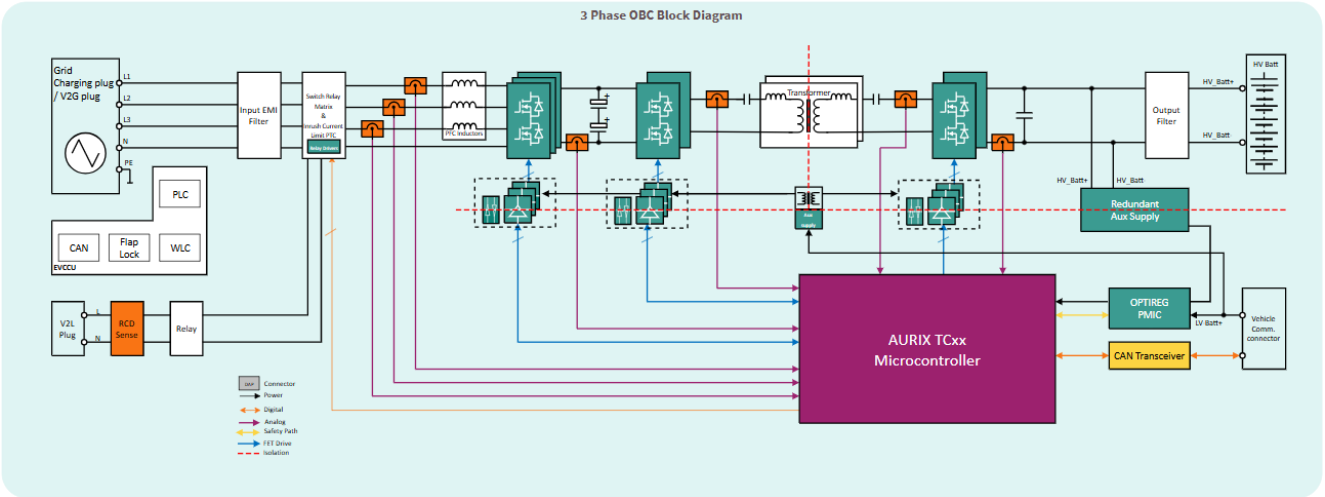


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
MOSFET	Automotive MOSFET
Power	Power Supply ICs
Transceiver	Automotive Transceiver

4.6 EV traction inverter

Enhance traction inverter designs and achieve the highest efficiency, optimized performance, and fastest time-to-market with Infineon's complete system solution. As an essential component for electric vehicle (EV) drivetrains, traction inverters control the motor and determine driving behavior. Our commitment to quality ensures minimal switching losses, maximum thermal efficiency, and enables regenerative braking to recharge the battery.

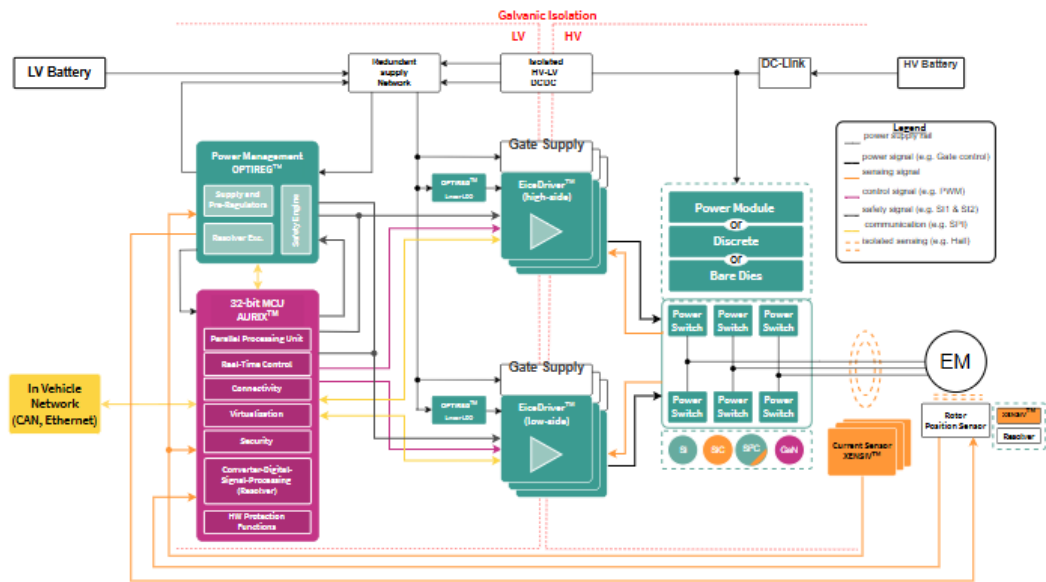


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
Power	IGBTs
Power	Power Supply ICs
Sensor	Current Sensor
Transceiver	Automotive Transceiver

