

# LM26430 Evaluation Module Quick Start Guide

## User's Guide



Literature Number: SNVU331  
November 2013

## **LM26430 Evaluation Module Overview**

---



---



---

The LM26430 Evaluation Module (EVM) enables the user to test out analog and digital capabilities of the LM26430 Power Management Unit (PMU). The EVM can be used with the USB2ANY adapter and PMU GUI which is documented separately in Power Management Unit GUI User Guide.

Topic	Page
<b>1 Essential Connections .....</b>	<b>3</b>
<b>2 Evaluation Module .....</b>	<b>3</b>
<b>3 Power Up Requirements .....</b>	<b>4</b>
<b>4 Specifications: .....</b>	<b>4</b>
<b>5 Connection to USB2ANY adapter .....</b>	<b>5</b>
<b>6 Synchronization feature .....</b>	<b>5</b>
<b>7 Start-Up Sequence Using External Jumper Bank .....</b>	<b>6</b>
<b>8 Circuit Schematics .....</b>	<b>7</b>
<b>9 Power Connector List .....</b>	<b>11</b>
<b>10 Signal Connector List .....</b>	<b>11</b>

# 1 Essential Connections

Position of the jumper sets channel's enable condition (no jumper=disabled). In general, connect to VDDD position to turn channel ON

Input return current from all channels  
 IN34+ line powers SW3 and SW4  
 IN12+ line powers SW1 and SW2

Negative current returns here for SW1 and SW2

Jumper sets the core supply to be IN12+ or IN34+

Negative current returns here for SW3 and SW4

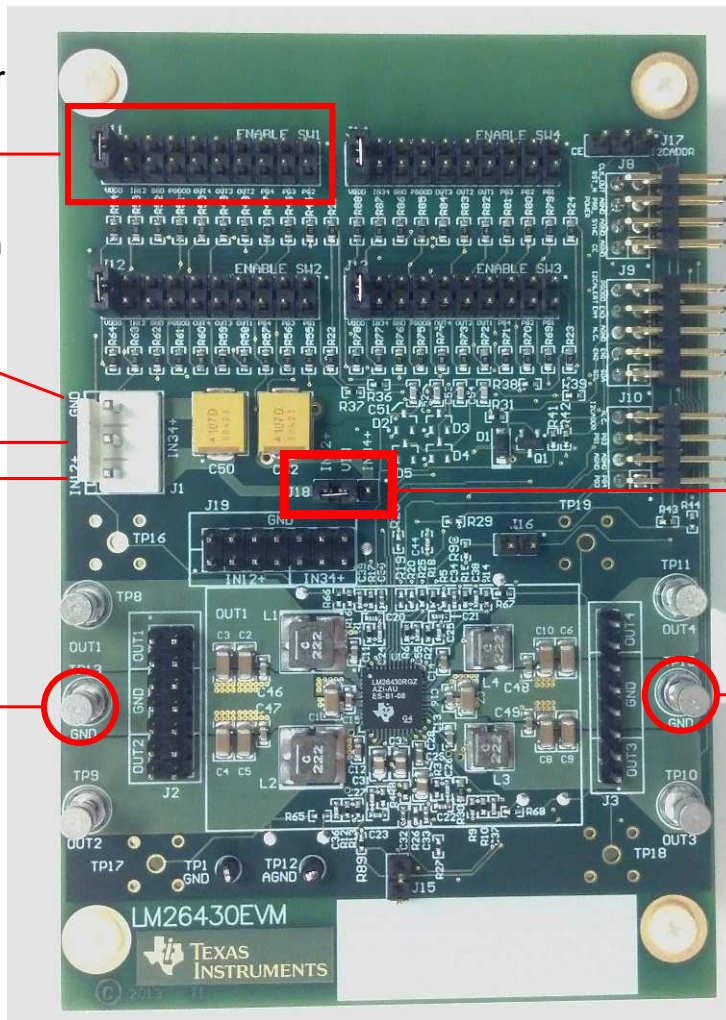


Figure 1.

# 2 Evaluation Module

The LM26430 evaluation module is designed to provide up to 4A (SW1&2) and 2A (SW3&4) continuous outputs with an operational range of 4.3V to 18V and a switching frequency of 1.0MHz. The LM26430 offers I2C communication with PMBus compatible functions allowing simple power-up/down sequencing, fault monitoring, compensation tuning, and other parameters. The controller's behavior can be set and saved into the built-in EEPROM to ensure specific application needs are met.

