RAA489110

Buck-Boost Configurable Battery Charger with SMBus Interface Supporting USB PD EPR

The RAA489110 is a digitally configurable buck-boost battery charger that supports Narrow Voltage Direct Charging (NVDC) and Hybrid Power Buck-Boost (HPBB/Bypass) charging, and it switches between these modes using firmware control. Bypass mode is also supported using the firmware of the controller, allowing the adapter to provide power directly to the system. The RAA489110 provides charging functionality, system bus regulation, and protection features using only N-MOSFETs for tablet, Ultrabook, and notebook platforms. The advanced Renesas R3™ technology provides an efficient Charging mode. The RAA489110 takes input power from a wide range of DC power sources (such as conventional AC/DC charger adapters, USB Type-C Power ports, and travel adapters) and safely charges battery packs with up to 4-series cell Li-ion batteries.

The system power is provided from the adapter, battery, or a combination of both. The reconfigurable internal registers of the charger allow the use of a smaller inductor for the HPBB mode to achieve higher efficiencies across multiple power levels. The RAA489110 can operate either with only a battery, only an adapter, or both connected. For Intel IMVP-compliant systems, the RAA489110 includes System Power monitor (PSYS) functionality that provides an analog signal representing total platform power. The PSYS output can connect to many different IMVP core regulators to provide an IMVP compliant power domain function. The RAA489110 supports reverse buck, boost, or buck-boost operation to the adapter port (OTG mode) from 2- to 4-cell batteries, allowing configurations to support USB-C Power Delivery (PD) output for Programmable Power Supply (PPS) ports. The RAA489110 serial communication uses SMBus/I^2C, allowing the programming of many key parameters to deliver a customized solution.

Applications

- 2- to 4-cell tablets, notebooks, power banks, DSLR, and any USB-C interface portable device requiring batteries

Features

- Buck-boost NVDC or hybrid power (turbo boost) charger for 2-, 3-, or 4-cell Li-ion batteries using all N-MOSFET transistors
- Input voltage range: 3.9V to 30V (no dead zone)
- System/battery output voltage: 3.9V to 18.304V
- Bypass mode supported to connect system to adapter
- Autonomous charging option (automatic end of charging)
- Adapter current and battery current monitor (AMON/BMON)
- PROCHOT# open-drain output, IMVP compliant
- System power monitor PSYS output, IMVP8/9 compliant
- Internal 8-bit ADC for monitoring key parameters
- USB-C PD Fast Role Swap support and PPS support
- Independent compensation pins for forward and reverse operation (OTG) modes
- Supports supplemental power (Intel V_{MIN} active protection)
- Battery Ship mode: IC ultra-low power state
- Supports programmable temperature profiles and JEITA compliance using an NTC
- 4x4 32 Ld TQFN package, pin-to-pin compatible with ISL9241 family of parts

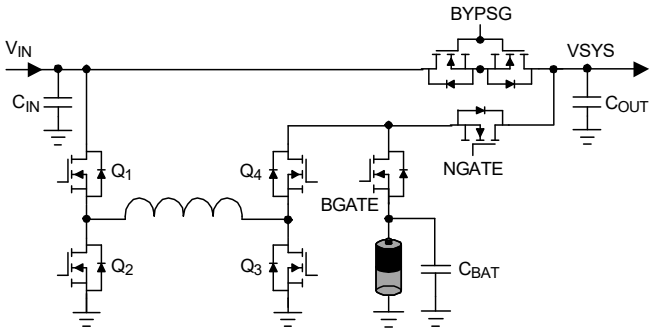

Figure 1. Typical Application

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