AN-1501 LP3905-30 Evaluation Board

1 General Information

The evaluation board is a complete circuit allowing full operation of the LP3905 within the recommended application circuit. Each board is pre-assembled and tested in the factory. The board contains the LP3905-30 in a 14 lead WSON package with all the associated passive components to enable all features of the device to be tested.

LP3905 is optimized for low power handheld applications. This device provides two 600 mA DC/DC Buck regulators, and two 100 mA linear regulators as configured on the board. The LP3905 additionally features two enable pins allowing control over the device outputs.

2 Operational Information

The circuit used in the evaluation board is that shown on the device datasheet.

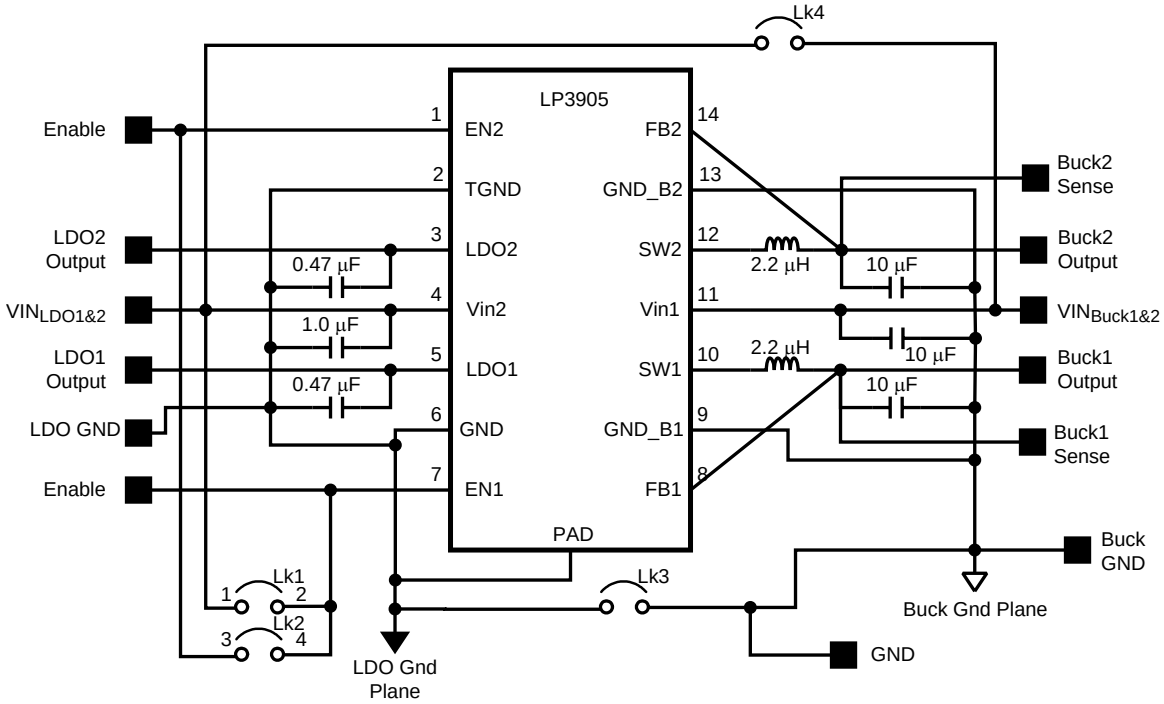


Figure 1. Evaluation Board Schematic

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The LP3905-30 has fixed output voltages as listed in Table 1.

Table 1. LP3905-30 Output Voltages

O/P	Voltage (V)
Buck1	1.2
Buck2	1.875
LDO1	2.8
LDO2	2.8

The board is fitted with 0.47µF capacitors on the outputs of the LDO's and thus the load current for these LDO's should not exceed 100mA.

The device has 1MΩ internal resistors from EN1 and EN2 to GND.

3 Connection Information

Connect a supply voltage (3.0V to 5.5V) to either of the VIN pins on the evaluation board. LK4 hardwired on the board connects both the BUCK supply side to the LDO supply side. These supplies are both required to correctly power the device.

Supply ground may be connected at either GND or BKGND. LK3 which is hardwired on the eval board connects the BUCK gnd to the LDO gnd.

For best results in current measurements on the Buck outputs, use 4 wire measurement techniques to eliminate any voltage drop on the PCB traces or connecting wires to the loads. For this the instrument sense connection should be connected to the corresponding buck 'S' (sense) connection on the evaluation board.

Input leads should be kept reasonably short to minimize inductance.

ON/OFF control is provided by logic signals on EN1 and EN2. A minimum of 1.2V is required on these pins to enable the corresponding outputs. The outputs will be shutdown with the enable pins set to 0.4V or less. If ON/OFF control is not required, then either or both enable pins may be connected to V_{IN} either externally or by using the on-board connection matrix.

A number of control options are provided on board by either hardwiring or using reconfigurable links on the 4-way matrix.

Table 2. Link Matrix Details

Link	Link	Connection Description
1 - 2	3 - 4	EN1 and EN2 connect to VIN supply. All outputs power on with the supply voltage.
3 - 4	-	EN1 connects to EN2 and may be driven externally from one source to control all outputs.
1 - 2	-	EN1 conencts to VIN. Buck1, LDO1, and LDO2 outputs are enabled at device power up. Buck 2 should be enabled separately using an external source connected to EN2.
1 - 3	-	EN2 conencts to VIN. Buck 2 is enabled at device power up. Buck1, LDO1, and LDO2 outputs should be enabled using an external source connected to EN1.
-	-	Both EN1 and EN2 can be driven separately from external sources connected at the board inputs EN1 and EN2.

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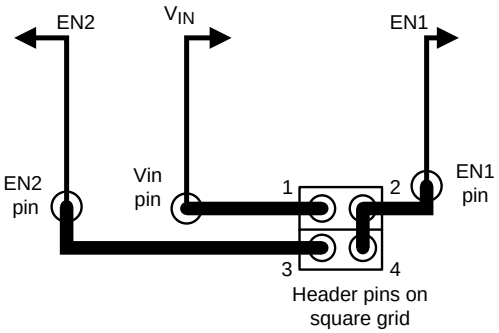


Figure 2. Link Matrix Diagram

4 PCB Layout

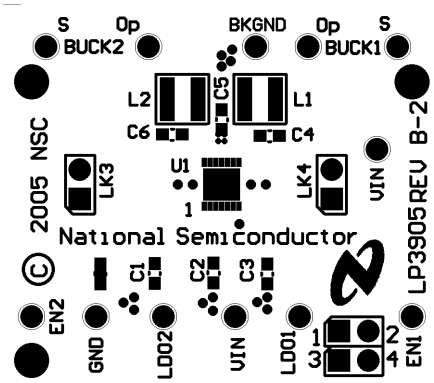


Figure 3. PCB Component and Pin Layout
Board SIze 1.5" × 1.3"

5 Bill of Materials

Table 3. Bill of Materials for LP3905-30 WSON Evaluation Board

Item	Type	Value	Qty	Part Number Suggested	Manufacturer Suggested	Footprint
U1			1	LP3905	Texas Instruments	NHL0014B
L1,L2	Inductor	1.0µF	1	DO3314-222MLB	Coilcraft	
C1, C3	Capacitor	0.47µF	2	GRM188R61A474 KA61D	Murata	0603
C4, C5, C6	Capacitor	10µF	3	GRM21BR61A106 KE19L	Murata	0805
C2	Capacitor	1.0nF	1	GRM188R61A105 KA61D	Murata	0603

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