



INTRODUCTION

The networked LiBAL n-BMS has been developed around the new communication standard isoSPI, which essentially does not require programmable processors on CMU's (Slave PCB) in the BMS network. In any application, this is a huge advantage, because it does not require software on the CMU and therefore greatly simplifies in-field maintenance. In addition, the isoSPI communication network ensure the most cost efficient communication circuit in the market.

The n-BMS is developed to meet all relevant automotive requirements. ISO 26262 compliant design with key components such as Processor, ASIC and PSU carefully selected to meet the functional safety at ASIL C level.

The n-BMS can be configured with up to 32 CMU's. Each CMU can monitor up to 12 cells in series and thus the n-BMS can monitor in total up to 384 cells in series.

The n-BMS can measure temperature with an accuracy up to ± 1 C and SOC accuracy to within $\pm 0,5\%$.

The n-BMS Creator™ software, enable the battery designer to create a unique Battery design based on the n-BMS hardware. The n-BMS Creator™ software facilitates a unique safety strategy, battery performance optimisation, charge time reduction as well as ensuring the best possible battery life.

SAFETY

- ISO 26262 rated components and design
- Self-test and redundancy in safety critical measurement circuits
- Open circuit detection

BATTERY LIFE

- High frequency sampling of current (100 mS) allows optimal detection of pulses
- Powerful and intelligent dissipative balancing at 200mA per cell
- 40° to +85°C operational range

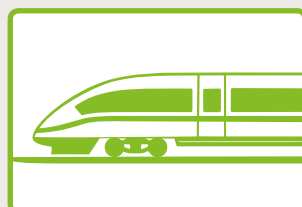
PERFORMANCE

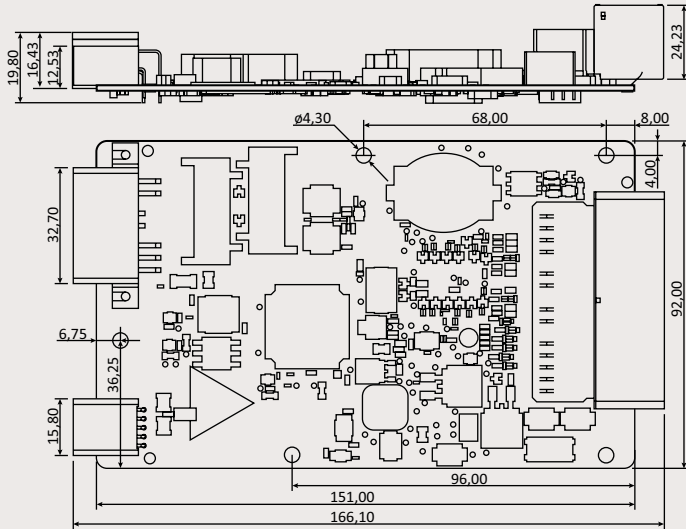
- $\pm 1,6$ mV at 25 °C at individual cell level
- Optimized low power consumption mode
- ± 1 °C accuracy in temperature measurement
- Advanced SOC algorithm with OCV compensation
- Advanced SOH algorithm
- Advanced SOP Algorithm

USABILITY

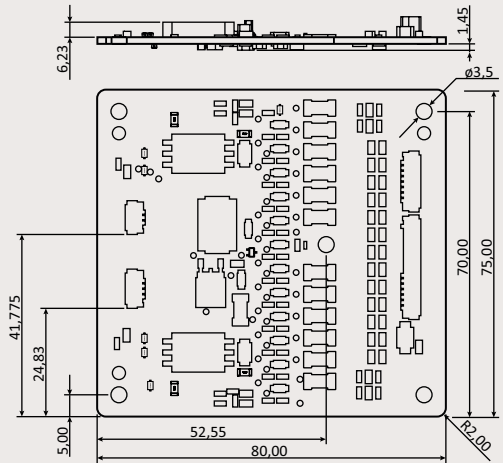
- RTC + logging of events, errors and warnings
- BMS Creator PC tool for easy configuration
- Optional current sensing (Hall effect or Shunt)
- CAN UDS tool

Applications





n-BMS MCU



n-BMS CMU 100808

Dimensions in MM

PARAMETERS

Master Control Unit (MCU)

- Power supply
- Number of CMU's supported
- Number of cells in series for total system
- Range of high voltage measurement
- Accuracy of high voltage measurement
- Range of current measurement input Shunt
- Accuracy of current measurement input Shunt
- Range of current measurement input (Hall effect sensor)
- Accuracy of current measurement input (Hall effect sensor)
- Accuracy of temperature (NTC)
- Ground fault detection (leakage) levels
- Standby Consumption
- Active Consumption
- Communication interface, master-slave
- Supported CAN communication type
- Supported CAN speeds
- Number of CAN ports
- External GPIOs
- Charger control interfaces

Cell Monitoring Unit (CMU)

- Number of cells per unit
- Detectable cell voltage
- Number of temperature sensors per unit
- Cell balancing topology
- Cell balancing current
- Cell voltage typical sampling time
- Accuracy of single cell voltage
- Range of Temperature measurements
- Accuracy of cell temperature (NTC)
- Communication interface
- Standby Consumption
- Active Consumption
- Patents

SPECIFICATIONS

- 6-35 V
- 1-32
- 384
- 0 - 1000 VDC
- ±1 VDC
- ±150 mV
- ±1.0 mV -40 – 85 °C
- 0.0 – 5.0 V, 0.0 -2.5 V current in, 2.5 V – 5.0 V current out
- ±1.5 mV -40 – 85 °C
- ±1 °C -40 – 85 °C
- 250/500/1000 Ω/V Between GND and HV+/-
- <8,5 mW at 12V supply
- <3,5 W at 12 V supply
- isoSPI
- CAN 2.0A/B 11 bit and 29 bit IDs
- 125, 250, 500, 1k kbit/sec
- 2, one isolated CAN, one non-isolated CAN.
- 16 (Active Low)
- CAN
- 3-12 Cells (minimum 11 V, to power the CMU)
- 0 - 5 VDC
- 4 (NTC based)
- Dissipative
- 200 mA, at cell voltage 4.2 V
- 100 ms
- ±1,6 mV at 25 °C
- 40 to +85 °C
- ±1 °C -40 – 85 °C
- isoSPI (Max. 5 m shielded cable between boards)
- <269µW (with 12 cells @ 3,2 V)
- <326 mW (with 12 cells @ 3,2 V)
- ZT 200780048774, EP 0781788.6, US 8.350.529

