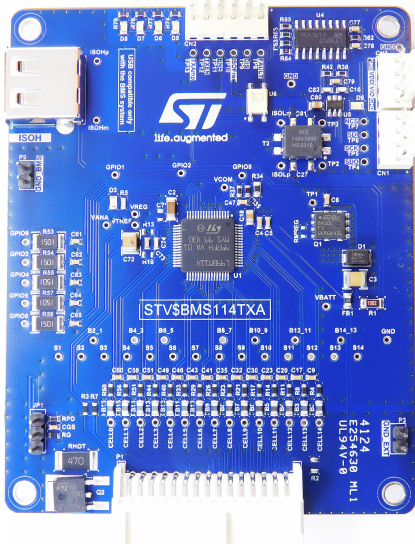


## Battery management system module based on L99BM114 and L99BM1T



### Features

- Hosts the L99BM114 multicell battery monitoring and balancing IC
- Hosts the L99BM1T general purpose SPI to isolated SPI bidirectional transceiver
- Voltage monitoring of every single cell and of the entire battery node
- Current sensing of the entire battery node
- 5 GPIOs to connect temperature sensors as NTCs
- CN1 connector that allows establishing communication with an MCU board via SPI
- CN2 connector that interfaces directly to an MCU board for control and diagnostic functions
- Passive balancing
- Compact size: 100 mm x 76 mm

### Description

The **STEVAL-BMS114TX** is a battery management system (BMS) evaluation board that manages from 4 to 14 battery cells.

The main advantage of this evaluation board is ensuring isolated connection to an external MCU, thanks to the embedded transceiver.

The board is based on the **L99BM114** Li-ion battery monitoring and protection chip for high-reliability applications and the **L99BM1T** general-purpose SPI to isolated SPI bidirectional transceiver.

The main activity of the **L99BM114** is monitoring the cells and battery node status through stack voltage measurement, cell voltage measurement, temperature measurement, and coulomb counting.

Measurement and diagnostic tasks can be executed either on demand or periodically, with a programmable cycle interval.

Measurement data are available for an external microcontroller to perform charge balancing and to compute the state of charge (SOC) and the state of health (SOH).

The **L99BM1T** general-purpose SPI to isolated SPI bidirectional transceiver can transfer communication data incoming from a classical 4-wire based SPI interface to a 2-wire isolated interface (and vice versa). In our board, the transceiver is configured as a slave.

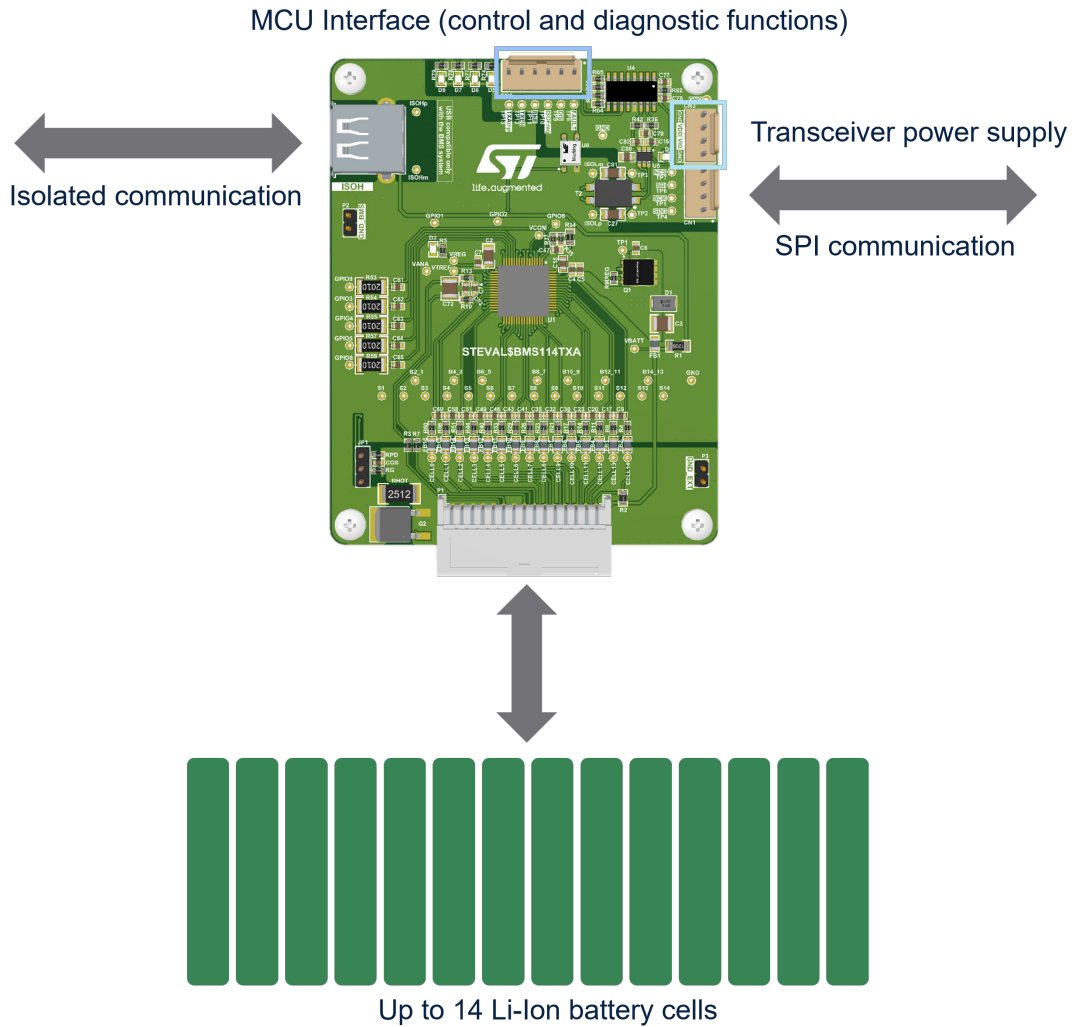
The **STEVAL-BMS114TX** provides an elaborate monitoring network to sense the voltage of each cell. It is possible to sense the current of the entire battery pack.

