AN-1626 551013037 - LMP8100 Evaluation Board

1 Connectors, Jumpers, Test Points

1.1 Introduction

This evaluation board contains the LMP8100, along with a logic circuit to program the register in the LMP8100.

1.2 Power Supply

There are three banana plugs labeled GND, V^+, and V^- to power the evaluation board. A single supply of +5 V or a dual supply of ±2.5 V can be used.

1.3 Signal Connectors

There are three connectors for signals:

J1	is a BNC labeled V_{IN} for the input signal.
J2	is a BNC labeled V_{OUT} for the output signal
J3	is a 5-pin header that can be connected to a microcontroller. A microcontroller can be used to write the register of the LMP8100 if the logic circuitry on the evaluation board is not used. For more information, see Section 3.4.

1.4 Jumpers

The evaluation board has six jumpers:

JP1	connects the SCK pin of the LMP8100 to either the on-board logic or to J3.
JP2	connects the SDI pin of the LMP8100 to either the on-board logic or to J3.
JP3	connects the $\overline{CS}$ pin of the LMP8100 to either the on-board logic or to J3.
JP4	connects the V^- pin of the LMP8100 to either the V^- banana plug or to ground.
JP5	connects the GRT pin of the LMP8100 to ground, a low-impedance DC source, or an AC ground. For more information, see Section 3.3.
JP6	connects the enable pin of the op amp used in the low-impedance DC source to either +5 V (enabled) or ground (disabled).

1.5 Test Points

The test points are connected as follows:

TP1 – +IN pin

TP2 – GRT pin

TP3 – SDO pin

TP4 – V_{OUT} pin

TP5 – SCK pin

TP6 – SDI pin

TP7 – $\overline{CS}$ pin

2 Hardware Setup

2.1 Register Programming Setup

- To use the on-board logic circuit to program the LMP8100 register connect the jumpers as follows:
  - JP1 – Pins 2 and 3
  - JP2 – Pins 2 and 3
  - JP3 – Pins 2 and 3
- To use an external microcontroller to program the LMP8100 register connect the jumpers as follows:
  - JP1 – Pins 1 and 2
  - JP2 – Pins 1 and 2
  - JP3 – Pins 1 and 2
  - Connect the external microcontroller to J3.

2.2 Power Supply Setup

- +5 V supply:
  - Connect the jumper as follows:
  - JP4 – GND and the center pin
  - Connect a +5 V supply to the V^+ and GND banana plugs.
- ±2.5 V supply:
  - Connect the jumper as follows:
  - JP4 – V^- and the center pin
  - Connect a +2.5 V supply to the V^+ banana plug, a −2.5 V supply to the V^- banana plug, and supply grounds to the GND banana plug.

2.3 GRT Pin Setup

- Connect the jumpers as follows to connect the GRT pin to ground:
  - JP5 – GND and the center pin
  - JP6 – GND and the center pin
- Connect the jumpers as follows to connect the GRT pin to a low-impedance source:
  - JP5 – DC and the center pin
  - JP6 – V^+ and the center pin
- Connect the jumpers as follows to connect the GRT pin to an AC ground:
  - JP5 – AC GND and the center pin
  - JP6 – GND and the center pin

2.4 Components

Various loads can be installed on the evaluation board. The series resistance at R8 can be changed or replaced by a jumper. The resistive load at R4 can be changed. An AC coupled load can be added by using C24 and R9. A capacitive load can be added at C4. The evaluation board with a jumper at R8 has between 6 and 7 pF of parasitic capacitance.

3 Using the Board

3.1 Input and Output Signals

The input signal is connected to the LMP8100 using J1 (V_{IN}). The output signal is taken from J2 (V_{OUT}).

3.2 Programming the LP8100

The register in the LMP8100 can be programmed using switches SW1 and SW2. SW1 consists of eight switches labeled G0, G1, G2, G3, PO, 0, C0, and C1 corresponding to the eight bits of the LMP8100 register. If the switch is up a “0” is programmed to the corresponding bit. SW2 is used to load the data into the register of the LMP8100.

For example, to load a gain of 6 with a compensation level of 1, SW1 would be set as follows:

G0 – Down = 1
G1 – Up = 0
G2 – Down = 1
G3 – Up = 0
PO – Up = 0
0 – Up = 0
C0 – Down = 1
C1 – Up = 0

Pushing SW2 will load the data into the register of the LMP8100. Table 1 shows the possible register values.

