TPS7B6950EVM User's Guide

1 Introduction

This user's guide describes operational use of TPS7B6950 evaluation module (EVM) as a reference design for engineering demonstration and evaluation of the TPS7B6950 low-dropout (LDO) linear regulator. Included in this user's guide are setup instructions, a schematic diagram, layout, and a bill of materials.

The TPS7B6950EVM helps engineers evaluate the operation and performance of the TPS7B6950 linear regulator. The TPS7B6950 device is an LDO linear regulator designed for up to 40-V V_{VIN} with a max 150-mA output current. With only a typical 15-µA quiescent current at light loads, the device is very suitable for always-on systems in automotive applications. The TPS7B6950 device can be stable with low ESR ceramic output capacitor from 2.2 to 100 µF. The device features an integrated short-circuit, overcurrent, and overtemperature protection with a –40°C to 125°C temperature range. Because of these features, not only can the device be used in normal power supply applications but can also be widely used in always-on systems in automotive applications such as gateway applications, remote keyless-entry systems, and immobilizers.

2 Setup

2.1 Input-Output Connectors

TP1 (VIN): — This connector is the input of the EVM. TP1 allows the user to connect a power supply and measure the input voltage.

TP2 (VOUT) — This connector is the output of the EVM. TP2 allows the user to connect a load and measure the output voltage of the EVM.

TP3 (GND) and TP4 (GND) — These connectors are the ground return connector of the EVM. The EVM provides two GND test points to allow the user to power the EVM, connect the load, and link the oscilloscope ground.

2.2 Equipment Setup

First, turn off the input power supply after verifying that the output voltage is set to greater than 5.5 V (40-V maximum). Connect the positive voltage lead from the input power supply to VIN at the TP1 connector of the EVM. Connect the ground lead from the input power supply to ground at the TP3 connector of the EVM.

Then connect a 0-mA to 150-mA load between the TP2 (VOUT) and the TP4 (GND) connector.

3 Operation

Turn on the input power supply. Vary the respective loads and V_{VIN} voltage as necessary for test purposes.

4 Board Layout

Figure 1, Figure 2, and Figure 3 show the board layout for the TPS7B6950EVM.

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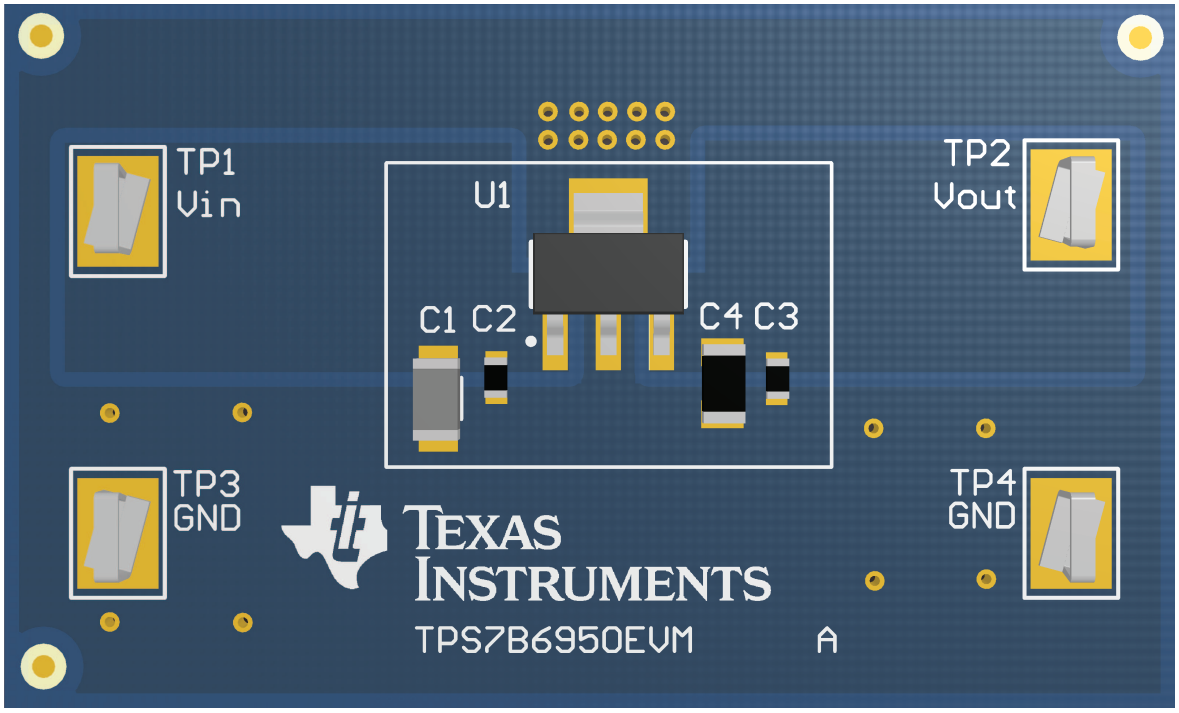


