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1 Kit Contents

- ZSPM4141 Evaluation Board
- Resistor set including 6 different values for 1/10W 0603 SMD resistors (see Table 5.1 for values)
- Kit documentation

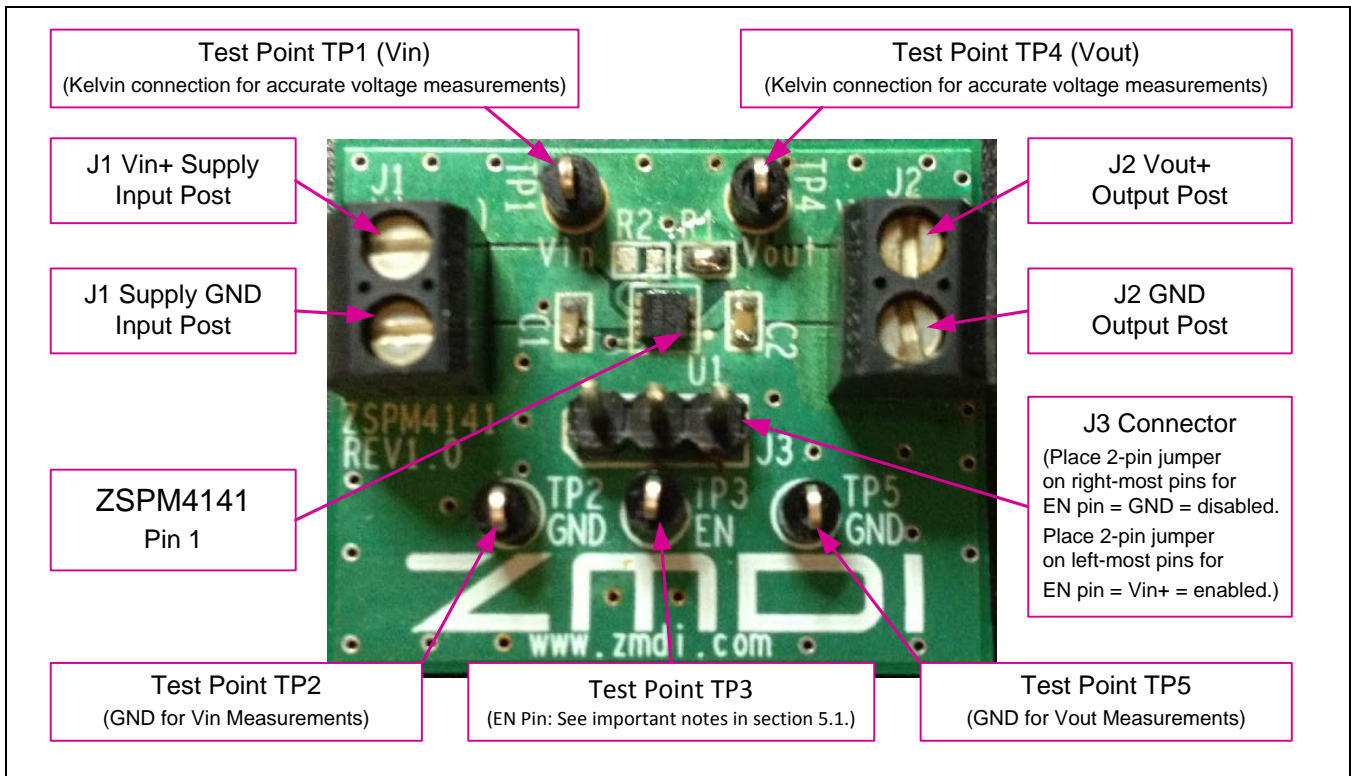
2 Introduction

The ZSPM4141 Evaluation Board is a compact system intended to facilitate measuring the performance and operating characteristics of the ZSPM4141 Ultra-low-Power Linear Regulator. The board contains a number of test points to allow evaluating the functions of the ZSPM4141 (see Figure 2.1 and section 4). It has a solid ground plane on the back of the board.

Note: The default part number for the ZSPM4141 Ultra-low-Power Linear Regulator (U1 in Figure 6.1) is the ZSPM4141A11W12 (note 1), which is factory configured for V_{OUT} set to 1.2 V. If the application requires different values for V_{OUT} , see section 5.2 for procedures for modifying V_{OUT} by changing resistor values on the board using the resistor set included with the kit.

Note: The default resistor configuration for the Evaluation Board is with the FB pin pulled up to V_{out} via R1, which has a value of 0.0Ω (i.e., a short), and R2 is unpopulated (NL designation in the schematic in Figure 6.1).

