



ABSTRACT

The Texas Instruments LMR51420EVM evaluation module (EVM) helps designers evaluate the operation and performance of the LMR51420 wide-input synchronous buck regulator. This document describes the setup, input/output connections of the EVM, board layout, schematic, and bill of materials.

Table of Contents

| | |
|--|---|
| 1 Introduction | 2 |
| 1.1 Description..... | 2 |
| 1.2 Features..... | 2 |
| 2 EVM Setup | 3 |
| 2.1 Adjusting the Output Voltage..... | 3 |
| 3 PCB Layouts | 4 |
| 4 Schematics | 5 |
| 5 LMR51420EVM Bill of Materials | 6 |

List of Figures

| | |
|---|---|
| Figure 1-1. LMR51420EVM Board..... | 2 |
| Figure 2-1. Vout Jumper Setting | 3 |
| Figure 2-2. Enable Jumper Setting..... | 3 |
| Figure 3-1. PCB Layout Top View..... | 4 |
| Figure 3-2. PCB Layout Bottom View..... | 4 |
| Figure 4-1. LMR51420EVM Schematic..... | 5 |

List of Tables

| | |
|---|---|
| Table 1-1. Device and Package Configurations..... | 2 |
| Table 5-1. LMR51420EVM Bill of Materials | 6 |

Trademarks

All trademarks are the property of their respective owners.

1 Introduction

The Texas Instruments LMR51420EVM evaluation module (EVM) helps designers evaluate the operation and performance of the LMR51420 wide-input buck regulator.

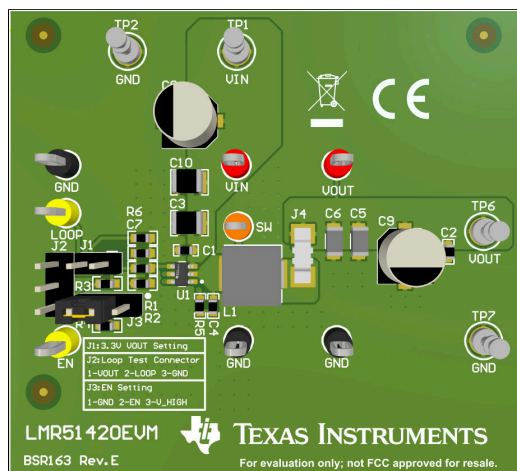


Figure 1-1. LMR51420EVM Board

1.1 Description

The Texas Instruments LMR51420EVM evaluation module (EVM) helps designers evaluate the operation and performance of the LMR51420 wide-input buck regulator.

1.2 Features

- 4.5-V to 36-V input voltage range
- Default 5-V output
- Up to 2-A output current
- 500-kHz switching frequency
- Hiccup mode short current protection
- Internal compensation

The EVM contains one DC/DC converter (see [Table 1-1](#)).

Table 1-1. Device and Package Configurations

| CONVERTER | EVM | DEVICE | PACKAGE |
|-----------|-------------|-----------|---------|
| U1 | LMR51420EVM | PLMR51420 | SOT23-6 |

2 EVM Setup

This section describes the jumpers and connectors on the EVM and how to properly connect, set up, and use the LMR51420EVM.

- VIN – Terminal TP1** Power input terminal for the converter. Adjacent to it is the GND reference ground. Use this terminal to attach the EVM to a cable harness.
- VOUT – Terminal TP3** Regulated output voltage for the converter. Adjacent to it is the GND reference ground.
- GND – Terminal TP2, TP4** Ground reference for the converter. Use these terminals to attach the EVM to a cable harness.
- VOUT SETTING – Jumper JP1** Used to set output voltage to 5-V or 3.3-V output
- ENABLE SETTING – Jumper JP3** Used to enable the switch-mode converter. The device will be enabled when the EN pin is high, and disabled when low.

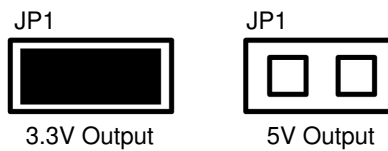


Figure 2-1. Vout Jumper Setting

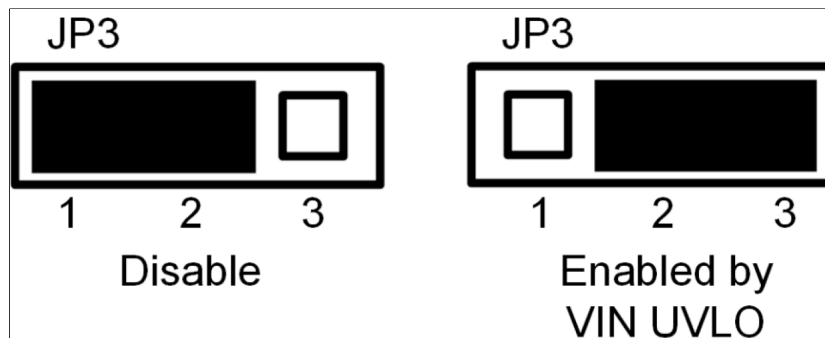


Figure 2-2. Enable Jumper Setting

- Jumper J2** Test points used for loop response measurements
- Jumper J4** Replacing J4 by wire can use current scope to test the inductor current

