

TLE9012DQU

Li-ion battery monitoring and balancing IC

The TLE9012DQU is a multi-channel battery monitoring and balancing IC designed for Li-Ion battery packs used in many applications in the automotive (electric vehicles of any kind MHEV, HEV, PHEV and BEV, etc.), industrial (Energy storage systems) and consumer world (e.g. e-bike BMS, home energy storage, etc.).

TLE9012DQU fulfills four main functions: cell voltage measurement, temperature measurement, cell balancing and isolated communication to main battery controller. Additionally, TLE9012DQU provides the necessary diagnostic tools to ensure proper function guaranteeing the safety of the persons around the controlled battery.

Summary of Features

- Voltage monitoring of up to 12 battery cells connected in series
- Hot plugging support
- Dedicated 16-bit delta-sigma ADC for each cell with the selectable measurement mode
- High-accuracy measurement for SoC and SoH calculation
- Integrated stress sensor with digital compensation algorithm and temperature-compensated measurements
- Secondary ADC with same averaging filter characteristics as advanced End to- End safety mechanism
- Five temperature measurement channels for external NTCs
- Internal temperature sensors
- Integrated balancing switch allows up to 200 mA balancing current
- Differential robust serial 2 Mbit/s communication interface
- Additional four GPIO pins to e.g. connect an external EEPROM
- Internal round-robin cycle routine triggers the majority of diagnostics mechanisms
 - Automatic balancing over- and undercurrent detection scheme
 - Automatic open load and open-wire detection scheme
 - Automatic NTC measurement unit monitoring scheme
- End-to-end CRC secured iso UART/UART communication
- Emergency mode for communication
- ISO 26262 Safety Element out of Context for safety requirements up to ASIL D
- Green Product (RoHS compliant)

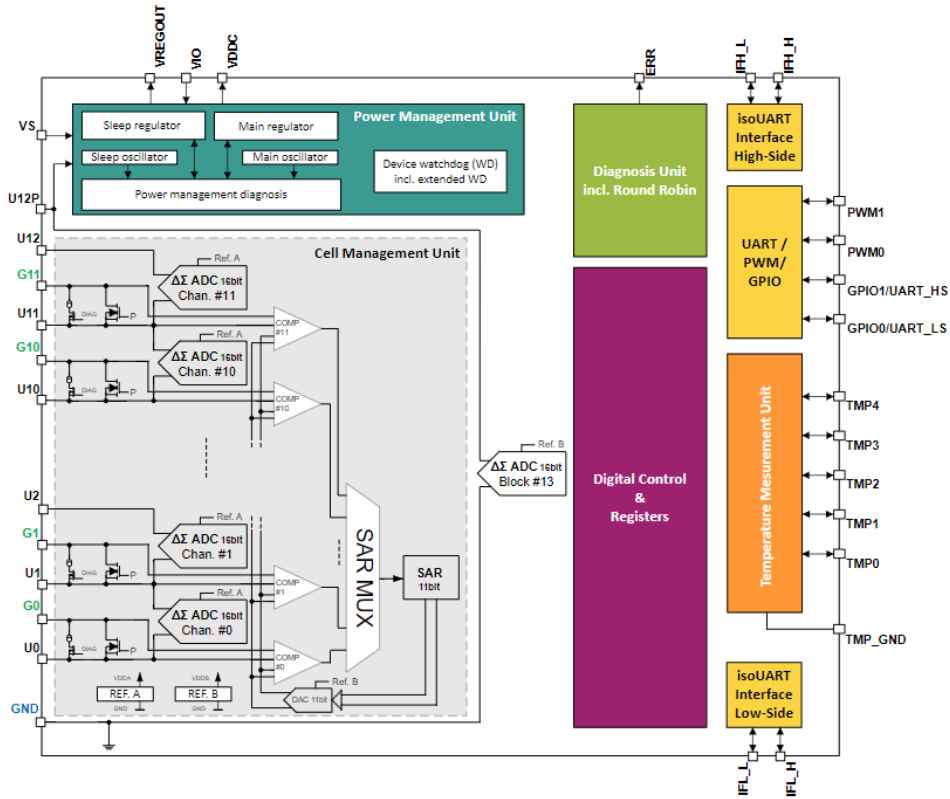
Key benefits

- **Best in class Application Robustness:** Infineon technology and device architecture guarantee best performances under noise
- **High accuracy voltage measurement:** Reliable and precise battery cell monitoring for highly accurate SoC and SoH
- **Lowest system cost:** Small package (TQFP-48) & high feature integration for a lean external BOM



PRODUCT BRIEF

Block Diagram



Product Table

Product	Balancing Current Max (mA)	Cell Voltage Max (V)	ES Protection (kV)	isoUART Interfaces	Isolated Communication Interface	Standby Current (µA)	Tj max (°C)	Temperature Measurement Channels	UART interfaces	Voltage Class (V)	Voltage Measurement Channels
TLE9012DQU Monitoring & Balancing IC	200	7	4	-	isoUART	2.5	150	5	-	75	12
TLE9015DQU Transceiver	-	-	4	2	isoUART	3	150	-	2	75	-

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