Efficient, LDO-free Power Supply for a 12-bit 500-MSPS ADC Reference Design

(ACTIVE) PMP9767.2

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Key Document

- PMP9767 Test Results (PDF 517 KB)
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Efficient, LDO-free Power Supply for a 12-bit 500-MSPS ADC Reference Design

Fully assembled board (shown above) developed for testing and performance validation only, not available for sale.

Description

The electrical performance of data converters depends on the cleanliness of their supply voltages. Linear regulators (LDOs) are commonly used but have low efficiency and high power loss, which is unsuitable for portable applications.

Using a switch mode power supply (SMPS) instead, such as the TPS62231 and TPS62237, is a cost-effective and efficient power supply solution. Such a solution does not degrade the performance of the 12-bit ADS540x family of analog to digital converters (ADCs) and does not waste excessive power. The test report shows the Signal to Noise Ratio (SNR) and Spurious-Free Dynamic Range (SFDR) comparisons between the two power supplies, which demonstrate the same performance.

Features

- Efficiency increase from 47% to 83%
- Input current reduced from 620 mA to 350 mA
- No linear regulators (LDOs) required to cleanly power ADC
- 12-bit performance maintained
- Smaller DC/DC solution size than LDOs
- Supports 5-V input

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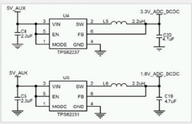
Schematic/Block Diagram

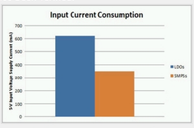
Quickly understand overall system functionality.



Download Schematic

Test Data

Get results faster with test and simulation data that's been verified.



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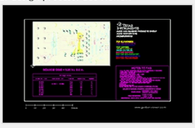
Design Files

Download ready-to-use system files to speed your design process. Get Viewer.



Download Design Files

Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

Parametrics

	PMP9767.2
Vin (Min) (V)	4
Vin (Max) (V)	6
Vout (Nom) (V)	1.8
Iout (Max) (A)	.5
Output Power (W)	.9
Isolated/Non-Isolated	Non-Isolated
Input Type	DC
Topology	Buck- Synchronous

TI Devices (5)

Order samples, get tools and find more information on the TI products in this reference design.

Part Number	Name	Product Family	Sample & Buy	Design Kits & Evaluation Modules
ADS5407	Low Power 12-Bit 500MSPS Dual Analog-to-Digital Converter	Analog to Digital Converter	Sample & Buy	View Design Kits & Evaluation Modules
SN65LVDS100	2Gbps LVDS/LVPECL/CML to LVDS Repeater/Translator	LVDS/M-LVDS/ECL/CML	Sample & Buy	View Design Kits & Evaluation Modules
TPS62231	3 MHz Ultra Small Step Down Converter in 1x1.5 SON Package	Converter (Integrated Switch)	Sample & Buy	View Design Kits & Evaluation Modules

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CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
SN65LVDS100	SOIC (D) | 8	Download	Download
	VSSOP (DGK) | 8	Download	Download
TPS62231	USON (DRY) | 6	Download	Download
TPS62237	USON (DRY) | 6	Download	Download

Texas Instruments and Accelerated Designs Inc. have collaborated together to provide TI customers with schematic symbols and PCB layout footprints for TI products.

Step 1: Download and install the Ultra Librarian software ZIP: 62MB

Step 2: Download the Symbol and Footprint .bxl file.

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Technical Documents

User guides (1)

Title	Abstract	Type	Size (KB)	Date	Views	TI Recommends
PMP9767 Test Results		PDF	517	18 Dec 2015	56	✓

Design files (3)

Title	Abstract	Type	Size (KB)	Date	Views
PMP9767 Gerber		ZIP	1238	18 Dec 2015	20
PMP9767 BOM		PDF	130	18 Dec 2015	29
PMP9767 Schematic		PDF	90	18 Dec 2015	88

Applications

- Signal Measurement - Digital Multimeters (DMM)

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