AN-2161 LP5904 DSBGA Evaluation Board Information

1 Introduction

This evaluation board is designed to enable the evaluation of the LP5904 Voltage Regulator. Each board is assembled and tested in the factory. This evaluation board has the 4-bump DSBGA package mounted.

2 General Description

The LP5904 is a linear regulator capable of supplying 200 mA output current. Designed to meet the requirements of RF/Analog circuits, the LP5904 provides low device noise, high PSRR, low quiescent current, and low line transient response. Using new innovative design techniques the LP5904 offers class-leading noise performance without a noise bypass capacitor.

The device has been designed to work with 1.0 µF input and output ceramic capacitors down to 0402 component size.

3 Operation

The input voltage, applied between V_{IN} and GND, should be at least 1.0V greater than V_{OUT} and no more than 5.5V. The minimum operating voltage is 2.2V. Loads can be connected to V_{OUT} with reference to GND. V_{OUT} and V_{IN} sense pins are provided on the board to allow accurate measurements directly onto the input and output pins of the device, eliminating any voltage drop on the PCB traces or connecting wires to the load.

ON/OFF control is provided by a two-way jumper on the V_{EN} pin. A minimum of 1.2V is required at this pin to enable the LDO. The LDO will be shut down when the V_{EN} pin is set to 0.4V or less.

In applications where the LP5904 is operated continuously from the battery, V_{IN} and V_{EN} can be tied together. However, if ON/OFF control is required, the V_{EN} pin should be driven from a separate signal to ensure correct operation of the fast startup circuit. The device has a 1MΩ internal resistor from V_{EN} to GND.

4 Hardware

The schematic and layout of the evaluation board are given below:

5 Schematic Diagram

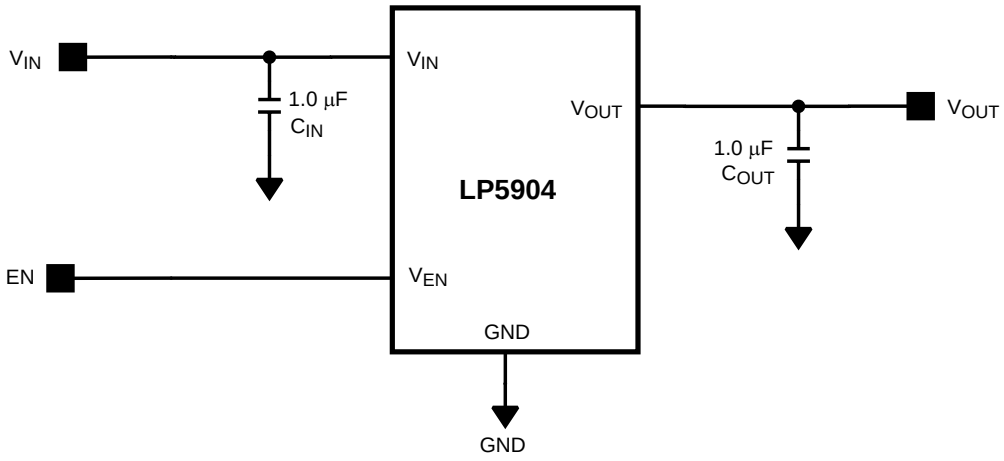

Figure 1. Evaluation Board Schematic.

6 PCB Layout

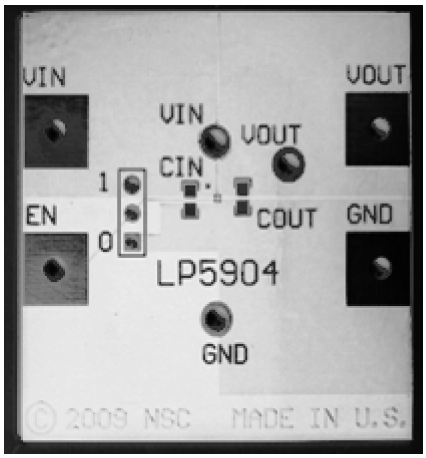

Figure 2. Evaluation Board Component

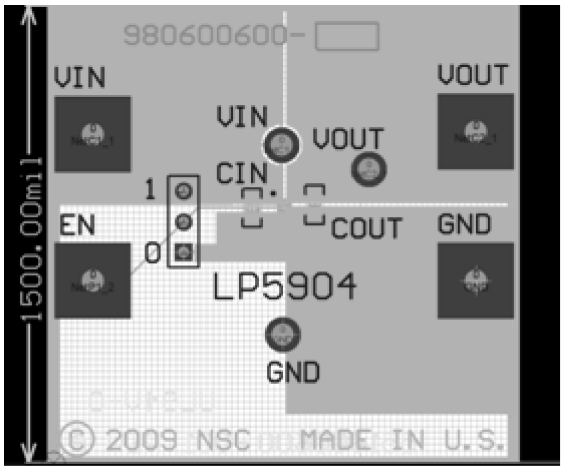

Figure 3. Pin Layout Board Size:- 21 mm x 21 mm

7 Hardware

Designator	Value	Amount	Footprint	Note
DUT	LP5904	1	YFQ0004AAA	
CIN	1.0 µF	1	0402	X7R, X5R
COUT	1.0 µF	1	0402	X7R, X5R
VIN, VOUT, VIN_TP, GND, GND_TP, EN, EN ON/OFF(EN1/0) pins	I/O and Test Pins	10		

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as “components”) are sold subject to TI’s terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI’s terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers’ products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers’ products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI’s goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or “enhanced plastic” are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have ***not*** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products		**Applications**	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
Wireless Connectivity	www.ti.com/wirelessconnectivity		

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265