

Interfacing the MC34708 with an External Battery Charger

1 Purpose

This document shows an example implementation of an external battery charger solution for the MC34708 power management architecture for i.MX processors.

2 Scope

This document provides the design-in information (including schematic) for using an external battery charger with isolated charging path while interfacing with the MC34708 PMIC. It does not provide instruction on how to fully configure the MC34708 system along with an i.MX processor; however, it does refer to them in order to provide a clear idea on how the battery charger would interact in a full system environment.

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3 MC34708 Device Overview

The MC34708 is a Power Management Integrated Circuit (PMIC) designed primarily for use with the Freescale i.MX50 and i.MX53 families. It offers a low-cost solution targeting embedded applications. It supports both consumer and industrial applications in two possible packages, a 206-pin, 8mm x 8mm, 0.5mm-pitch MAPBGA package and a 206-pin, 13mm x 13mm, 0.8mm-pitch MAPBGA package, both of which provide flexibility between size and design constraints for specific PCB layout requirements.

Features:

- Six multi-mode buck regulators for directly supplying the processor core, memory, and peripherals
- Boost regulator for USB PHY domain on i.MX processors
- Eight regulators with internal and external pass devices for thermal budget optimization
- 10-bit ADC for monitoring battery and other inputs
- Eight regulators with internal and external pass devices for thermal budget optimization
- Real-time clock and crystal oscillator circuitry with a coin cell backup/charger
- SPI/I²C bus for control and register interface
- Four general purpose low-voltage I/Os with interrupt capability
- Two PWM outputs

The MC34708 can be easily combined with an external charger, allowing flexibility for either single or multi-cell Li-Ion battery configurations. This document presents the MAX8903 battery charger as an example of a battery charging solution for the MC34708 power management device. However, it is up to the customer, according to his system requirements, to select a proper charger device to be used in conjunction with the power management unit.

4 Interfacing with the MC34708

The MC34708 power management device is powered by a single input supply (BP) that provides full system power distribution. BP operating voltage range goes from 3.0 V to 4.5 V; therefore, the charger system voltage must be set within the operating range. One such example of a charger IC, the MAX8903 provides a typical $V_{SYS} = 4.325$ V, which makes it suitable to supply full system power to the MC34708. The MAX8903 supplies a 4.2 V battery regulation voltage suitable for standard 3.7 V Li-ion batteries, which are used in common portable applications.

[Figure 1](#), [Figure 2](#) and [Figure 3](#) show the application schematic, including the external charger and how it connects to the MC34708.

Freescale does not assume liability, endorse, or warrant components from external manufacturers that are referenced in circuit drawings or tables. While Freescale offers component recommendations in this configuration, it is the customer's responsibility to validate their application.