This evaluation board contains the necessary circuitry and connectors to power up four individual rails and to set up the enabling signals and external sequence in a flexible way. The board is also set up for interfacing with the USB2ANY adapter supplied in the kit through a powerful and convenient dedicated GUI.

### 3 Power Up Requirements

- Without USB2ANY adapter
  - Set up J18 to power the LM26430 from either IN12+ or IN34+ as desired
  - Set up J11-J13 jumpers to set up the desired start-up sequence
  - Apply DC voltage to the J1 connector OR to the J19 connector. Be careful to respect proper polarity as shown on the eval board
  - Verify that the proper voltage is present on the enabled outputs
  - Connect load(s)
- With USB2ANY adapter
  - Set up J18 to power the LM26430 from either IN12+ or IN34+ as desired
  - Remove jumpers from J11-J13 connectors
  - Connect USB2ANY adapter to the J8-J10 connector. The key should be facing upward (the cable will not engage fully if connected on the wrong side)
  - Apply DC voltage to J1 connector OR to the J19 connector. Be careful to respect proper polarity as shown on the eval board.
  - Use GUI to control the behavior of the PMU (enable, reset, and so forth...).
  - Connect load(s)
  - **Note:** When the USB2ANY is connected and providing power, the UVLO function and its related power-on reset will not work as intended because power is always provided to VIN. This can cause the startup sequence to operate erratically. To see the accurate startup behavior from power-up, store the desired settings in the EEPROM and apply power with the USB2ANY disconnected.

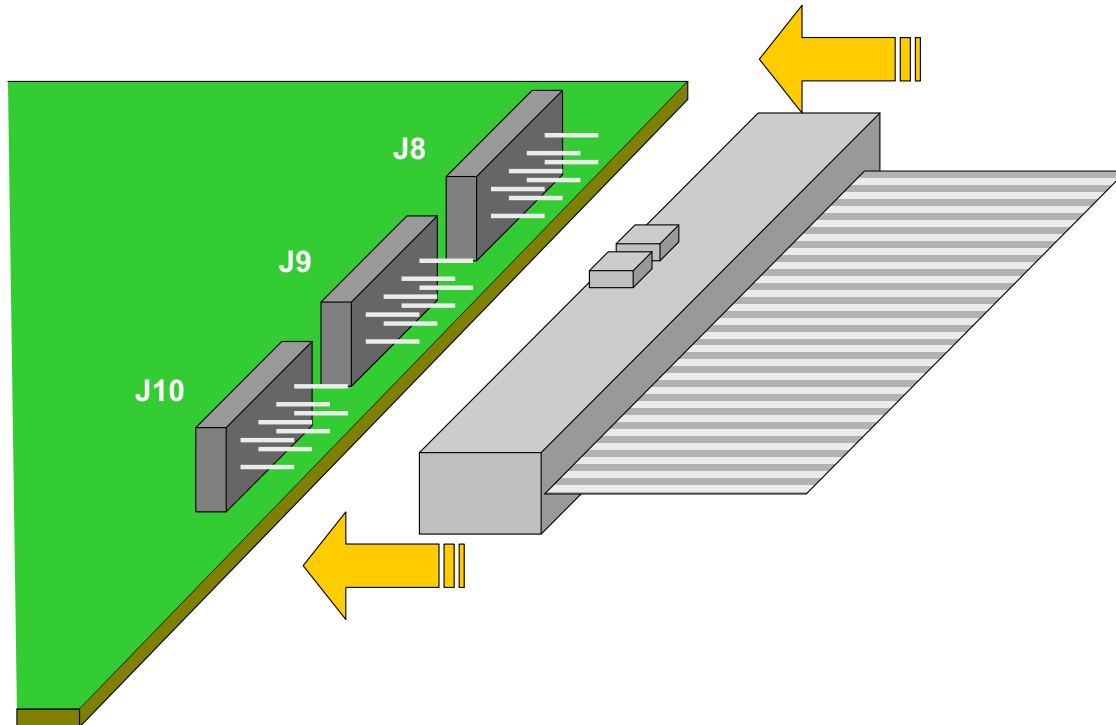
### 4 Specifications:

**Table 1.**

EVM	TEST CONDITIONS	DEFAULT OUTPUT RANGE
LM26430 EVAL	Vin=5V to 12V Fsw=1.0MHz	Buck 1: 1.8V, 4A
		Buck 2: 3.3V, 4A
		Buck 3: 1.2V, 2A
		Buck 4: 2.5V, 2A

## 5 Connection to USB2ANY adapter

The LM26430 evaluation module interacts with the USB2ANY adapter through the J8, J9 and J10 connectors. Simply slide the 2x15 cable provided in the kit into J8-J10. The cable end connects to all the connectors at the same time. Make sure that the key is facing upwards when connecting the cable to the evaluation board (refer to [Figure 2](#) below).



