Balance your cells

www.ams.com/AS8506

AS8506 – Monitor and balancer IC for Li-Ion cell stacks

- Autonomous cell balancing
- Simultaneous cell voltage comparison
- Simplified readout of cells
- Robust, simple and small solution

We provide innovative analog solutions to the most challenging applications in sensor and sensor interfaces, power management, and wireless.

General Description

The AS8506 features simultaneous cell voltage comparison with upper and lower threshold, active- or optionally passive cell balancing by simultaneous comparison of actual cell voltages with a target cell voltage. Cells which are below target will either cyclically receive charge packages from an isolated DCDC converter or, optionally, cells above target will cyclically be discharged by an external flying resistor through integrated switches in an autonomous way.
The device can flexibly be used for battery stacks of 3 up to 7 cells. It can be chained to support battery packs of virtually any number of cells in a synchronized mode.

Autonomous monitoring and balancing is triggered through control signal while absolute cell voltages / temperatures are accessible in communication mode. Direct action diagnosis signals are available to report cell voltage within limits and balance ready signal. Target cell voltage, min and max cell voltage are broadcasted to all of the chained devices during short communication slots. Together with autonomous monitoring and balancing this significantly reduces data communication compared to existing solutions and improves EMC robustness.

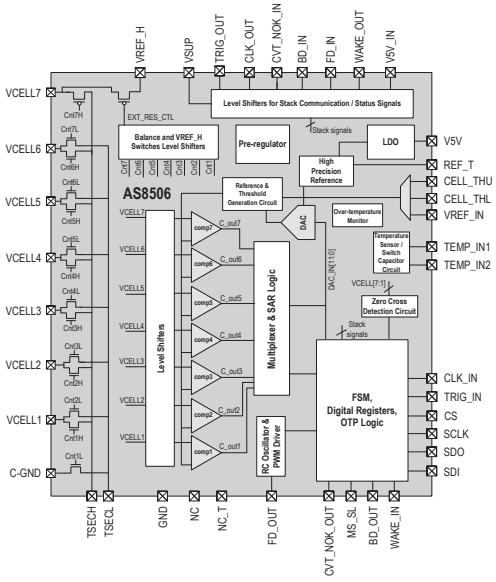
Specifications

Operating Supply Range [V]	6 to 32
Operating Temperature [°C]	-40 to +85 Ambient
Number of cells per IC	3-7
Typical standby quiescent current [µA]	14
Balancing current [mA]	typically 100
Balancing target accuracy over full temperature range [mV]	10
Cell voltage target accuracy [mV]	10
Cell voltage range [V]	1,5 – 4,5
12 bit ADC for cell voltage capture. Accuracy target [mV]	±5
8 bit ADC for temperature capture. Accuracy target [°C]	±3

Features

- Simultaneous cell voltage capture for balancing and SOA monitoring to reduce filter/synchronization effort and intentionally enables continuous balancing also under entire load and charge phase
- Autonomous balancing and SOA monitoring strongly reduces data communication and data processing and thereby improves EMC robustness
- Active charge balancing with very few external components for good efficiency and little heat dissipation. One small fly back transformer per 14 cells, all switches integrated
- For active balancing true energy redistribution if energy is taken from entire pack. Optional energy source from PV or 12V board net
- Absolute cell voltage readout for OCV capture and cell impedance calculation. Readout of 2 temperature sensors
- QFN-40 6x6 package

AS8506 Block Diagram



www.ams.com
automotive@ams.com

Headquarters
ams AG
Tobelbader Strasse 30, 8141 Unterpremstaetten, Austria
Phone +43 3136 500-0 · Fax +43 3136 525-01

Sales Offices Worldwide
sales-europe@ams.com
sales-asia@ams.com
sales-americas@ams.com