Figure 2.1 ZSPM4141 Evaluation Board Connections



3 Connectors

The board contains the following connectors for external signals and supplies (see Figure 2.1):

- J1:** Screw terminal connection for V_{in} supply (V_{in+} and GND)
- J2:** Screw terminal connection to V_{out} output (V_{out+} and GND)

4 Probe and Test Points

The board contains the following test/probe points (see Figure 2.1):

- TP1/ V_{in} :** Kelvin measurement test point for V_{in} main input.
- TP4/ V_{out} :** Kelvin measurement test point for V_{out} output.
- TP3/EN:** Measurement point for the ZSPM4141's EN pin 8 (enable input), which must be HIGH for the ZSPM4141 to operate (see *ZSPM414 Data Sheet*). Note: do not use TP3 to input a control signal to the EN pin. See section 5.3 for the proper method of inputting a control signal.
- TP2/GND:** Test point for ground; recommended ground for accurate measurements for V_{in} .
- TP5/GND:** Test point for ground; recommended ground for accurate measurements for V_{out} .

5 Setup

5.1. Jumper on J3 Connector

The Evaluation Board's J3 three-pin connector allows manually enabling the device. When a 2-pin jumper is placed on the left-most position (see Figure 2.1), the EN pin is connected to V_{in+} and the VCC pin, which enables the ZSPM4141. If the 2-pin jumper is placed on the right-most position, the EN pin is connected to ground, which disables the ZSPM4141. See section 5.3 for an alternative method of enabling the ZSPM4141.

5.2. Controlling V_{OUT} via R1 and R2 Values

The default configuration for the Evaluation Board results in a V_{OUT} of 1.2V (see section 2). If the application requires a different level for V_{OUT} , V_{OUT} can be modified by changing the R1 and R2 resistor values on the board according to Table 5.1 using the resistor set included with the kit.

The default resistor configuration for the Evaluation Board is with the FB pin pulled up to V_{out} via R1, which has a value of 0.0Ω (i.e., a short), and R2 is unpopulated as shown in Figure 5.1 and also represented by the first row of resistor combinations in Table 5.1.