**Figure 2. Connecting Mating Cable for USB2ANY Adapter**

To use the USB2ANY adapter, install the drivers provided in the kit before connecting to the board. For additional details on the USB2ANY adapter and the graphical user interface used to interact with the board, refer to the GUI User Guide.

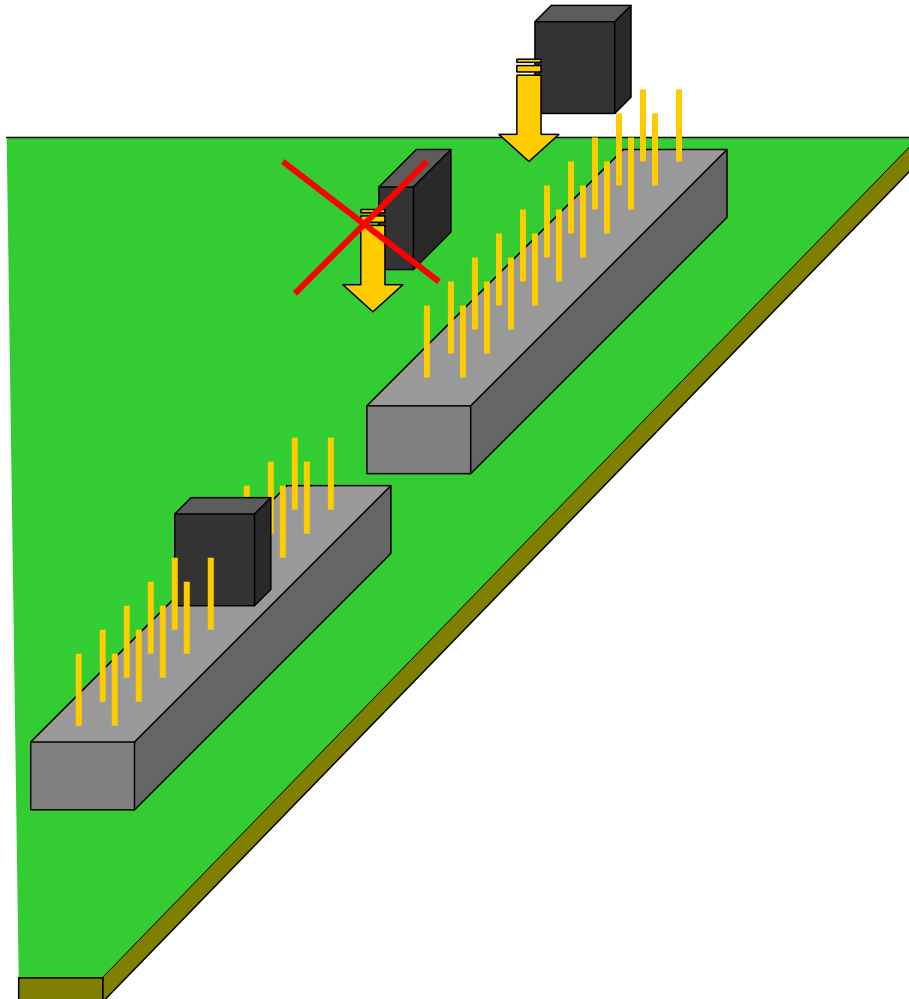
## 6 Synchronization feature

The LM26430 is capable of synchronizing to a clock to control the switching frequency. The USB2ANY is capable of providing this clock and the frequency can be set with the dedicated GUI. When issuing the clock care must be taken not to upset the frequency by a large step. This could upset the internal PLL of the LM26430 and cause it to lose lock, especially when synchronizing down. Steps of 200kHz should ensure a proper behavior.

## 7 Start-Up Sequence Using External Jumper Bank

The evaluation module comes with four 0.100" connector banks (J11-J14) designed to receive jumpers for setting up the desired power-up sequence. By connecting a jumper across the connector, a connection is made between a specific signal (VDDD for example) and the ENSW pin of the specific buck channel associated with the connector bank. Using this setup, the ENSW can be tied to any of the following signals: VDDD, GND, IN+, SS/PG of any channel other buck, OUT+ of any other buck and finally the global PGOOD pin. Only one jumper should be connected per bank.

