User's Guide
SLVUAC5B–December 2014–Revised September 2015

TPS82085EVM-672 Evaluation Module

The TPS82085EVM-672 (PWR672-001) facilitates the evaluation of the TPS82085 MicroSiP™ module. The device outputs a 1.2-V output voltage at up to 3-A of output current from input voltages between 2.5 V and 6 V.

Contents

List of Figures

List of Tables

1 Introduction

The TPS82085 is a synchronous, step-down module in a 2.8- x 3.0- x 1.33-mm package. The inductor and IC are included in the device.

1.1 Performance Specification

Table 1 provides a summary of the TPS82085EVM-672 performance specifications.

Table 1. Performance Specification Summary

Specification	Test Conditions	Min	Typ	Max	Unit
Input Voltage		2.5		6	V
Output Voltage Setpoint			1.2		V
Output Current		0		3000	mA

1.2 Modifications

The printed-circuit board (PCB) for this EVM is designed to accommodate some modifications by the user. Additional input and output capacitors can be added.

1.2.1 Input and Output Capacitors

C4 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.

C5, C6, C7, and C8 are provided for additional output capacitors. These capacitors are 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 TPS82085EVM-672.

2.1 Input/Output Connector Descriptions

J1 – VIN	Positive input connection from the input supply for the EVM
J2 – S+/S-	Input voltage sense connections. Measure the input voltage at this point.
J3 – GND	Return connection from the input supply for the EVM
J4 – VOUT	Output voltage connection
J5 – S+/S-	Output voltage sense connections. Measure the output voltage at this point.
J6 – GND	Output return connection
J7 – PG/GND	The PG output appears on pin 1 of this header with a convenient ground on pin 2
JP1 – EN	EN pin input jumper. Place the supplied jumper across ON and EN to turn on the IC. Place the jumper across OFF and EN to turn off the IC.
JP2 – PG Pullup Voltage	PG pin pullup voltage jumper. Place the supplied jumper on JP2 to connect the PG pin pullup resistor to Vin. Alternatively, the jumper can be removed and a different voltage can be supplied on pin 1 to pull up the PG pin to a different level. This externally applied voltage should remain below 6 V.

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 J3 and connect the load to J4 and J6.

3 TPS82085EVM-672 Test Results

The TPS82085EVM-672 was used to take all the data in the TPS82085 data sheet (SLVSCN4). See the device data sheet for the performance of this EVM.

Figure 1 shows the thermal performance of the EVM. "Spot" shows the temperature of the PCB.

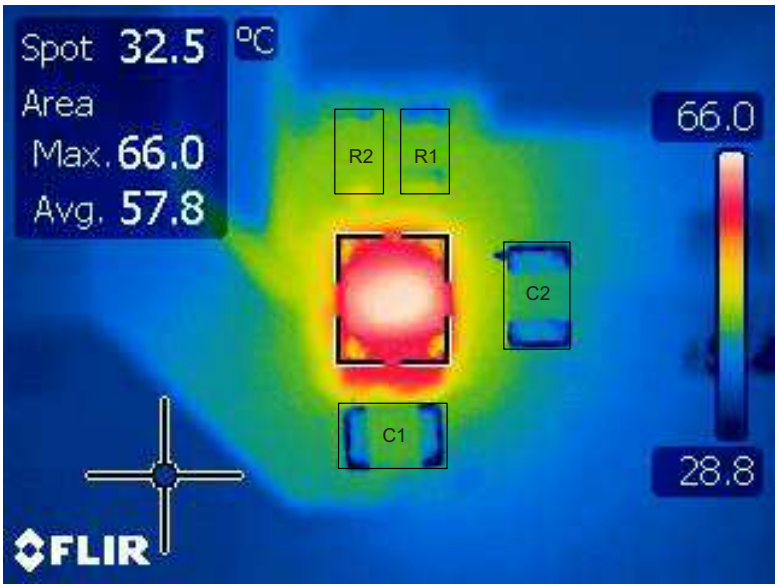

Figure 1. Thermal Performance (V_{IN} = 5 V, I_{OUT} = 3000 mA)

WARNING

Hot surface. Contact may cause burns. Do not touch!

4 Board Layout

This section provides the TPS82085EVM-672 board layout and illustrations in Figure 2 through Figure 7. The Gerbers are available on the EVM product page: TPS82085EVM-672. Rev B of the PCB changed the land pattern of the TPS82085 to use solder mask defined (SMD) pads. This gives better assembly results during reflow.