4.7 Traction inverter for electric commercial vehicles

Minimize switching losses, maximize thermal efficiency, and efficiently store regenerative braking energy with Infineon's traction inverter solutions for electric commercial vehicle drivetrains. Our comprehensive system solution offers the most scalable power portfolio, along with optimized gate-driver and MCU technology. Ensure ASIL-D functional safety through seamless component interoperability for sustained operational excellence.

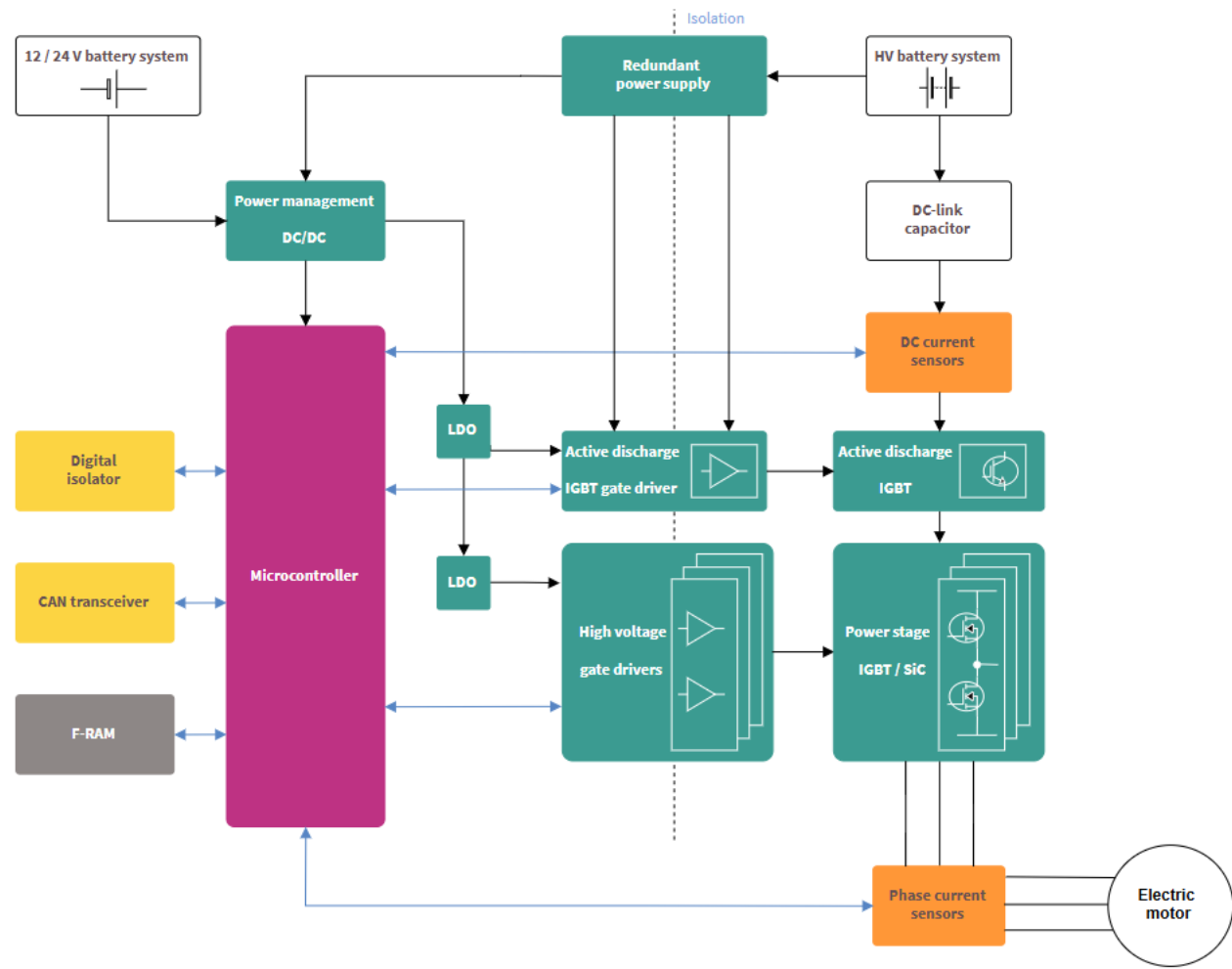


Table Suggested Products

Product Type	Descriptions
Memories	F-RAM (Ferroelectric RAM)
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Power	Gate Driver ICs
Power	IGBTs
Transceiver	Automotive Transceiver

