

# Freescale introduces intelligent sensor for car battery monitoring

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Freescale Semiconductor today introduced the MM912J637 intelligent battery sensor (IBS), which accurately measures the voltage, current and temperature of lead-acid batteries and calculates the battery state, all while operating in harsh automotive conditions. The ability to accurately assess these battery parameters is becoming more important with increases in the number of hybrid vehicles on the road and overall electronic content in vehicles, as well as the introduction of start-stop systems.

The MM912J637 IBS offers a rugged and cost-effective solution for designers, enabling precision measurement of key [battery](#) parameters in automotive and industrial applications. The device integrates a S12 [microcontroller](#) and a SMARTMOS analog control integrated circuit in a single-package solution, enabling significant reduction of effective application board space. The MM912J637 IBS is designed to meet the highest automotive standards for electrostatic discharge, electromagnetic compatibility and zero defect quality levels. It is fully AEC-Q100 automotive qualified for operation from -40°C to +125°C, providing low power consumption in the target application. It comes in a small form factor, 7 x 7mm QFN package with wettable flanks technology, enabling optical inspection during assembly.

In today's vehicles, the increasing electrical load presents a challenge to the battery. Vehicle breakdowns caused by the electrical system can usually be traced back to the lead-acid battery and can generally be avoided by knowing the precise state of the battery. The battery must be able to provide enough energy to crank the engine and be available as a passive power source to support new functions of hybrid vehicles such as start-stop and intelligent alternator control. In addition, the power consumption of the IBS needs to be as low as possible to ensure energy efficiency.

"With the rise in electrical content in hybrid and electric vehicles and the advent of the start-stop systems, it's crucial to be able to accurately monitor a vehicle's battery at all times, especially under tough automotive conditions," said Gavin Woods, vice president and general manager of Freescale's Analog, Mixed-Signal & Power Division. "We are providing the industry's first fully automotive qualified and cost-effective solution that helps to ensure precise monitoring of important battery parameters which can be shared with other vehicle systems and the driver, providing the driver a certain amount of peace of mind when it comes to knowing the battery's status."

Freescale's fully integrated, battery monitoring device communicates using a local interconnect network (LIN). It includes a two-channel, 16-bit analog-to-digital converter (ADC) for simultaneous measurement of battery voltage and current and an independent 16-bit ADC for temperature measurement. The IBS provides accurate monitoring with high resolution, even in worst-case conditions to allow a proper prediction of the battery's state-of-health, state-of-charge and state-of-function. The automotive certified, in-vehicle LIN network communicates these parameters periodically or on-request.

The MM912J637 supports precise current measurement via an external shunt resistor at the negative pole of the battery and precise battery voltage measurement via a series resistor at the positive pole. The integrated temperature sensor combined with battery mounting allows accurate battery temperature measurement.

Source: Freescale Semiconductor

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