



Automotive Solutions

Enabling the Future of Mobility



Providing comfort, convenience, safety and security to the driver and other occupants is the main function of body electronics systems. From accessing and starting the vehicle to controlling seats, mirrors and the interior climate, these systems play an important role in ensuring a safe, comfortable journey.

Microchip can help you design body electronics systems with a wide variety of solutions for car access, networking and connectivity, power management and more. Our advanced technologies provide designers with the tools needed to develop body electronics systems for ease of use and reliable control of the vehicle's interior environment.



Microchip's Key Technology Solutions for Body Electronics

Car Access

As an industry leader in car access solutions, Microchip provides all the products and tools necessary for developing reliable and secure passive entry and start applications. Our portfolio of RF and LF transmitters, receivers and transceivers complement our low-power microcontroller families needed for advanced car access systems.

Power Management

With sensors and actuators distributed throughout the vehicle, power management becomes a critical component of body electronics systems. Microchip's automotive-grade voltage regulators and output drivers provide designers with power management solutions that are key to power-efficient and reliable embedded control systems.

Signal Conditioning

Body electronics systems rely upon several inputs from the driver and the vehicle to control many different components inside the vehicle. Our broad portfolio of signal conditioning products provide solutions for signal filtering, sensing, amplifying, detecting and shaping within these systems.

Networking and Connectivity

One of the key components of body electronics systems is the connectivity to sensors, motors and actuators, and other systems within the vehicle. Microchip's lineup of networking and connectivity solutions such as LIN, CAN and Ethernet, provide the means necessary for connecting all these components within the vehicle.

The in-vehicle experience keeps evolving as new and innovative ways of informing and entertaining the driver and passengers emerge. At the heart of any journey, infotainment applications provide critical data to the driver in order to make more informed decisions. Likewise, they provide entertainment choices to all occupants for a more enjoyable and relaxing journey. As vehicles continue to advance into becoming data centers on wheels, infotainment systems become just as important as those attributed to powering, controlling and protecting the vehicle and its occupants.

Designing a wide variety of infotainment systems is easy with Microchip's advanced portfolio of networking and connectivity, touch, cybersecurity and analog solutions. These solutions provide the means to distribute data and various forms of media throughout the vehicle as well as to occupants during the journey in quick, reliable and secure ways.



Microchip's Key Technology Solutions for Infotainment

Networking and Connectivity

A variety of communication protocols and solutions are needed for advanced infotainment systems. Connecting audio/video components within the vehicle and to the external world can be achieved with Microchip's portfolio of Ethernet, USB, INICnet™, CAN and LIN networking and connectivity solutions.

Cybersecurity

Protecting the vehicle from cyber attacks is a major focus for automakers and their suppliers. Infotainment systems are especially vulnerable as they connect with numerous systems inside and outside the vehicle. Our automotive cybersecurity products facilitate the design of secure infotainment systems that are immune from cyber attacks.

Human-Machine Interface

Advancements in touch control have paved the way for more sophisticated interfaces between driver and vehicle. Microchip is the leader for 1D (buttons, sliders and wheels), 2D (touchscreens) and 3D (gesture recognition) touch sensing solutions for innovative automotive infotainment systems.

Signal Conditioning

With tons of data and various forms of media flowing throughout infotainment systems, a key requirement is signal conditioning and control. Microchip's broad portfolio of automotive-grade mixed-signal, linear, sensing and other analog products provide comprehensive solutions for signal conditioning in these applications.

Many advancements for powering a vehicle are taking place as the transition from vehicles powered by internal combustion engines to various forms of Battery Electric Vehicles (BEV) and Hybrid Electric Vehicles (HEV) is accelerating. This change will bring about many new innovations for high-power generation and control. Moving to electric-powered vehicles will bring about an entirely new ecosystem for mobility that will be substantially different from what is in use today.

With Microchip's solutions for high-temperature environments, motor control and power management, traditional combustion engine applications can be served. For BEV and HEV, the higher power requirements can be managed with our Silicon Carbide (SiC) and dsPIC® Digital Signal Controller portfolio. Microchip offers solutions for generating, distributing and managing power internally and externally for these high-voltage applications that are robust, reliable and secure.



Microchip's Key Technology Solutions for HEV/EV/Powertrain

High Temperature

One of the major challenges for embedded control systems in internal combustion engines has been designing for high-temperature environments. Microchip offers a broad lineup of microcontroller, analog, connectivity and memory products that can operate in these rugged environments, giving designers much-needed flexibility.

