

## Evaluating the **ADM8641/ADM8642** Ultralow Power Voltage Detector

### FEATURES

- On-board **ADM8641** voltage detector with 2.63 V internal threshold and a  $\pm 1.3\%$  accuracy on the ADM8641-EVALZ
- On-board **ADM8642** voltage detector with 1 V internal threshold and a  $\pm 1.6\%$  accuracy on the ADM8642-EVALZ
- Separate voltage supply pin (VCC) and input pin (INPUT) for low voltage monitoring using the ADM8642-EVALZ
- Built in tact switch for input condition override
- Built in LED for output monitoring

### EQUIPMENT NEEDED

- Oscilloscope
- User defined VCC power supply

### DOCUMENTS NEEDED

- [ADM8641/ADM8642 data sheet](#)

### GENERAL DESCRIPTION

Through the systems shown in Figure 3 and Figure 4, the ADM8641-EVALZ/ADM8642-EVALZ evaluate the **ADM8641/ADM8642** ultralow power voltage detectors that have pretrimmed voltage monitoring thresholds of 2.63 V and 1 V, respectively. These thresholds are accurate up to  $\pm 1.3\%$  and  $\pm 1.6\%$  for the ADM8641-EVALZ and ADM8642-EVALZ, respectively.

The ADM8641-EVALZ VCC pin can be used to monitor the level of an external voltage. The user can place an external jumper on the ADM8642-EVALZ VCC\_SEL pin to achieve this monitoring on the ADM8642-EVALZ VCC pin. The user can also use a separate supply for the ADM8642-EVALZ INPUT pin to achieve low voltage monitoring.

The ADM8641-EVALZ/ADM8642-EVALZ have an OUT pin that can be held low regardless of the status of the monitored external voltage by pressing the built in tact switch, which shorts the **ADM8641/ADM8642** DIS pin to ground. A built in light emitting diode (LED) is placed at the ADM8641-EVALZ/ADM8642-EVALZ OUT pin to monitor the pin status depending on the level of the monitored external voltage.

For full details on the **ADM8641/ADM8642**, see the **ADM8641/ADM8642** data sheet, which must be consulted in conjunction with this user guide when using the ADM8641-EVALZ/ADM8642-EVALZ.