Table 1. Register Values

C1	C0	Zero	PD	G3	G2	G1	G0	Gain	Comp.	Other
0	0	0	0	0	0	0	0	1	00	
0	0	0	0	0	0	0	1	2	00	
0	0	0	0	0	0	1	0	3	00	
0	0	0	0	0	0	1	1	4	00	
0	0	0	0	0	1	0	0	5	00	
0	0/1	0	0	0	1	0	1	6	00,01	
0	0/1	0	0	0	1	1	0	7	00,01	
0	0/1	0	0	0	1	1	1	8	00,01	
0	0/1	0	0	1	0	0	0	9	00,01	
0	0/1	0	0	1	0	0	1	10	00,01	
0/1	0/1	0	0	1	0	1	0	11	00,01,10	
0/1	0/1	0	0	1	0	1	1	12	00,01,10	
0/1	0/1	0	0	1	1	0	0	13	00,01,10	
0/1	0/1	0	0	1	1	0	1	14	00,01,10	
0/1	0/1	0	0	1	1	1	0	15	00,01,10	
0/1	0/1	0	0	1	1	1	1	16	00,01,10,11	
X	X	X	1	X	X	X	X	NA	NA	Power Down
X	X	1	0	X	X	X	X	NA	NA	Zero Down

3.3 Low-Impedance DC Source

A DC voltage can be applied to the GRT pin. Because the GRT pin is connected to the internal gain setting resistors this DC source needs to be low impedance. Impedance on the GRT pin will change the gain of the LMP8100. The DC source on the evaluation board can use an op amp, U1, to provide a low-impedance source. To use the DC source install an op amp, connect the DC and center pin of JP5, and connect the V^+ and center pin of JP6. The voltage is set by adjusting R1.

3.4 Writing to the Register Using a Microcontroller

A microcontroller can be used to program the LMP8100. The on-board register programmer is disconnected from the LMP8100 by connecting pins 1 and 2 of JP1, JP2, and JP3. The microcontroller signals are connected to the LMP8100 through J3.

