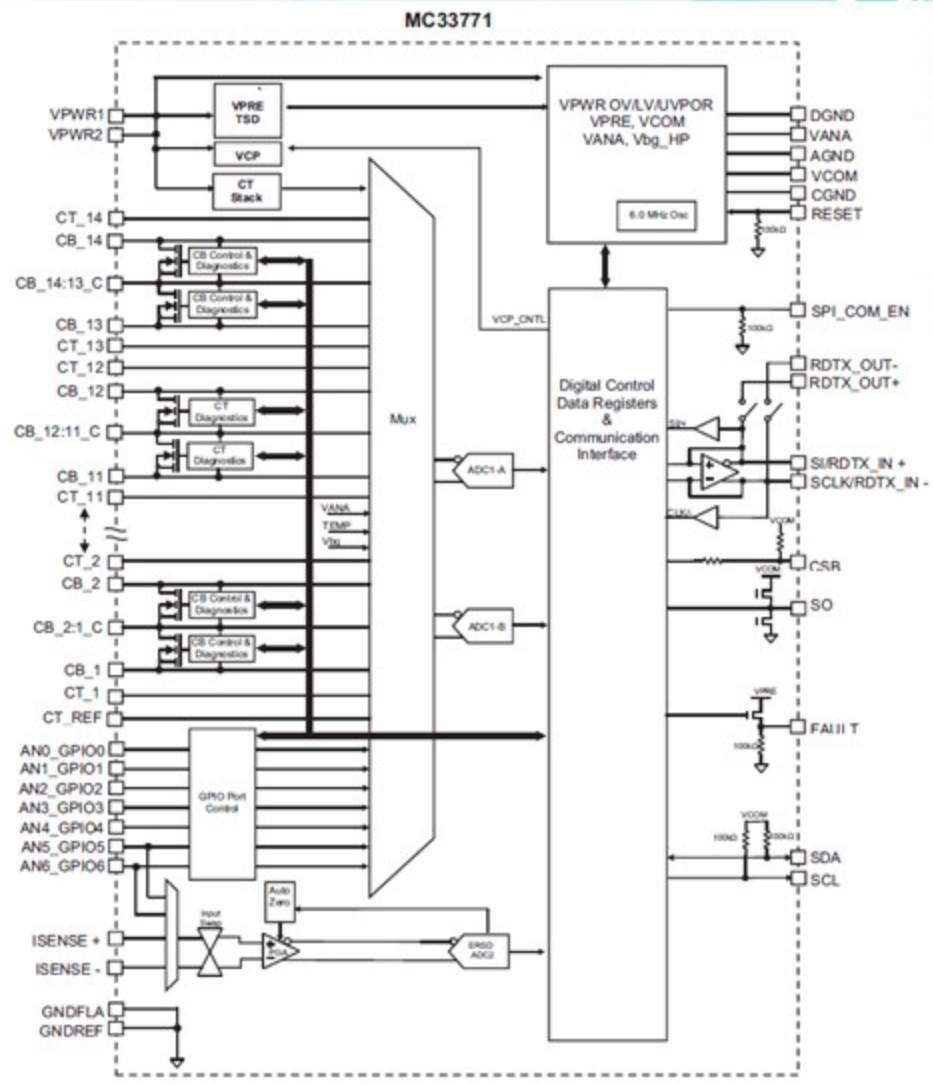
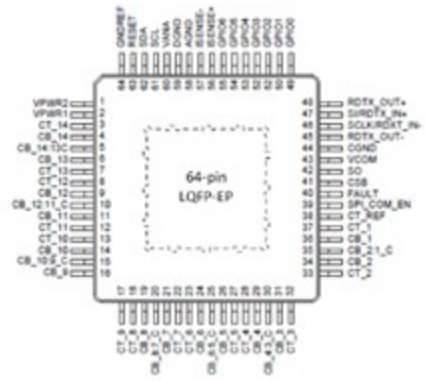
MC33771 – 14 CELL BATTERY CELL CONTROLLER AFE

