LMR14010AEVM Evaluation Board

1 Introduction

This document describes the setup and the input/output connections of the EVM. Included are the board layout, schematic, and list of materials. The Texas Instruments LMR14010AEVM evaluation module (EVM) helps designers evaluate the operation and performance of the LMR14010A switching mode power supply.

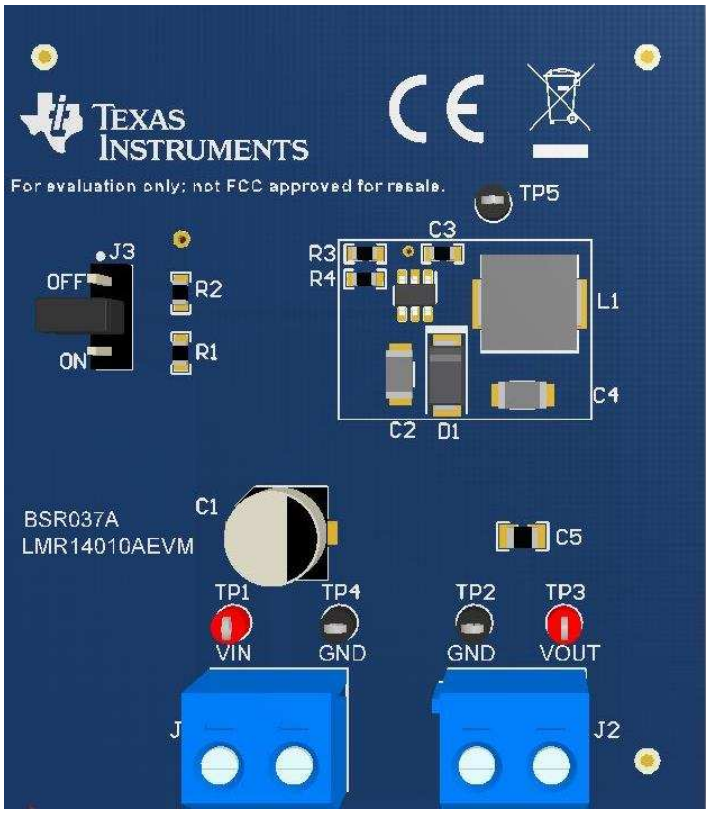

Figure 1. LMR14010AEVM Board

The LMR14010A and is a PWM DC/DC buck (step-down) converter. With a wide input range from 4 V to 40 V, it is suitable for a wide range of applications from automotive to industry for power conditioning from unregulated sources. The LMR14010AEVM evaluation board is designed to provide the design engineer with a fully functional power converter based on the buck topology to evaluate the LMR14010A series of buck converters.

1.1 EVM Features

- 6-V to 18-V Input Voltage Range
- 5-V Output Voltage
- Up to 1-A Output Current
- Switching Frequency 700 kHz
- Frequency Foldback Current Limit of 1.5 A
- Internal Compensation

The EVM contains one DC-to-DC converter (See Table 1)

Table 1. Device and Package Configurations

CONVERTER	EVM	ORDERABLE DEVICE	PACKAGE
U1	LMR14010AEVM	LMR14010ADDCR	SOT23-6

2 Setup

This section describes the jumpers and connectors on the EVM and how to properly connect, set up and use the LMR14010AEVM.

2.1 Input, Output Connector Description

V_{IN} – Input is the power input terminal for the device. Adjacent to it is the GND reference ground. Use those terminals to attach the EVM to a cable harness.

V_{OUT} – Output is the output terminal for the LMR14010A switch-mode converter. Adjacent to it is the GND reference ground.

EN is the jumper used to enable the switch-mode converter. The rail will be enabled when the respective jumper is high or floating, and disabled when low. External resistors can also be used to adjust the EN turn off trip point, and the jumper should not be used in that case.