5 In-vehicle infotainment (IVI) & HMI

Automotive human-machine interface (HMI) systems are designed to enable drivers to interact with their vehicles without being distracted. HMI can establish a more natural interaction between humans and machines through touchpads, buttons, or speech systems. The increasing demand for connectivity solutions, low-cost HMI software, and enhanced user experience (UX) has made HMI solutions like head-up displays (HUD), rear-seat entertainment systems, steering-based controls, instrument clusters, and voice command systems popular in the automotive market.

Infineon, as a leading automotive semiconductor manufacturer, offers a wide range of solutions that support seamless and secure communication between the driver and the vehicle. They provide high-performance microcontrollers, memories, HMI controllers, and automotive-grade security solutions for automotive infotainment systems. In addition, their automotive radar systems help improve the vehicle's situational awareness and driver assistance features. Overall, Infineon's solutions help automakers provide a more natural and intuitive HMI system that ensures safety, comfort, and convenience for drivers.



5.1 High-performance cockpit controller

Unleash high computer processing power and an enhanced user experience with a cockpit domain controller (CDC) that supports different operating systems (OS) through a scalable hardware platform. Typically enabled by high-performance system-on-chip (SoC), microcontroller, memory, Wi-Fi & Bluetooth®, power supply, and sensor components, Infineon's rigorously tested product portfolio is designed to meet the demands of complex fundamental functions.

