

## **TPS61322-BMC001 Evaluation Module**

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This user's guide describes the characteristics, operation, and the use of the TPS61322EVM-001 evaluation module (EVM). The EVM contains the TPS61322 device, which is a high-performance, high-efficiency, synchronous boost converter, with only 6- $\mu$ A quiescent current. The user's guide includes the EVM specifications, recommended test setup, test result, schematic diagram, bill of materials, and board layout.

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## 1 Introduction

### 1.1 Performance Specification

Table 1 lists a summary of the TPS61322EVM performance specifications. All specifications are given for an ambient temperature of 25°C.

**Table 1. Performance Specification Summary**

| Specification | Test Conditions                                  | MIN | TYP | MAX | UNIT |
|---------------|--------------------------------------------------|-----|-----|-----|------|
| $V_{IN}$      | —                                                |     | 1.2 |     | V    |
| $V_{OUT}$     | TPS61322 EVM, $V_{IN} = 1.2$ V, $I_o \leq 0.1$ A |     | 2.2 |     | V    |

### 1.2 Modification

The printed-circuit board (PCB) for this EVM is designed to accommodate some modifications by the user. The external component can be changed according to the real application.

### 1.3 Input Capacitor

A 150-μF, tantalum capacitor, C1, is added as the input capacitor in the EVM. The ESR of the tantalum capacitor is 0.1 Ω, which helps to damp the ringing of the input voltage when the EVM is powered by a power supply with a long cable. The capacitor is not required for proper operation and can be removed in a real application.

### 1.4 Output Capacitor Selection

A 22-μF, ceramic capacitor, C3, is added as the output capacitors. This capacitor can ensure the low-output ripple at heavy load condition.

## 2 Test Setup

This section describes how to properly connect, set up, and use the TPS61322EVM-001 device.

### 2.1 Input/Output Connector Descriptions

**J1-VIN** — Positive input connection from the input supply for the EVM

**J3-GND** — Return connection from the input supply for the EVM

**J4-VOUT** — Positive connection for the output voltage

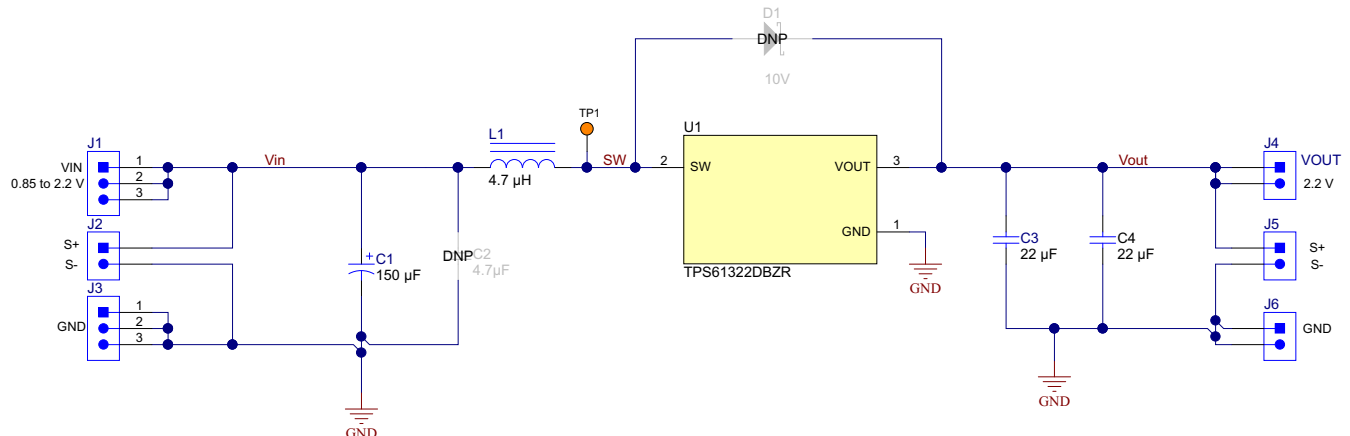
**J6-GND** — Return connection for the output voltage

### 3 Schematic, Bill of Materials, and Board Layout

This section provides the TPS61322EVM-001 schematic, bill of materials (BOM), and board layout.

#### 3.1 Schematic

Figure 1 shows the TPS61322EVM-001 schematic.