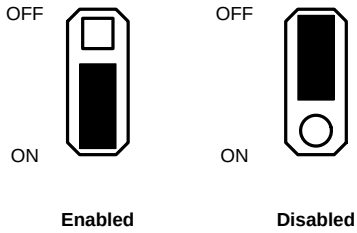

Figure 2. Enable Jumper Setting

2.2 Adjusting the Output Voltage

The output voltage can be changed from 5.0 V to another voltage by adjusting the feedback resistors using the following equation:

VOUT = VFB (1+(R4/R3)) (1)

Where VFB is 0.765 V.

Test Points

- TP_GND (x2) ground
- TP_Vin buck input
- TP_Vout buck output
- TP_SW buck phase pin

3 Schematic

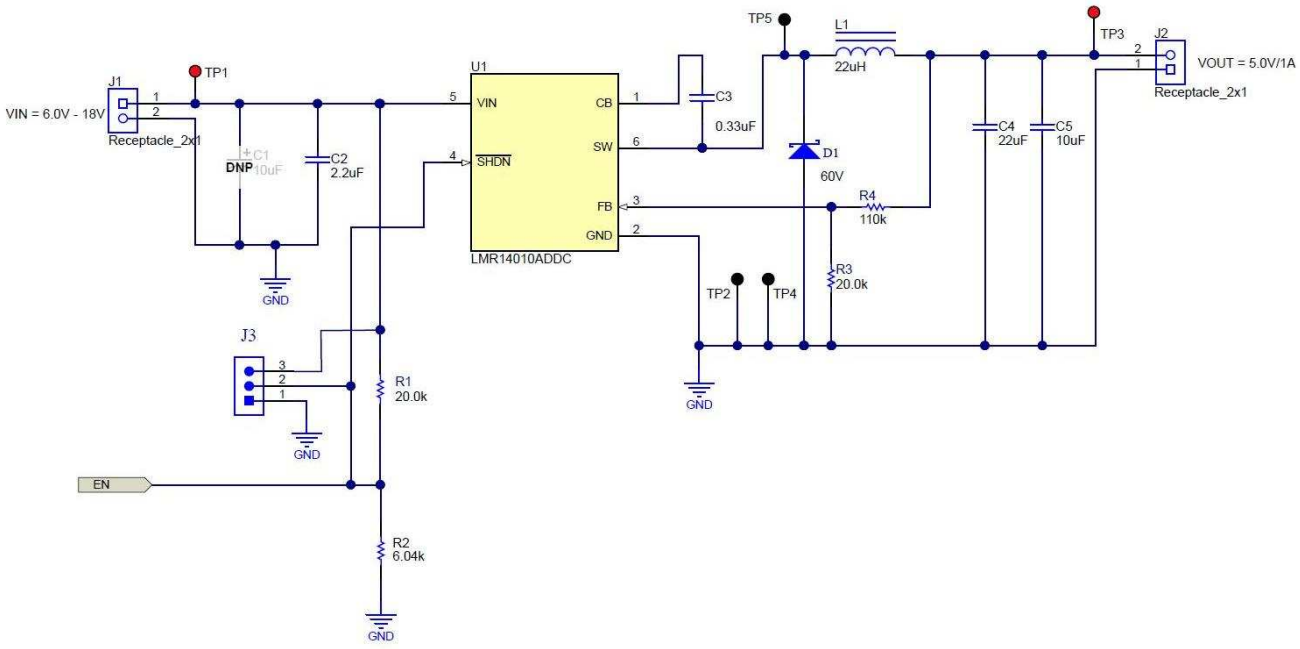

Figure 3. LMR14010AEVM Schematic

4 Board Layout

Figure 4 and Figure 6 show the board layout for the LMR14010AEVM. The EVM offers jumper to enable the converter.