Key features

- **High-performance integrated functions**
  - Operating voltage: 9.6V ≤ VPWR ≤ 61.6 V operation, 75 V transient
  - **Life-time guaranteed** high accuracy 14 cell voltage measurement channels
  - 4.0 Mbps SPI or isolated 2.0 Mbps differential communication
  - Synchronized on-chip current measurement with ±0.5% accuracy (±1500 A)
  - Synchronized on-chip Coulomb counter (also in low-power mode)
  - 7 ADC/GPIO/temperature sensor inputs
- **Comprehensive integrated functional safety features**
  - Designed to support ISO 26262, up to ASIL D system safety capability
  - Automatic OV/UV and temperature detection routable to fault pin
  - Integrated sleep mode OV/UV and temperature monitoring
  - OV/UV, over/under temperature fault verification
  - Detection of internal and **external faults**, i.e. open line, short, and leakage
  - Integrated balancing diagnostics
- **Quality & robustness**
  - AEC-Q100 automotive Qualified
  - Temp range: -40°C to 105°C
  - Operational low-power mode
  - Hot plug capable
  - EMC/ESD robustness





NXP MC33771/2 BATTERY CELL CONTROLLER SOLUTION

Differentiating Points

Battery topology flexibility

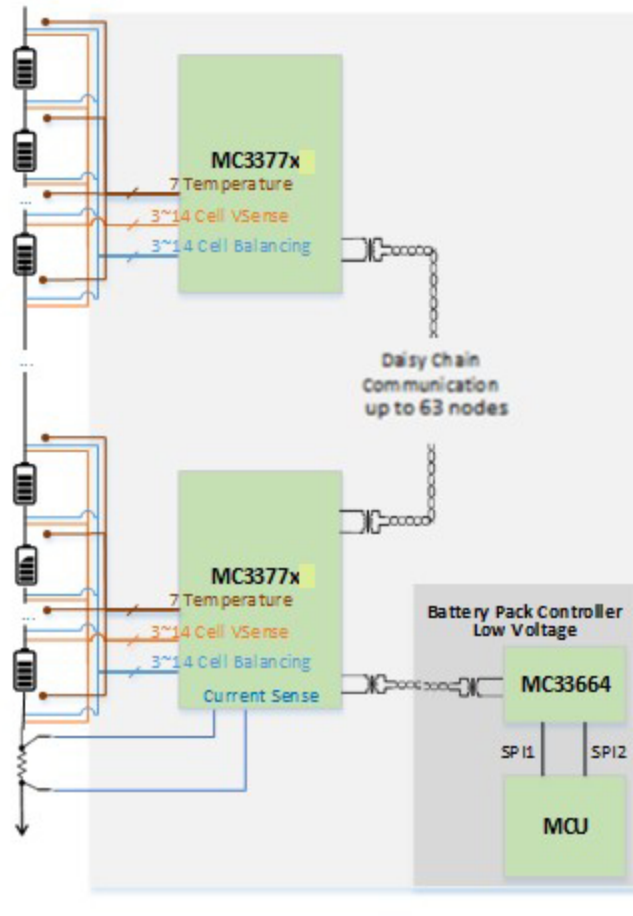
- Scalable SW & HW compatible BMS solution supporting **4 to >800 cells per daisy chain**
- MC33771 (7 to 14 cells) & MC33772 (3 to 6 cells) fully compatible
- Supporting centralized, distributed daisy chain, distributed CAN

High integration level

- Synchronized on-chip current sensor
- Synchronized on-chip coulomb counter
- Integrated passive balancing (300 mA per ch)
- Integrated power regulator

Fast & robust communication & DAQ

- 4.0 Mbps SPI or isolated 2.0 Mbps differential communication with transformer
- < 546 us conversion time for all measurements
- 3.6 ~ 4.1ms for sending command and read back **96** cell 16-bit voltage data



High lifetime measurement accuracy

- **± 0.8 mV** total voltage measurement error
- Specification **after soldering** & 1000 hrs HTOL aging
- ± 0.5% total stack voltage measurement
- ± 0.5% accuracy integrated current sensor

Diagnosis and functional safety supporting ISO 26262 w/ single chip

- Single chip ASIL C capable (easy ASIL D)
- Sleep mode OV/UV and temperature monitor
- **> 40** integrated safety mechanisms detecting internal and external faults

Automotive robustness

- ESD, EMC; Hot Plug, AEC-Q 100
- Temp range: -40°C to 105°C
- Operational low-power mode