TPSM82821EVM-080 and TPSM82822EVM-080 Evaluation Module

User's Guide

Literature Number: SLVUBR5B
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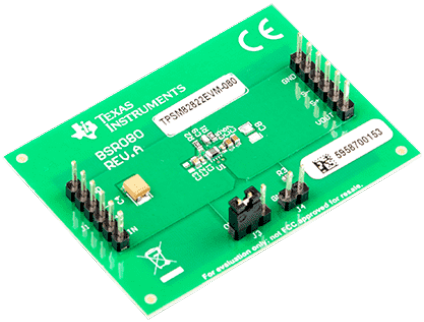
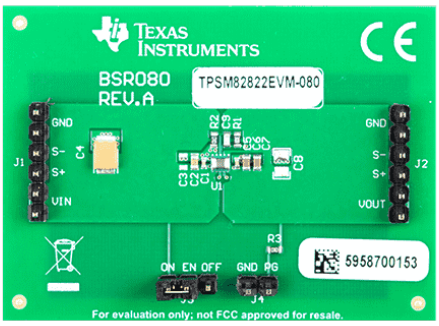
TPSM82821EVM-080 and TPSM82822EVM-080 Evaluation Modules

The TPSM8282xEVM-080 facilitates the evaluation of the TPSM82821 and TPSM82822 1-A and 2-A pin-to-pin compatible step-down module with DCS-Control in a 2-mm × 2.5-mm uSiL package. The EVMs have a 1.8-V output voltage with 1% accuracy for input voltages from 2.4 V to 5.5 V with a maximum solution height of 1.1 mm. The TPSM82821 and TPSM82822 are highly efficient and small solutions for point-of-load (POL) modules in applications, such as optical modules, machine vision, embedded camera system, and patient monitoring and diagnostics.





1 Introduction

The TPSM82821 and TPSM82822 are synchronous, step-down converter power modules in a small 2-mm × 2.5-mm uSiL package. The two different devices of this family support 1 A or 2 A output current.

1.1 Performance Specification

Table 1 provides a summary of the TPSM8282xEVM-080 performance specifications.

Table 1. Performance Specification Summary

SPECIFICATION	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input voltage		2.4	5	5.5	V
Output voltage setpoint			1.8		V
Output current	TPSM82821EVM-080	0		1	A
	TPSM82822EVM-080	0		2	A

1.2 Modifications

The printed-circuit board (PCB) for this EVM is designed to accommodate both the adjustable output voltage versions of this module. Additional input and output capacitors can also be added.

1.2.1 Input and Output Capacitors

C3, shown in Figure 6, is provided for an additional input capacitor. This capacitor is not required for proper operation, but can be used to reduce the input voltage ripple.

C8 is provided for additional output capacitors. This capacitor is not required for proper operation but can be used to reduce the output voltage ripple and to improve the load transient response. The total output capacitance must remain within the recommended range in the data sheet for proper operation.

2 Setup

This section describes how to properly use the TPSM8282xEVM-080.

2.1 Input/Output Connector Descriptions

J1, Pin 1 and 2 – VIN	Positive input connection from the input supply for the EVM.
J1, Pin 3 and 4 – S+/S–	Input voltage sense connections. Measure the input voltage at this point.
J1, Pin 5 and 6 – GND	Input return connection from the input supply for the EVM.
J2, Pin 1 and 2 – VOUT	Output voltage connection
J2, Pin 3 and 4 – S+/S–	Output voltage sense connections. Measure the output voltage at this point.
J2, Pin 5 and 6 – GND	Output return connection
J3 – EN	EN pin input jumper. Place the supplied jumper across ON and EN to turn on the module. Place the jumper across OFF and EN to turn off the IC.
J4 – PG/GND	The PG output appears on pin 1 of this header with ground on pin 2.

2.2 Setup

To operate the EVM, set jumper J3 between ON and EN to turn on the device as shown in Section 2.1. Connect the input supply to J1 and connect the load to J2.

3 Board Layout

This section provides the TPSM8282xEVM-080 board layout and illustrations in Figure 1 through Figure 5. The Gerbers are available on the TPSM82822EVM-080 product page.