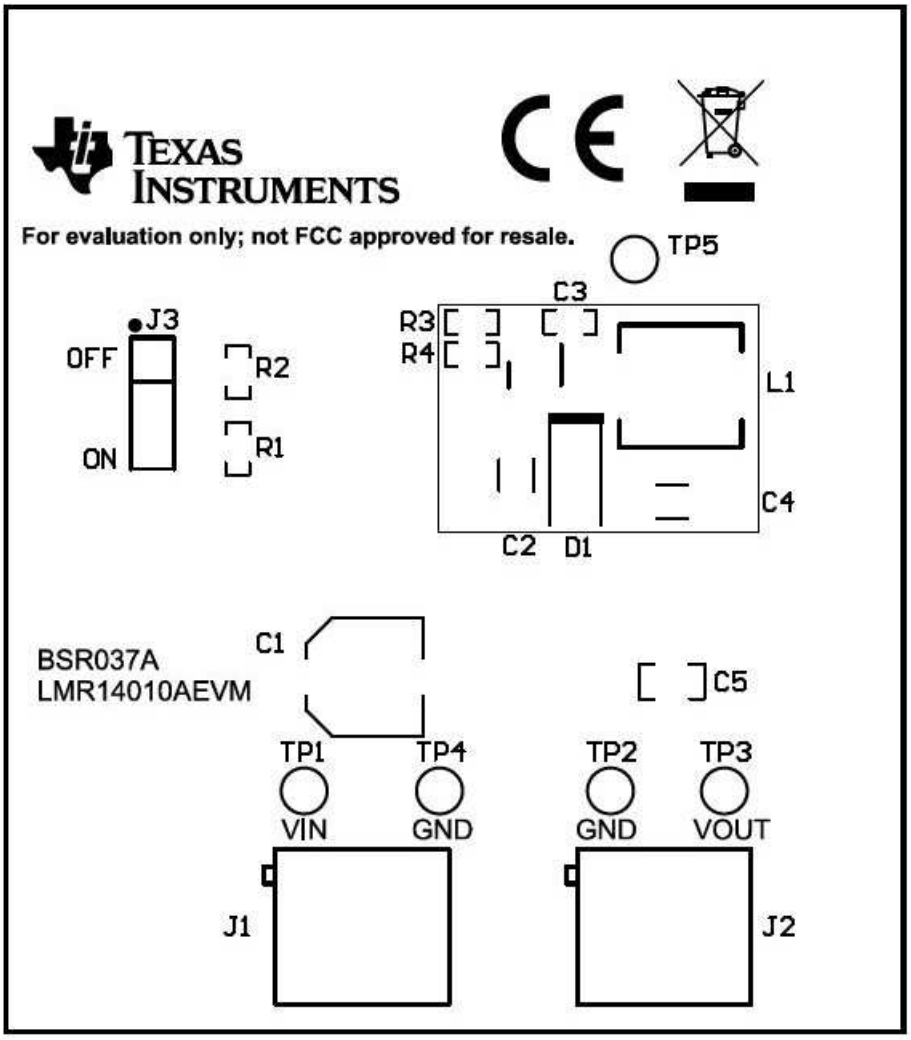

Figure 4. Top Assembly

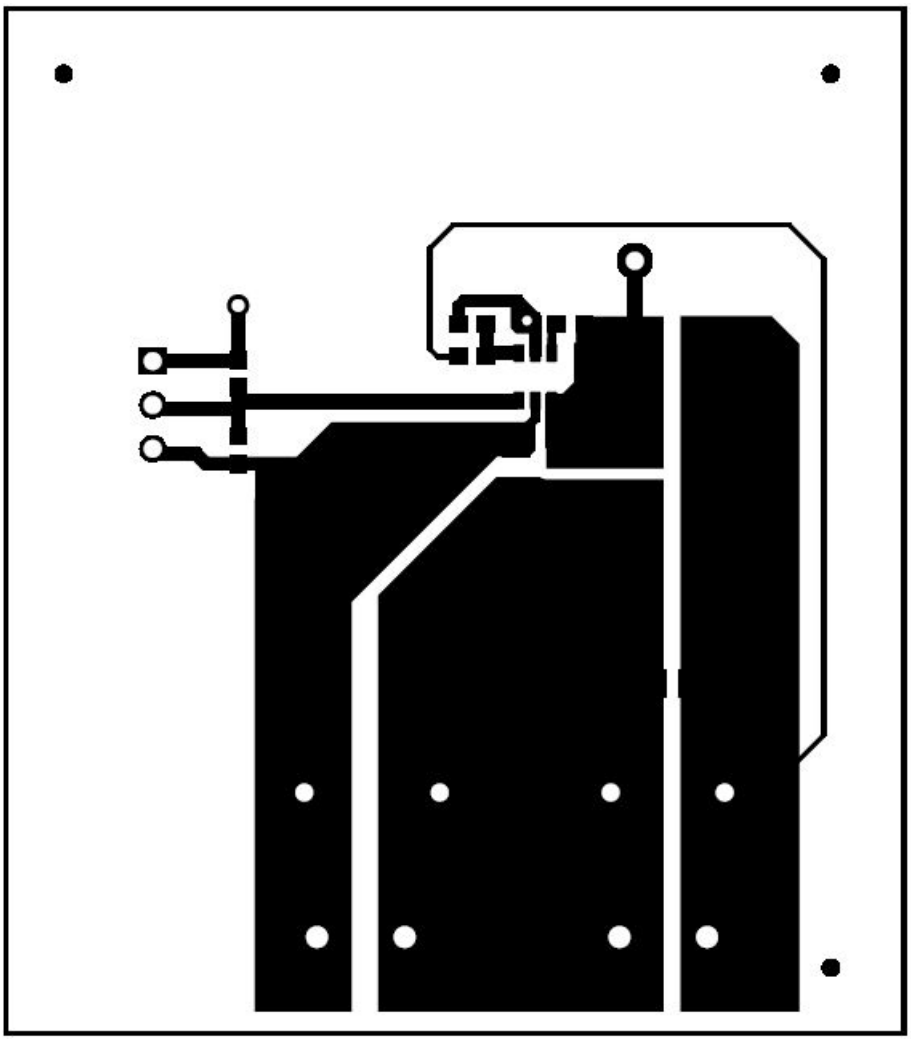

Figure 5. Top Layer

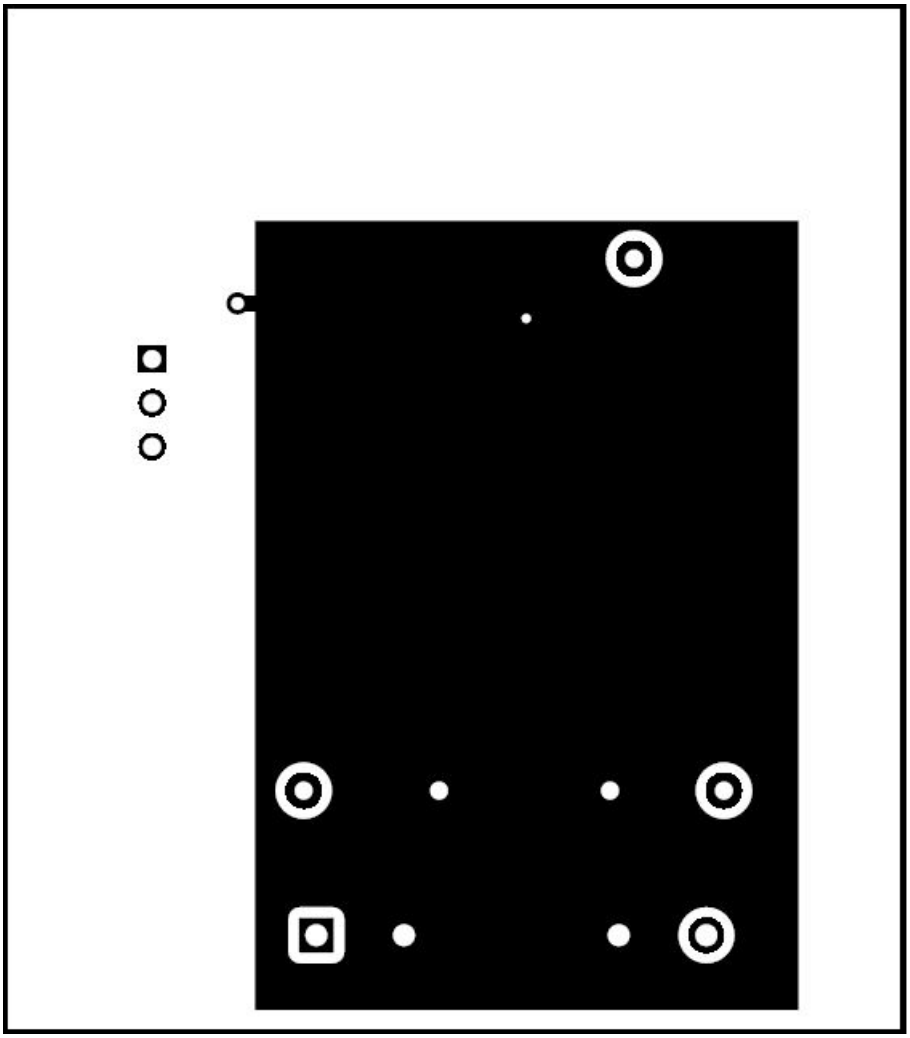

Figure 6. Bottom Layer

5 List of Materials

Table 2. LMR14010AEVM List of Materials

QTY	DES	DESCRIPTION	PART NUMBER	MANUFACTURER
1	PCB	Printed circuit board, FR4, 1 oz, 2 layers, size 1922 x 2054 mil	PCB	Any
0	C1	Capacitor, aluminum, 10 µF, 50 V, ±20%, 2 ohm, SMD	EEE-FC1H100P	Panasonic
1	C2	Capacitor, ceramic, 2.2 µF, 50 V, ±10%, X7R, 1206	GRM31CR71H225KA88L	MuRata