2.1 Adjusting the Output Voltage

If other outputs need to be configured, leave jumper J1 unconnected and adjust the feedback resistors using the [Equation 1](#).

$$V_{OUT} = V_{REF} \times (1 + (R1 / R2)) \tag{1}$$

where

- V_{REF} is 0.6 V

3 PCB Layouts

Figure 3-1 to Figure 3-2 show the board layout for the LMR51420EVM. The PCB consists of a 2-layer design. The board size is 57.8-mm x 64mm, 2-oz copper planes are applied on both layers.

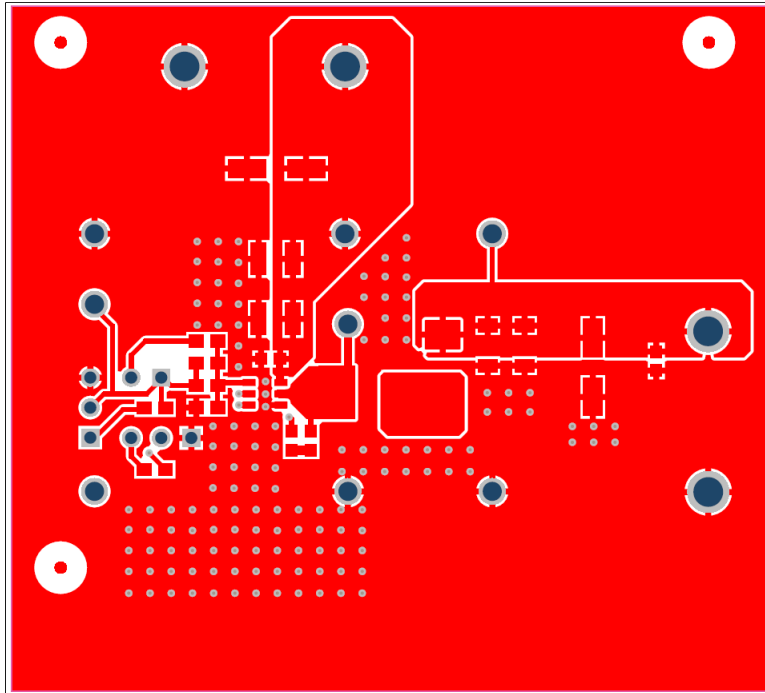


Figure 3-1. PCB Layout Top View

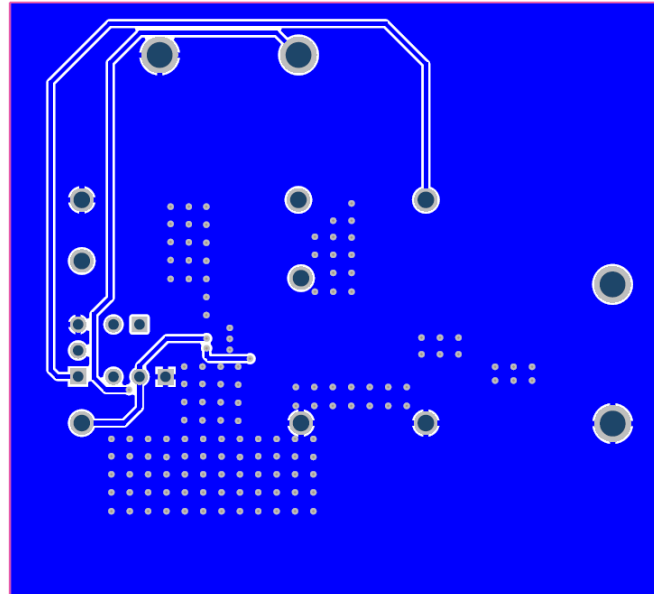


Figure 3-2. PCB Layout Bottom View

4 Schematics

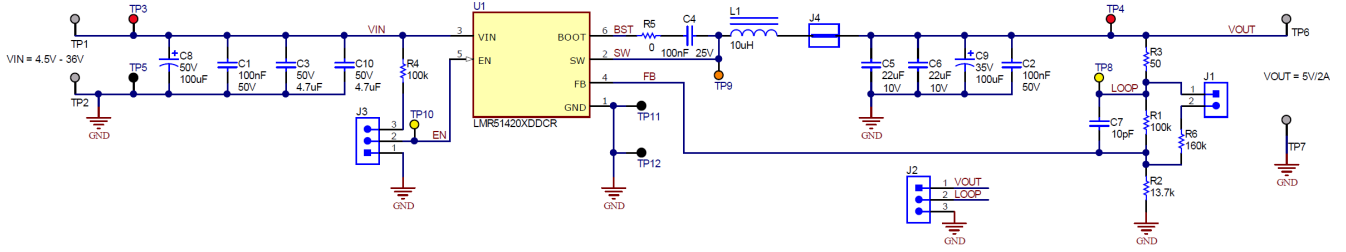


Figure 4-1. LMR51420EVM Schematic

5 LMR51420EVM Bill of Materials

Table 5-1. LMR51420EVM Bill of Materials

| Designator | Quantity | Description | PartNumber | Manufacturer |
|--------------------|----------|---|--------------------|-----------------------------|
| C1, C2 | 2 | CAP, CERM, 0.1 uF, 50 V, +/- 10%, X7R, 0603 | GRM188R71H104KA93D | MuRata |
| C3, C10 | 2 | CAP, CERM, 4.7 uF, 50 V, +/- 10%, X7R, 1210 | GRM32ER71H475KA88L | MuRata |
| C4 | 1 | CAP, CERM, 0.1 uF, 25 V, +/- 10%, X7R, 0603 | GRM188R71E104KA01D | MuRata |
| C5, C6 | 2 | CAP, CERM, 22 uF, 10 V, +/- 10%, X7R, 1206 | GRM31CR71A226KE15L | MuRata |
| FID1, FID2, FID3 | 3 | Fiducial mark. There is nothing to buy or mount. | N/A | N/A |
| J1 | 1 | Header, 100mil, 2x1, Tin, TH | PEC02SAAN | Sullins Connector Solutions |
| J2, J3 | 2 | Header, 100mil, 3x1, Tin, TH | PEC03SAAN | Sullins Connector Solutions |