Figure 1. 3D Model

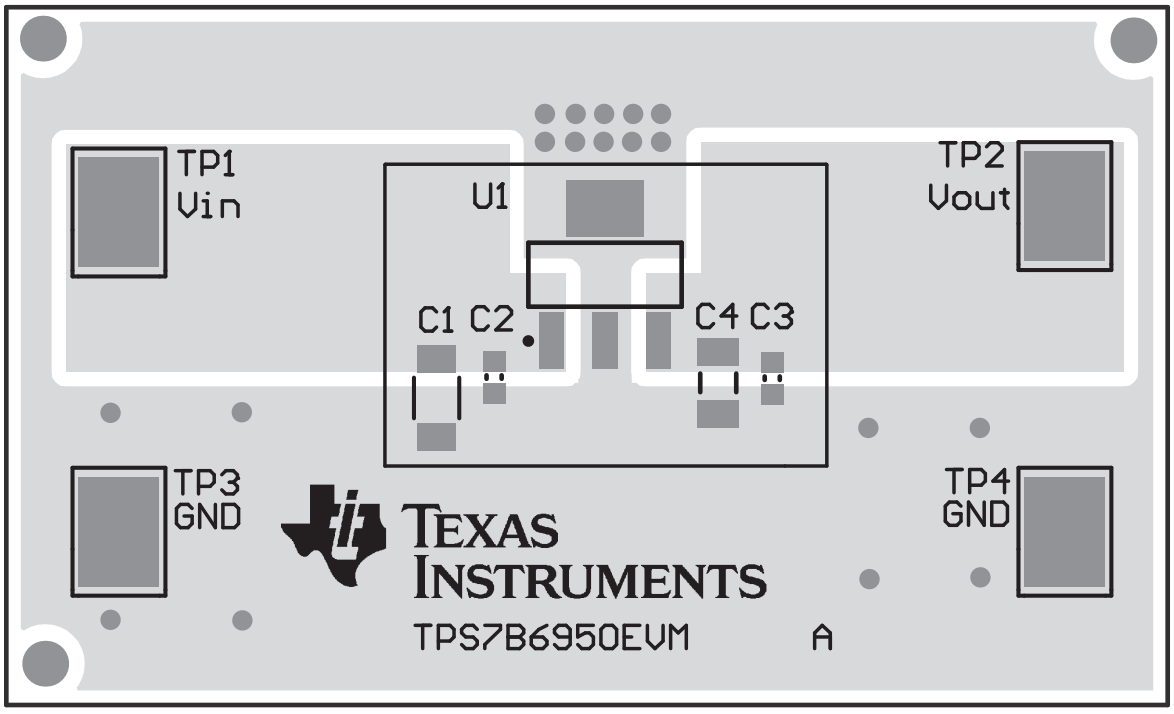


Figure 2. Top-Layer Routing

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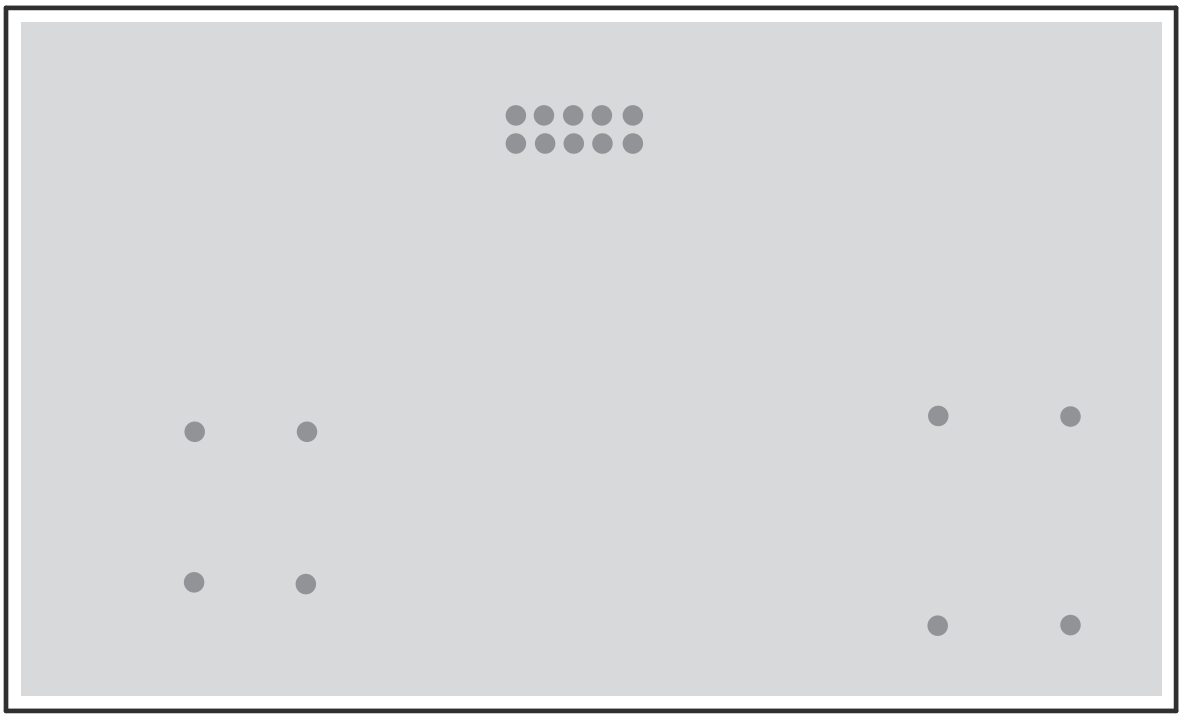


