

ams introduces simpler, more robust architecture for lithium cell monitoring and balancing

New AS8506 cell monitoring IC eliminates need for complex software and reduces hardware requirements in battery cell management systems

Unterpremstaetten, Austria (16 October, 2013), ams AG (SIX: AMS), a leading provider of high performance analog ICs and sensors, today introduced a vastly simplified and more robust method of implementing cell monitoring and balancing in lithium battery systems.

The innovative architecture developed by ams has been implemented in a new, highly integrated chip, the AS8506, to perform distributed cell monitoring and balancing operations for stacked cell modules, including Safe Operating Area (SOA) checks and passive or active cell balancing. It is ideal for all lithium-based cell chemistries, such as those found in hybrid and fully electric vehicles, as well as for EDLCs (also known as supercaps or ultracaps).

In conventional systems, a complicated algorithm running remotely on a high-end microcontroller decides which cells have to be balanced. The new architecture supported by the AS8506 can control balancing locally at the cells, enabling designers to implement a more streamlined cell management system that eliminates the powerful host controller, complex software and vulnerable serial communication links normally used today.

The AS8506 can implement both passive and active cell balancing autonomously, or it can support a microcontroller-based system via its Serial Peripheral Interface. An advanced analog circuit in the AS8506 compares up to seven cell voltages against an internal or external reference with an accuracy of 1mV, to support cell-balancing and cell-monitoring functions. Cell voltage measurements can also be digitized with an accuracy of 5mV and reported to a host controller.

Active and passive cell balancing use a similar circuit design, but active balancing requires an additional flyback transformer. The control circuit is integrated in the AS8506.

The device also features internally or external adjustable upper and lower cell voltage limits. Temperature measurement is carried out through two external NTC sensors.

The fully autonomous cell management architecture enabled by the AS8506 is in stark contrast to the typical system implementations found today using existing cell monitoring ICs. These are typically limited to the sequential capturing of cell voltage measurements that must be processed by a host controller. These prior architectures have several drawbacks for designers of battery management systems:

- The system must stream large amounts of data over a serial link – a communications channel that is vulnerable to interference in noisy environments.
- A powerful host controller running complex software is required to turn individual cell voltage measurements into useful functions such as cell balancing decisions. Writing this software is a difficult and time-consuming task. The software requires exhaustive testing in order to qualify for use in automotive ISO26262-compliant systems.
- Sequential cell measurements require complex compensation algorithms in order to produce valid voltage and current readings across a stack of cells. By contrast, the simultaneous measurements captured by the AS8506 require no compensation.

“The AS8506 marks a breakthrough in cell monitoring – not an incremental improvement on previous cell monitoring ICs, but a completely new approach”, said Manfred Brandl, Product Manager for battery management in the automotive business unit at ams. “By offering local cell and temperature monitoring, the AS8506 gives system designers a simple and robust means to implement a battery management system, with just a simple microcontroller required for basic system functions.”

ams is demonstrating the AS8506 at Stand 74 at the VDI Congress on ‘Elektronik im Kraftfahrzeug’ (Baden-Baden, Germany, 16-17 October 2013).

Price & Availability

The AS8506 cell monitoring IC is available for sampling now. It is priced at \$9.10 for 1,000 pieces. ams also provides a non-automotive version called the AS8506C. It is priced at \$7.80 for 1,000 pieces.

Technical Support

A stand-alone Cell Balancer Evaluation Kit for the AS8506 is available online from ams, priced at \$80. An Active/Passive Balancer Board is also available at the ams online webshop, priced at \$100. For further information on the AS8506 or to request samples, please visit www.ams.com/cell-balancing-IC/AS8506

About ams

ams develops and manufactures high performance analog semiconductors that solve its customers' most challenging problems with innovative solutions. ams' products are aimed at applications which require extreme precision, accuracy, dynamic range, sensitivity, and ultra-low power consumption. ams' product range includes sensors, sensor interfaces, power management ICs and wireless ICs for customers in the consumer, industrial, medical, mobile communications and automotive markets.

With headquarters in Austria, ams employs over 1,300 people globally and serves more than 7,800 customers worldwide. ams is the new name of austriamicrosystems, following the 2011 acquisition of optical sensor company TAOS Inc. ams is listed on the SIX Swiss stock exchange (ticker symbol: AMS). More information about ams can be found at www.ams.com.



Press Release
ams' new AS8506 cell monitoring
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