

TPS7A6201QKTT EVM

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1 Introduction

The Texas Instruments TPS7A6201QKTT EVM evaluation module (EVM) helps designers evaluate the operation and performance of the TPS7A6201QKTT Linear Regulator.

The EVM contains one linear regulator (see [Table 1](#)).

Table 1. Device and Package Configurations

| Converter | IC | Package |
|-----------|------------------|---------|
| U1 | TPS7A6201QKTTRQ1 | KTT-5 |

2 Setup

This section describes the jumpers and connectors on the EVM as well and how to properly connect, set up and use the TPS7A6201QKTT EVM.

2.1 Input/Output Connector Description

VBAT is the protected power input for the regulator. The test point provides a power (Vbat) connection and a reverse battery protection diode to allow the user to power the EVM.

GND is the ground return for the regulator. The EVM provides three GND test points to allow the user to power the EVM, connect the load and attach an oscilloscope ground lead

VIN is a power test point. The test point allows the user to measure the input voltage after the reverse battery protection diode. The user can also apply power to the regulator through this test point.

VOUT is output for the regulator. The test point provides a connection to attach a load to the EVM.

EN is a test point to monitor the Enable input to the device. It can also be used to provide an enable signal to the device from an outside source, if the EN jumper is left open. The EN jumper will disable the regulator when removed and enable the regulator when installed.

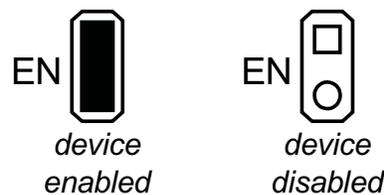


Figure 1. Enable Jumper

FB is a test point to monitor the feedback voltage to the device. The EVM is setup to provide a 5V output voltage, but the feedback resistors can be changed to set the output voltage to a value between 2.5V and 7V using the equation presented in [Equation 1](#).

$$V_{OUT} = 1.23 \times \left(1 + \frac{R1}{R2} \right) \tag{1}$$

2.2 Setup

The input voltage range for the converter is (VOUT + 0.3V) volts to 40 volts. The EVM can support up to 300mA of load current.

2.3 Operation

The TPS7A6201QKTT will power-up after the VBAT voltage has exceeded the Power-On Reset threshold.

In this configuration, the device will power up when power is applied.

The PCB offers footprints for the TPS7A6201QKTTQ1 or the TPS7A6201QKVUQ1 device.

3 Board Layout

Figure 2, through Figure 4 show the board layout for the TPS7A6201QKTT EVM PWB.

The PowerPAD™ package offers an exposed thermal pad to enhance thermal performance. This must be soldered to the copper landing on the PCB for optimal performance. The PCB provides 2 oz copper planes on the top and bottom to dissipate heat.