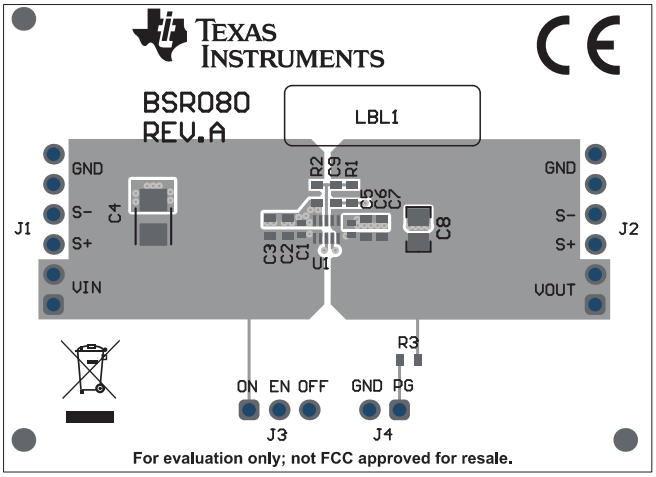


Figure 1. Top Assembly

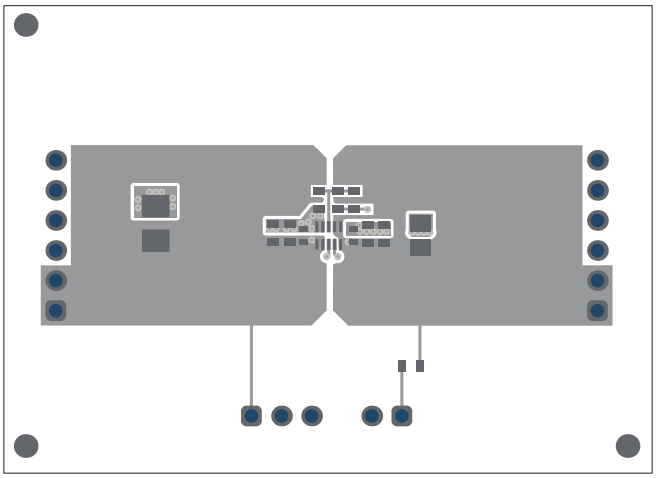


Figure 2. Top Layer

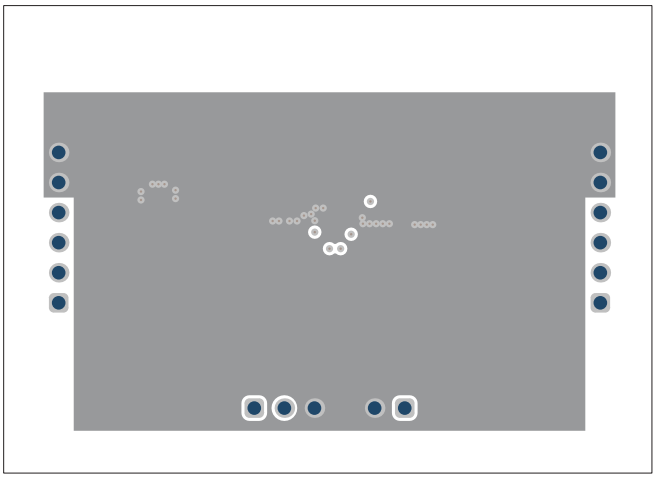


Figure 3. Signal Layer 1

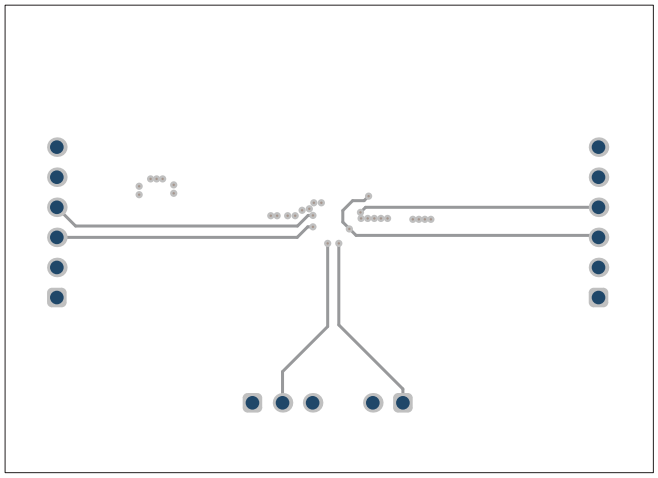


Figure 4. Signal Layer 2

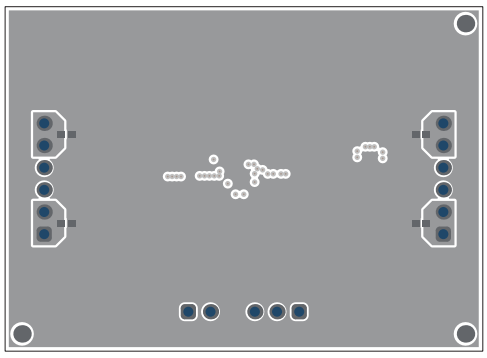


Figure 5. Bottom Layer

4 Schematic and Bill of Materials

This section provides the TPSM8282xEVM-080 schematic and bill of materials (BOM).

4.1 Schematic

Figure 6 illustrates the EVM schematic.