Motor Control

Internal combustion engines rely on various motors and actuators to control the flow of fluids, valve positions and perform other functions. Offering digital signal controllers with motor control peripherals along with analog devices for motor and MOSFET control, Microchip simplifies designs of complete motor control systems.

Silicon Carbide

SiC MOSFETs and diodes are enabling the design of higher voltage systems for charging, control and propulsion within BEV and HEV. Our lineup of SiC products is providing many options for embedded control system designers in these high-voltage applications, for cost-effective robust systems.

Power Management

Whether it's charging, controlling, distributing or monitoring high-voltage busses in BEV and HEV, Microchip's power management solutions are ideal for these applications. Digital signal controllers with SMPS peripherals and analog devices are key components for charging, DC/DC conversion and DC/AC inverting applications.

Advanced Driver Assistance Systems

Although Advanced Driver Assistance Systems (ADAS) have been improving driver safety and control for years, new innovations in these systems have taken on a much more rapid pace as the drive towards fully autonomous vehicles progresses. ADAS has changed the way we think about driving decision-making and control, putting more emphasis on intelligence within the vehicle and taking more and more responsibility away from the driver.

Decision-making is vital for ADAS and the critical components needed for proper decision-making include processing information quickly, accurately and securely. Microchip's portfolio of networking and connectivity solutions help provide quick access to data from sensors, camera and the external infrastructure, and our microprocessor, microcontroller and FPGA solutions help to process that data quickly and accurately. Data security and integrity can be achieved with our automotive cybersecurity products in order to prevent cyber attacks or erroneous data calculations.



Microchip's Key Technology Solutions for ADAS

Networking and Connectivity

Real-time decision-making is one of the main criteria when it comes to effective ADAS performance. To accomplish this, sensor data and other information must be transmitted quickly and reliably for timely decisions to take place. Our solutions for Ethernet, INICnet, CoaXPress®, CAN, LIN and USB provide the network backbone to accomplish this.

Timing Solutions

ADAS require highly-reliable timing devices with robust performance and tight stability under harsh environments. Microchip offers the industry's most reliable and robust clock and oscillator family by leveraging cutting-edge MEMS technology, advanced Phase-locked Loop (PLL) design and semiconductor packaging.

CyberSecurity

Autonomous vehicles are routinely referred to as data centers on wheels. Security is paramount when transmitting and processing the large amounts of data necessary for the operation of self-driving vehicles. Microchip's automotive cybersecurity products provide solutions for encryption, authentication, key storage, secure boot and more.

Processing

Microchip's broad portfolio of high-speed microcontrollers, microprocessors and field-programmable gate arrays offers solutions for many types of processing functions in ADAS applications. Processing sensor data, managing communications, controlling peripheral devices and serving housekeeping functions are just a few examples.

Functional Safety

For a growing number of applications, it is important to minimize the risk of injury caused by electronics that malfunction. The rigorous design practices and fault detection with mitigation requirements of functional safety achieve this goal. In some applications, these requirements are formalized and mandatory, while in others they are implemented to turn a good product to an excellent product for differentiation in a competitive market.

Microchip offers a number of products that enable system-level compliance to functional safety. This means that they have integrated features, qualified test libraries, safety manuals and FMEDA reports, depending on the standard and the level of safety they support. All these items make it easier to develop applications that conform to the functional safety standards and thereby reduce the work and cost of the final product compliance.



Functional Safety Ready



A product that contains the “Functional Safety Ready” designation has been carefully selected as one that encompasses the latest features and support collateral available from Microchip, including integrated safety features, safety manuals, FMEDA reports and in some cases, diagnostic software. Certain products also have qualified development tools including TÜV SÜD-certified MPLAB® XC Licenses for Functional Safety for microcontroller devices.