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**Figure 1. TPS61322EVM-001 Schematic**

#### 3.2 Bill of Materials

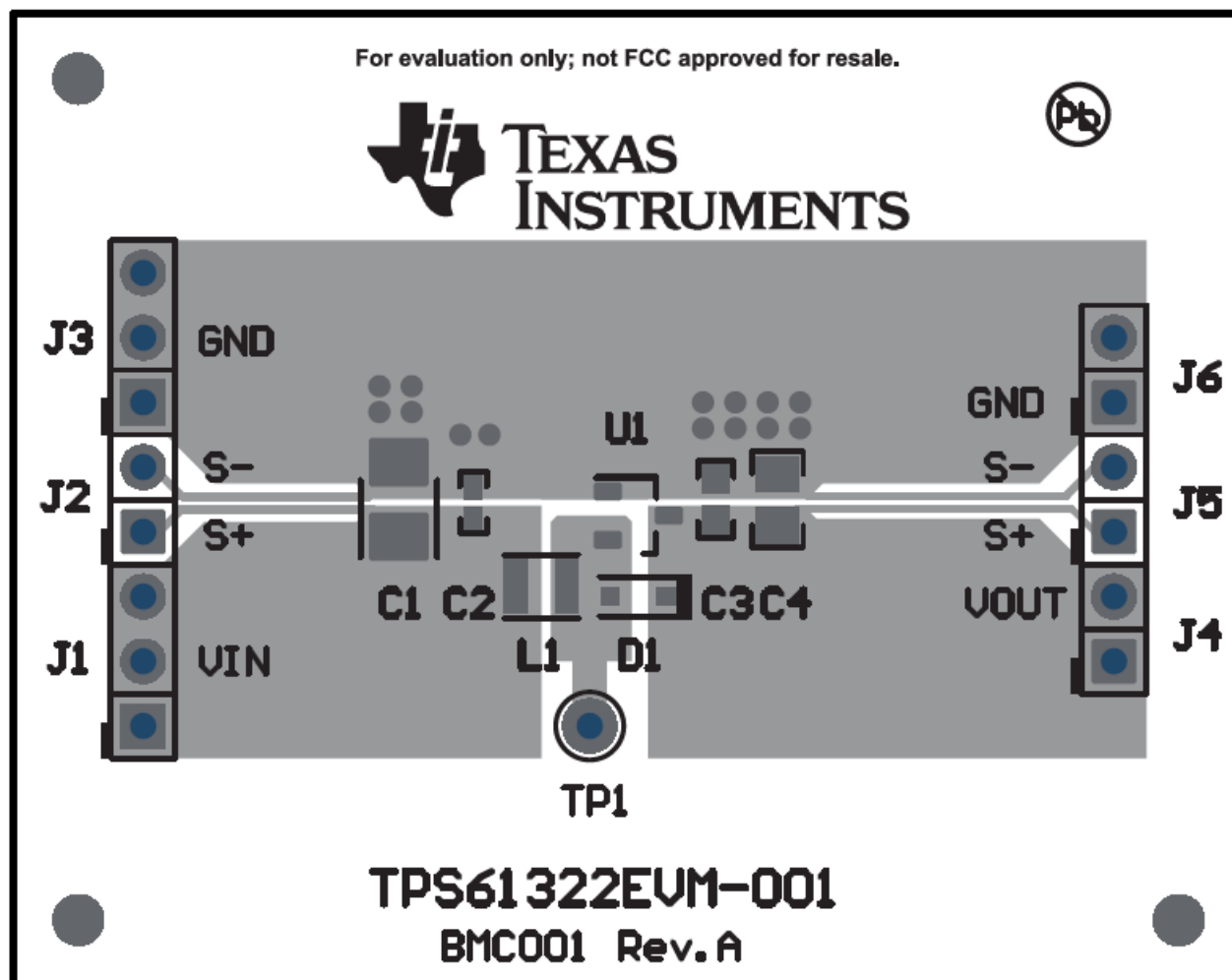
Table 2 lists the BOM.

**Table 2. Bill of Materials**

| Designator     | QTY | Value  | Description                                                                      | Package Reference           | Part Number        | Manufacturer      |
|----------------|-----|--------|----------------------------------------------------------------------------------|-----------------------------|--------------------|-------------------|
| C1             | 1   | 150 µF | Capacitor, TA, 150 µF, 6.3 V, ± 20%, 0.07 Ω, SMD                                 | 3528-21                     | T520B157M006ATE070 | Kemet             |
| C3             | 1   | 22 µF  | Capacitor, ceramic, 22 µF, 6.3 V, ± 20%, X5R, 0603                               | 0603                        | GRM188R60J226MEA0D | MuRata            |
| C4             | 1   | 22 µF  | Capacitor, ceramic, 22 µF, 16 V, ± 20%, X5R, 0805                                | 0805                        | GRM21BR61C226ME44L | MuRata            |
| J1, J3         | 2   |        | Header, 100 mil, 3 × 1, Gold, TH                                                 | 3 × 1 header                | TSW-103-07-G-S     | Samtec            |
| J2, J4, J5, J6 | 4   |        | Header, 100 mil, 2 × 1, Gold, TH                                                 | 2 × 1 header                | TSW-102-07-G-S     | Samtec            |
| L1             | 1   | 4.7 µH | Inductor, shielded, powdered iron, 4.7 µH, 0.15 A, 0.19 Ω, SMD                   | 2.5 × 1.2 × 2 mm            | DPE252012F-4R7M=P2 | MuRata Toko       |
| TP1            | 1   | Orange | Test point, miniature, orange, TH                                                | Orange miniature test point | 5003               | Keystone          |
| U1             | 1   |        | 6-µA quiescent current, 2-A, switch current boost converter, DBZ0003A (SOT-23-3) | DBZ0003A                    | TPS61322DBZR       | Texas Instruments |
| C2             | 0   | 4.7 µF | Capacitor, ceramic, 4.7 µF, 10 V, ± 20%, X5R, 0402                               | 0402                        | GRM155R61A475MEAAD | MuRata            |
| D1             | 0   | 10 V   | Diode, Schottky, 10 V, 0.75 A, SOD-323                                           | SOD-323                     | ZLLS410TA          | Diodes Inc.       |

