

## **TPS560430 Evaluation Module**

The Texas Instruments TPS560430XFEVM evaluation module (EVM) helps designers evaluate the operation and performance of the TPS560430 wide-input synchronous buck regulator. This document describes the setup and the input / output connections of the EVM. Included are the board layout, schematic and bill of materials.

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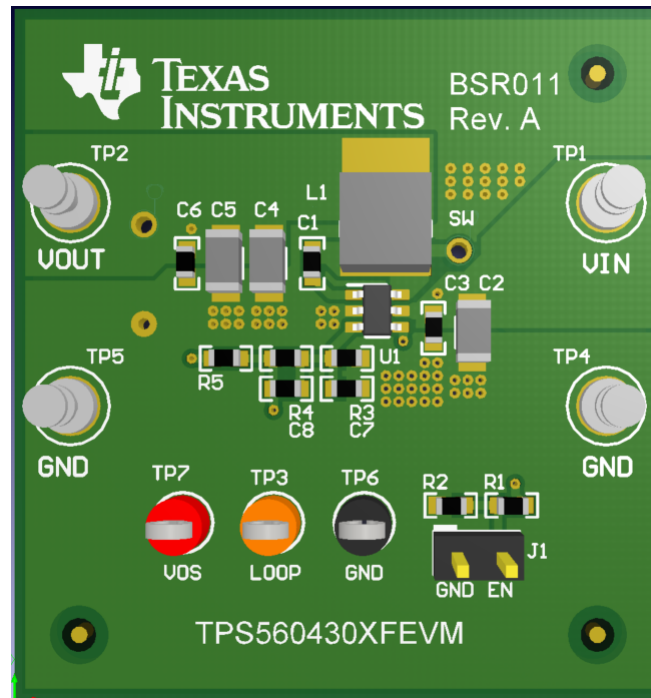
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## 1 Introduction

The Texas Instruments TPS560430XFEVM evaluation module (EVM) helps designers evaluate the operation and performance of the TPS560430 wide-input buck regulator.



**Figure 1. TPS560430XFEVM Board**

### EVM Features

- 4-V to 36-V input voltage range
- Accurate 5-V output
- Up to 600-mA output current
- Switching frequency 1.1 MHz
- Hiccup mode short current protection
- Internal compensation

The EVM contains one DC/DC converter (See [Table 1](#))

**Table 1. Device and Package Configurations**

| CONVERTER | EVM            | DEVICE      | PACKAGE |
|-----------|----------------|-------------|---------|
| U1        | TPS560430XFEVM | TPS560430XF | SOT23-6 |

## 2 Setup

This section describes the jumpers and connectors on the EVM and how to properly connect, set up and use the TPS560430XFEVM.

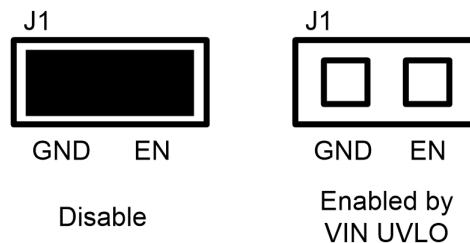
### 2.1 Input/Output Connector Description

**VIN — Terminal TP1** — is the 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 TP2** — is the regulated output voltage for the converter. Adjacent to it is the GND reference ground.

**GND — Terminal TP4, TP5** — are the ground reference for the converter. Use these terminals to attach the EVM to a cable harness.

**EN — Jumper J1** — is used to enable the switch-mode converter. The device will be enabled when the EN pin is high, and disabled when low. EN turn off trip point also can be programmed by changing R1 or R2. Refer to [TPS560430](#) datasheet for enable and adjustable under-voltage lockout.



**Figure 2. Enable Jumper Setting**

**Testpoint — TP3, TP6, TP7** — these are test points used for loop response measurements.

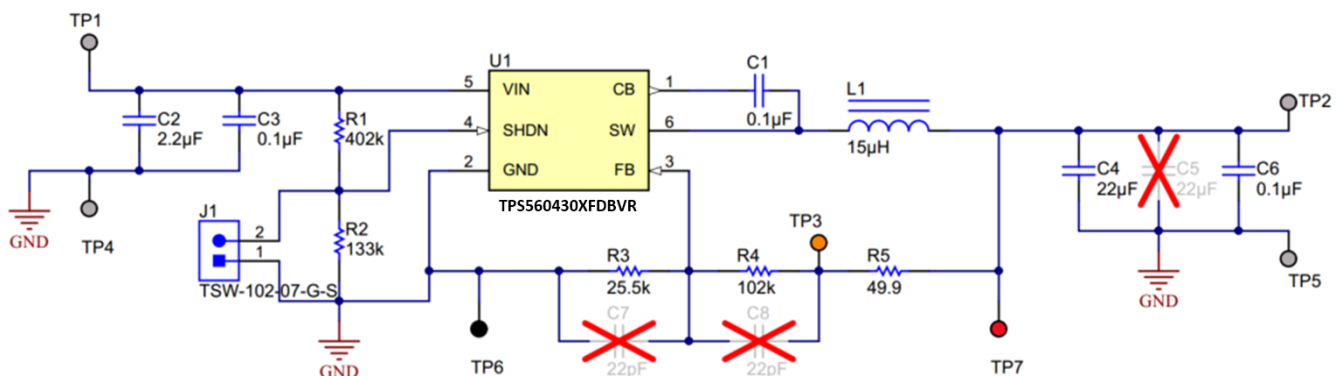
### 2.2 Adjusting the Output Voltage

If other outputs need to be configured, adjust the feedback resistors using the following equation.

$$V_{OUT} = V_{REF} \times (1 + (R4 / R3)) \quad (1)$$

Where  $V_{REF}$  is 1.0 V

## 3 TPS560430XFEVM Schematic



**Figure 3. TPS560430XFEVM Schematic**

## 4 Board Layout

Figure 4 and Figure 5 show the board layout for the TPS560430XFEVM. The PCB consists of a 2-layer design. The board size is 38 mm x 41 mm, 1-oz copper planes is applied on both layers.