### ADM8641-EVALZ/ADM8642-EVALZ EVALUATION BOARD PHOTOGRAPHS

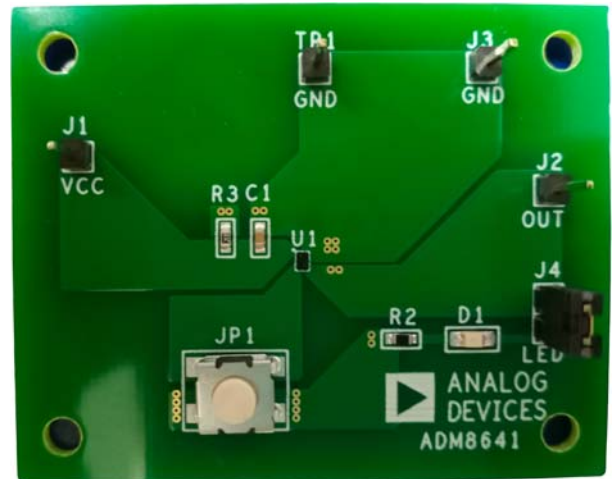


Figure 1. ADM8641-EVALZ

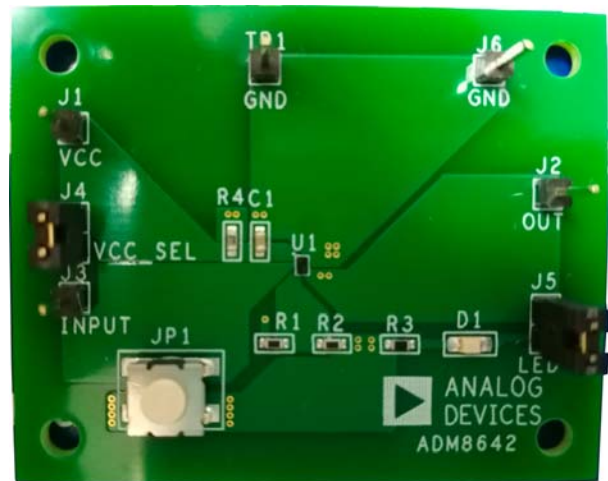


Figure 2. ADM8642-EVALZ

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**REVISION HISTORY**

3/2020—Revision 0: Initial Version

EVALUATION BOARD CONNECTION DIAGRAMS

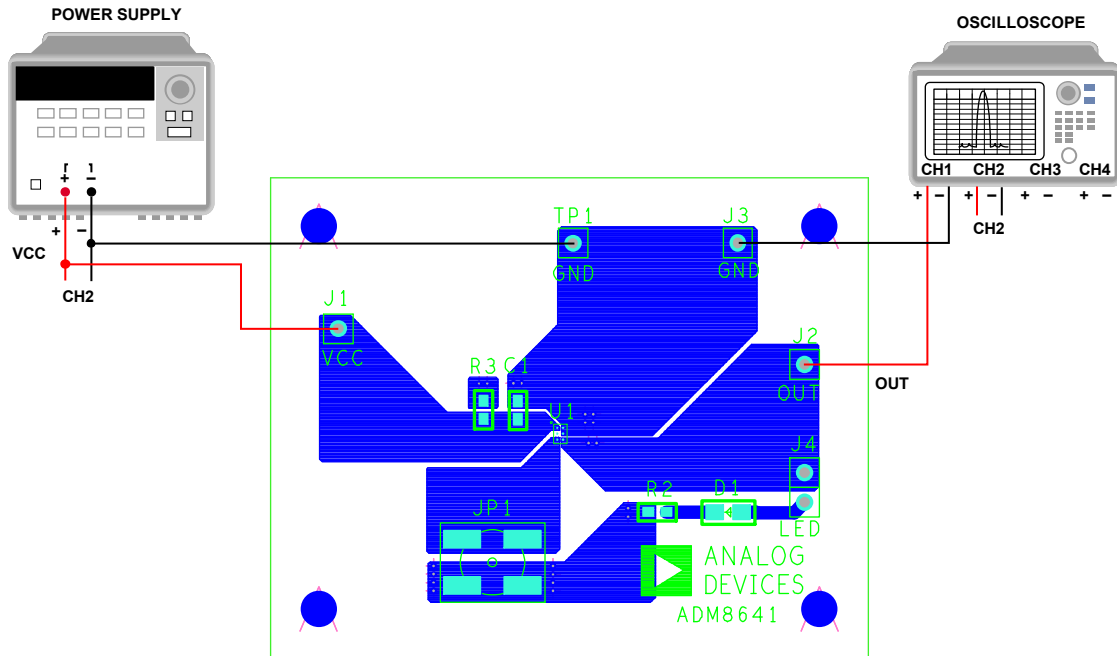


Figure 3. ADM8641-EVALZ Connection Diagram

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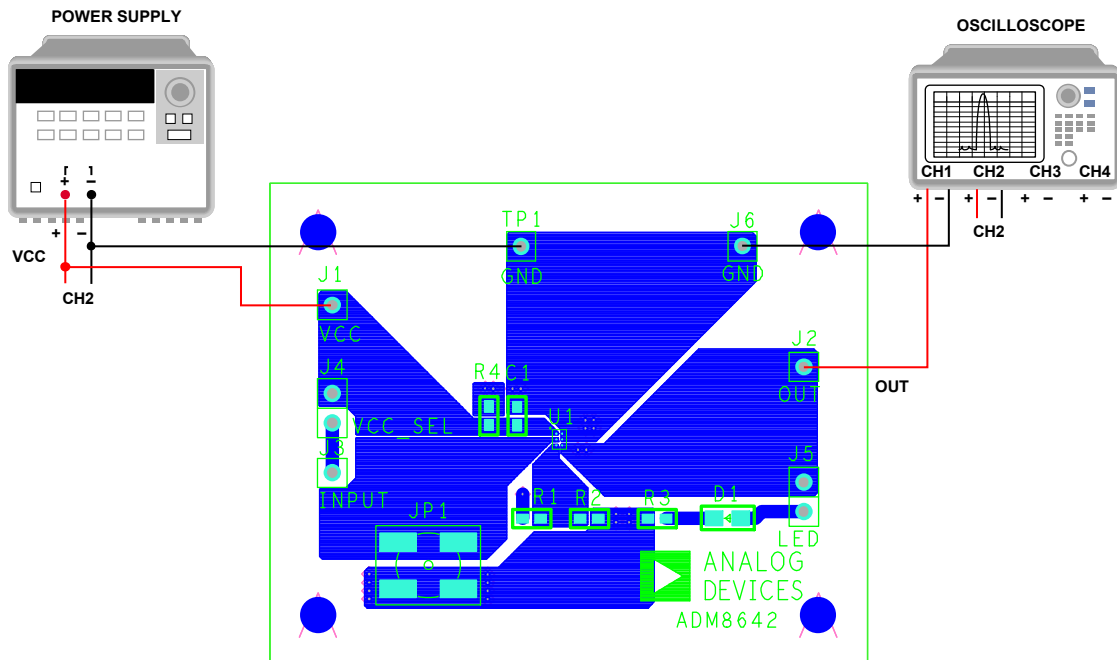


Figure 4. ADM8642-EVALZ Connection Diagram

23470-007

## USING THE EVALUATION BOARDS

### ADM8641-EVALZ

This section explains how to evaluate the performance of the [ADM8641](#) using the ADM8641-EVALZ. For this procedure, refer to Figure 3 and Figure 5 and take the following steps:

1. Connect the power supply and the oscilloscope to the ADM8641-EVALZ, as shown in the Figure 3 connection diagram.
2. Use Channel 1 and Channel 2 on the oscilloscope to monitor the ADM8641-EVALZ OUT pin and VCC pin, respectively.
3. Use an external jumper to short the ADM8641-EVALZ LED pin and to monitor the OUT pin with the built in LED.
4. Take the following steps to check the detector output:
  - a. Set the ADM8641-EVALZ VCC pin to 3 V to turn on the built in LED and cause the ADM8641-EVALZ OUT pin to go high.