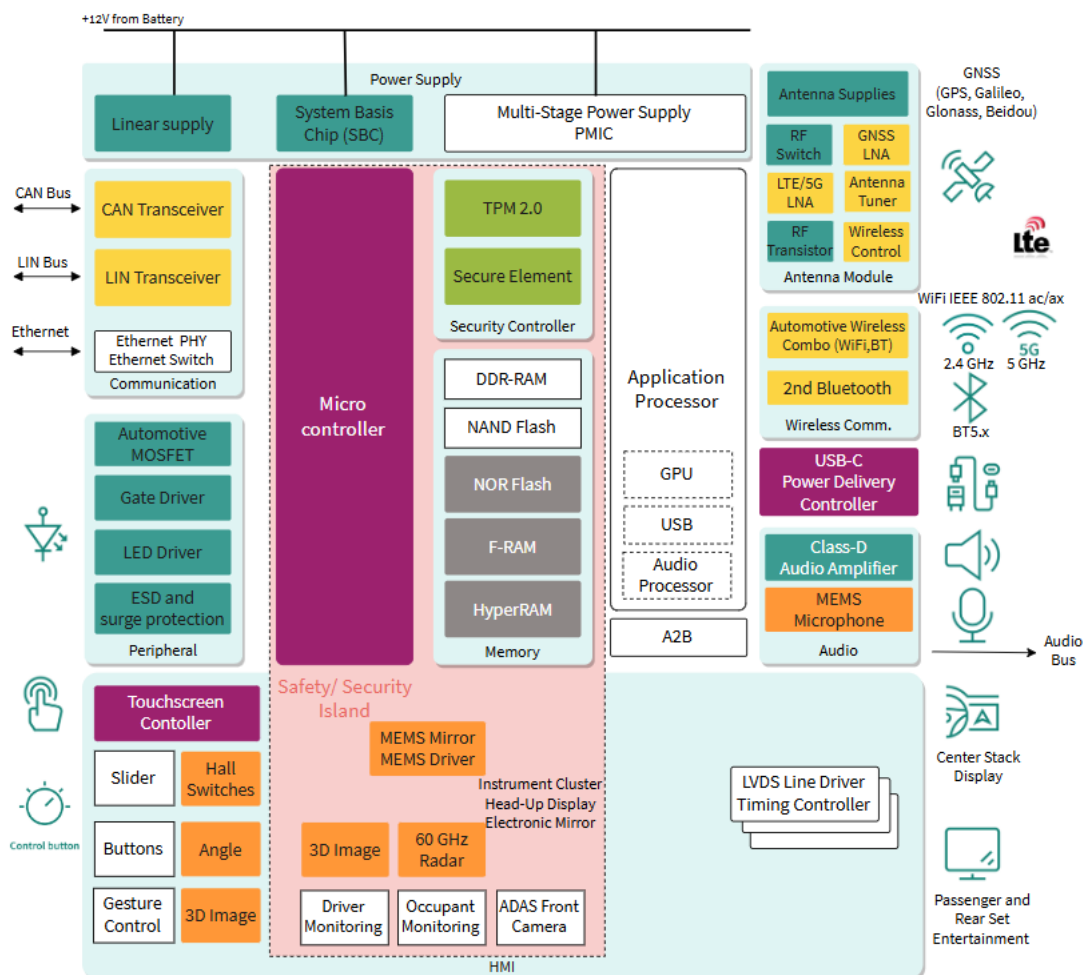


Table Suggested Products

Product Type	Descriptions
Memories	NOR flash
Microcontroller	PSOC™ Automotive Multitouch Arm® Cortex®-M0
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	LITIX™ - Automotive LED Driver IC
Sensor	MEMS microphones for automotive
Transceiver	Automotive Transceivers

5.2 Automotive USB-C power and data solution

Elevate your designs with efficient and reliable automotive USB hub solutions from Infineon. Our Standard Power Range (SPR) and Extended Power Range (EPR) solutions for in-cabin USB-C charging provide higher charging speeds and data transfer rates. EZ-PD™ CCG7xxx USB PD controllers and EZ-USB™ HX3 USB hub controllers combined with firmware can implement dynamic load sharing, output power throttling and moisture detection. The entire solution is completed with the latest MOSFET OptiMOS™ family and LIN transceivers which simplify the design process and speed up time-to-market by AEC-Q100 qualification and wide range of compact packages.

The USB promoter group introduced the SPR and EPR standards, enabling USB devices to deliver up to 100 W of power. Mobile devices such as phones, tablets, gaming consoles, and PCs are now increasing their charging capabilities to around 100 W. Automotive OEMs can now meet these high-power charging demands with USB hub and Power Delivery (PD) controllers from Infineon for all three types of applications: Head-unit (HU) applications or breakout boxes, Rear-seat charger (RSC) applications and Rear-seat entertainment (RSE) applications.

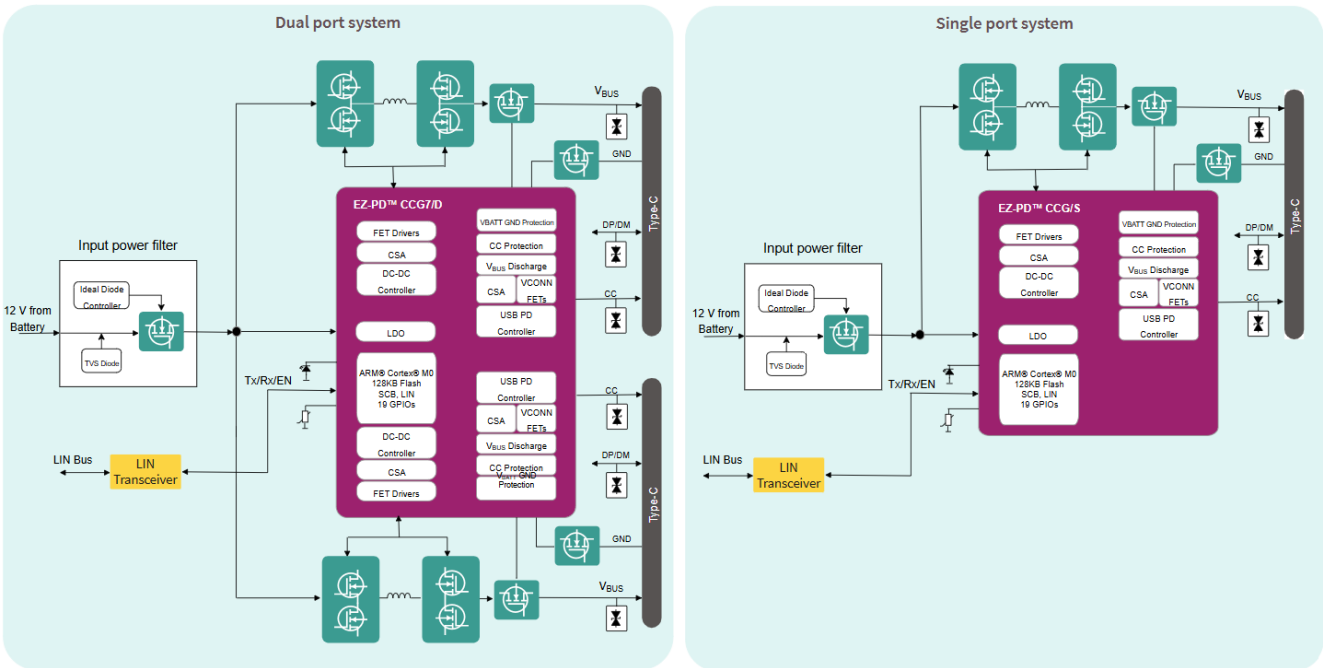


Table Suggested Products

Product Type	Descriptions
MOSFET	Automotive MOSFET
Power	Power Supply ICs
Transceiver	Automotive Transceiver