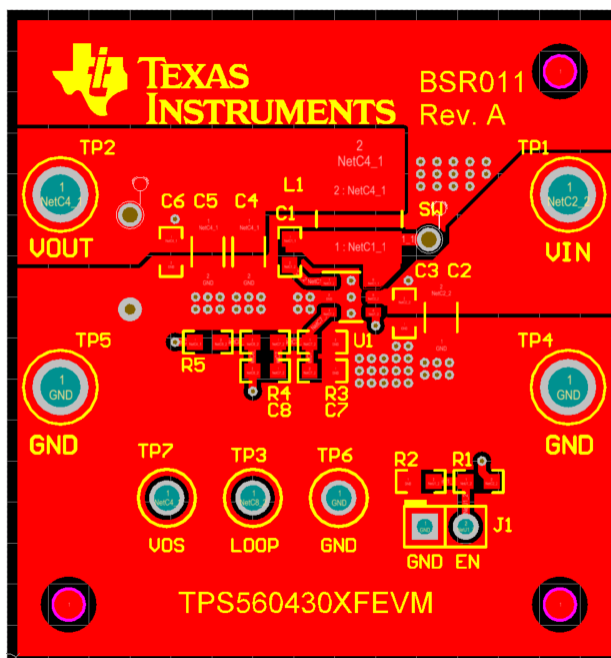


Figure 4. Top Layer

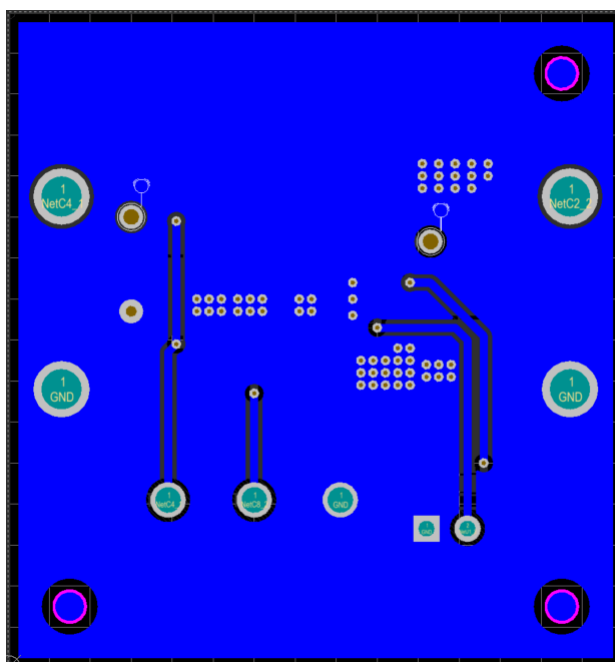


Figure 5. Bottom Layer

## 5 List of Materials

**Table 2. TPS560430XFEVM List of Materials**

| DES                | DESCRIPTION                                                                    | PART NUMBER        | MANUFACTURE       | QUANTIT<br>Y |
|--------------------|--------------------------------------------------------------------------------|--------------------|-------------------|--------------|
| C1, C3, C6         | Capacitor, ceramic, 0.1 $\mu$ F, 50 V, $\pm$ 10%, X7R, 0603                    | GRM188R71H104KA93D |                   | 3            |
| C2                 | Capacitor, ceramic, 2.2 $\mu$ F, 50 V, $\pm$ 10%, X7R, 1206                    | GRM31CR71H225KA88L |                   | 1            |
| C4                 | Capacitor, ceramic, 22 $\mu$ F, 10 V, $\pm$ 10%, X7R, 1206                     | GRM31CR71A226KE15L |                   | 1            |
| J1                 | Header, 100 mil, 2 x 1, gold, TH                                               | TSW-102-07-G-S     |                   | 1            |
| L1                 | Inductor, shielded drum core, ferrite, 15 $\mu$ H, 1.4 A, 0.118 ohm, SMD, 4838 | 74408943150        |                   | 1            |
| R1                 | Resistor, 402 k $\Omega$ , 1%, 0.1 W, 0603                                     | CRCW0603402KFKEA   |                   | 1            |
| R2                 | Resistor, 133 k $\Omega$ , 1%, 0.1 W, 0603                                     | CRCW0603133KFKEA   |                   | 1            |
| R3                 | Resistor, 25.5 k $\Omega$ , 1%, 0.1 W, 0603                                    | CRCW060325K5FKEA   |                   | 1            |
| R4                 | Resistor, 102 k $\Omega$ , 1%, 0.1 W, 0603                                     | CRCW0603102KFKEA   |                   | 1            |
| R5                 | Resistor, 49.9 $\Omega$ , 1%, 0.1 W, 0603                                      | CRCW060349R9FKEA   |                   | 1            |
| SH-J1              | Shunt, 100 mil, flash gold, black                                              | SPC02SYAN          |                   | 1            |
| TP1, TP2, TP4, TP5 | Terminal, turret, TH, double                                                   | 1502-2             |                   | 4            |
| TP3                | Test point, compact, orange, TH                                                | 5008               |                   | 1            |
| TP6                | Test point, compact, black, TH                                                 | 5006               |                   | 1            |
| TP7                | Test point, compact, red, TH                                                   | 5005               |                   | 1            |
| U1                 | Device, 36-V, 600-mA, Synchronous Buck Regulator                               | TPS560430XFBVR     | Texas Instruments | 1            |

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- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265  
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