  - b. Press and hold the ADM8641-EVALZ JP1 tact switch to short the [ADM8641](#)  $\overline{\text{DIS}}$  pin to ground. The built in LED turns off and the ADM8641-EVALZ OUT pin goes low.
  - c. Release the ADM8641-EVALZ JP1 tact switch. The built in LED turns from off to on and the ADM8641-EVALZ OUT pin goes from low to high.
5. Take the following steps to check the detector input:
  - a. Vary the supply voltage of the ADM8641-EVALZ VCC pin slowly from 3 V to 2.5 V while monitoring the ADM8641-EVALZ OUT pin waveform until the OUT pin goes low.
  - b. Record the VCC pin voltage at the point where the OUT pin goes low. This falling reset threshold voltage at the VCC pin is called  $V_{\text{CC\_RESET\_THRESH\_FALL}}$ .
  - c. Vary the supply voltage of the ADM8641-EVALZ VCC pin slowly from 2.5 V to 3 V while monitoring the ADM8641-EVALZ OUT pin waveform until the OUT pin goes high.
  - d. Record the VCC pin voltage at the point where the OUT pin goes high. This rising reset threshold voltage at the VCC pin is called  $V_{\text{CC\_RESET\_THRESH\_RISE}}$ .

The value of  $V_{\text{CC\_RESET\_THRESH\_FALL}}$  and  $V_{\text{CC\_RESET\_THRESH\_RISE}}$  on the ADM8641-EVALZ is from 2.596 V to 2.664 V.

