Application Report
SLVA405–March 2010

Highly Integrated PMIC for Powering the Samsung S3C6400-533MHz

PMP-DC Power Mgmt Units

ABSTRACT

This design was created to help those needing to power the Samsung S3C6400-533MHz and doing so by implementing a highly integrated and efficient design using the TPS650245 power management unit.

1 Introduction

This reference design is for powering one S3C6400-533MHz and accounts for voltage and current; requirements are presented in Table 1. The TPS650245 is an integrated power management integrated circuit (PMIC), suitable for applications that require multiple power rails. The TPS650245 provides three highly efficient, step-down converters targeted at providing the core voltage, peripheral, I/O, and memory rails in the system. The Samsung S3C6400-533MHz requires 0.9-V/1.1-V, 1.8-V, and 3.3-V input.

2 Power Requirements

The power requirements for each S3C6400-533MHz are listed in the following table.

For more information and other reference designs, visit www.ti.com/processorpower.

Table 1. S3C6400-533MHz Power Requirements

Power Requirements for S3C6400-533MHz				
Core, I/O	**Pin Name**	**Voltage (V)**	**Imax (mA)**	**Tolerance**
I/O	VDDEXT; VDDMMC; VDDHI; VDDLCD; VDDPCM; VDDSYS	3.3	1000	±5%
	VDD_MEM0; VDD_MEM1	1.8	800	±5%
	VDDARM	0.9/1.1	800	±5%
	VDDADC; VDDDAC; VDDOTG; VDDUH	3.3	200	±5%
	VDDOTGI	1.1	200	±5%
	VDDALIVE	1.1	30	±5%
	APLL; EPLL; MPLL; VDDINT	1	600	±5%

2.1 Device Features

TPS650245

- 1.6-A, 1-A, or 0.8-A, 97% Efficient Step-Down Converter for System Voltage (VDCDC1)
  - 3.3 V or 2.80 V or Adjustable
- 1.6-A, 1-A, or 0.8-A, Up to 95% Efficient Step-Down Converter for Memory Voltage (VDCDC2)
  - 1.8 V or 2.5 V or Adjustable
- 0.8-A 90% Efficient Step-Down Converter for Processor Core (VDCDC3)
- Two Selectable Voltages for VDCDC3
  - TPS650245:DEFDCDC3= LOW: V_O = 0.9 VDEFDCDC3 = HIGH: V_O = 1.1 V
- 30-mA LDO/Switch for Vdd_alive
- 2 × 200-mA General-Purpose LDOs (LDO1 and LDO2)
- Dynamic Voltage Management for Processor Core

- Preselectable LDO Voltage Using Two Digital Input Pins
- LDO1 and LDO2 Voltage Externally Adjustable
- Separate Enable Pins for Inductive Converters
- 2.25-MHz Switching Frequency
- Thermal Shutdown Protection

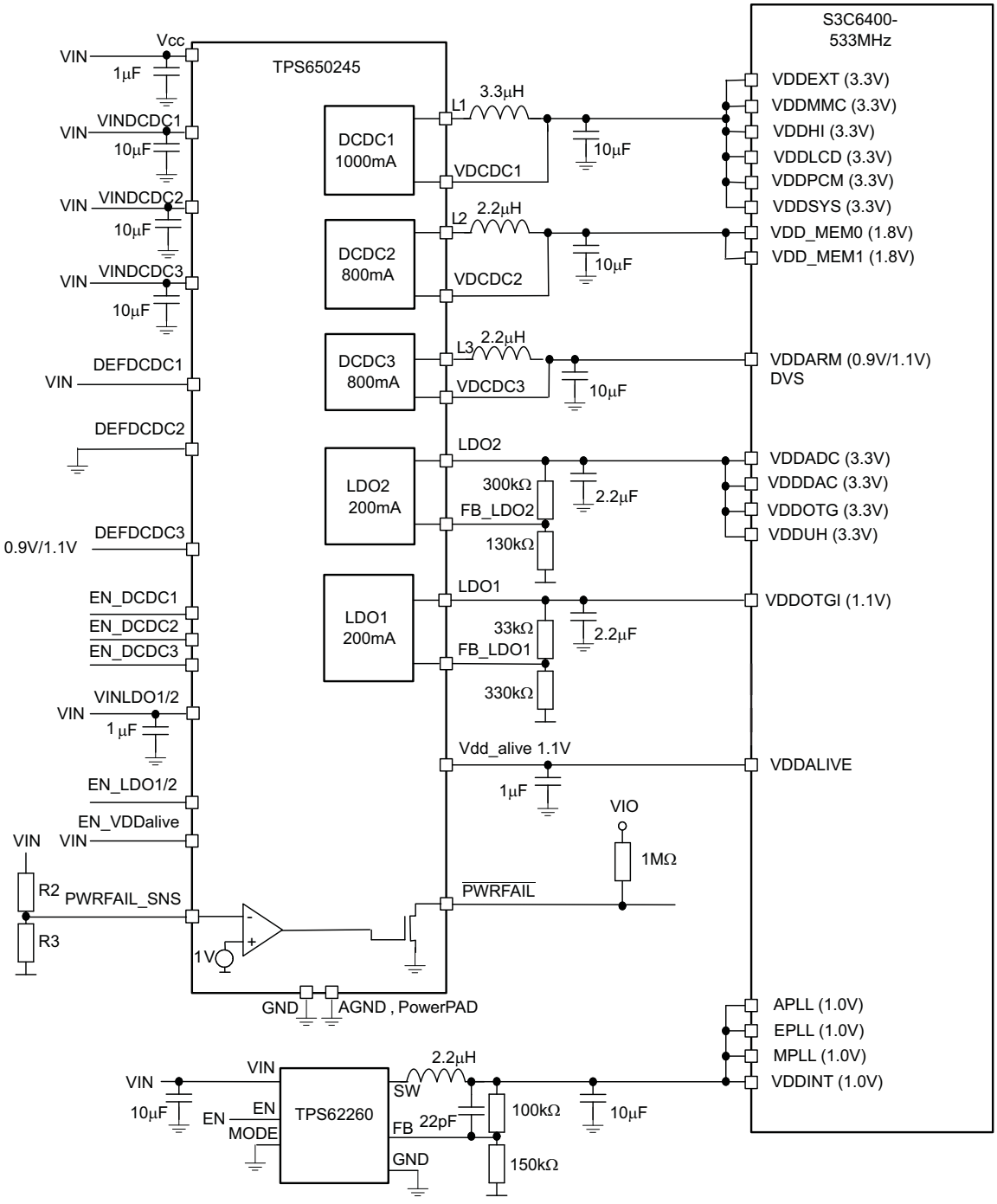

Figure 1. Typical Configuration for Powering the Samsung S3C6400-533MHz Processor

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