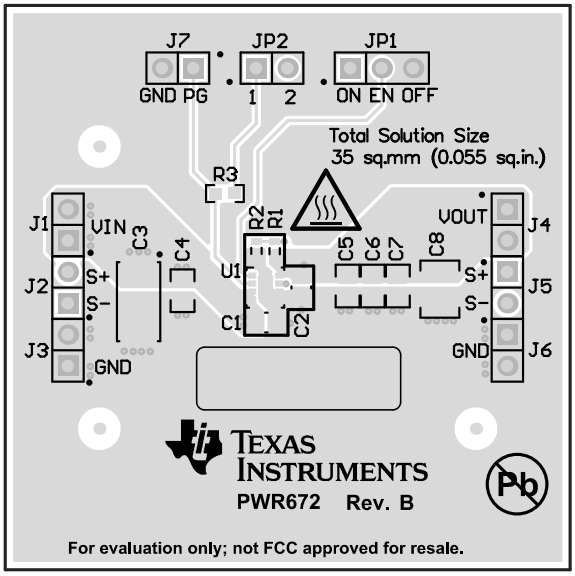

Figure 2. Top Assembly

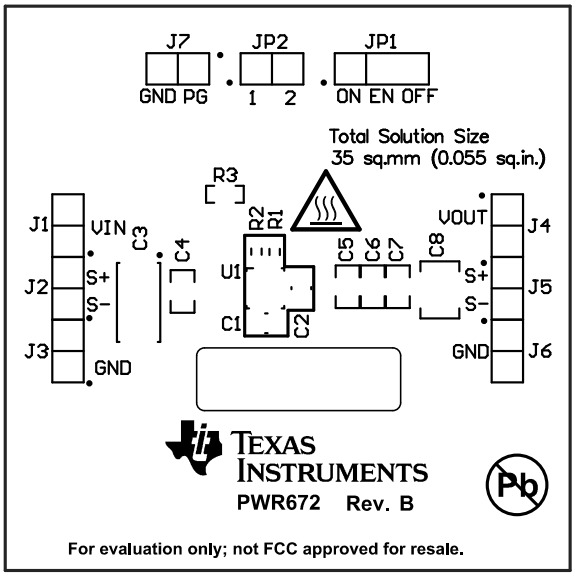

Figure 3. Top Overlay

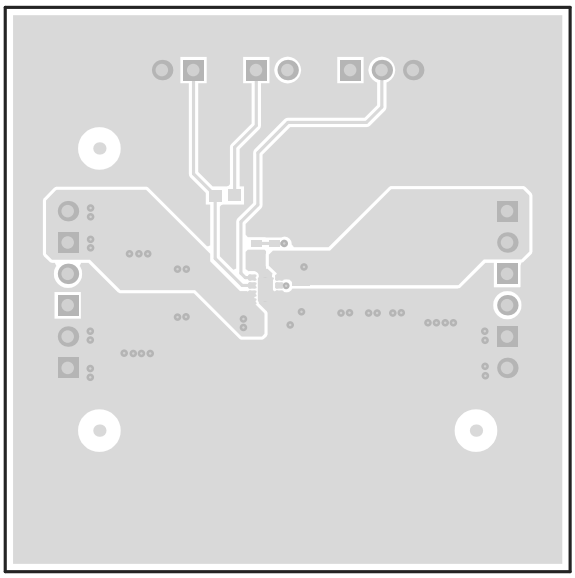

Figure 4. Top Layer

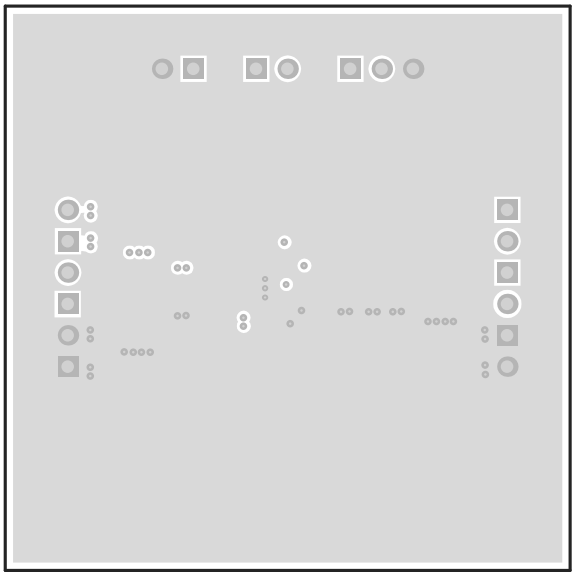

Figure 5. Layer 1

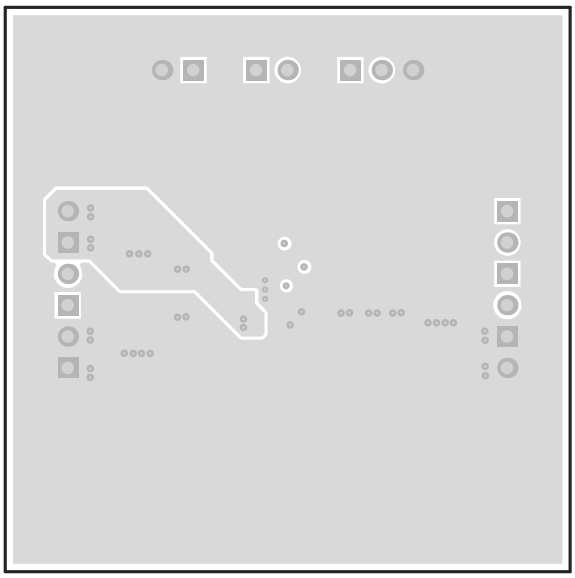

Figure 6. Layer 2

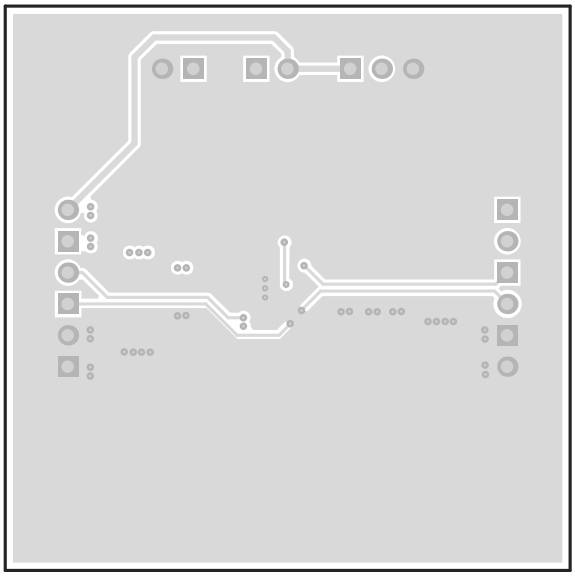

Figure 7. Bottom Layer

5 Schematic and Bill of Materials

This section provides the TPS82085EVM-672 schematic and bill of materials (BOM).

5.1 Schematic

Figure 8 illustrates the EVM schematic.

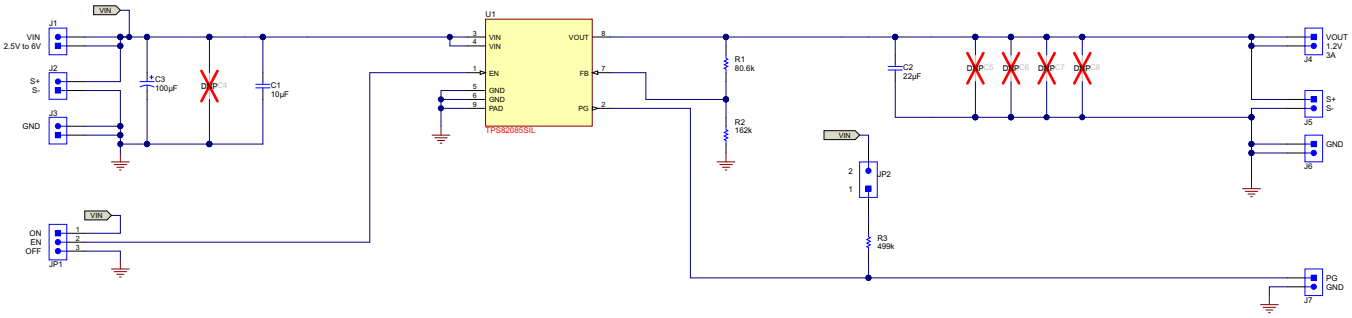

Figure 8. TPS82085EVM-672 Schematic

5.2 Bill of Materials

Table 2 lists the BOM for this EVM.

Table 2. TPS82085EVM-672 Bill of Materials

Ref Des	Qty	Value	Description	Size	Part Number	Manufacturer
C1	1	10uF	CAP, CERM, 10 µF, 10 V, +/- 10%, X7R	0805	GRM21BR71A106KE51	MuRata
C2	1	22uF	CAP, CERM, 22 µF, +/- 20%, X7x	0805	CL21B226MQQNNNE or C2012X7S1A226M125AC	Samsung or TDK
C3	1	100uF	CAP, TA, 100uF, 10V, +/-10%, 0.075 ohm, SMD	6032-28	TPSC107K010R0075	AVX
R1	1	80.6k	RES, 80.6 k, 1%, 0.1 W, 0603	0603	Std	Std
R2	1	162k	RES, 162 k, 1%, 0.1 W, 0603	0603	Std	Std
R3	1	499k	RES, 499 k, 1%, 0.1 W, 0603	0603	Std	Std
U1	1	TPS82085	3A, High Efficiency Step Down Converter Module with Integrated Inductor	3 x 2.8 mm	TPS82085SIL	Texas Instruments

Revision History

Changes from A Revision (April 2015) to B Revision **Page**

- Changed MicroSIL™ To: MicroSIP™ in the document abstract 1
- Deleted text "and enable bypass mode" from JP1–EN in Section 2.1 2

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

Revision History

Changes from Original (December 2015) to A Revision **Page**

- Changed *Thermal Performance (V_{IN} = 5 V, I_{OUT} = 3000 mA)* image. 3
- Changed PCB layout images in *Board Layout* section. 4
- Changed contents of the BOM. 7

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

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- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
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Only those TI components which TI has specifically designated as military grade or “enhanced plastic” are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have ***not*** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

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