### ADM8642-EVALZ

This section explains how to evaluate the performance of the [ADM8642](#) using the ADM8642-EVALZ. For this procedure, refer to Figure 4 and Figure 6 and take the following steps:

1. Connect the power supply and the oscilloscope to the ADM8642-EVALZ, as shown in the Figure 4 connection diagram.
2. Use an external jumper to short the ADM8642-EVALZ VCC\_SEL pin and combine the ADM8642-EVALZ VCC pin and INPUT pin. This combination causes the low voltage monitoring level on the ADM8642-EVALZ INPUT pin to equal half of the voltage on the ADM8642-EVALZ VCC pin.
3. Use Channel 1 and Channel 2 on the oscilloscope to monitor the ADM8642-EVALZ OUT pin and VCC pin, respectively.
4. Use an external jumper to short the ADM8642-EVALZ LED pin and to monitor the OUT pin with the built in LED.
5. Take the following steps to check the detector output:
  - a. Set the ADM8642-EVALZ VCC pin to 2.5 V to turn on the built in LED and cause the ADM8642-EVALZ OUT pin to go high.
  - b. Press and hold the ADM8642-EVALZ JP1 tact switch to short the [ADM8642](#)  $\overline{\text{DIS}}$  pin to ground. The built in LED turns off and the ADM8642-EVALZ OUT pin goes low.
  - c. Release the ADM8642-EVALZ JP1 tact switch. The built in LED turns from off to on and the ADM8642-EVALZ OUT pin goes from low to high.
6. Take the following steps to check the detector input:
  - a. Vary the supply voltage of the ADM8642-EVALZ VCC pin slowly from 2.5 V to 1.5 V while monitoring the ADM8642-EVALZ OUT pin waveform until the OUT pin goes low.
  - b. Record the  $V_{\text{CC\_RESET\_THRESH\_FALL}}$  VCC pin voltage at the point where the OUT pin goes low.
  - c. Vary the supply voltage of the ADM8642-EVALZ VCC pin slowly from 1.5 V to 2.5 V while monitoring the ADM8642-EVALZ OUT pin waveform until the OUT pin goes high.
  - d. Record the  $V_{\text{CC\_RESET\_THRESH\_RISE}}$  VCC pin voltage at the point where the OUT pin goes high.

The value of  $V_{\text{CC\_RESET\_THRESH\_FALL}}$  and  $V_{\text{CC\_RESET\_THRESH\_RISE}}$  on the ADM8642-EVALZ is from 1.968 V to 2.032 V, and the actual threshold on the [ADM8642](#) VIN device pin is from 0.984 V to 1.016 V. The ADM8642-EVALZ INPUT pin can be controlled separately if the jumper at the VCC\_SEL pin is not connected. To adjust the monitoring voltage level at the ADM8642-EVALZ INPUT pin, select a divider combination for R1 and R2.

