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ISL95520

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

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The ISL95520 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 together 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 system power in Turbo mode. The NVDC charger configuration quickly turns on BGATE to enable the battery to help the adapter provide system power in Turbo mode.

The ISL95520 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 ISL95520 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 ISL95520 also features hardware based adapter current limit and battery-current limit in addition to SMBus programmable limits.

The ISL95520 provides high accuracy adapter current monitor, battery current monitor, and system power monitor outputs. To provide maximum flexibility for working with high power and low power systems, the ISL95520 provides several configurable current-sense resistor value options to achieve the best trade-off of current sensing accuracy vs power loss.

The ISL95520 uses the Renesas patented Robust Ripple Regulator (R3™) modulation scheme to provide excellent light-load efficiency and fast dynamic response. The ISL95520 is available in a 32 Ld 4x4mm^2 QFN package.

Related Literature

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

- ISL95520 device page

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 NFETs 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, and 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
- Robust Ripple Regulator (R3) modulation scheme provides excellent light-load efficiency and fast dynamic response
- 32 Ld 4x4mm^2 QFN package
- Pb-free (RoHS compliant)

Applications

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

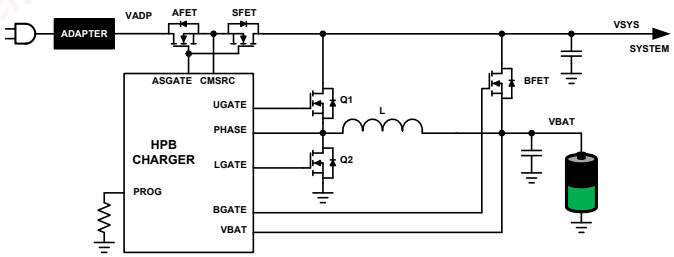


FIGURE 1. HPB CHARGER CONFIGURATION

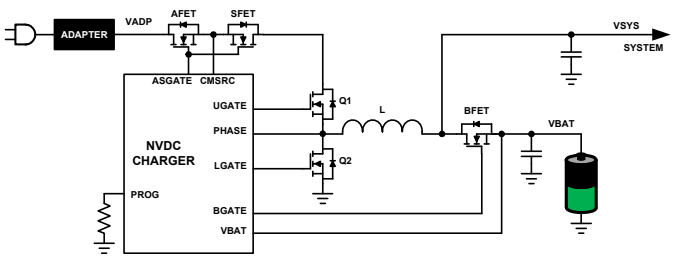


FIGURE 2. NVDC CHARGER CONFIGURATION

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