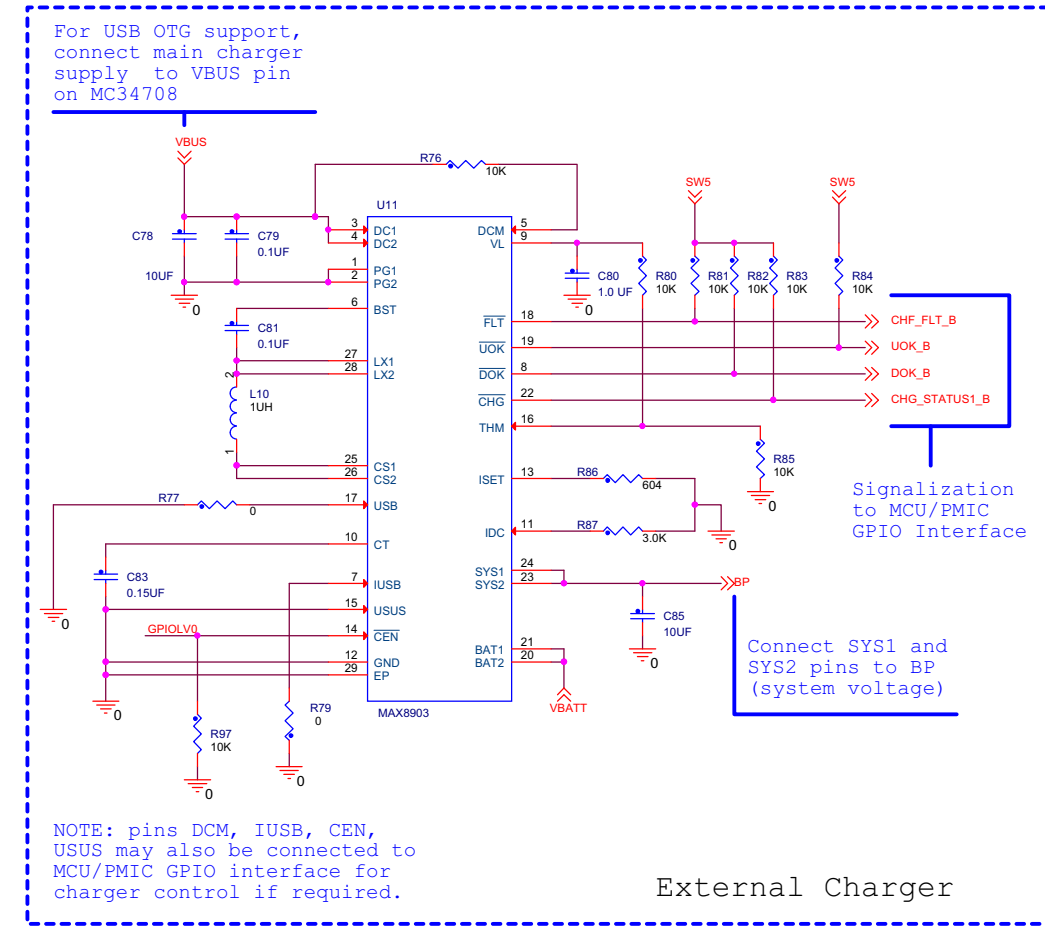


Figure 1. External Charger Connection Diagram

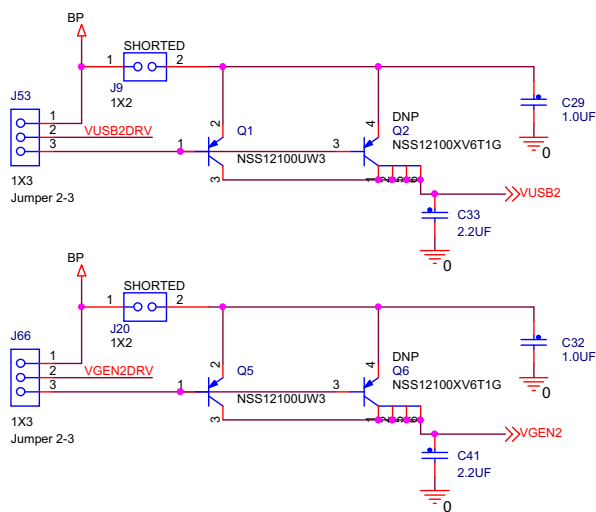
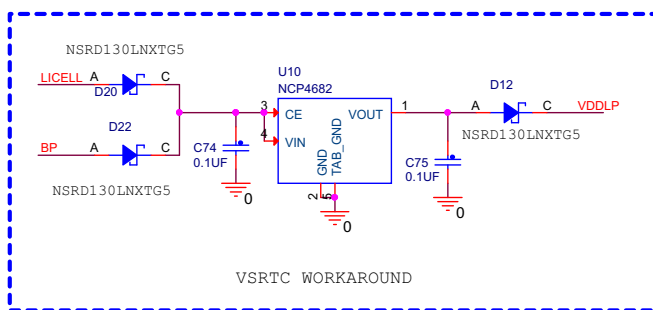


Figure 2. MC34708 Connection Diagram (Part 1)

