



Robust, reliable  
analog solutions

# MC33772 and MC33664 Battery Cell Controller and Transformer Physical Layer

The MC33772 battery six-cell controller and MC33664 transformer physical layer solutions enable reliable, safe and bill of materials (BOM) optimized Li-ion cell control applications with low-cost, robust, high-speed isolated communication.

## TARGET APPLICATIONS

### Automotive Applications

- ▶ High-voltage battery management systems (200 V–+800 V)
- ▶ 14 V Li-ion battery management systems

### Industrial Applications

- ▶ Energy storage systems (ESS)
- ▶ Uninterrupted power supply (UPS)
- ▶ E-bikes, e-scooters

This solution addresses all existing battery management system topologies that support centralized, distributed daisy chain as well as high-speed and robust daisy chain. It is compatible with 14 V Li-ion batteries with one analog front end (AFE) and optional high-speed isolated or SPI communications. These fully integrated battery monitoring devices are for automotive and industrial mission-critical applications.

High-speed and robust daisy chain is used as an alternative to CAN solutions. Fast data acquisition and communication to the pack controller can be achieved in only 0.86 ms for the pack controller to acquire conversions from six cells, seven external temperatures, the current and coulomb counter. The MC33772 controller can work down to three cells and up to six cells. Also, determination of individual cell impedances in one shot is synchronized for cell voltages and current measurements at 113  $\mu$ s.

With functional verification and diagnostics, the MC33772 and MC33664 support ISO 26262 SafeAssure<sup>®</sup> functional safety. Functional verification of cell measure, current measure, cell terminal openings or leakage and ADC precision checks are all performed.

## FEATURES

- ▶ 5.0 V (7.0 V for TPL)  $< V_{PWR} < 30$  V operation, 42 V transient for TPL communication
- ▶ Isolated 2 Mbps differential communication or 4 Mbps SPI
- ▶ Up to six cell voltage (differential) measurements and stack voltage measurements
- ▶ Synchronized cell voltage/current measurement with coulomb counting
- ▶ Seven ADC/GPIO/temperature sensor inputs
- ▶ Addressable on initialization
- ▶ Onboard 300 mA passive cell balancing low ohmic MOSFETS with diagnostics
- ▶ Designed to support ISO 26262, up to ASIL D safety capability
- ▶ Low-power modes
- ▶ 48-pin LQFP package



