

ISL88739A

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

FN8953
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The [ISL88739A](https://www.renesas.com/en/products/power-management/isl88739a) 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 ISL88739A 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 ISL88739A provides many protection features including the PROCHOT# indicator for system low voltage, adapter overcurrent, battery overcurrent or overheating, with an array of SMBus programmable parameters for maximum flexibility. The ISL88739A also features hardware-based adapter-current limit and battery-current limit in addition to SMBus programmable limits.

The ISL88739A provides a 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 ISL88739A provides several configurable current-sense resistor value options to achieve the best trade-off of current sensing accuracy vs power loss.

The ISL88739A uses the Renesas Robust Ripple Regulator (R3™) modulation scheme to provide excellent light-load efficiency and fast dynamic response. The ISL88739A is available in a 32 Ld 4mmx4mm QFN package.

Features

- Configurable as an HPB charger or NVDC charger
- Compliant with Intel PROCHOT# requirements
- Adapter current monitor and battery discharging current monitor
- Uses NFET for all the switches
 - 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
- Robust Ripple Regulator (R3) modulation scheme provides excellent light-load efficiency and fast dynamic response
- 32 Ld 4mmx4mm 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

- [ISL88739A](https://www.renesas.com/en/products/power-management/isl88739a) product page

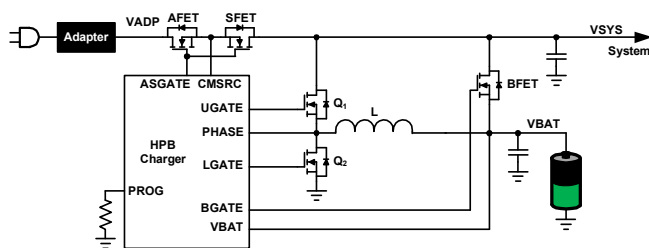


Figure 1. HPB Charger Configuration

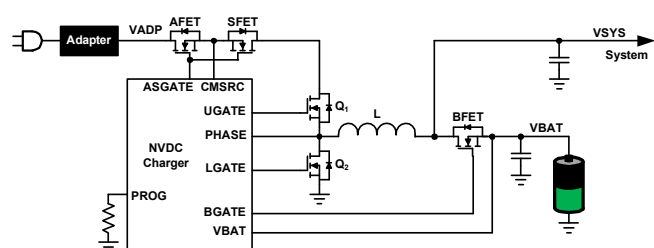


Figure 2. NVDC Charger Configuration

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