

TLE9016DQK

Li-ion battery monitoring and balancing IC

The TLE9016DQK 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.).

TLE9016DQK fulfills four main functions: cell voltage measurement, temperature measurement, cell balancing and isolated communication to main battery controller. Additionally, TLE9016DQK provides diagnostic tools to ensure proper function guaranteeing the safety of the people around the controlled battery.

Summary of Features

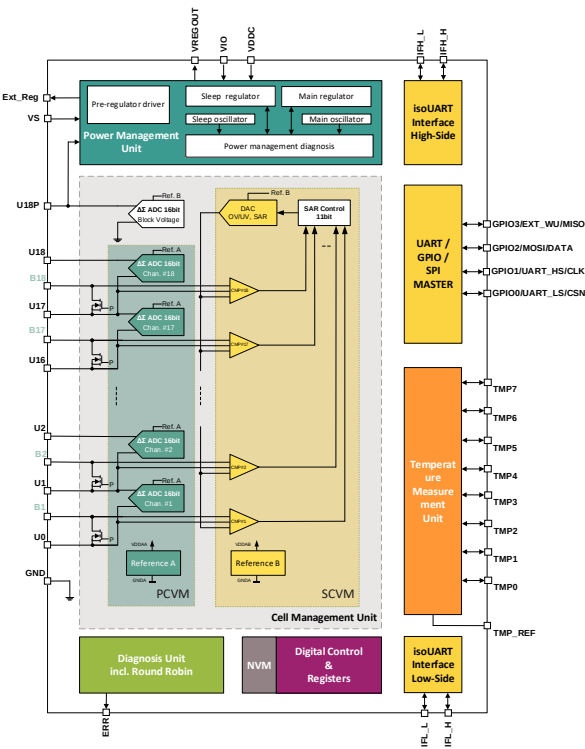
- Balancing & monitoring for up to **16 cells in series**
 - Simultaneous balancing up to 300mA/per cell (cont. or PWM)
 - Low power balancing mode
- Robust **Infineon 120V automotive technology** supports hot plug without external protection
- Dedicated 16-bit DS ADC per cell enables parallel & filtered measurements
 - **Configurable digital filter** (down to 70Hz cut-off)
 - IIR filtering <10Hz cut-off option
- Secondary ADC with same filter characteristics for a synced cell voltage plausibility as advanced End-to-End safety mechanism
- Iso UART communication interface
 - Differential robust serial 3 Mbit/s
 - Robust capacitive coupled interface for daisy chain & ring mode communication
 - Emergency mode for communication
 - Low EMI and power balanced communication scheme
- 8 error-compensated NTC channels
- **SPI master interface** e.g. for external sensors or EEPROM
- Sleep current down to 4µA
- **Several wake sources** via bus or static signal
- **Internal round robin cycle routine** to trigger **safety mechanisms** such as
 - Automatic balancing overcurrent and undercurrent detection scheme
 - Automatic open load detection scheme
 - Automatic NTC measurement unit monitoring scheme
- Compatible with Infineon **Complex Device Driver** for AURIX™ TC36x/37x/38x
- Compatible with **PSoC** HVPA PPM/CPM Pack Monitor IC
- Supporting up to **ASIL D** BMS safety applications
- High feature integration for **leanest BOM**

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:** High feature integration for a lean external BOM



Block Diagram



Product Table

Product	Balancing Current Max (mA)	Lowest voltage (V)	abs. max (V)	Standby Current (µA)	Tj max (°C)	Temp. Measurement Channels	Comm. Speed (Mbit)	Voltage Measurement Channels	Functional Safety	Package
TLE9018DQK	300	6	120	4	150	8	3	18	ASIL D	LQFP-64
TLE9016DQK	300	6	120	4	150	8	3	16	ASIL D	LQFP-64
TLE9012DQU	200	4,75	90	4	150	5	2	12	ASIL D	TQFP-48
TLE9009DQU	200	4,75	90	4	150	5	2	9	ASIL D	TQFP-48
TLE9015DQU (Transceiver)	-	4,75	90	3	150	-	2	-	-	TQFP-48

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