EVAL-ADuM3123EBZ User Guide
UG-918

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Evaluation Board for the ADuM3123 *i*Coupler, 4.0 A, Isolated Precision Gate Driver

FEATURES

4.0 A peak output current
High frequency operation: 1 MHz maximum
CMOS input logic levels
4.5 V to 18 V output drive
Supports TO-263 or TO-252 IGBT/MOSFETs

REQUIRED DOCUMENTS

ADuM3123 data sheet

SUPPORTED *i*Coupler MODELS

ADuM3123ARZ
ADuM3123BRZ
ADuM3123CRZ

GENERAL DESCRIPTION

The EVAL-ADuM3123EBZ supports the ADuM3123 isolated precision gate driver. Because the evaluation board has footprints for isolated gate bipolar transistors (IGBTs) and MOSFETs in TO-263 or TO-252 packages, respectively, the ADuM3123 can be evaluated with many different power devices.

The ADuM3123ARZ model represents a superset of the ADuM3123 models because it has the lowest minimum output voltage (4.4 V). The ADuM3123BRZ and ADuM3123CRZ models have minimum output voltages of 7.4 V and 11.1 V, respectively.

Complete information about the ADuM3123 is available in the ADuM3123 data sheet, which should be consulted in conjunction with this user guide when using the evaluation board.

ADUM3123 EVALUATION BOARD

Figure 1.

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REVISION HISTORY

2/16—Revision 0: Initial Version

SETTING UP THE EVALUATION BOARD

PAD LAYOUT FOR THE DEVICE UNDER TEST

Figure 4 shows the top layer layout for the evaluation board. The layout includes the following components:

- U1 is the footprint for the ADuM3123.
- C2 and C5 are 1 µF bypass capacitors; C1 is a 10 µF bypass capacitor.
- Q1 can be populated with TO-263 MOSFETs or TO-252 IGBTs (that is, MOSFETs) or only one package (that is, a TO-263 MOFSET) with the footprint shown in Figure 2.
- Capacitor C3 is a 1206 pad available for load simulation capacitance. A typical value to test the evaluation board with is 2 nF.
- Resistors R1, R2, and R3 are 1206 pads provided for the user to place external series gate resistors to the load. A typical total resistance for the evaluation board is around 3 Ω.
- P2, a jumper pad, is available to aid in measuring peak current. A differential probe is recommended.

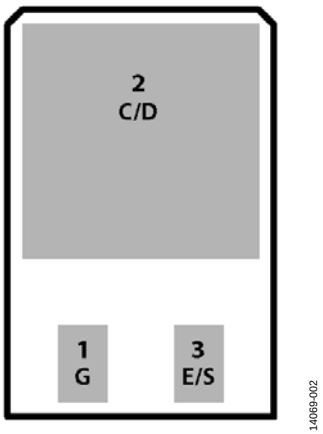

Figure 2. IGBT/MOSFET Footprint

POWER CONNECTIONS

To connect the evaluation board to a power supply, follow these steps:

- V_{DD1} to GND_1 must connect to a voltage source between 3.0 V and 5.5 V. A current limit setting of 25 mA is recommended, but a higher setting is also acceptable.
- V_{DD2} to GND_2 must connect to a voltage source between 4.5 V and 18 V. A current limit setting of 200 mA is recommended, but a higher setting is also acceptable. The current draw depends on the switching speed and load being driven.

GND_1 and GND_2 are isolated from each other. However, GND_1 and GND_2 can connect if the user desires. Ensure the power supplies connecting to each isolation region are floating but are not interacting with each other and can operate with the common mode introduced between the grounds (if there are any).

INPUT/OUTPUT CONNECTIONS

Resistor R4 is a 1206 pad that allows input termination if desired. Resistor R4 is unpopulated in the default state of the evaluation board, making VIA to GND_1 a high impedance input. In the default state, the evaluation board must be driven with a high impedance output with a square wave between 0 V and VDD_1 with respect to GND_1.

The source of Q1 is tied directly to GND_2. The screw terminal marked GND_2 can easily access the source of the Q1 device if needed.