4 Schematic

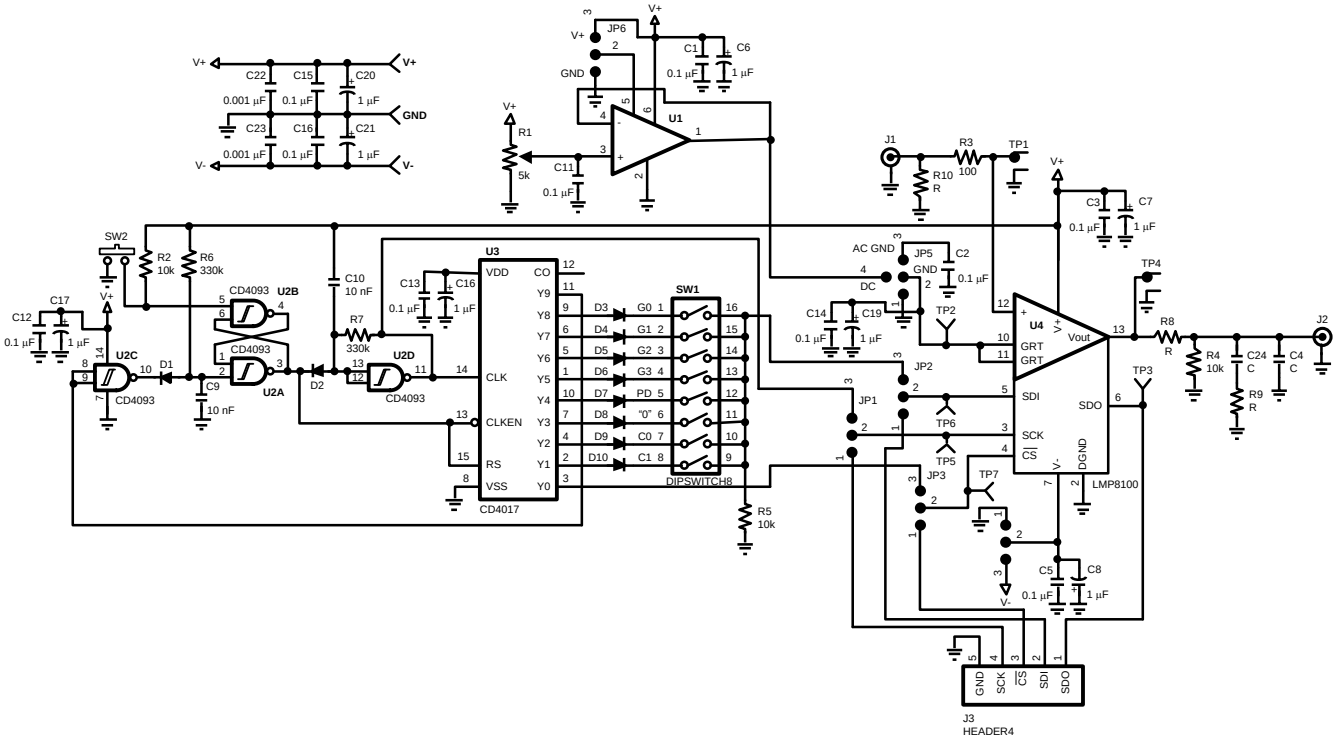

Figure 1. Schematic

5 Board Layout

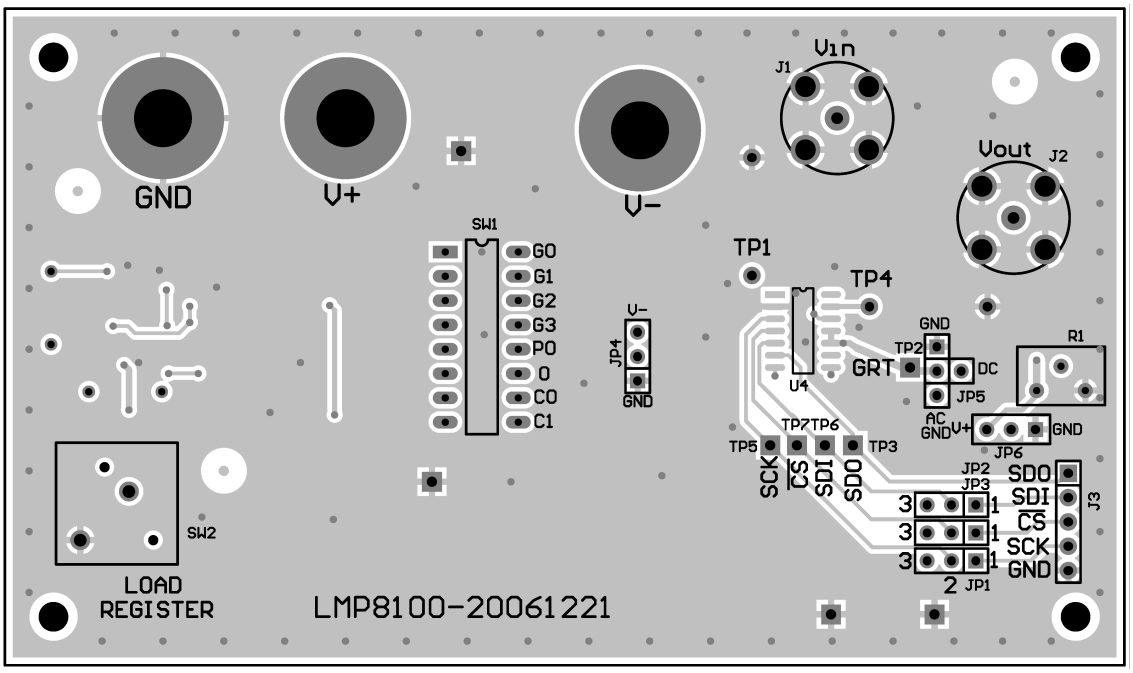

Figure 2. Top Layout

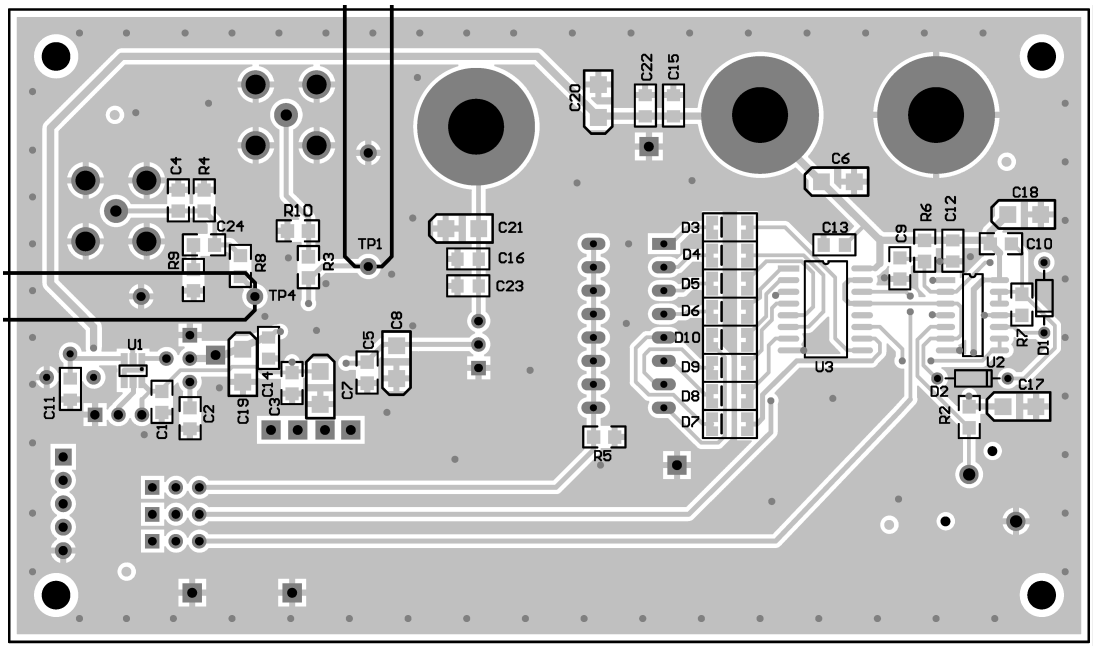

Figure 3. Bottom Layout

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