If no jumper is connected to the bank, the associated ENSW signal will go low, disabling the buck channel, or the entire board if the LM26430 is set up with ENSW1 as the global enable input (this is NOT the default mode of operation. See LM26430 datasheet for more detail).

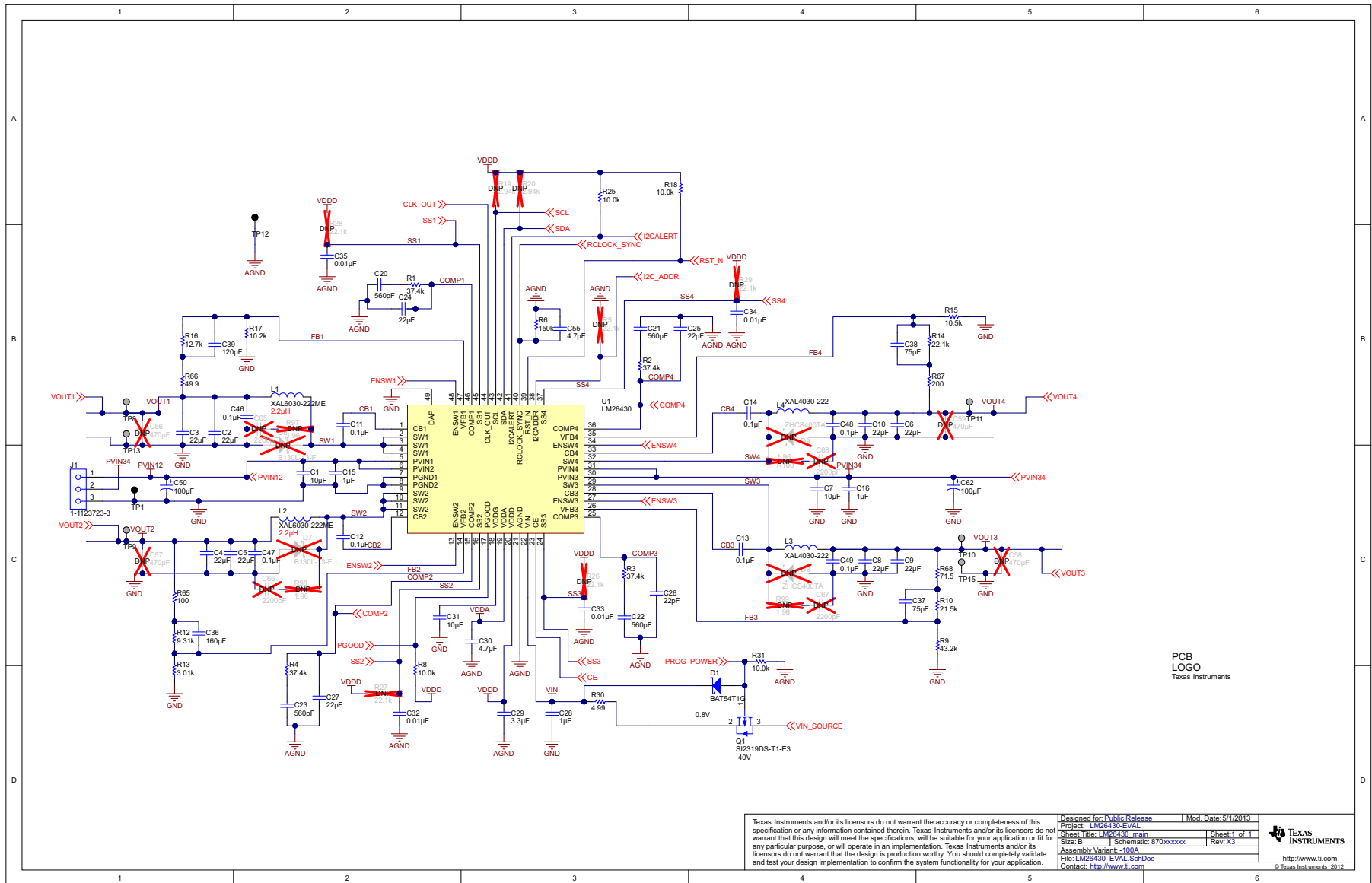


**Figure 3. Connecting Jumper to J11-J14 for Start-Up Sequence and Enable**

For a precise list of the connection, refer to the circuit schematic in this document

For ease of identification, the related signal is indicated on the board for each row of jumper setting. The signal associated with the label is connected to the connector (J11-J14) through a resistor located directly below the name. See the circuit schematic in this document for more details.