| J4 | 1 | Shorting Jumper, 5.375mm, 2 Position, Tin, SMT | 5102 | Keystone |
| L1 | 1 | Inductor, Shielded Drum Core, Powdered Iron, 10 uH, 3.2 A, 0.065 ohm, SMD | 74437349100 | Würth Elektronik |
| R1, R4 | 2 | RES, 100 k, 1%, 0.1 W, 0603 | CRCW0603100KFKEA | Vishay-Dale |
| R2 | 1 | RES, 13.7 k, 1%, 0.1 W, 0603 | CRCW060313K7FKEA | Vishay-Dale |
| R3 | 1 | RES, 50, 1%, 0.1 W, 0603 | CRCW060350R0FKEA | Vishay-Dale |
| R5 | 1 | RES, 0, 5%, 0.1 W, AEC-Q200 Grade 0, 0603 | ERJ-3GEY0R00V | Panasonic |
| R6 | 1 | RES, 160 k, 1%, 0.1 W, 0603 | CRCW0603160KFKEA | Vishay-Dale |
| SH-J1 | 1 | Shunt, 100mil, Gold plated, Black | SNT-100-BK-G | Samtec |
| TP1, TP2, TP6, TP7 | 4 | Terminal, Turret, TH, Double | 1502-2 | Keystone |
| TP3, TP4 | 2 | Test Point, Multipurpose, Red, TH | 5010 | Keystone |
| TP5, TP11, TP12 | 3 | Test Point, Multipurpose, Black, TH | 5011 | Keystone |
| TP8, TP10 | 2 | Test Point, Multipurpose, Yellow, TH | 5014 | Keystone |
| TP9 | 1 | Test Point, Multipurpose, Orange, TH | 5013 | Keystone |
| U1 | 1 | PLMR51420XDDCR | PLMR51420XDDCR | Texas Instruments |
| C7 | 0 | CAP, CERM, 10 pF, 100 V, +/- 5%, C0G/NP0, 0603 | GRM1885C2A100JA01D | MuRata |
| C8 | 0 | CAP, AL, 100 uF, 50 V, +/- 20%, 0.34 ohm, AEC-Q200 Grade 2, SMD | EEE-FK1H101P | Panasonic |
| C9 | 0 | CAP, AL, 100 uF, 35 V, +/- 20%, 0.26 ohm, AEC-Q200 Grade 2, SMD | EEE-FT1V101AP | Panasonic |

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#), [TI's General Quality Guidelines](#), or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Copyright © 2026, Texas Instruments Incorporated

Last updated 10/2025