EVM User's Guide: TPS22991EVM

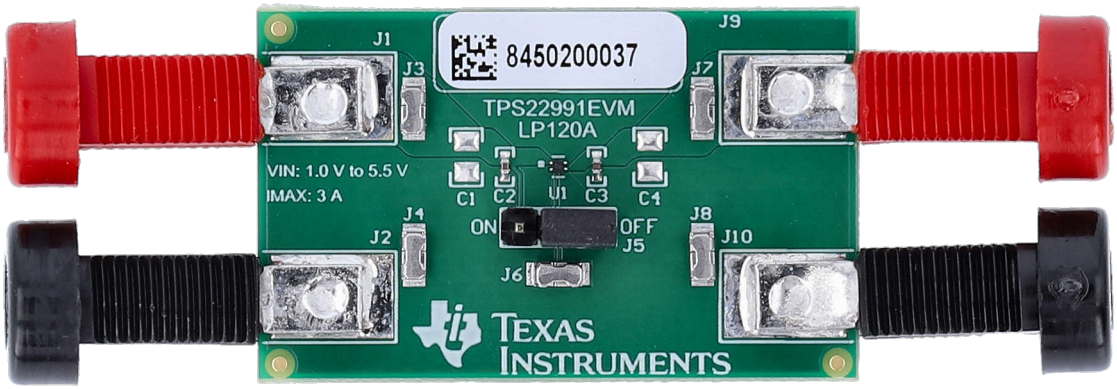
TPS22991 Evaluation Module

Description

The TPS22991EVM is a PCB containing the TPS22991 load switch device. The V_{IN} and V_{OUT} connections to the device and the PCB layout routing are capable of handling high continuous currents and provide a low-resistance pathway into and out of the device under test. Test point connections allow the user to control the device with user-defined test conditions and make accurate R_{ON} measurements.

Features

- V_{IN} range: 1V to 5.5V
- I_{MAX}: 3A
- Onboard C_{IN} and C_{OUT} capacitors
- Small package size at 0.85mm x 0.75mm



1 Evaluation Module Overview

1.1 Introduction

This user's guide describes the characteristics, operation, and use of the TPS22991 load switch evaluation module (EVM). This document contains the complete EVM schematic diagram, printed-circuit board layouts, bill of materials, and necessary instructions on how to operate the EVM.

1.2 Kit Contents

Table 1-1 lists the contents of the EVM kit. Contact the Texas Instruments Product Information Center nearest if any components are missing.

Table 1-1. Kit Contents

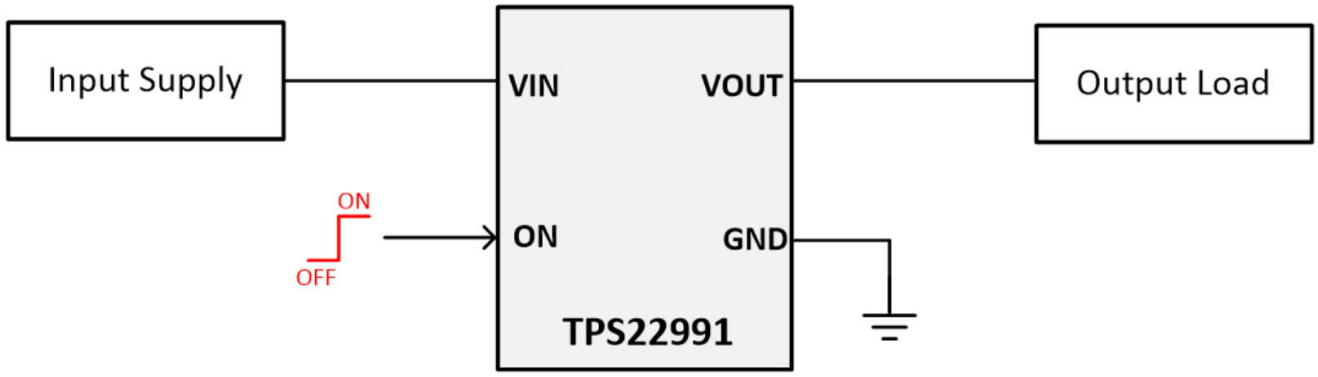
Item	Quantity
TPS22991EVM	1
TPS22991RAA	1

1.3 Specification

Table 1-2 lists a short description of the TPS22991 load switch performance specification. For additional details on load switch performance, application notes, and data sheets, see www.ti.com/loadswitch.

