User's Guide

TPS62867EVM-121 Evaluation Module

ABSTRACT

This user's guide describes the characteristics, operation, and use of TI's evaluation module (EVM) for the TPS62867 and TPS62865 devices.The TPS62867EVM-121 facilitates the evaluation of the TPS62867 6-A, step-down converter with DCS-Control™ in a tiny 1.5-mm by 2.5-mm QFN package. The EVM outputs a 0.9-V output voltage with 1% accuracy from input voltages between 2.4 V and 5.5 V. The TPS62867 is a highly efficient and small solution for point-of-load (POL) converters for space-constrained applications, such as core supply, camera modules, solid state drives (SSDs), and optical modules.

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Trademarks

DCS-Control™ is a trademark of TI.
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1 Introduction

The TPS62867 is a synchronous, step-down converter in a 1.5- x 2.5-mm QFN package.

1.1 Performance Specification

Table 1-1 provides a summary of the TPS62867EVM-121 performance specifications.

Table 1-1. Performance Specification Summary

SPECIFICATION	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input voltage		2.4	5	5.5	V
Output voltage setpoint		0.6	0.9	Vin	V
Output current		0		6000	mA

1.2 Modifications

The EVM can support variance of the whole IC family. Additional input and output capacitors can also be added.

2 Setup

This section describes how to properly use the TPS62867EVM-121.

2.1 Input/Output Connector Descriptions

J1, Pin 1, 2 and 3 – VIN Positive input connection from the input supply for the EVM

J1, Pin 4, 5 and 6 – GND Input return connection from the input supply for the EVM

J2, Pin 1, 2 and 3 – VOUT Output voltage connection

J2, Pin 4, 5 and 6 – GND Output return connection

J3, Pin 1 and 2 GND GND pin headers to facilitate probing of signals

JP1 – EN EN pin input jumper. Place the jumper across ON and EN to turn on the IC. Place the jumper across OFF and EN to turn off the IC.

JP2 – MODE MODE pin jumper. At startup, the jumper should not be used in order to enable a good readout of the voltage level at VSET/MODE pin. After startup, in normal operation, place the jumper across PFM and MODE to select the PFM operation. Place the jumper across FPWM and MODE to select the forced PWM mode.

JP3 - PG The PG output appears on pin 2 of this header. Place a jumper across VOUT and PG to connect the PG pin to the output voltage through a 100kΩ resistor. Place a jumper across VIN and PG to connect the PG pin to the input voltage through a 100kΩ resistor.

2.2 Setup

To operate the EVM, set jumpers JP1 and JP2 to the desired position per Section 2.1. Connect the input supply to J1 and connect the load to J2.

3 TPS62867EVM-121 Test Results

The TPS62867EVM-121 was used to take all the data in the TPS62867 data sheet. See the device data sheet for the performance of this EVM.

4 Board Layout

This section provides the TPS62867EVM-121 board layout and illustrations in Figure 4-1 through Figure 4-7. The Gerbers are available on the EVM product page: TPS62867EVM-121

