

SY6801 (5-16 series High Accuracy Battery and Protector for Li-Ion Li-polymer, and LiFePO4 Battery Packs)

1 Description

SY6801 is a highly integrated, high-accuracy battery monitor and protector for 5~16series Li-ion, Li-polymer, and LiFePO4 battery packs.

2 Applications

Battery backup unit (BBU)

E-bike, e-scooter, and LEV

Other industrial battery pack(>10S)

3 Features

- Battery monitoring capability for 5~16 series cells; support Li-ion, Li-Polymer, and LiFePO4 battery Packs;
- Reliable and flexible protection FET driver;
 - Integrated **dual-charge pump** for high-side NFET driver;
 - Integrated multi-purpose high-side PFET driver, support pre-charge, pre-discharge, and **parallel charge path short protection**;
 - Support MCU control directly, by register, or by CFETOFF/DFETOFF pin;
- Extensive protection suit, including cell voltage, open-wire fault, internal temperature, cell temperature, FET temperature, charging/discharging current, etc;
 - Support current cascade protection, high-precision ADC-based & quick-response comparator-based;
 - **Multiple fault reporting method**: traditional ALERTn, or DCHG/DDSG pins; Could be compatible with external low-side NFET driver;
 - Highly programmable protection strategy,
- each fault source's protective action and ALERTn could be individually masked;
- Integrated charger-remove detection and load-remove detection, support autonomous fault recovery;
- Two independent delta-sigma ADCs:
 - Low temp-coefficient reference, $\pm 2\text{mV}$ / $\pm 15\text{mV}$ cell voltage measurement accuracy (typical / -20°C~85°C);
 - Independent programmable decimation-ratio for each ADCs; 400us conversation time for 1-cells (typical);
 - High accuracy current measurement $\pm 5\text{LSB}$
- Multi-purpose voltage-ADC, for cell-voltage, temp-sense etc; independent programmable time-interval for each purpose-series, independent programmable decimation-ratio for each purpose-series;
- Support autonomous measurement and command trigger measurement;
- Support **synchronized voltage and current measurement** for individual cell impedance analysis;
- **Human-readable ADC result**, 100uV/LSB for voltage-ADC and 8uV/LSB for current ADC;
- Up to eight external thermistors, and TS3 could be configured as FET temp sense;
- Integrated coulomb counter
- Integrated delta-voltage based autonomous balance, and support host-control cell balancing;
- Integrated balance timer up to 1000s,

support auto cell measure frequency down to get **larger balance duty cycle**;

- Integrated internal balance over-temp-protection;
- Multiple power mode:
 - Shutdown mode:2uA;
 - Deepsleep mode:10uA;
 - Sleep mode:100uA (function and measure frequency dependent);
 - Normal mode:300uA; (function and measure frequency dependent);
- High voltage tolerance of **100V** on cell connect and select additional pins;
- Dual-programmable LDOs for external system usage;
- Support 400KHz I2C or 1MHz SPI communication, integrated programmable watchdog;
- Integrated MTP memory for customer use on production line;
- 48-pin TQFP package

4 Typical Application Circuit

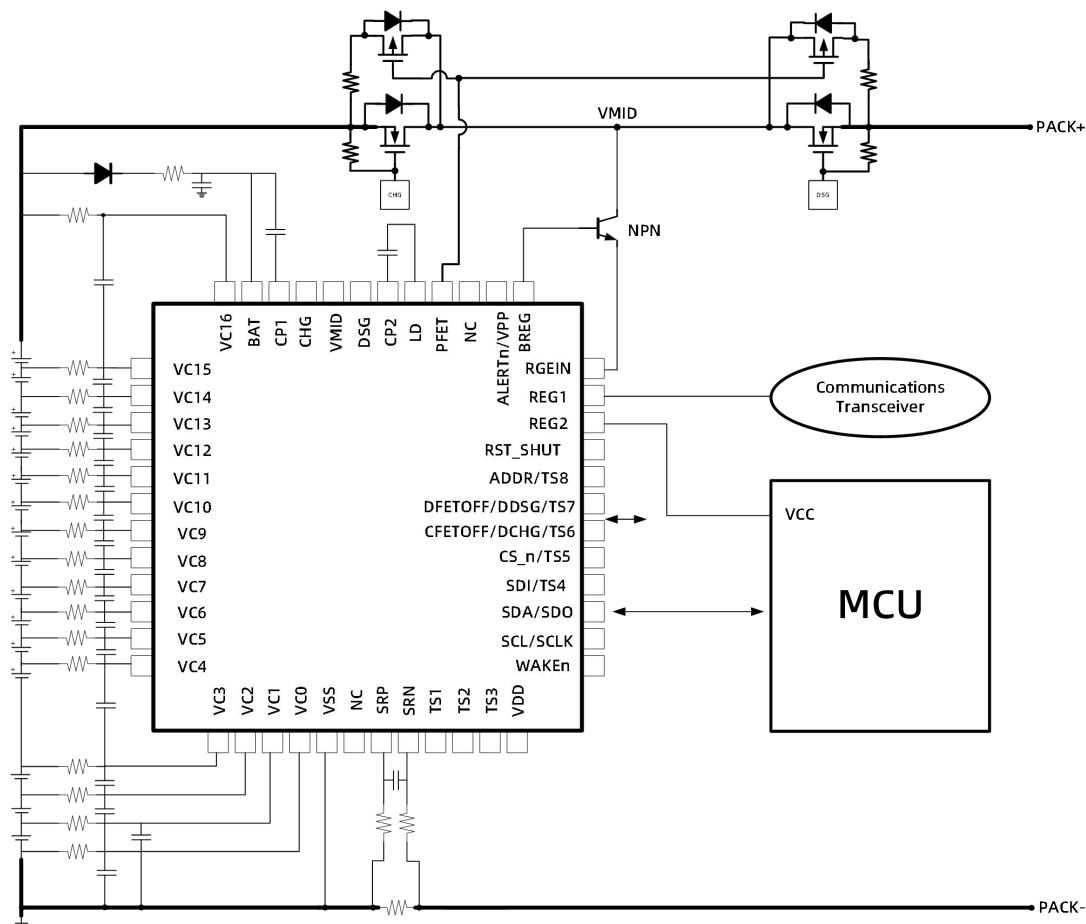


Figure 4- 1 Typical Application Circuit