Table 1-2. TPS22991 Characteristics

EVM	Device	Rise Time	V_{IN}	Enable (ON Pin)	Quick Output Discharge
LP120	TPS22991	Fixed	1V to 5.5V	Active High	Fixed



1.4 Device Information

The TPS22991 is a small, single N-channel load switch that operates from 1V to 5.5V. The device can support a continuous current of 3A and has integrated thermal shutdown for added protection. Additionally, the TPS22991 includes a 150Ω on-chip load resistor for quick output discharge when the switch is turned off.

2 Hardware Design Files

2.1 Schematic

Figure 2-1 illustrates the TPS22991EVM schematic.

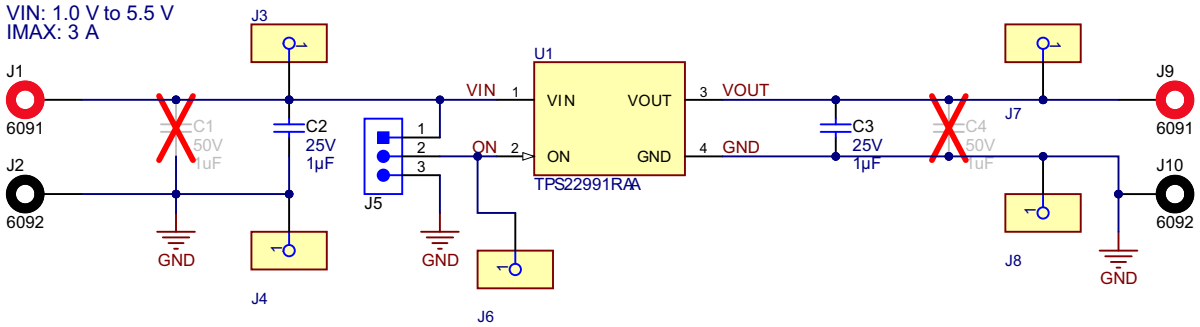


Figure 2-1. TPS22991EVM Schematic

2.2 PCB Layout

Figure 2-2 shows the PCB layout.

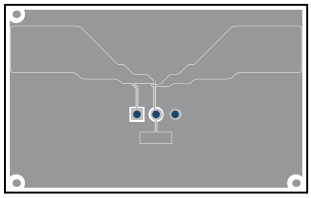


Figure 2-2. TPS22991EVM Layout

2.3 Bill of Materials (BOM)

Table 2-1 lists the TPS22991EVM BOM.

Table 2-1. TPS22991EVM BOM

Designator	Quantity	Value	Description	Package Reference	Part Number	Manufacturer
PCB1	1		Printed Circuit Board		LP120	Any
C2, C3	2	1uF	CAP, CERM, 1µF, 25V,+/- 20%, X5R, 0402	0402	GRM155R61E105MA12D	MuRata
H1, H2, H3, H4	4		Bumpon, Hemisphere, 0.44 X 0.20, Clear	Transparent Bumpon	SJ-5303 (CLEAR)	3M
J1, J9	2		Standard Banana Jack, Insulated, Red		6091	Keystone
J2, J10	2		Standard Banana Jack, Insulated, Black		6092	Keystone
J3, J4, J6, J7, J8	5		PC Test Point Plating Surface Mount Mounting Type		RCWCTE	KOA Speer
J5	1		Header, 100mil, 3x1, Tin, TH		PEC03SAAN	Sullins Connector Solutions
SH-J1	1		Shunt, 100mil, Flash Gold, Black		SPC02SYAN	Sullins Connector Solutions
U1	1		Single Channel 25mΩ Load Switch Capable of Driving 5.5V 3A Loads, uQFN	uQFN	TPS22991RAA	Texas Instruments
C1, C4	2		CAP, 0805	0805		Any

3 Additional Information

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CAUTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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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 or RSS-247*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concernant les EVMs avec appareils radio:

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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Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

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https://www.ti.com/ja-jp/legal/notice-for-evaluation-kits-delivered-in-japan.html

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1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
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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