Spacer

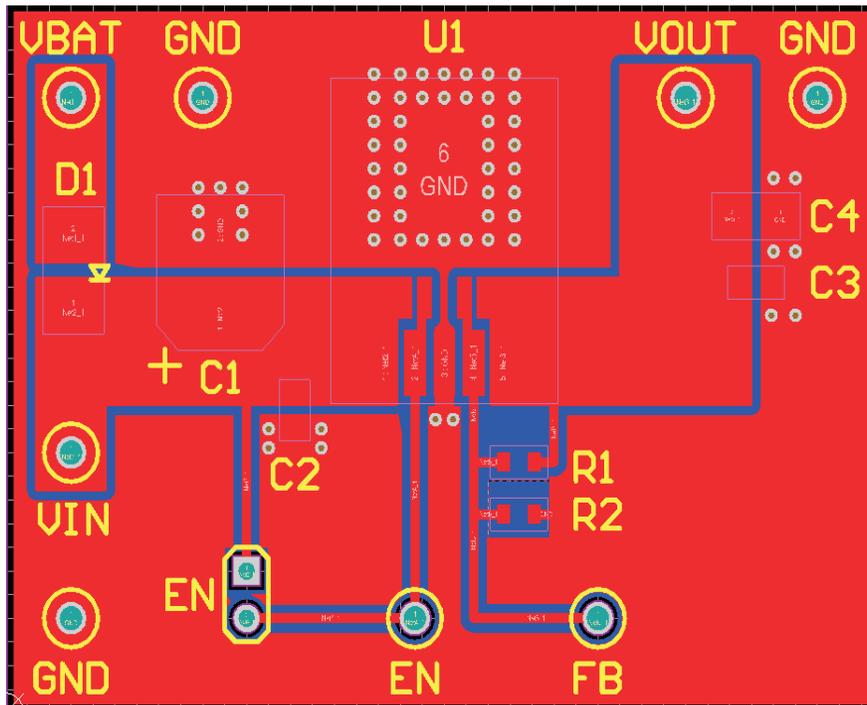


Figure 2. Top Assembly Layer

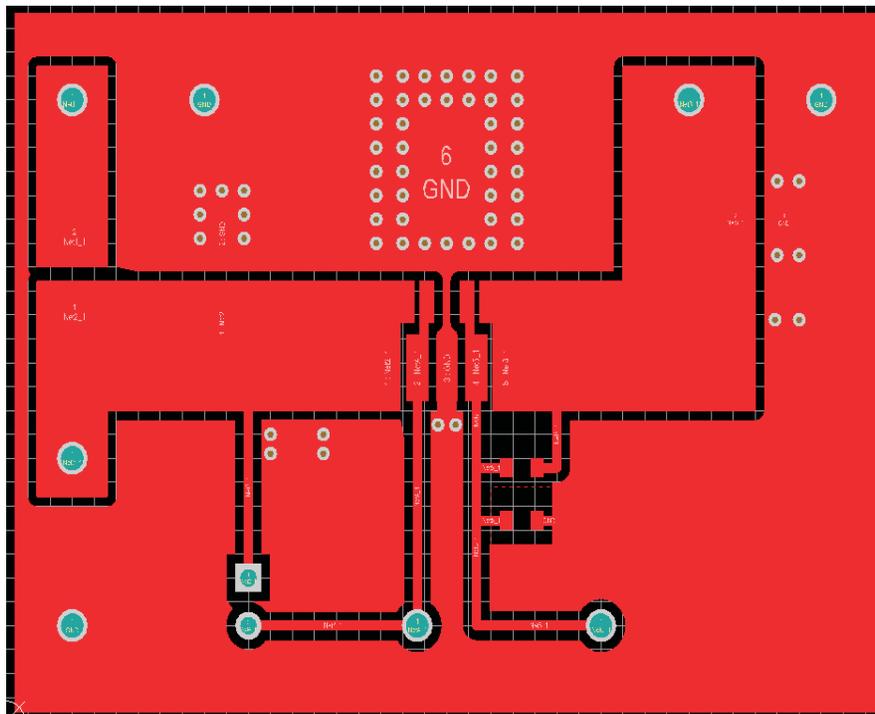


Figure 3. Top Layer Routing

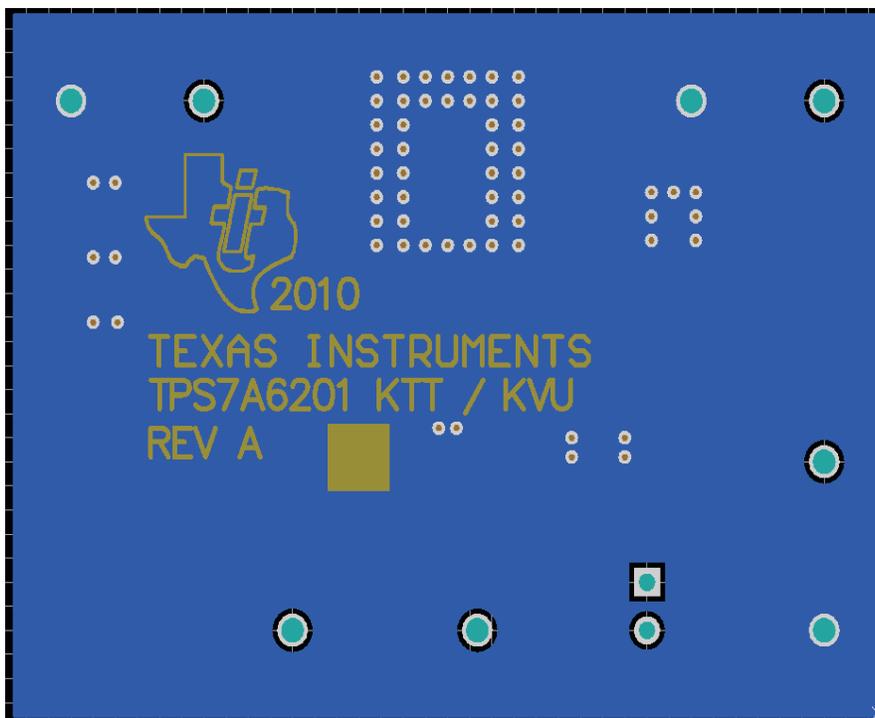


Figure 4. Bottom Assembly Layer

4 Schematic and Bill of Materials

4.1 Schematic

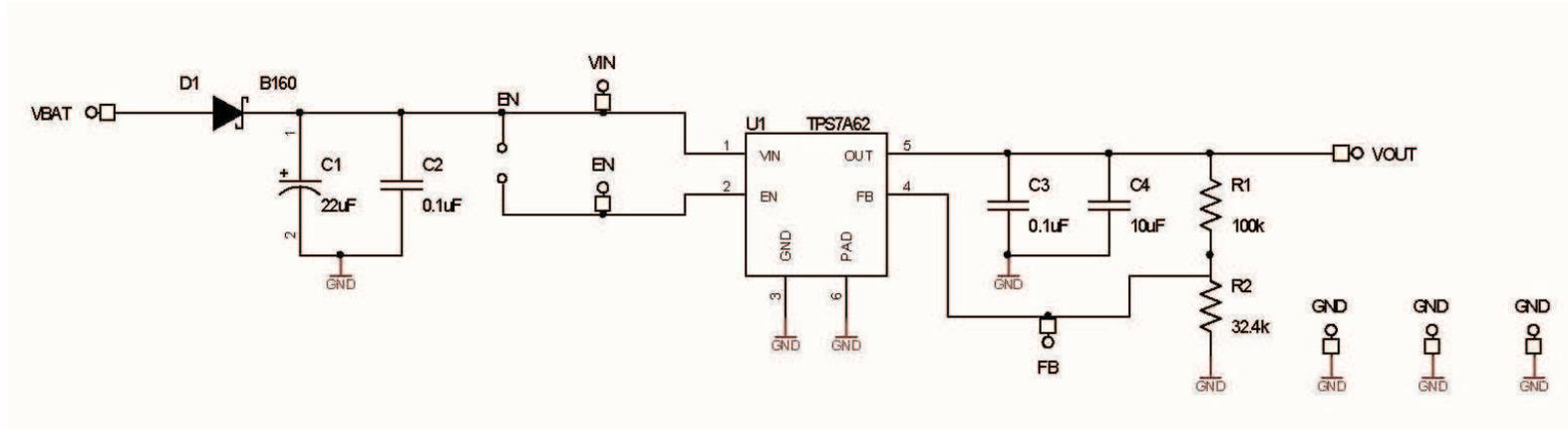


Figure 5. TPS7A6201QKTT EVM Schematic

4.2 Bill of Materials

Table 2. TPS7A6201QKTT EVM Bill of Materials

| COUNT | REF DES | DESCRIPTION | SIZE | MFR | PART NUMBER |
|-------|--------------------------------------|--|---------------|-----------|------------------|
| 1 | C1 | Capacitor, electrolytic, 22µF, 50V | 6.3mm x 5.8mm | Panasonic | EEV-FK1H220P |
| 2 | C2, C3 | Capacitor, ceramic, 0.1µF, 50V, 10% | 603 | STD | STD |
| 1 | C4 | Capacitor, ceramic, 10µF, 16V, 10% | 1206 | STD | STD |
| 1 | D1 | Diode, Schottky, 1A, 60V | SMA | Diodes | B160-13-F |
| 8 | EN, FB, GND (x3), VBAT, VIN, VOUT | Test point, 52-mil | 0.052 | Kobiconn | 151-103-RC |
| 1 | EN | Header, 6-pin, 100-mil spacing, (36-pin strip) | 0.100 x 3 | Sullins | PEC06DAAN |
| 1 | EN | Connector jumper, shorting, 100-mil spacing | 0.1 | Sullins | SPC02SYAN |
| 1 | R1 | Resistor, chip, 100-k , 1/10W, 1% | 603 | STD | STD |
| 1 | R2 | Resistor, chip, 32.4-k , 1/10W, 1% | 603 | STD | STD |
| 1 | U1 | IC, TPS7A6201QKTTQ1 | | TI | TPS7A6201QKTTQ1 |
| - | - | PCB, 2-inch x 1.5-inch x 0.062 | | Any | TPS7A6201, REV A |

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EVM Warnings and Restrictions

It is important to operate this EVM within the input voltage range of 2 V to 40 V (Boost enabled) or 4V to 40 V (Boost disabled) and the output voltage range of 9 V to 11 V .

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 85°C. The EVM is designed to operate properly with certain components above 60°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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