6 Light electric vehicles

Revolutionize e-mobility with our advanced LEV technologies

Smaller, lighter, more affordable: light electric vehicles (LEV) are bringing e-mobility to a growing number of people. Unlock the future of transportation with Infineon's advanced solutions for electrified 2-wheelers and 3-wheelers.

With Infineon, you can source right-fit components to overcome design challenges and implement state-of-the-art LEV system solutions for both micromobility and minimobility use cases. Our comprehensive range of semiconductor components includes MOSFETs, MCUs, gate drivers, sensors (position, speed, pressure, or current sensors), precharge FETs, memory, authentication ICs, transceivers, controllers, switches, and more - all designed to meet the unique needs of light electric vehicle technologies.

One of the most significant design challenges in light electric car design is balancing speed and range per charge, while ensuring maximum safety. At Infineon, we understand these challenges and offer a range of non-automotive and automotive components for a wide range of use cases, from micromobility to ePTWs like e-mopeds, e-scooters, and e-rickshaws, micro EVs like electric microcars, LSEVs, NEVs, and electric quadricycles, as well as e-golf carts.



6.1 [BMS solution for electric two- and three-wheelers](#)

Our comprehensive battery management system (BMS) solutions ensure safe and efficient battery operation in two- and three-wheelers, featuring advanced components, reference designs, and software tools for optimized performance and range.

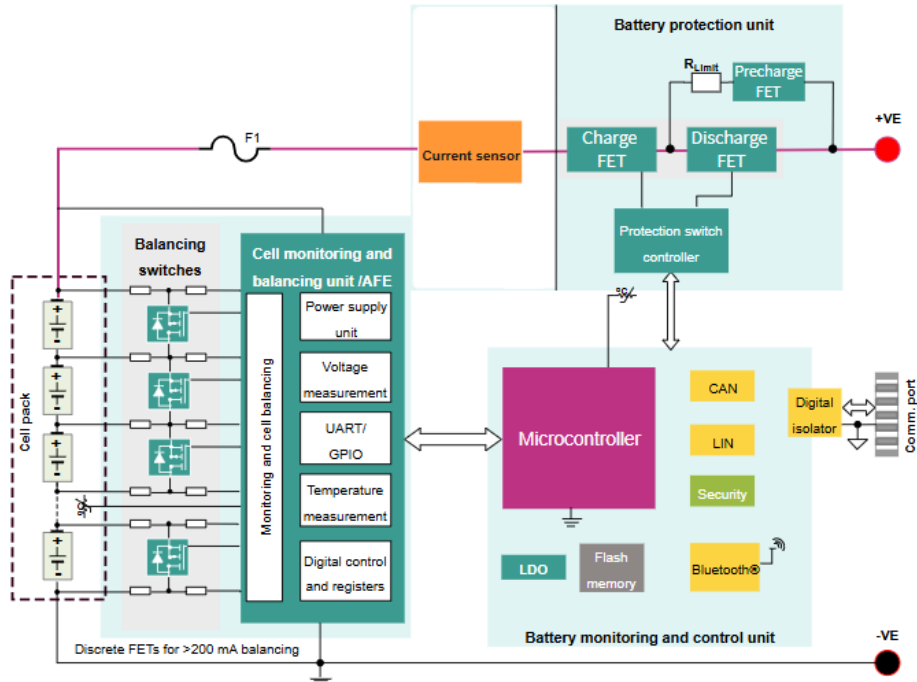


Table Suggested Products

Product Type	Descriptions
Memories	NOR Flash
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Power	IGBTs
Power	Gate Driver ICs
Sensor	Current Sensor
Transceiver	Automotive Transceiver

6.2 Smart instrument cluster for two- and three-wheelers

The chipset for two- and three-wheelers integrates AIROC™ Wi-Fi / Bluetooth® SoCs and TRAVEO™ T2G Cluster MCUs, featuring up to two ARM® Cortex® M7 CPUs and a graphics engine with smart rendering technology for minimal memory usage. In a benchmark of Qt Company, TRAVEO™ T2G Cluster outperforms its two closest competitors with superior performance and reduced memory requirements for advanced connectivity. The cluster chipset also offers touchscreen and power IC solutions.