Figure 5.1 ZSPM4141 Evaluation Board Default Configuration for R1 and R2

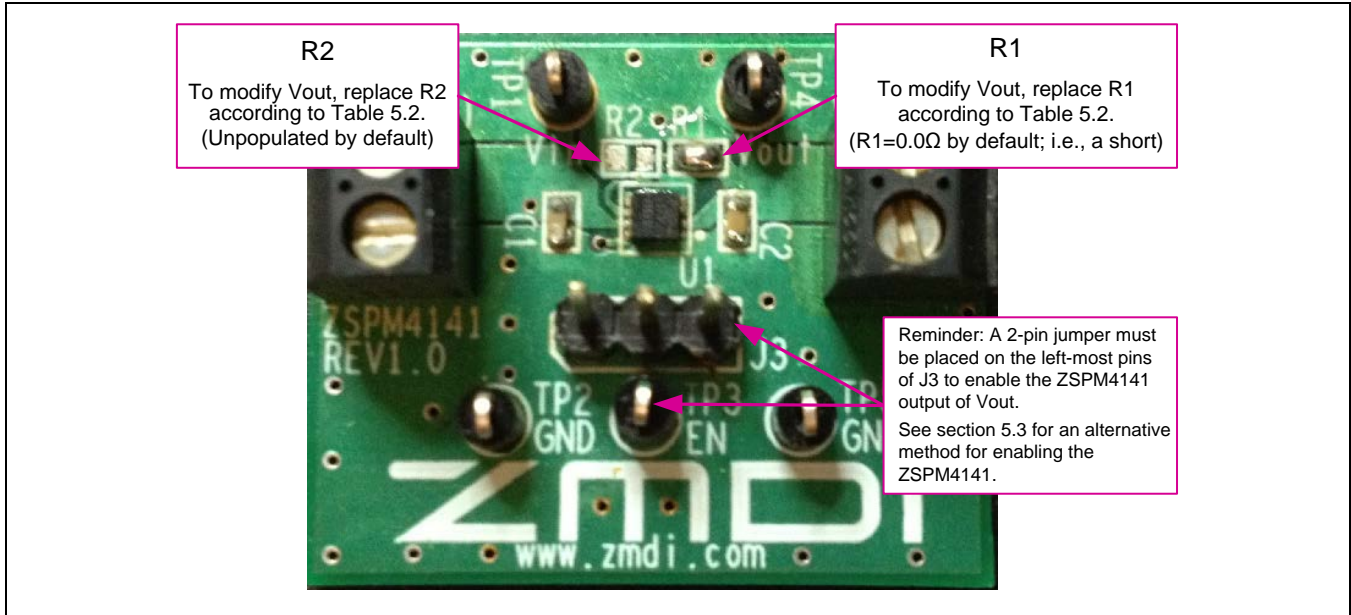


Table 5.1 Resistor Combinations for Setting Vout

Vout	R1 (+/-0.1%)	R2 Calculated	R2 Standard Value	Current Drawn by Feedback Divider	Comments
1.2V	0Ω	Unpopulated	Not applicable	Not applicable	Default
1.5V	1000000Ω	4000000Ω	4.02MΩ	0.30μA	R1 and R2 standard values included in resistor set provided with kit.
1.8V	1000000Ω	2000000Ω	2MΩ	0.60μA	R1 and R2 standard values included in resistor set provided with kit.
3.0V	1000000Ω	666667Ω	665KΩ	1.80μA	R1 and R2 standard values included in resistor set provided with kit.
3.3V	1000000Ω	571429Ω	576KΩ	2.10μA	R1 and R2 standard values included in resistor set provided with kit.
4.2V	1000000Ω	400000Ω	402KΩ	3.00μA	R1 and R2 standard values included in resistor set provided with kit.

5.3. Input and Output Connections

Connect the input voltage supply for the ZSPM4141 at the J1 screw terminal with the leads connected as indicated in Figure 2.1.

The output of the ZSPM4141 Evaluation Board can be measured at the J2 screw terminal.

Recommendation: Use J1 and J2 only for power connections. Use test points TP1 (Vin) and TP4 (Vout) as Kelvin connections for accurate voltage measurements (see Figure 2.1).

Optional: Instead of using the EN pin jumper on J3 described in section 5.1 for manually enabling/disabling the ZSPM4141, a signal can be input on J3 to control the enabling of the ZSPM4141. In this case, remove the jumper on J3 and connect the control signal (e.g., a function generator) to J3 with the positive lead on the middle pin and the ground lead on the right-most pin of J3. Note the J3 jumper **must** be removed; otherwise the board will be damaged. Do not use TP3 to connect the control signal.

