NU2115 I²C Controlled Single-Cell High Efficiency 8-A Switched Cap Fast Charger

1 Feature

- 98.2% Efficient at 2:1 charge mode, 99.2% Efficient at 1:1 charge mode
- Switched Cap Architecture Optimized for 50% Duty Cycle.
  - Input Voltage is 2x Single-Cell Battery Voltage
  - Output Current is 2x of Input Current
  - Reduces Power Loss Across the Cable
- Bypass Mode From Adapter to Battery
  - Low Ron Charging Path Resistance to Support 5A Charging Current
- Dual Input Power Path Management
  - Two Drivers for External Back-back MOSFETs integrated to manage power from two different input sources
- Support Master and Slave Operation
- Integrated Programmable Protection Features for Safe Operation
  - Input Over-Voltage Protection (BUS_OVP) with Adjustable Alarm
  - Input Over-Current Protection (BUS_OCP) with Adjustable Alarm
  - Input Under-Current Protection (BUS_UCP)
  - BUS Reverse-Current Protection (BUS_RCP)
  - Input Over-Voltage with External OVP FET
  - Battery Over-Voltage Protection (BAT_OVP) with Adjustable Alarm
  - Output Over-Voltage (VOUT_OVP)
  - IBAT Over-Current Protection (BAT_OCP) with Adjustable Alarm
  - IBAT Under-Current Protection Alarm (BAT_UCP_ALM)
  - Battery Temperature Monitoring
  - Connector Temperature Monitoring
- Programmable Settings for System Optimization
  - STAT, FLAG, and MASK options for Interrupts
  - ADC Readings and Configuration
- Integrated 15-Bit Analog-to-Digital Converter (ADC)
  - ±1% VAC1, VAC2 and BUS Voltage
  - ±5% BUS current at 3A and above
  - ±1% VOUT Voltage
  - ±0.35% BAT voltage with Differential Sensing
  - ±1.5% BAT Current at 6 A with External RSENSE =2m Ω
  - ±1% BAT Temperature
  - ±1% BUS Temperature
  - ±4℃ Die Temperature

2 Applications

- Smart Phone
- Tablet PC

3 Descriptions

The NU2115 is a 98.2% efficient, 8-A battery charging solution using a switched cap architecture. This architecture and the integrated FETs are optimized to enable a 50% duty cycle, allowing the cable current to be half the current delivered to the battery, reducing the losses over the charging cable as well as limiting the temperature rise in the application. The dual-phase architecture reduces the input cap requirements as well as reducing the output voltage ripple.

Device Information

PART NUMBER	PACKAGE	BODY SIZE (NOM)
NU2115	WLCSP	2.65mm×2.65mm

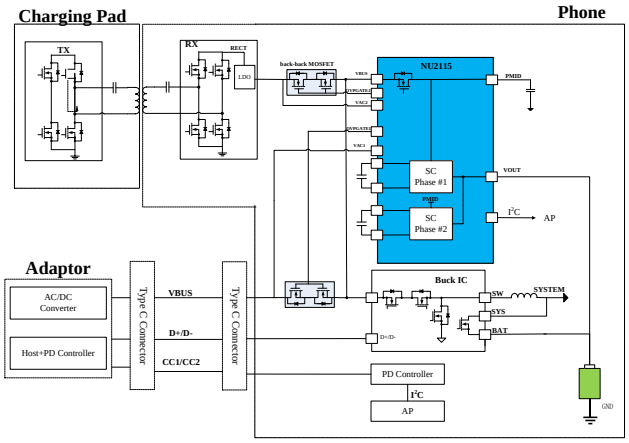

Figure 1. Simplified Application Diagram