ISL95521B

Hybrid Power Boost (HPB) and Narrow VDC (NVDC) Combo Battery Charger with SMBus Interface

FN8952
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The ISL95521B is a highly versatile combo battery charger configurable for operating as either a Hybrid Power Boost (HPB) charger or a Narrow VDC (NVDC) charger, supporting 2-, 3-, or 4-cell batteries. Both configurations allow the battery to work with the adapter to supply the system load when it exceeds the adapter capability, referred to as system Turbo mode. The HPB charger configuration reverse-boosts battery energy to the system bus to help the adapter provide the system power in Turbo mode. The NVDC charger configuration quickly turns on BGATE to enable the battery to help the adapter provide the system power in Turbo mode.

The ISL95521B uses N-channel MOSFETs (NFETs) for all the switches to achieve the best performance and lowest BOM cost. The internal charge pump is capable of turning on all the NFETs fast or slow, depending on the circumstance or the need. The ability to quickly turn on NFETs prevents system bus voltage drop when the battery is suddenly removed in Turbo mode or in Battery Learn mode.

The ISL95521B provides many protection features including a PROCHOT# indicator for system low voltage, adapter overcurrent, battery overcurrent, or overheating, with an array of SMBus programmable parameters for maximum flexibility. The ISL95521B also features a hardware-based adapter-current limit and battery-current limit in addition to SMBus programmable limits.

The ISL95521B provides a high accuracy adapter current monitor, battery current monitor, and system power monitor outputs. To provide maximum flexibility for working with high and low power systems, the ISL95521B provides several configurable current-sense resistor value options to achieve the best trade-off of current sensing accuracy vs power loss.

The ISL95521B uses the Renesas Robust Ripple Regulator (R3™) modulation scheme to provide excellent light-load efficiency and fast dynamic response.

Features

- Configurable as an HPB charger or NVDC charger
- Compliant with Intel PROCHOT# and PSYS requirements
- Adapter current monitor and battery discharging current monitor
- Uses NFET for all the switches
  - Supports battery removal during Battery Learn mode
  - Actively controlled inrush current to prevent FET damage
- SMBus programmable settings and high accuracy
- Comprehensive protection features:
  - PROCHOT# indicator for system low voltage, adapter overcurrent, battery overcurrent, or system overheating
  - Hardware-based adapter current and battery current limits
  - Supports sudden battery removal in system Turbo mode
- 16 switching frequency options from 350kHz to 1MHz
- Low quiescent current
- SMBus and auto-increment I^2C compatible
- Robust Ripple Regulator (R3) modulation scheme provides excellent light-load efficiency and fast dynamic response
- 32 Ld 4mm x 4mm QFN package
- Pb-free (RoHS compliant)

Applications

- Devices with rechargeable 2-, 3-, or 4-cell batteries

Related Literature

For a full list of related documents, visit our website:

- ISL95521B product page

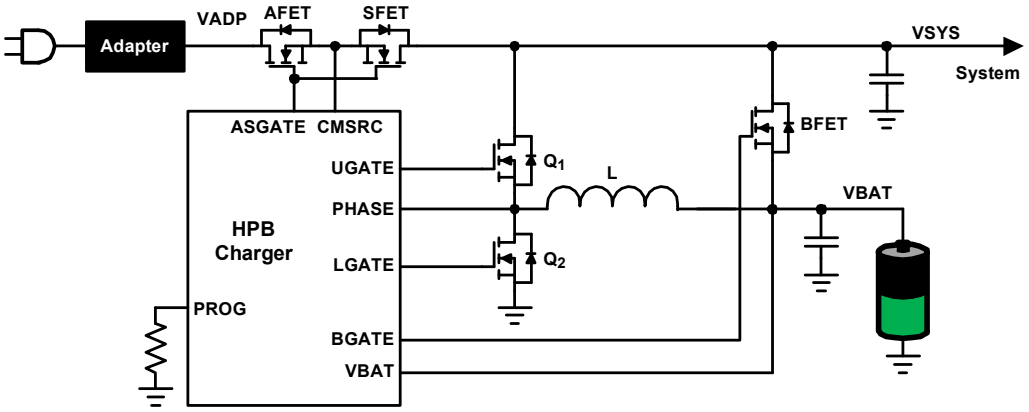

Figure 1. HPB Charger Configuration

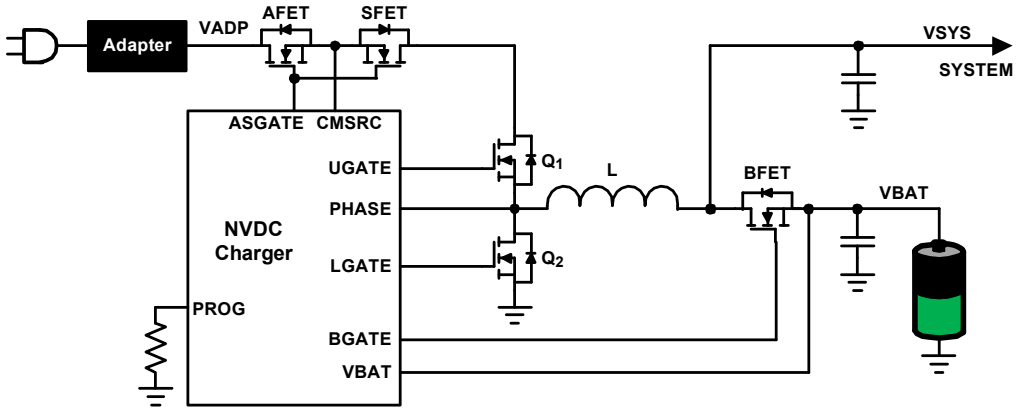

Figure 2. NVDC Charger Configuration

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