## EVALUATION BOARD SCHEMATICS AND ARTWORK

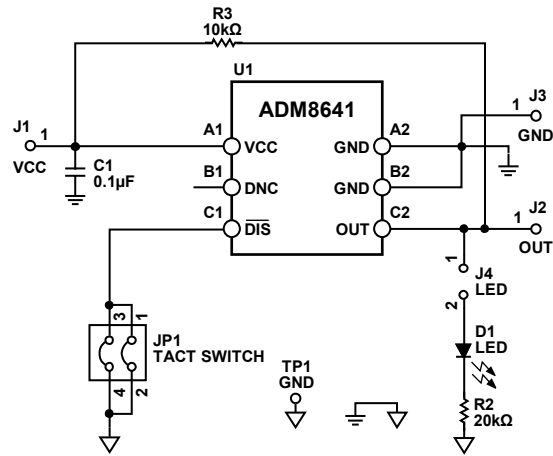


Figure 5. ADM8641-EVALZ Schematic

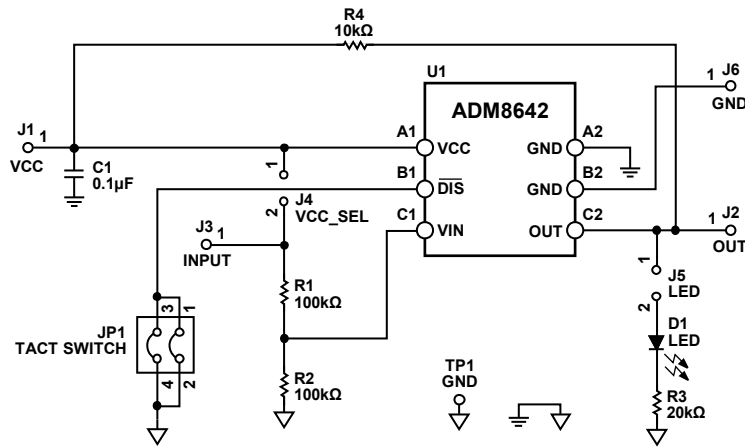


Figure 6. ADM8642-EVALZ Schematic

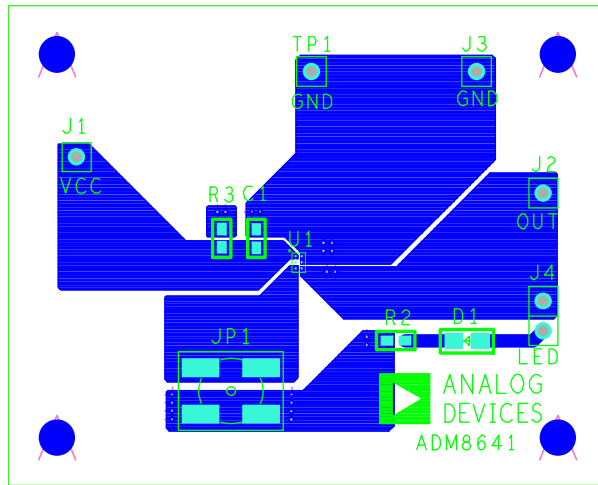


Figure 7. ADM8641-EVALZ Top Assembly

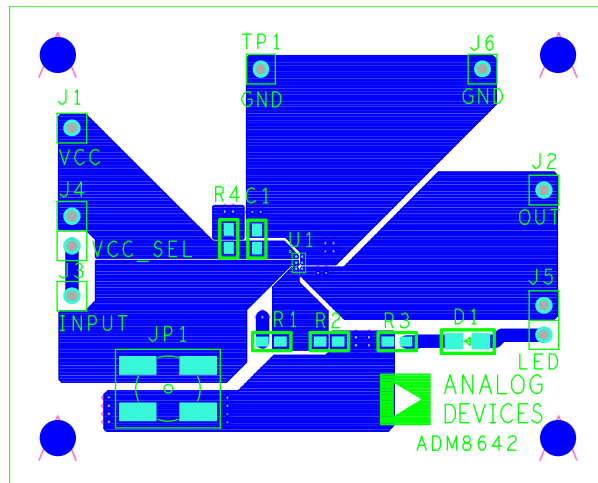


Figure 8. ADM8642-EVALZ Top Assembly

## ORDERING INFORMATION

### BILL OF MATERIALS

Table 1. ADM8641-EVALZ Bill of Materials

Qty	Reference Designator	Description	Manufacturer	Part Number
1	C1	0.1 µF capacitor	Murata	GRM188R71H104KA93
1	D1	LED	Lumex	SML-LXT0805IW-TR
1	JP1	Tact switch	C&K	KT11P3JM34LFS
5	J1 to J4, TP1	Connector headers	Würth Elektronik	61304011121
1	R2	20 kΩ, 1% resistor	Vishay Dale	CRCW060320K0FKEA
1	R3	10 kΩ, 1% resistor	Vishay Dale	CRCW060310K0FKEA
1	U1	Ultralow power voltage detector	Analog Devices, Inc.	ADM8641T263ACBZ-R7

Table 2. ADM8642-EVALZ Bill of Materials

Qty	Reference Designator	Description	Manufacturer	Part Number
1	C1	0.1 µF capacitor	Murata	GRM188R71H104KA93
1	D1	LED	Lumex	SML-LXT0805IW-TR
1	JP1	Tact switch	C&K	KT11P3JM34LFS
7	J1 to J6, TP1	Connector headers	Würth Elektronik	61304011121
2	R1, R2	100 kΩ, 1% resistors	Vishay Dale	CRCW0603100KFKEA
1	R3	20 kΩ, 1% resistor	Vishay Dale	CRCW060320K0FKEA
1	R4	10 kΩ, 1% resistor	Vishay Dale	CRCW060310K0FKEA
1	U1	Ultralow power voltage detector	Analog Devices	ADM8642T100ACBZ-R7

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