Passive cell balancing can be performed either via the **L99BM114** internal MOSFETs or via external MOSFETs. The controller can either manually control the balancing drivers or start a balancing task with a fixed duration. In the second case, the balancing may be programmed to continue even when the IC enters a low-power mode called silent balancing, to avoid unnecessary current absorption from the battery pack. The balancing function is necessary to lengthen the battery capacity and its duration.

Product summary	
Battery management system module based on L99BM114 and L99BM1T	<b>STEVAL-BMS114TX</b>
Multicell battery monitoring and balancing IC	<b>L99BM114-TR</b>
General purpose SPI to isolated SPI transceiver	<b>L99BM1T-TR</b>
Applications	<b>Battery Management Systems</b>

# 1 Block diagram

Figure 1. Block diagram



# 2 STEVAL-BMS114TX schematic diagrams

Figure 2. STEVAL-BMS114TX circuit schematic (1 of 2)

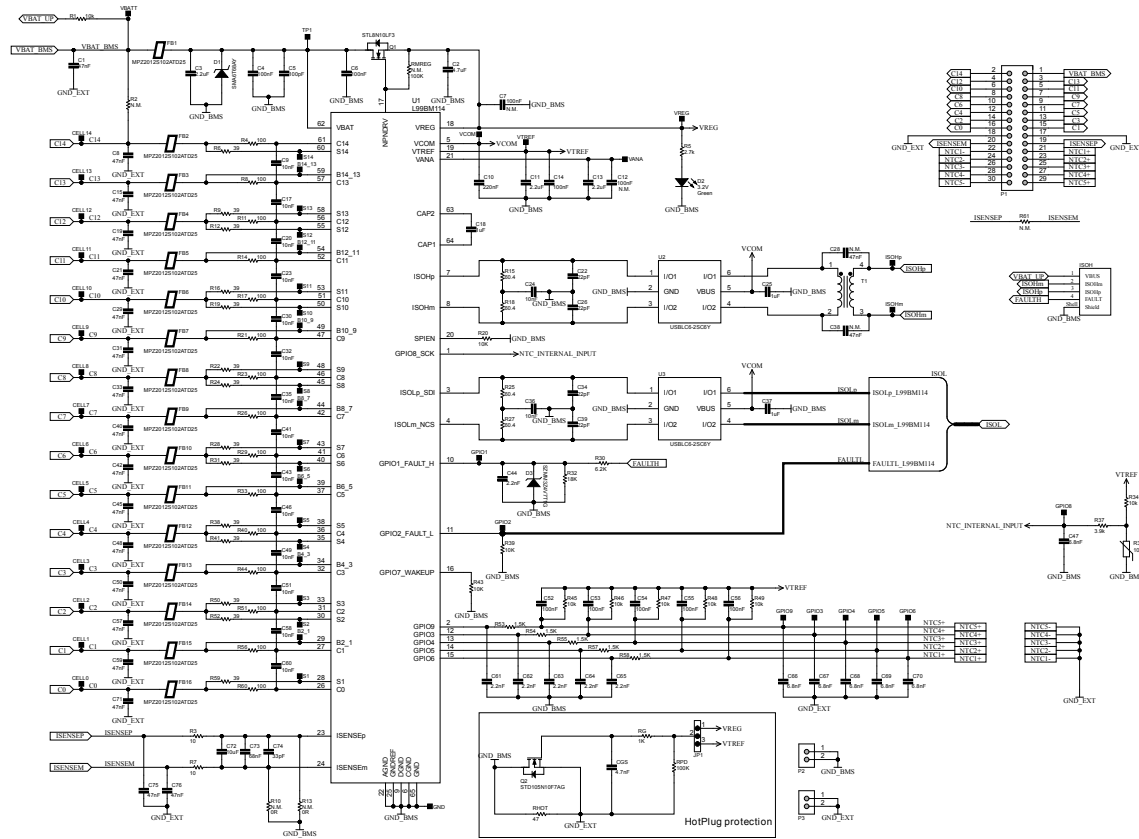
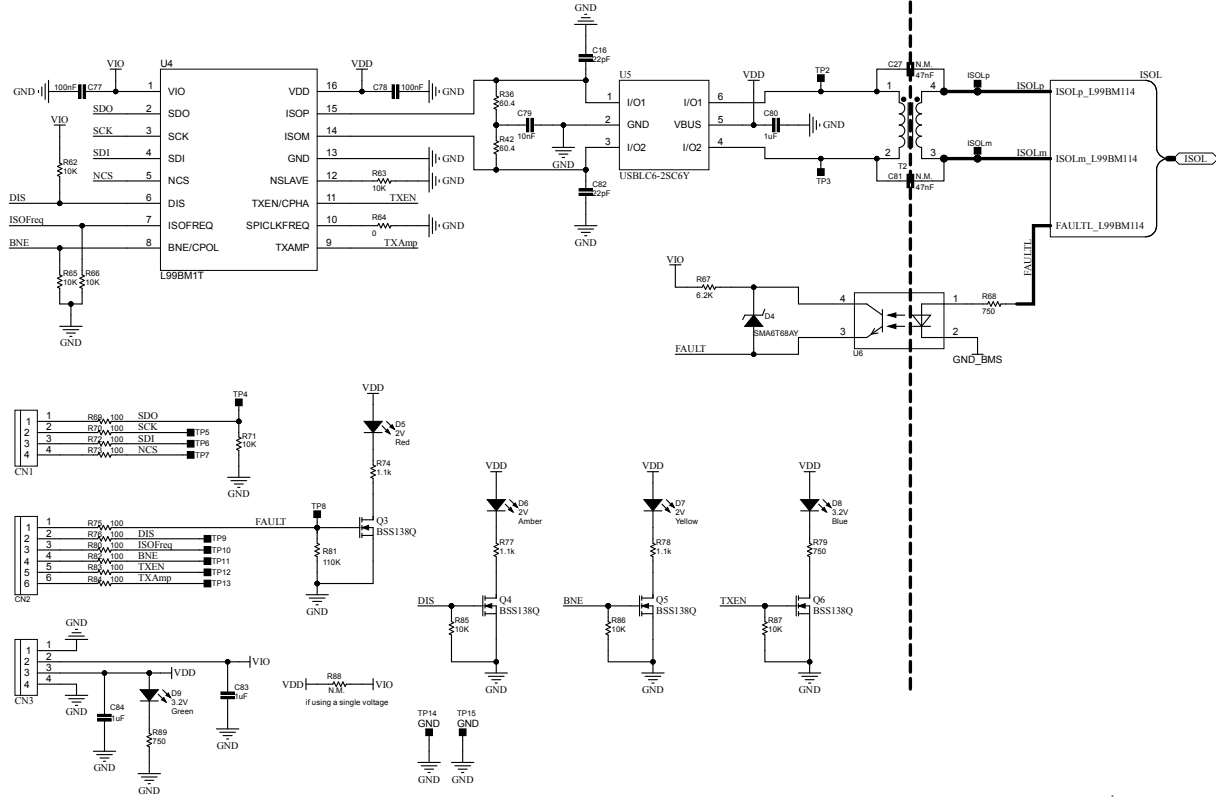


Figure 3. STEVAL-BMS114TX circuit schematic (2 of 2)



### 3 Board versions

Table 1. STEVAL-BMS114TX versions

Finished good	Schematic diagrams	Bill of materials
STV\$BMS114TXA <sup>(1)</sup>	STV\$BMS114TXA schematic diagrams	STV\$BMS114TXA bill of materials

1. This code identifies the STEVAL-BMS114TX evaluation board first version.

## Revision history

Table 2. Document revision history

Date	Revision	Changes
16-Jan-2025	1	Initial release.

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