1	C3	Capacitor, ceramic, 0.33 µF, 16 V, ±10%, X7R, 0603	GRM188R71A334KA61D	MuRata
1	C4	Capacitor, ceramic, 22 µF, 16 V, ±10%, X5R, 1206	GRM31CR61C226KE15L	MuRata
1	C5	Capacitor, ceramic, 10 µF, 16 V, ±10%, X5R, 0805	GRM21BR61C106KE15L	MuRata
1	D1	Diode, Schottky, 60 V, 2 A, SMA	B260A-13-F	Diodes Inc.
2	R1, R3	Resistor, 20.0 kΩ, 1%, 0.1 W, 0603	CRCW060320K0FKEA	Vishay-Dale
1	R2	Resistor, 6.04 kΩ, 1%, 0.1 W. 0603	CRCW06036K04FKEA	Vishay-Dale
1	R4	Resistor, 110 kΩ, 1%, 0.1 W, 0603	CRCW0603110KFKEA	Vishay-Dale
2	J1, J2	Terminal block, 5.08 mm, 2 x 1, Brass, TH	ED120/2DS	On-Shore Technology
1	J3	Header, 100 mil, 3 x 1, tin, TH	PEC03SAAN	Sullins Connector Solutions
1	L1	Inductor, shielded drum core, powered iron, 22 µH,1.9 A, 0.165 Ω, SMD	74437346220	Wurth Electronik
1	SH-J1	Shunt, 100 mil, flash gold, black	SPC02SYAN	Sullins Connector Solutions
2	TP1, TP3	Test point, multipurpose, red, TH	5000	Keystone
3	TP2, TP4, TP5	Test point, multipurpose, black, TH	5001	Keystone
1	U1	Wide Input Voltage Range Buck converter with High Efficiency Sleep Mode, DDC0006A (SOT-6)	LMR14010ADDC	TI

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