EVALUATION BOARD SCHEMATICS AND ARTWORK

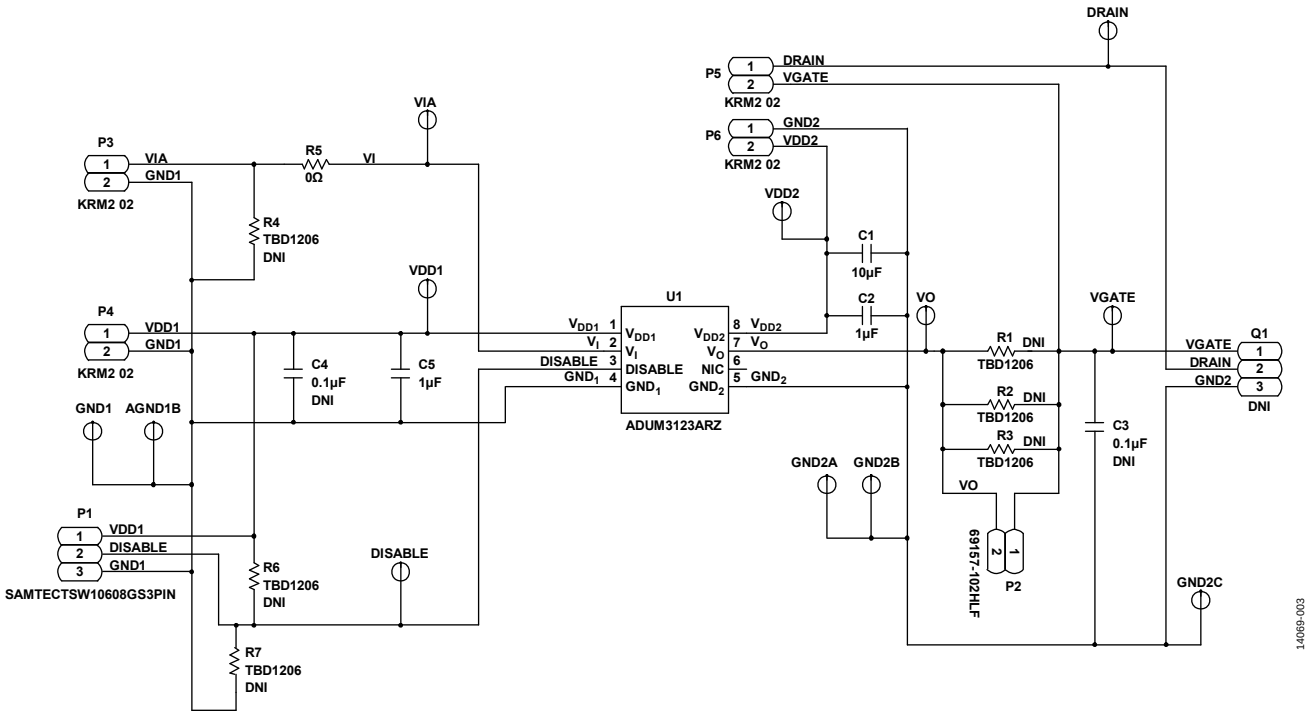

Figure 3. Evaluation Board Schematic

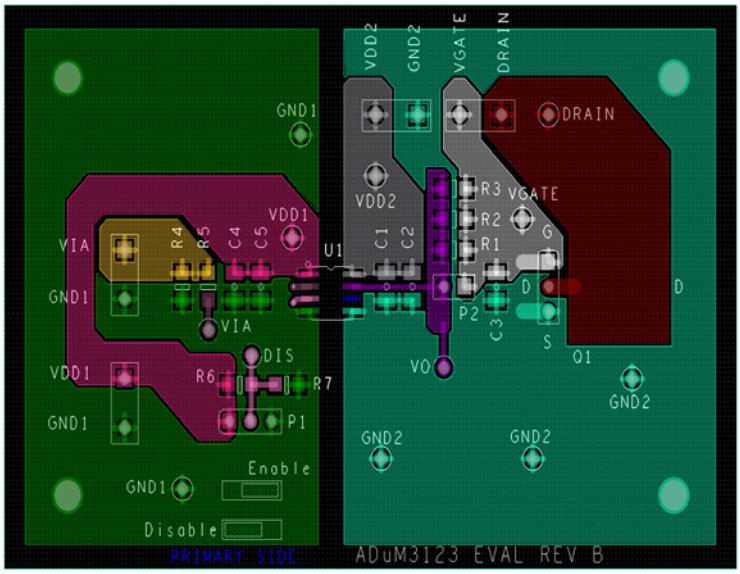

Figure 4. EVAL-ADuM3123EBZ Top Layer

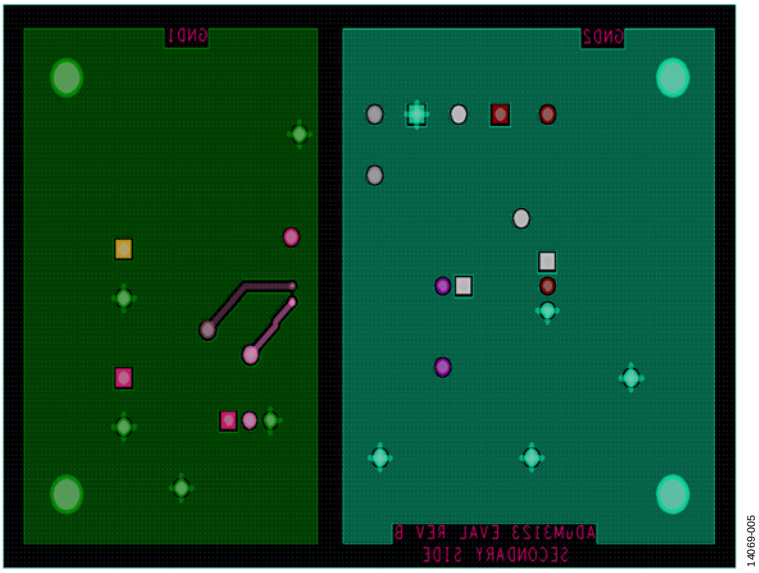

Figure 5. EVAL-ADuM3123EBZ Bottom Layer

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Quantity	Reference Designator	Description
1	U1	ADuM3123ARZ IC
1	C1	Capacitor, 10 µF, 25 V, 10%, 1206
2	C2, C5	Capacitor, 1 µF, 25 V, 10%, 1206
2	C3, C4	Capacitor, 1206, not installed
6	R1, R2, R3, R4, R6, R7	Resistor, 1206, not installed
1	R5	Resistor, 0 Ω, 1206