

Product brief

Battery monitoring and balancing IC TLE9012AQU

The TLE9012AQU is a multi-channel battery monitoring and balancing system IC designed for Li-Ion battery packs used in automotive, industrial and consumer applications. TLE9012AQU fulfills four main functions: cell voltage measurement, temperature measurement, cell balancing and isolated communication to main battery controller. Additionally, TLE9012AQU provides the necessary diagnosis tools to ensure proper function of the controlled battery.

Features

- › General
 - Monitors up to 12 series connected cells
 - Supports communication of more than 20 devices
 - Supports hot plugging
- › Voltage measurement
 - 16 bit high resolution ADC measurement for each cell
 - High accuracy measurement for SoC (State-of-Charge) and SoH (State-of-Health) calculation
 - Temperature compensated measurements
 - Built in noise filtering
 - Selectable measurement bit length
- › Temperature measurement
 - 5 temperature measurement channels for connection to external NTC
 - On-chip temperature measurement and monitoring
- › Balancing
 - Integrated balancing switch allowing up to 150 mA balancing current
- › Communication Interface (iso UART)
 - Differential robust serial interface for communication between battery blocks
 - High-speed communication up to 2 Mbps
 - Power balanced communication scheme
- › Green product (RoHS-compliant)
- › AEC-Q100 qualified
- › ISO 26262 ready, supporting ASIL-C BMS safety applications
- › Safety features
 - Two independent internal voltage references
 - Block voltage measurement based on different ADC
 - Configurable analog OV/UV comparators
 - End-to-end CRC secured communication
 - CRC secured configuration registers
 - Internal open load detection
 - Emergency mode for communication

Benefits

- › Robust communication without need of transformers or common mode chokes
- › Best in class voltage measurement accuracy even after soldering thanks to stress sensor technology
- › Integrated diagnosis easing functional safety design
- › Integrated UART communication for systems with a microcontroller on local ground

Target applications

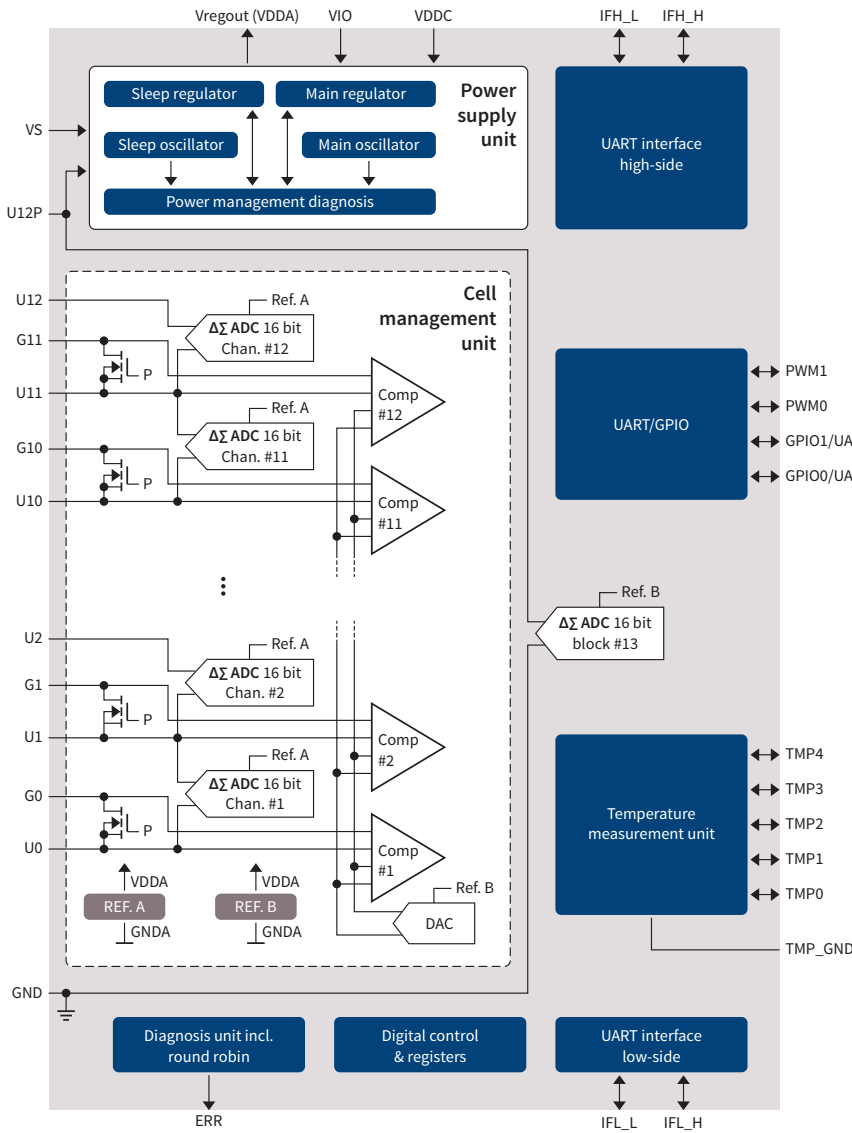
- › Mild Hybrid Electric Vehicle (MHEV)
- › Hybrid Electric Vehicle (HEV)
- › Plug-in Hybrid Electric Vehicle (PHEV)
- › Battery Electric Vehicle (BEV)
- › 12 V Li-Ion battery systems
- › Energy Storage System (ESS)
- › Home Energy Storage System (HESS)
- › eBike battery management system
- › Commercial, construction and agricultural vehicles (electric bus, truck, forklift, ...)



Battery monitoring and balancing IC

TLE9012AQU

Block diagram



Parametrics TLE9012AQU

| | |
|--|----------|
| Number of voltage measurement channels | 12 |
| Number of temperature measurement channels | 5 |
| Maximum balancing current with internal switch | 150 mA |
| Voltage class | 75 V |
| Maximum cell voltage | 5.5 V |
| Isolated communication interface | Iso UART |
| Non-isolated communication interface | UART |
| Communication maximum bandwidth | 2 Mbps |
| Stand-by current | 3 μA |
| ESD protection | 4 kV |
| T _j max | 150°C |
| Package | TQFP-48 |

Orderable Part Number OPN:
TLE9012AQUXUMA1

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2020 Infineon Technologies AG.
All Rights Reserved.

Please note!

This Document is for information purposes only and any information given herein shall in no event be regarded as a warranty, guarantee or description of any functionality, conditions and/or quality of our products or any suitability for a particular purpose. With regard to the technical specifications of our products, we kindly ask you to refer to the relevant product data sheets provided by us. Our customers and their technical departments are required to evaluate the suitability of our products for the intended application.

We reserve the right to change this document and/or the information given herein at any time.

Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.