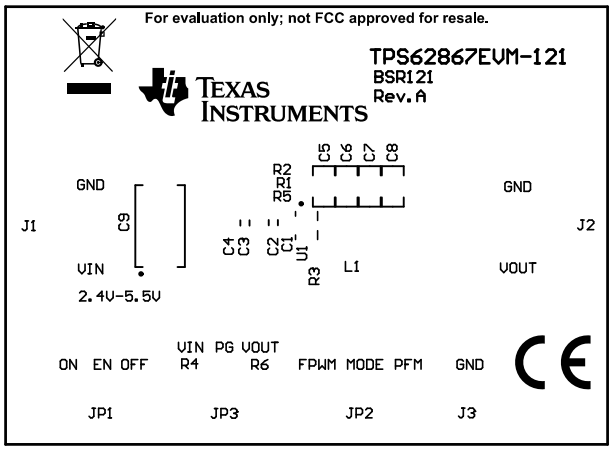

Figure 4-1. Top Assembly

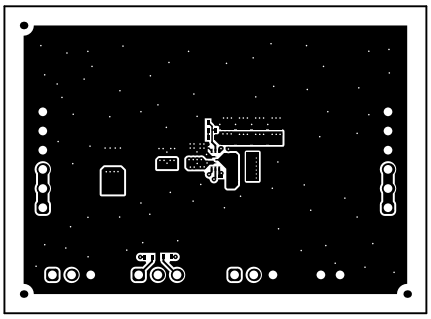

Figure 4-2. Top Layer

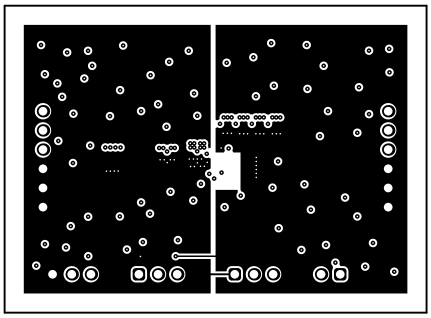

Figure 4-3. Signal Layer 1

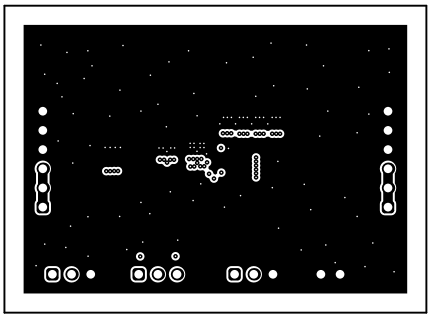

Figure 4-4. Signal Layer 2

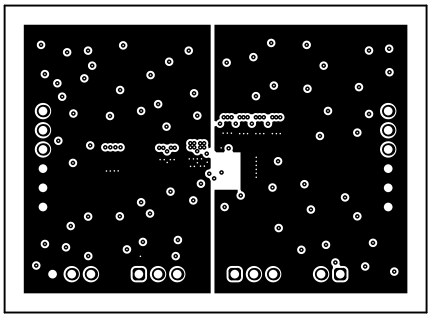

Figure 4-5. Signal Layer 3

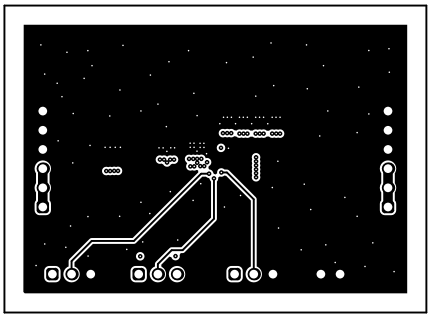

Figure 4-6. Signal Layer 4

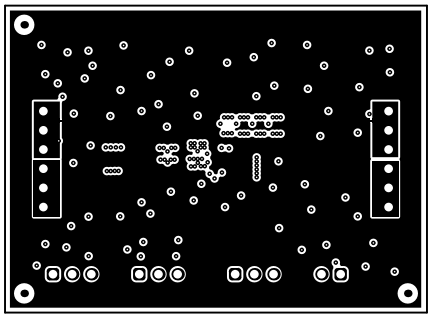

Figure 4-7. Bottom Layer

5 Schematic and List of Materials

This section provides the TPS62867EVM-121 schematic and list of materials.

5.1 Schematic

Figure 5-1 illustrates the EVM schematic.