Figure 3. Bottom-Layer Routing

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5 Schematic and Bill of Materials

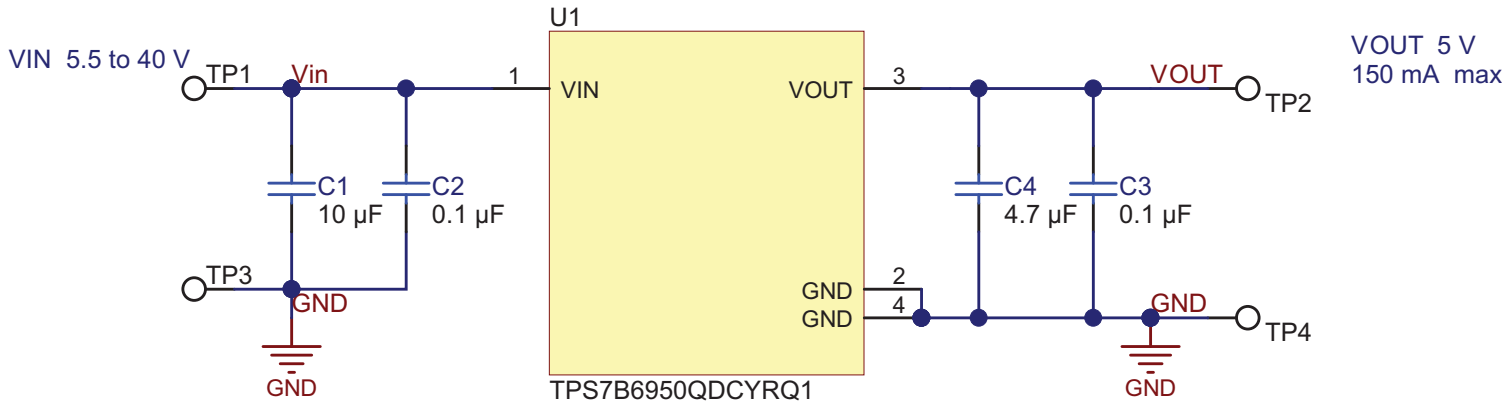


Figure 4. TPS7B6950EVM Schematic

Table 1. TPS7B6950EVM Bill of Materials

DESIGNATOR	QUANTITY	VALUE	PARTNUMBER	MANUFACTURER	DESCRIPTION	PACKAGE REFERENCE
C1	1	10 µF	CGA5L3X5R1H106K160AB	TDK	Capacitor, ceramic, 10 µF, 50 V, ±10%, X5R, 1206_190	1206s
C2	1	0.1 µF	C1608X7R1H104K	TDK	Capacitor, ceramic, 0.1 µF, 50 V, ±10%, X7R, 0603	0603
C3	1	0.1 µF	0603YC104JAT2A	AVX	Capacitor, ceramic, 0.1 µF, 16 V, ±5%, X7R, 0603	0603
C4	1	4.7 µF	C3216X7R1E475K	TDK	Capacitor, ceramic, 4.7 µF, 25 V, ±10%, X7R, 1206	1206
TP1, TP2, TP3, TP4	4	SMT	5016	Keystone	Test point, compact, SMT	Testpoint_Keystone_Compact
U1	1		TPS7B6950QDCYRQ1	Texas Instruments	High-voltage, ultra-low I_Q, low-drop out regulator, DCY0004A	DCY0004A

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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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3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210*

Concerning EVMs Including Radio Transmitters:

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Concernant les EVMs avec antennes détachables

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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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