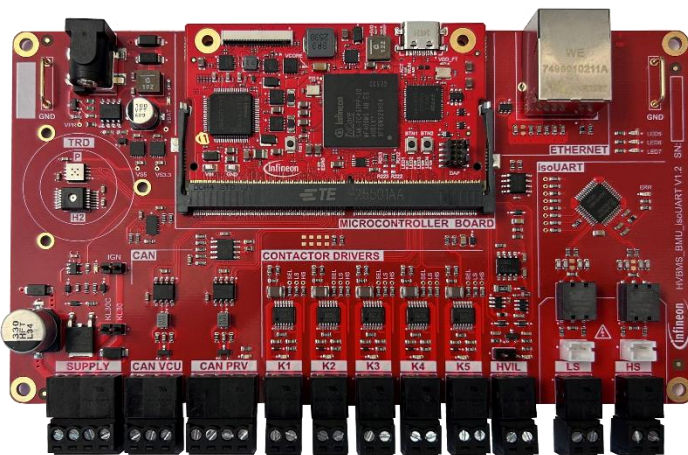


Battery Management Unit Reference Design

The one-stop-shop solution to accelerate your battery design

Infineon's Battery Management Unit (BMU) reference design kit accelerates the development and evaluation of high-voltage battery systems. It features example implementations on the **AURIX™ TC4x** with its **PPU hardware accelerator**, supporting complex digital twin, AI-based, and hybrid cell models. This capability is crucial for maximizing performance, optimizing charging speeds, and enabling next-generation semi- and full-solid-state cell chemistry.



System benefits

- **Plug-and-Play for Rapid Prototyping:** Designed to minimize time-to-market, the kit covers full BM functionality out of the box:
 - ISO 26262 ASIL-D compliant architecture
 - Integrated mechanical contactor control
 - Advanced thermal runaway monitoring
 - Seamless communication with the Vehicle Control Unit (VCU) and cell sensing ICs
- **Comprehensive Hardware Chipset:**
 - ASIL-D compliant safety microcontroller
 - Robust power supply supporting 12V KL30/KL31 modes
 - Dual CAN communication interfaces (one public, one private)
 - Five smart mechanical contactor drivers
 - High-voltage interlock loop (HVIL) monitoring
 - Isolated UART daisy-chain communication
 - Gas and pressure sensor for thermal runaway detection
- **Complete Software Stack:**
 - Low-level drivers and basic software libraries
 - Middleware software
 - Application-level software featuring Equivalent Circuit Models (ECMs) and AI-based cell models
 - Model-based design software examples

Key features

Battery Management Unit:

- MCU: [AURIX™ TC4x](#)
- PMIC: [TLE9744QK](#)
- Pressure sensor: [XENSIV™ KP467](#)
- Gas sensor: [XENSIV™ TCI-B](#)
- Iso UART: [TLE9015DQU](#)
- CAN FD: [TLE9371VSJ](#)
- LDOs: [OPTIREG™ TLS810B1LD](#)
[OPTIREG™ TLS810B1EJ](#)
- Full-bridge ICs: [MOTIX™ BTM9010EP](#)

Compatible with other BMS boards:

Cell Monitoring Unit:

- [TLE9018DQK](#)

Pack Monitoring Unit:

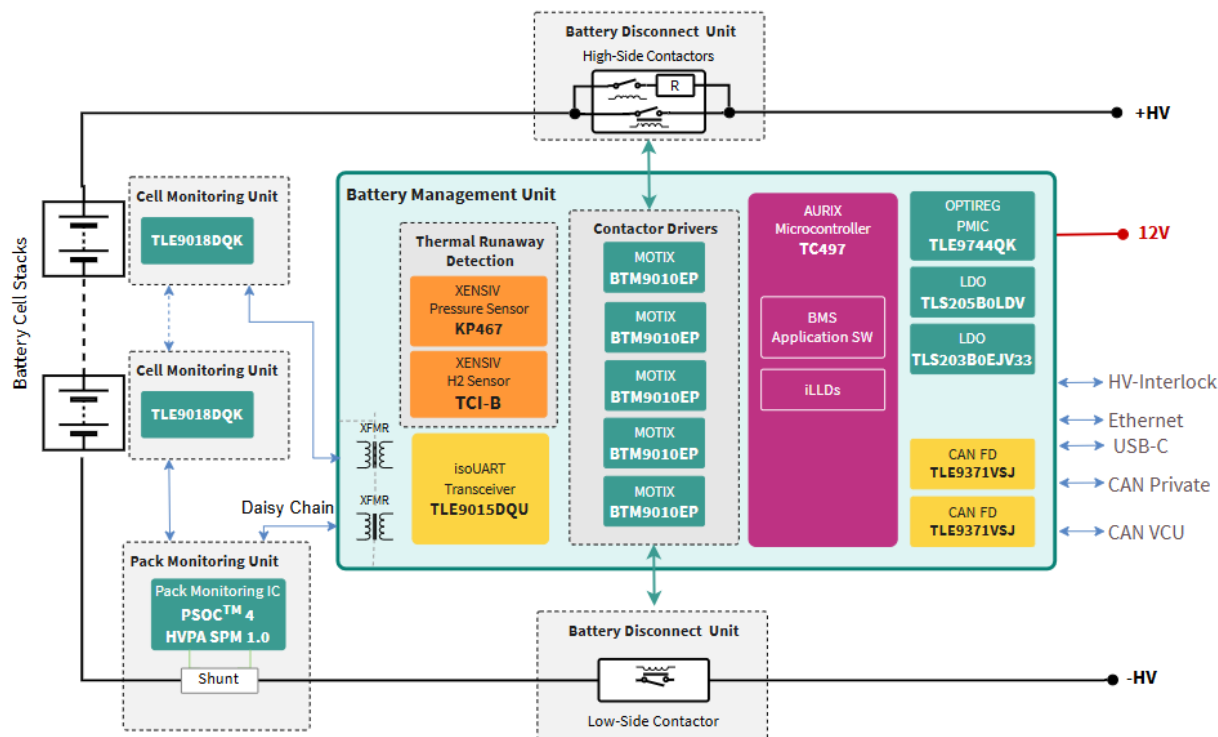
- [PSOC™ 4 HVPA SPM 1.0](#)

Solid State Battery Disconnect Unit:

- SiC JFET: [CoolSiC™ JFET](#)
- SiC MOS: [CoolSiC™ MOSFET](#)
- Isolated Gate Drive: [EiceDRIVER™](#)



Battery Management System Block Diagram



Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Germany

© 2026 Infineon Technologies AG
All rights reserved.

Public

Version: V1.0_EN
Date: 07/2026

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.



Scan QR code and explore offering
www.infineon.com