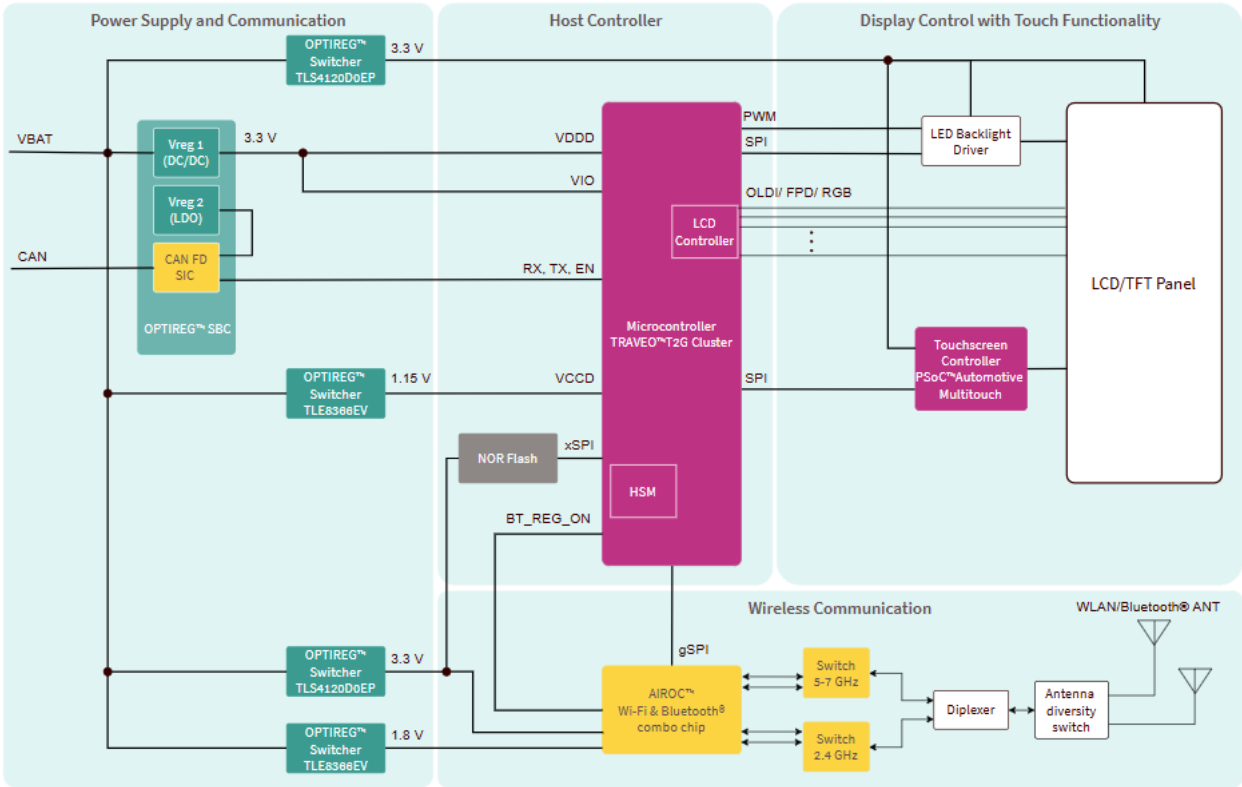


Table Suggested Products

Product Type	Descriptions
Memories	NOR Flash
Microcontroller	PSoC™ Automotive Multitouch Arm® Cortex®-M0
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
Power	Power Supply ICs

6.3 [Traction inverter solution for electric two- and three-wheelers](#)

We offer a comprehensive and affordable ecosystem for safe and efficient traction motor control in two- and three-wheelers. Our offering includes a range of tools and resources such as online simulation access, reference designs, evaluation boards, Arduino kits, and our ModusToolbox™ embedded software development platform, addressing key considerations for modern LEV traction inverters, from individual components to fully integrated solutions.