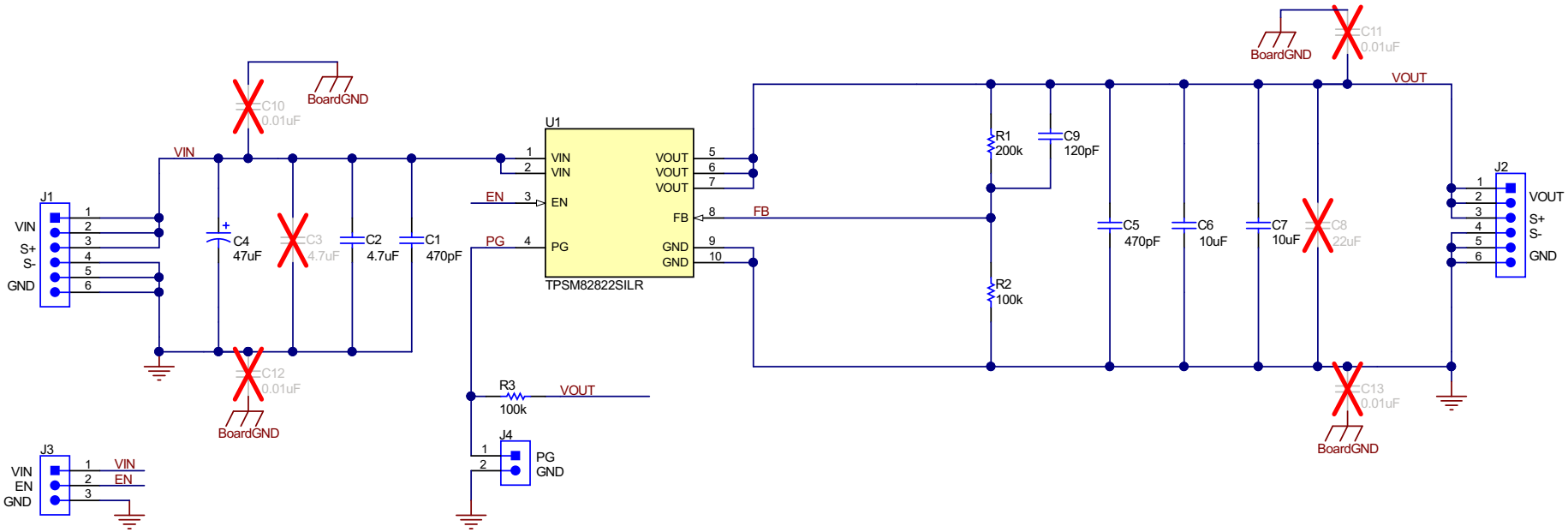


Figure 6. TPSM8282xEVM-080 Schematic

4.2 Bill of Materials

Table 2 lists the BOM for this EVM.

Table 2. TPSM8282xEVM-080 Bill of Materials

COUNT		DESIGNATOR	VALUE	DESCRIPTION	PACKAGE REFERENCE	PART NUMBER	MANUFACTURER
-001	-002						
2	2	C1, C5	470 pF	CAP, CERM, 470 pF, 50 V, ±10%, X7R, 0402	0402	GCM155R71H471KA37D	MuRata
2	2	C2	4.7 µF	CAP, CERM, 4.7 µF, 6.3 V, ±10%, X7R, 0603	0603	JMK107BB7475MA-T	Taiyo Yuden
1	1	C4	47 µF	CAP, TA, 47 µF, 10 V, ±10%, 0.25 Ω, SMD	3528-21	TPSB476K010R0250	AVX
2	2	C6, C7	10 µF	CAP, CERM, 10 µF, 10 V, ±20%, X7R, 0603	0603	GRM188Z71A106MA73D	Murata
1	1	C9	120 pF	CAP, CERM, 120 pF, 50 V, +/- 5%, C0G/NP0, 0603	0603	GRM1885C1H121JA01D	Murata
1	1	R1	200 k	RES, 200 k, 1%, 0.1 W, 0603	0603	Std	Std
2	2	R2, R3	100 k	RES, 100 k, 1%, 0.1 W, 0603	0603	Std	Std
1	0	U1		1-A Step-Down Module with 1% Output Accuracy in 2-mm × 2.5-mm uSip	2×2.5 mm	TPSM82821SILR	Texas Instruments
0	1	U1		2-A Step-Down Module with 1% Output Accuracy in 2-mm × 2.5-mm uSip	2×2.5 mm	TPSM82822SILR	Texas Instruments

Revision History

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

Changes from Original (August 2019) to A Revision	Page
• Edited Bill of Materials	9

Changes from A Revision (October 2019) to B Revision	Page
• Edited Bill of Materials	9

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