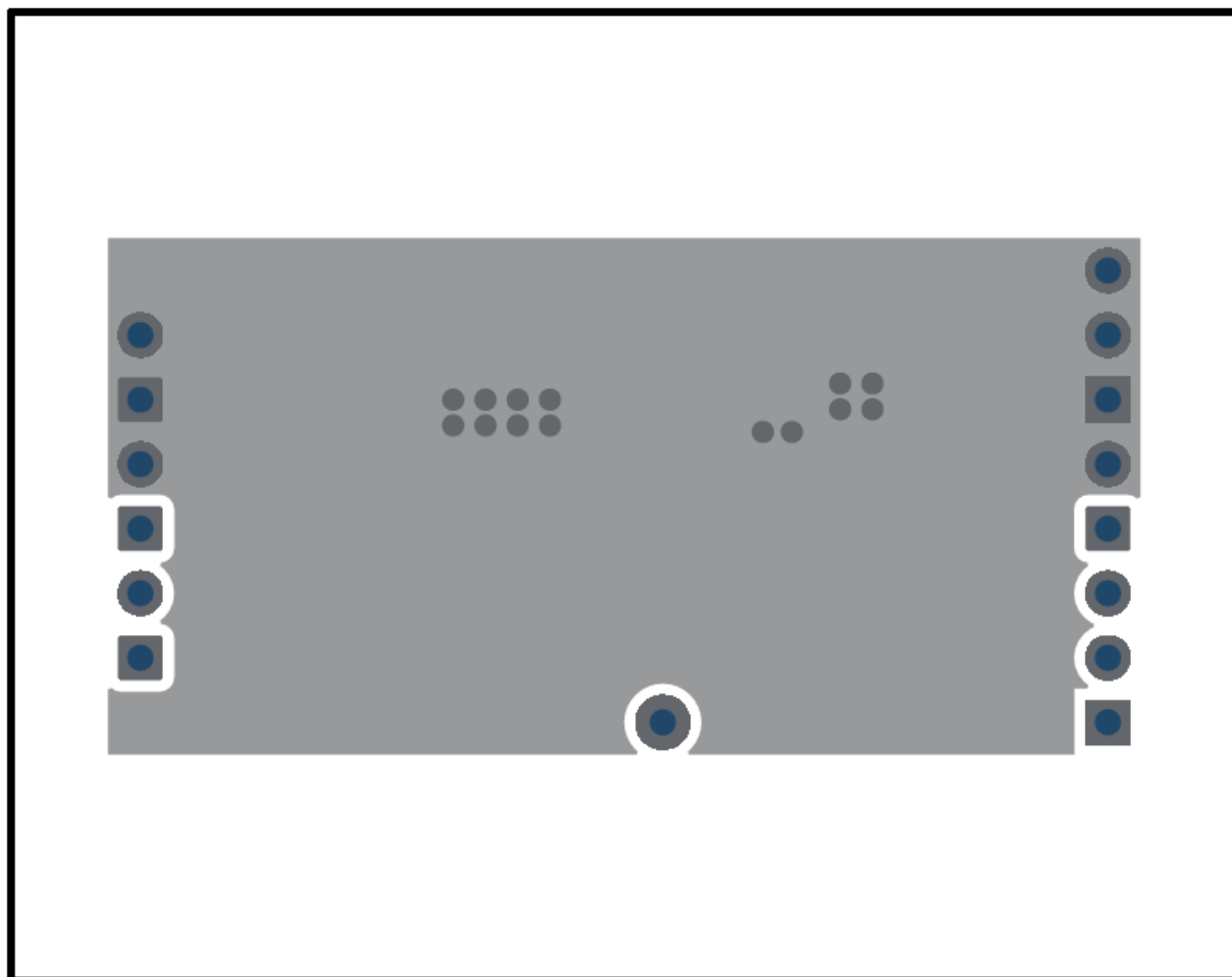
### 3.3 Board Layout

Figure 2 and Figure 3 show the TPS61322EVM-001 board layout.



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Figure 2. TPS61322EVM-001 Top-Side Layout



**Figure 3. TPS61322EVM-001 Bottom-Side Layout**

## Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

| Changes from June 23, 2017 to November 7, 2017         | Page |
|--------------------------------------------------------|------|
| • Changed <i>TPS61322EVM-001 Schematic</i> image ..... | 3    |
| • Changed <i>BOM</i> table .....                       | 3    |

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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.

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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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#### 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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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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