6 Evaluation Board Schematic

Figure 6.1 ZSPM4141 Evaluation Board Circuit

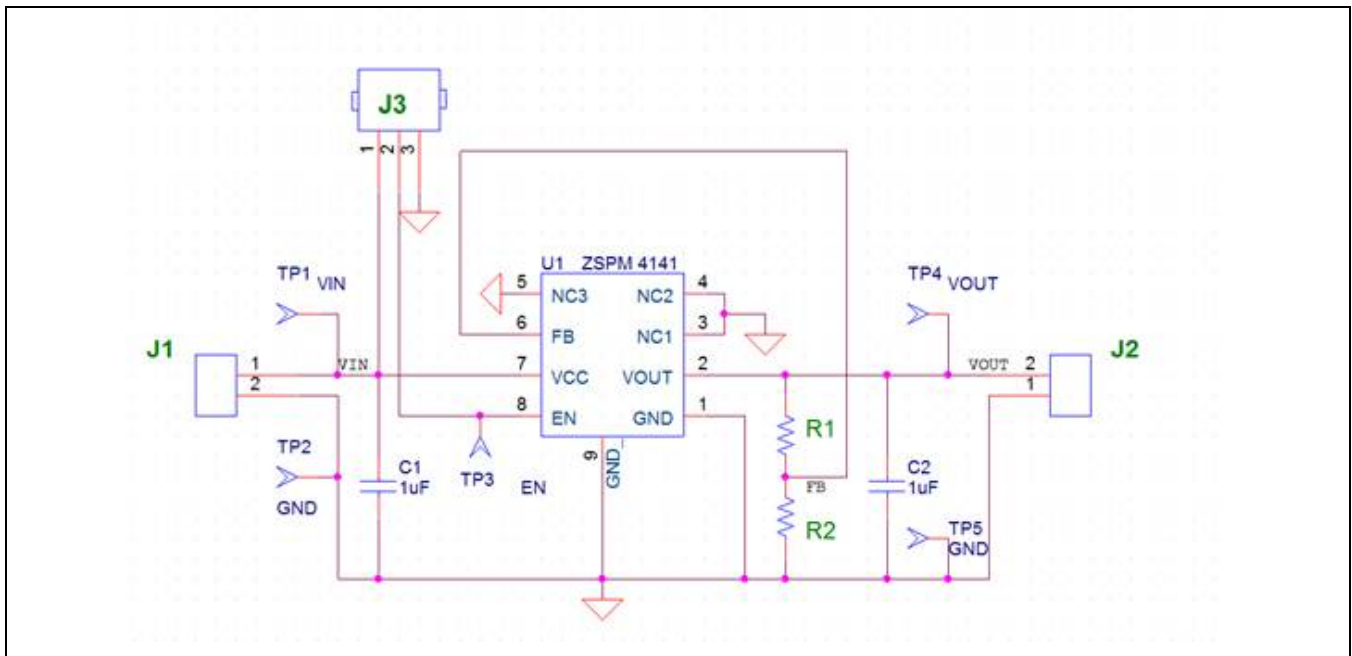
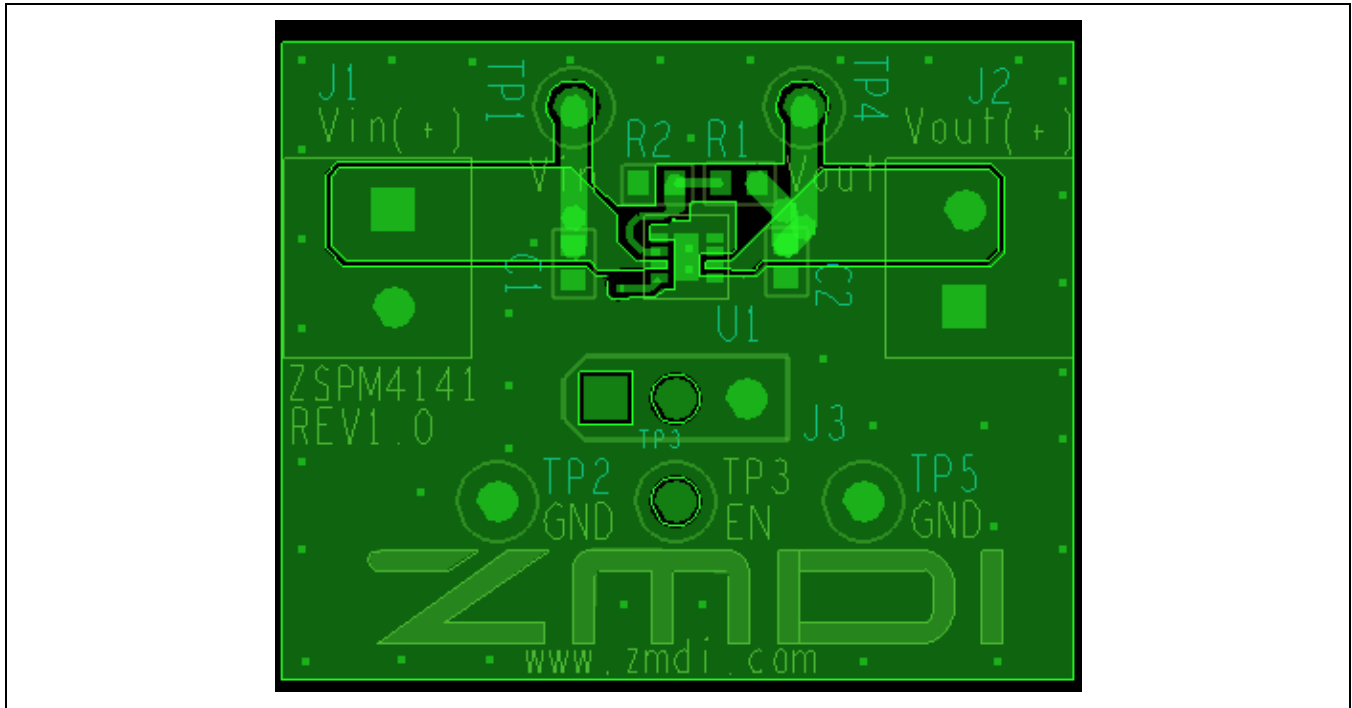


Table 6.1 ZSPM4141 Evaluation Board Bill of Materials (BOM)

QTY	Reference	Description	Manufacturer	Manufacturer P/N	Digikey P/N
1	U1	ZSPM4141	IDT	ZSPM4141AI1W12	N/A
2	C1, C2	CAP CER 1UF 25V 10% X5R 0603	TDK	C1608X5R1E105K	445-5146-2-ND
1	R1	Default configuration: RES 0.0 OHM 1/10W 0603 SMD See section 5.2.	Stackpole	RMCF0603ZT0R00	RMCF0603ZT0R00CT-ND
0	R2	Not populated in default configuration. See section 5.2.			
5	TP1, TP2, TP3, TP4, TP5	Test Point	Keystone	5001	5001K-ND
2	J1, J2	Terminal Block 3.5mm 2-pos PCB	On Shore Technology Inc	ED555/2DS	ED1514-ND
1	J3	Header 3 pin 2.54mm	TE Connectivity	3-644456-3	A31113-ND

7 Evaluation Board Layout

Figure 7.1 ZSPM4141 Evaluation Board Layout – Top View



8 Related Documents

File Name
<i>ZSPM4141 Data Sheet</i>
<i>ZSPM4141 Feature Sheet</i>

Visit www.IDT.com/ZSPM4141 or contact your nearest sales office for the latest version of these documents.

9 Document Revision History

Revision	Date	Description
1.00	November 14, 2012	First release.
	April 15, 2016	Changed to IDT branding.

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