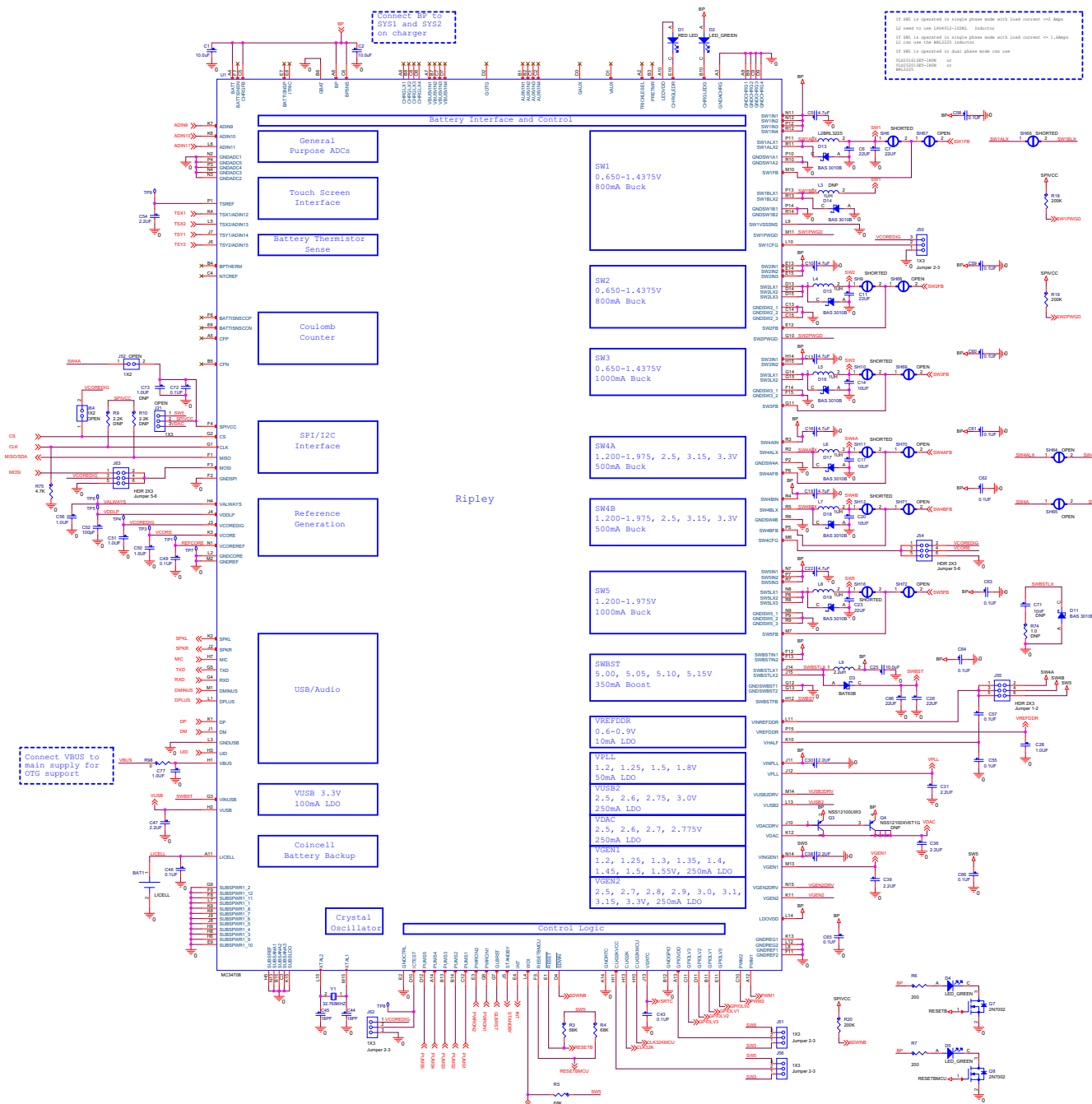


Figure 3. MC34708 Connection Diagram (Part 2)

4.1 Control Interface Signals

Since the external charger provides an isolated charging path with internal charging logic, the battery charging process is fully transparent to the MC34708 and the system itself. However, depending on the external charger selected by the customer, parallel control and signaling pins may be required to interact with GPIO signals from either the MCU or the MC34708, thereby providing full charging control and signaling to/from the system controller. For further information on the external charger component selection, please refer to the vendor data sheet.

5 References

Document Number	Description	URL
MC34708	Data Sheet	http://cache.freescale.com/files/analog/doc/data_sheet/MC34708.pdf
MC34708ER	Errata	http://cache.freescale.com/files/analog/doc/errata/MC34708ER.pdf
	Product Summary Page	http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=MC34708
	Power Management Home Page	http://www.freescale.com/webapp/sps/site/homepage.jsp?code=POWERMGTHOME
	Analog Home Page	www.freescale.com/analog

6 Revision History

Revision	Date	Description of Changes
1.0	12/2012	• Initial release

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