

Evaluation Board for the **ADuM3123** iCoupler, 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 iCoupler 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 μ F bypass capacitors; C1 is a 10 μ F 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 MOSFET) 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.

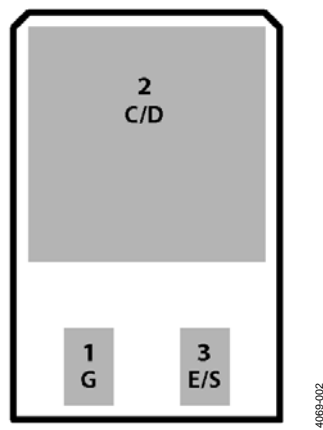


Figure 2. IGBT/MOSFET Footprint

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 V_{DD1} 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

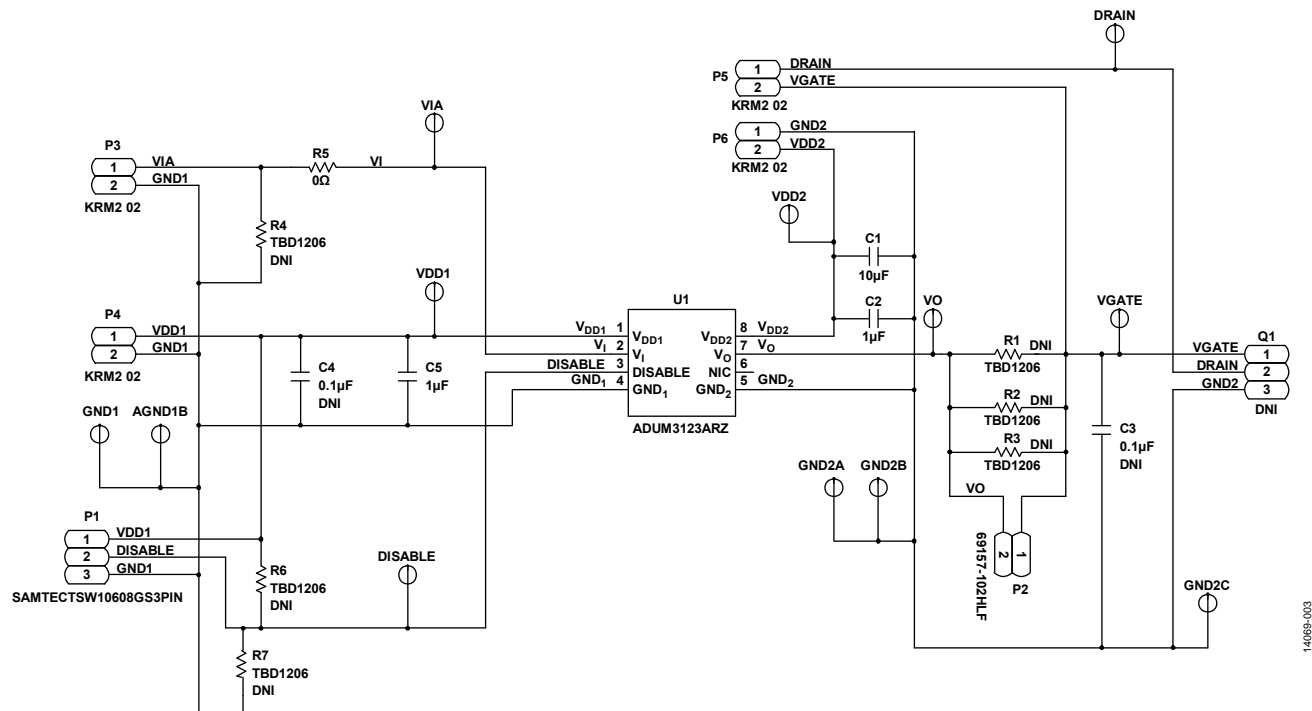


Figure 3. Evaluation Board Schematic

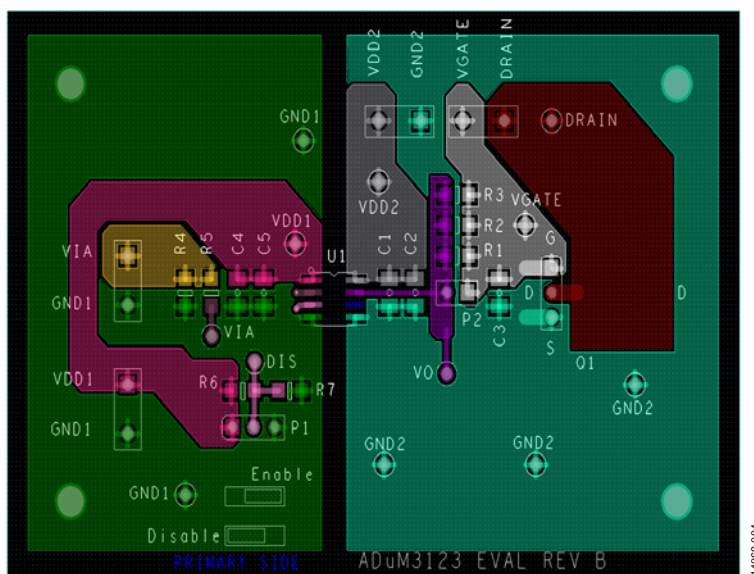


Figure 4. EVAL-ADuM3123EBZ Top Layer

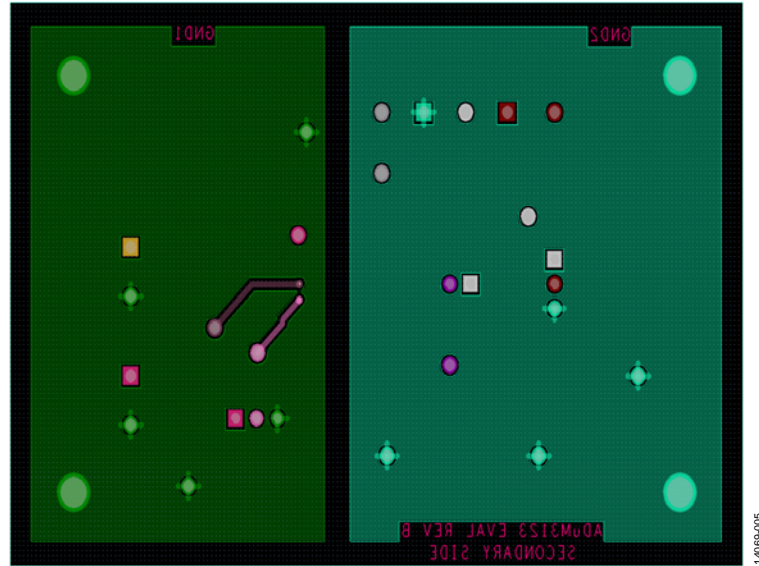


Figure 5. EVAL-ADuM3123EBZ Bottom Layer

ORDERING INFORMATION

BILL OF MATERIALS

Table 1.

Quantity	Reference Designator	Description
1	U1	ADuM3123ARZ IC
1	C1	Capacitor, 10 μ F, 25 V, 10%, 1206
2	C2, C5	Capacitor, 1 μ F, 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



ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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