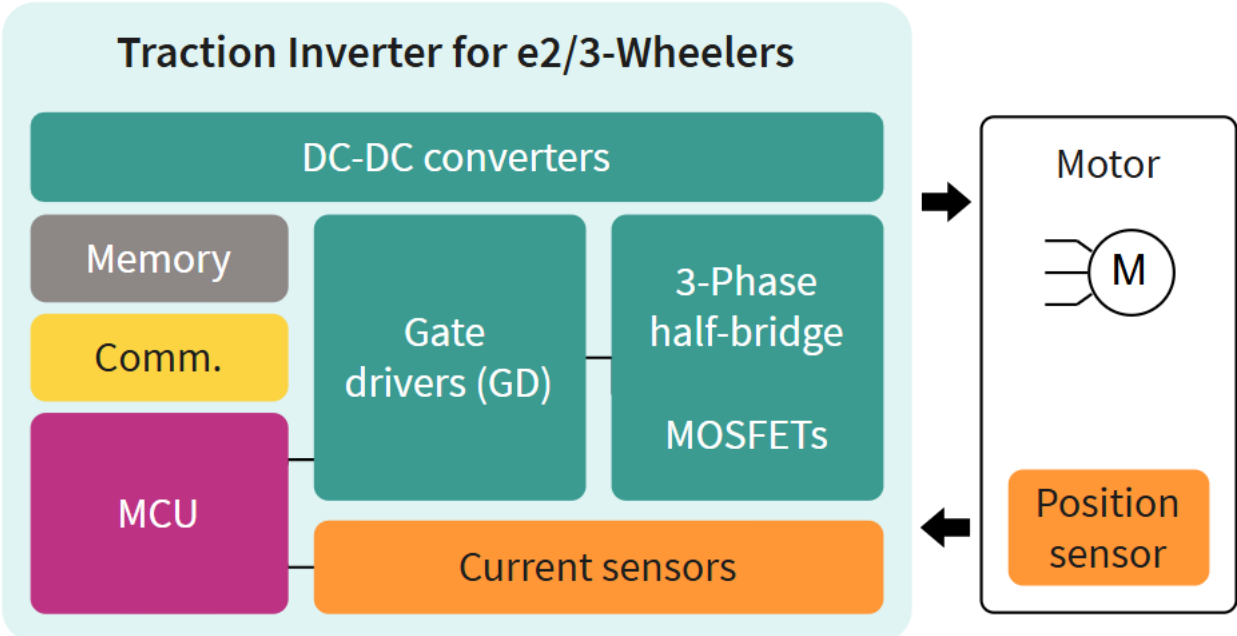


Table Suggested Products

Product Type	Descriptions
Memories	F-RAM (Ferroelectric RAM)
Microcontroller	32-bit AURIX™ TriCore™ Microcontroller
Power	Gate Driver ICs
MOSFET	Automotive MOSFET
Sensor	Current Sensor

