BATTERY MANAGEMENT SYSTEM

36 V and beyond from BMS ICs to the MCU

STBMIC

Highly scalable battery management system from Low-voltage up to 400/800/1200 V batteries for e-mobility and industrial applications

ST's scalable portfolio provides flexible battery management solutions thanks to the ability to daisy chain up to 31 L9963E BMS ICs, each one able to manage up to 14 battery cells, and based on our SPC58 automotive MCUs for traditional applications or Stellar integration MCUs for software-defined vehicles.

Our automotive-grade products provide for the highest safety requirements reaching ASIL-D.

Developers benefit from a comprehensive development ecosystem built around our SPC5-Studio framemwork including an L9963E evaluation board with an on-board SPC57 4S Line MCU with preloaded firmware for use with our user-friendly graphical user interface (STSW-L9963E).

COMPLETE BMS SOLUTION

- BMS IC with integrated current sensing
  - Fully ISO26262 compliant
  - Documentation available to aid ASIL-D system design
- MCU roadmap
  - Scaling up to ASIL-D
  - Supported by fitting Power Supply IC
- Contactor driver
- Fast Discharge
- Power MOS

TARGET APPLICATIONS

- eBikes, e-scooters
- Energy storage & backup systems
- xEVs
  - 48 V Battery Systems
- High Voltage BMS
  - EVs 400/800 V systems
- Low Voltage BMS
  - 12 V Lead Acid replacement

www.st.com/electro-mobility

Key Components

BMS ICs

A Li-ion battery monitoring and balancing chip, the L9963E embeds parallel Sigma-Delta ADCs with a fully redundant measurerement path in combination with integrated current sensing ideal for 48 V applications. Able to stack multiple devices in daisy chain with superior synchronicity, high-voltage applications are no problem in a combination with isolated transcievers. An additional product, based on our automotive experience, is L9961, up to 5-cells BMS IC for industrial and consumer applications.

Microcontrollers

SPC58 Automotive MCUs include devices with up to 10 Mbytes of NVM with 3 cores. Designed to handle the complexity of new car architectures, Stellar Integration MCUs offer safe, secure and deterministic solutions for highly demanding applications. Compatible power management ICs, optimized to meet the stringent requirements of automotive applications, are also available with the full development ecosystem including functional safety software such as MCAL, safety, and more.

Contactor driver

Based on ViPower technology which provides control, protection and diagnostics for medium/high power automotive loads, these contactor drivers are ideal for BMS systems. PWM is performed via low-side drivers.

High-temperature thyristors

Our high-temperature silicon-controlled rectifiers ensure fast discharge capabilities to quickly bring systems to a safe state.
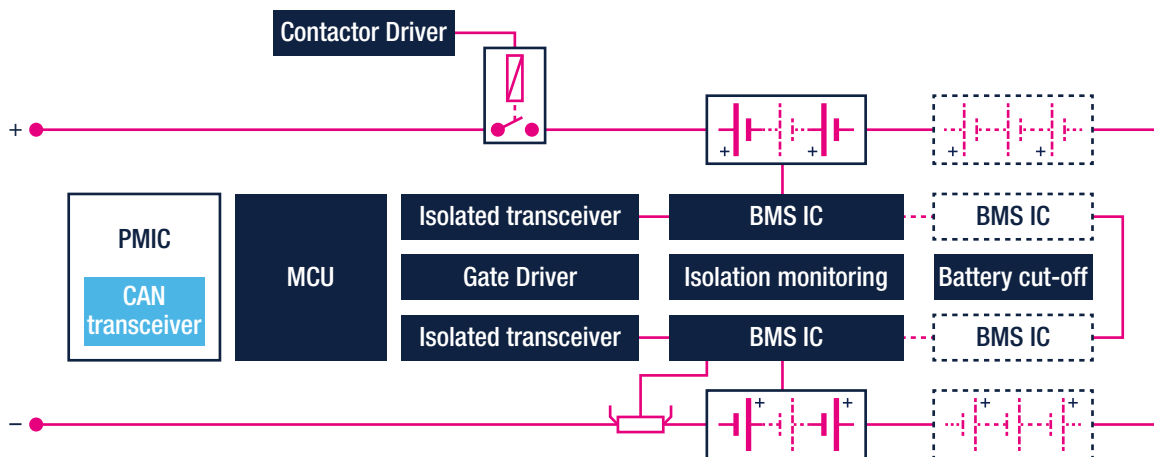
Gate driver

Our high-side switch controllers with intelligent fuse protection are ideal for automotive applications.

L9963E evaluation board (EVAL-L9963E-MCU) with on-board SPC5 MCU and preloaded firmware

Block Diagram

Product Portfolio

Product name	Part type	ASIL Level	Description	Package
L9963E	BMS IC	ASIL-D	14-channel multicell Analog Front End	TQFP64EP
L9961	BMS IC	QM	5-channels for consumer/industrial applications	VFQFPN32
SPC58/Stellar MCUs*	MCU	ASIL-D	PowerPC and ARM based 32-bit MCUs	LQFPs and BGAs
STPM066S	PMIC	ASIL-D	Power management with Buck, Boost, LDO & ADC ref.	QFN48
VND9025AJ	Contactor driver	ISO ready (ASIL-D)	Discrete half-bridge with high- and low-side drivers	PowerSSO-16
VND7NV04				DPAK
VNF1048F	Gate driver	ISO ready (ASIL-D)	Gate driver with integrated fuses for solid-state relays	QFN32L
STK335N8F8AG	Power MOS	-	Power MOS for solid-state relays	PowerLEADED 8x8
L9679E	Battery Cut-off	ASIL-D	Squib driver	TQFP48EP
TN4035HA-8**	Fast discharge	ISO ready (ASIL-D)	High surge current SCR for active discharge	D2PAK

Notes: * for non-safety industrial application, STM32 as MCU alternative to automotive requirements
** evaluation boards on demand

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Order code: FL2210BMS

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