Microchip's Quality Policy

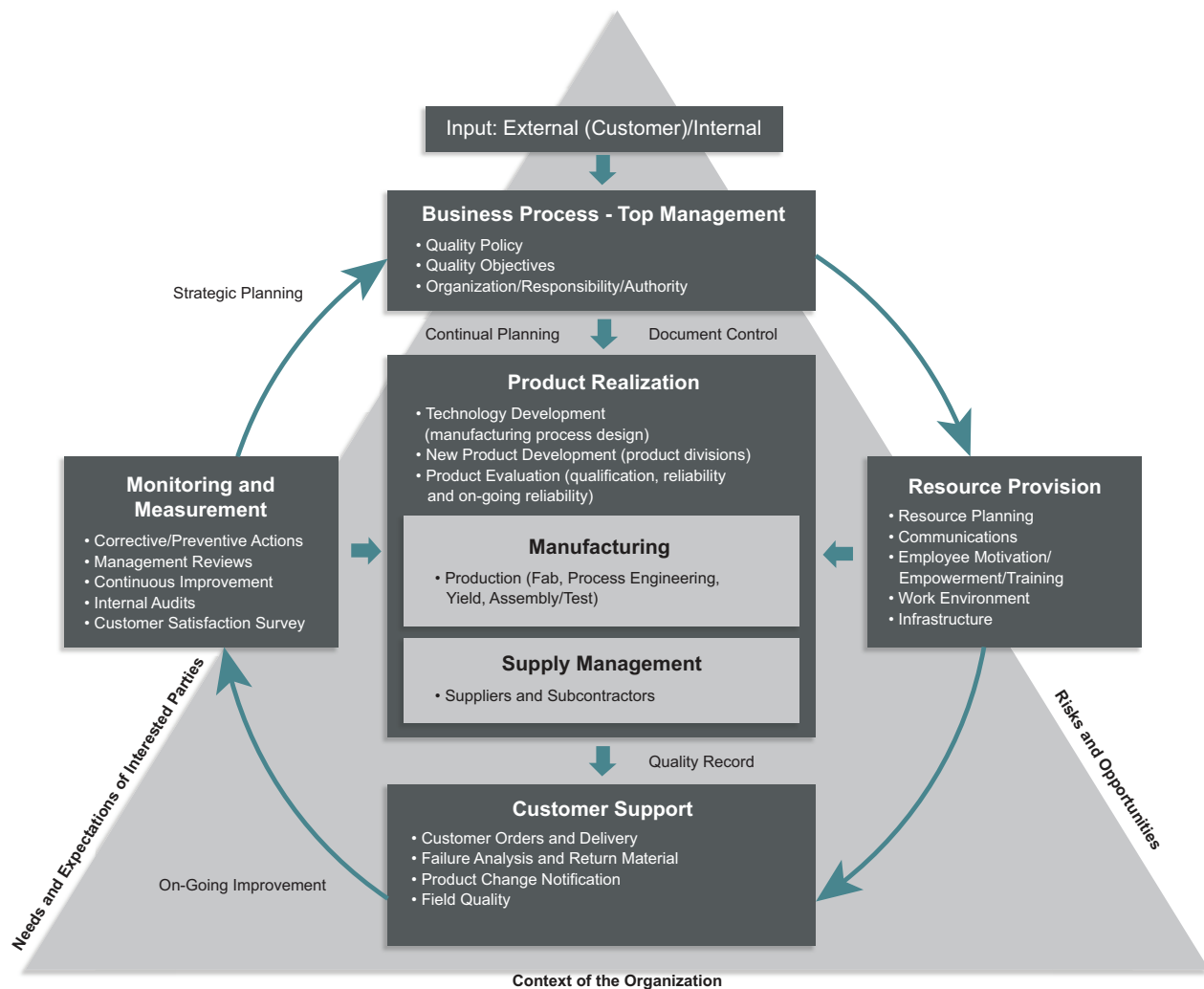
In order to meet or exceed customer expectations at a reduced cost, we encourage our employees to support continuous improvement, anticipate problems and implement root cause solutions.

Quality Certifications

Microchip Technology Inc. is an IATF 16949 certified company. Additional certificates include ISO 14001 and OHSAS 18001.

Quality Management System

Microchip's Quality Management System (QMS) serves as the foundation for customer satisfaction and continuous improvement in all aspects of operation. The QMS is based on a customer-supplier partnership and provides a framework for managing the activities used to develop and deliver quality products that consistently satisfy customer and other external requirements. This QMS is deeply rooted in Microchip's culture, corporate mission, company values, business principles, actions and results. Improvement to the QMS is an ongoing process that cascades throughout Microchip's organization. Key elements of Microchip's Quality Management System are illustrated in the figure below.



Support

Microchip is committed to supporting its customers in developing products faster and more efficiently. We maintain a worldwide network of field applications engineers and technical support ready to provide product and system assistance. For more information, please visit www.microchip.com:

- Technical Support: www.microchip.com/support
- Evaluation samples of any Microchip device: www.microchip.com/sample
- Knowledge base and peer help: www.microchip.com/forums
- Sales and Global Distribution: www.microchip.com/sales

Training

If additional training interests you, Microchip offers several resources including in-depth technical training and reference material, self-paced tutorials and significant online resources.

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