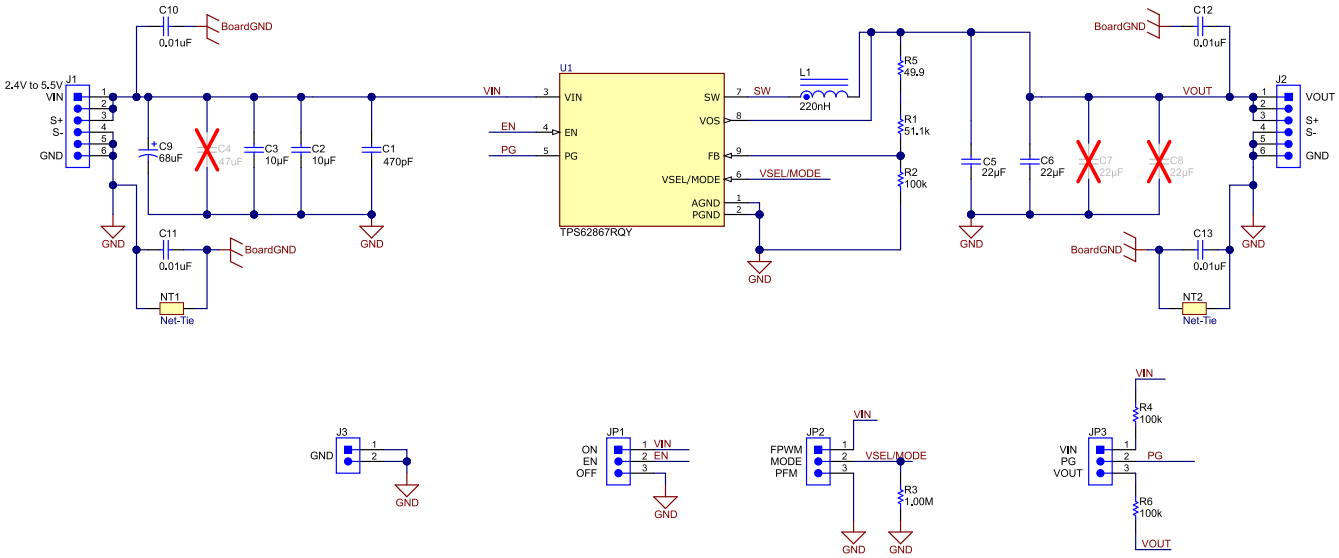

Figure 5-1. TPS62867EVM-121 Schematic

5.2 List of Materials

Table 5-1 lists a list of materials for this EVM.

Table 5-1. TPS62867EVM-121 List of Materials

DESIGNATOR	QTY	DESCRIPTION	PART NUMBER	MANUFACTURER
C1	1	Capacitor, ceramic, 470 pF, 50 V, ±5%, C0G/NP0, 0603	GRM1885C1H471JA01D	Murata
C2, C3	2	Capacitor, ceramic, 10 µF, 6.3 V, ±20%, X7R, 0603	GRM188Z71A106KA73D	Murata
C5, C6	2	Multilayer Ceramic Capacitors MLCC - SMD/SMT 22UF 6.3V 20% 0805	GRM21BZ70J226ME44L	Murata
C9	1	CAP, TA, 68 uF, 20 V, +/- 10%, 0.15 ohm, SMD	T495D686K020ATE150	Kemet
C10, C11, C12, C13	4	CAP, CERM, 0.01 uF, 50 V, +/- 10%, C0G/NP0, 0402	GCM155R71H103KA55D	Murata
L1	1	Inductor, 220 nH, 16.8 A, 5.8 mΩ, SMD, 4040	XAL4020-221MEB	Coilcraft
R1	1	Resistor, 51.1 kΩ, 1%, 0.1 W, 0402	Std	Std
R2,R4,R6	3	Resistor, 100 kΩ, 1%, 0.1 W, 0402	Std	Std
R3	1	Resistor, 1.0 MΩ, 1%, 0.1 W, 0402	Std	Std
R5	1	Resistor, 49.9 Ω, 1%, 0.1 W, 0402	Std	Std
U1	1	2.4-V to 5.5-V Input, 6-A Step-Down Converter in 1.5-mm x 2.5-mm QFN Package	TPS62867RQY	Texas Instruments

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