MC34709
Power Management Integrated Circuit Without Battery Charger
Designed for the Freescale i.MX50/53 Families

Applications
- Tablets
- Smart mobile devices
- Digital signage/kiosks
- Telehealth
- Connected TV
- Patient monitors
- Printers
- Industrial HMI
- Security & surveillance
- Barcode scanners

Overview
The MC34709 Power Management Integrated Circuit (PMIC) integrates power management and interface functions into a single package. Specifically designed for use with the i.MX50/53 families, it can be easily partnered with an external charger allowing flexibility for either single or multi-cell Li-Ion battery configurations. This device is powered by SMARTMOS technology.

The MC34709 supports both consumer and industrial applications with a single 130 pin 8x8 MAPBGA 0.5mm pitch package that is easily routable in low cost board designs.

The MC34709 integrates six multi-mode regulators and eight LDO regulators for direct supply of the processor core, memory and peripherals and operates directly from a 3.3 V input supply. In addition, it integrates a real time clock, a 10-bit ADC, 5.0 V Boost regulator, two PWM outputs, resistive touch screen interface, and four GPIOs.

Performance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Typical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buck Regulators Output Voltage Range</td>
<td>0.65 to 3.15 V</td>
</tr>
<tr>
<td>Buck Regulators Load Capability</td>
<td>Up to 2000 mA</td>
</tr>
<tr>
<td>LDO Output Voltage Range</td>
<td>1.2 to 3.3 V</td>
</tr>
<tr>
<td>LDO Load Capacity</td>
<td>Up to 350 mA</td>
</tr>
<tr>
<td>Total Standby Quiescent Current</td>
<td>260 μA</td>
</tr>
<tr>
<td>Consumption (no load)</td>
<td></td>
</tr>
<tr>
<td>Boost Regulator Load Capability</td>
<td>380 mA</td>
</tr>
</tbody>
</table>

MC34709 Functional Block Diagram

- SIX BUCK REGULATORS
  - Processor Core
  - Split Power Domains
  - DDR Memory I/O
- EIGHT LDO REGULATORS
- 5 V BOOST REGULATOR
- 10 BIT ADC CORE
  - General Purpose
  - Resistive Touch
  - Screen Interface
- CONTROL INTERFACE
  - SPI/I2C
- BIAS & REFERENCES
  - Trimmer Bandgap
- 32.768 kHz CRYSTAL OSCILLATOR
  - Real Time Clock
  - SRTC Support
  - Coin Cell Charger
- POWER CONTROL LOGIC
  - State Machine
- GENERAL PURPOSE
  - I/O & PWM OUTPUTS
Features

- Six multi-mode buck regulators for direct supply of the processor core, memory and peripherals
- Boost regulator
- Eight LDO regulators with internal and external pass devices for thermal budget optimization
- 10-bit ADC for monitoring general purpose inputs
- Real time clock and crystal oscillator circuitry with coin cell backup charger
- SPI/I2C bus for control and register interface

Freescale Semiconductor is a leading provider for over 25 years of high-performance products that use SMARTMOS technology that combines digital, power and standard analog functions. The company supplies analog and power management ICs for the automotive, consumer, networking and industrial markets.

Freescale’s analog and power ICs complement our broad portfolio of microcontrollers, microprocessors, ZigBee® technology, digital signal processors, sensors and development tools. Freescale offers superior support for system solutions to help customers.

The i.MX53 and i.MX50 families of processors represent Freescale’s next generation of advanced multimedia and power-efficient implementation of the ARM® Cortex™-A8 core.

The i.MX53 family is optimized for both performance and power to meet the demands of high-end, advanced applications. An integrated display controller, 1080p HD video decode and 720p video encode, enhanced graphics and connectivity features make the i.MX53 ideal for applications which require rich user interfaces with high color displays. The i.MX50 family supports both LCD and EPD displays to allow customers the flexibility in designing their system.

Benefits

- Highly integrated cost-effective solution
- Optimized for use with Freescale’s i.MX family
- Integration reduces system costs in mobile applications and reduces board space for compact designs
- High efficiency switching regulators increase battery life for portable applications