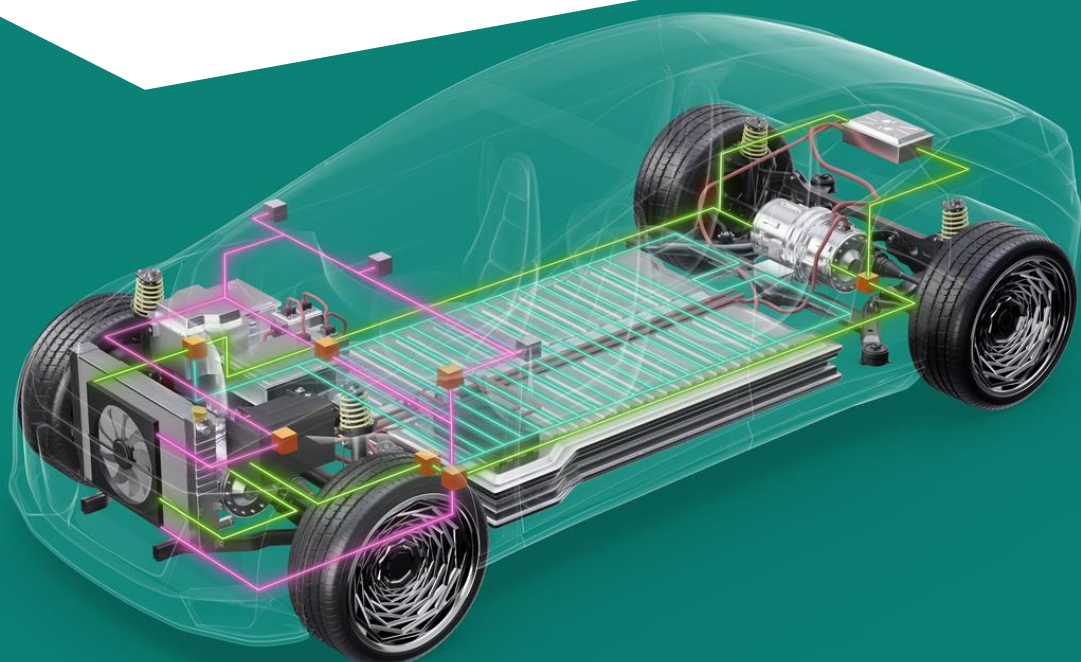
7 Thermal management system

Cool and in-control with best-in-class EV thermal management solutions

Infineon's comprehensive thermal management portfolio for electric vehicles includes in-cabin refrigerant circuit (HVAC systems), battery cooling and heating systems, and inverter cooling systems. Additionally, we provide integrated thermal management systems, which are more commonly used by OEMs that converge on liquid-based battery cooling strategies.

Thermal management plays a crucial role in battery electric vehicles (BEV) due to the minimal heat generated by their electric motors. This poses challenges in maintaining optimal temperatures, requiring additional heating for passenger comfort at the expense of reduced range. Fast charging further drives the need for precise thermal management in electric vehicles. As many network providers offer DC fast charging stations with up to 350 kW of power, the batteries must operate within a narrow temperature window to maximize charging power.

Effective electric vehicle thermal management prevents issues like demagnetization, aging of insulation materials, decreased efficiency, and even motor burnout. It also enhances battery longevity and serves as a safety feature against thermal runaway in electric vehicles.



7.1 Automotive integrated thermal management system (ITMS)

Experience an integrated thermal management system (ITMS) that consolidates various components like electric pumps and coolant valves into a centralized thermal management unit controlled by a single ECU. With our dedication to quality and reliability, our integrated thermal management modules reduce complexity and assembly costs while improving overall efficiency to effortlessly meet your most complex and demanding needs.

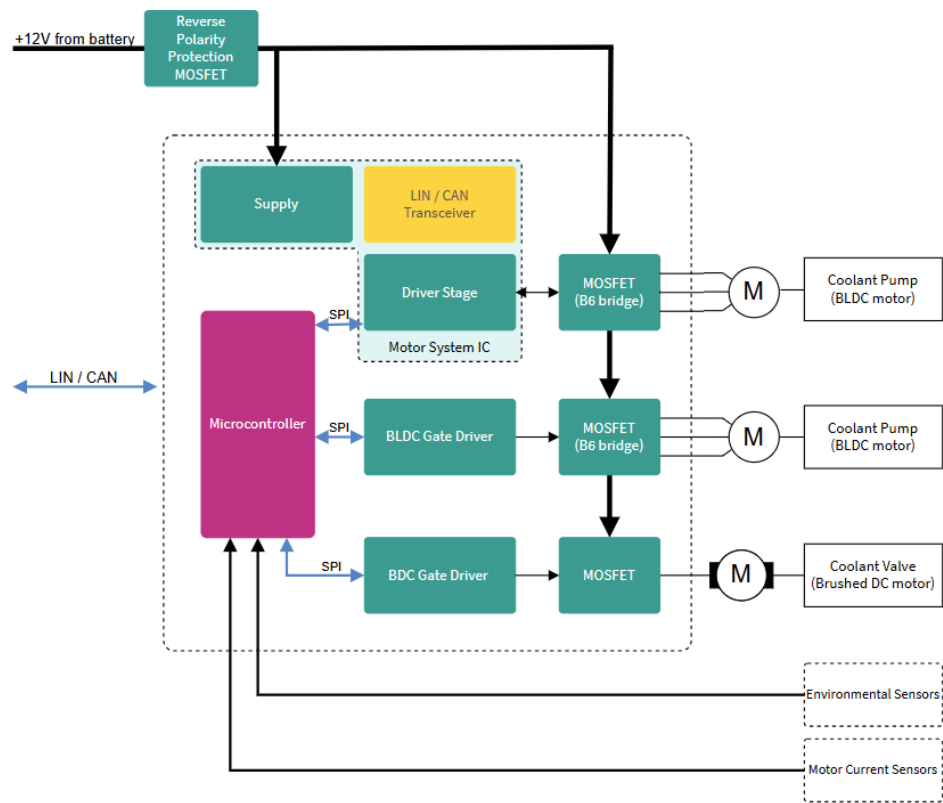


Table Suggested Products

Product Type	Descriptions
Microcontroller	32-bit TRAVEO™ T2G Arm® Cortex®
MOSFET	Automotive MOSFET
Power	Motor control ICs
Sensor	Current Sensor
Transceiver	Automotive Transceiver

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