**8 Circuit Schematics**



Texas Instruments and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. Texas Instruments and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. Texas Instruments and/or its licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.		Designed for Public Release	Mod. Date: 5/17/2013
		Project: LM26430-EVAL	Sheet: 1 of 1
		Sheet Title: LM26430_main	Rev: X3
		Size: 9	Schematic: 870xxxxxx
		Assembly Variant: -100A	File: LM26430_EVAL_SchDoc
		Contact: <a href="http://www.ti.com">http://www.ti.com</a>	<a href="http://www.ti.com">http://www.ti.com</a>

**Figure 4. Circuit Schematic**

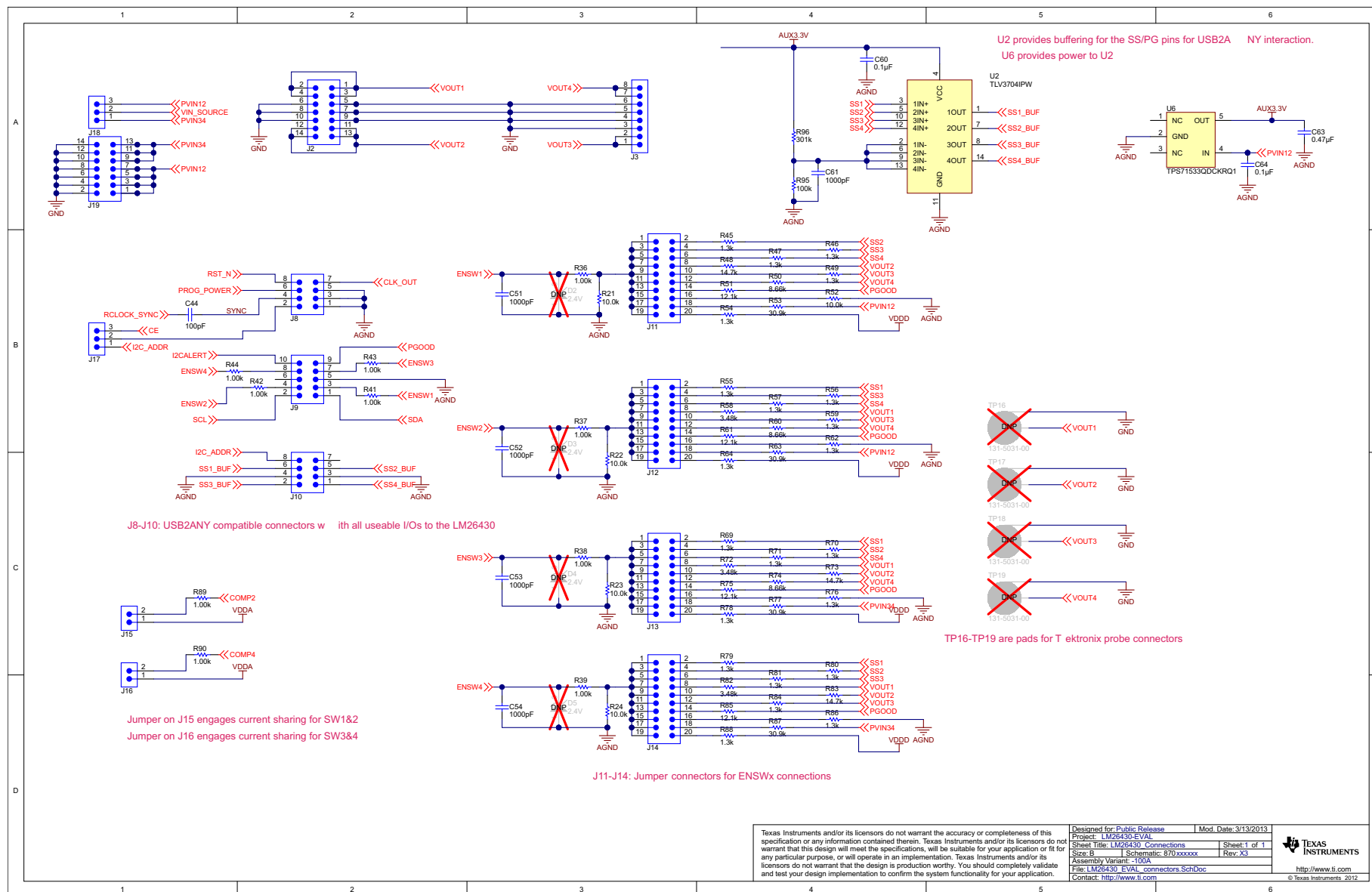


Figure 5. Circuit Schematic



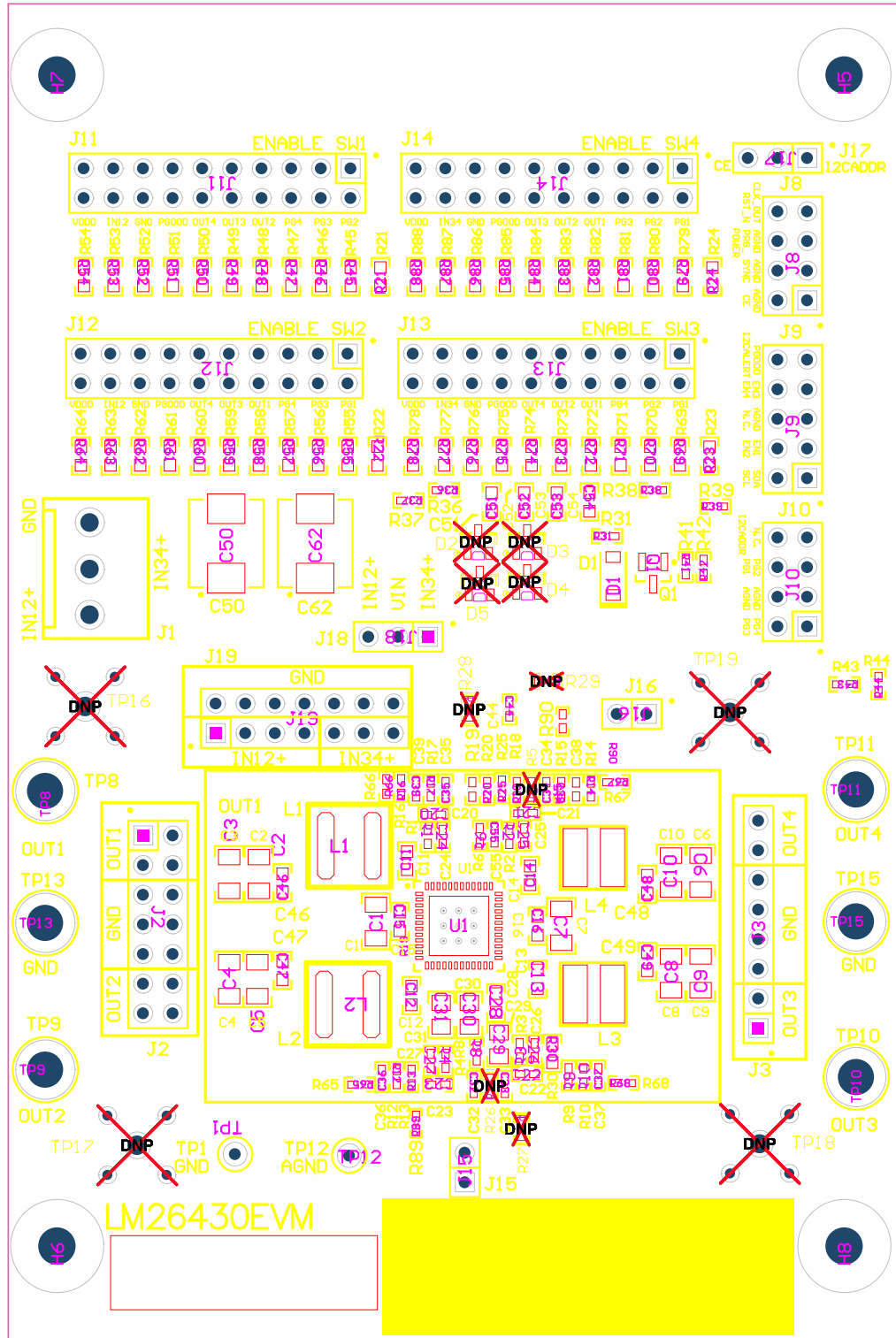


Figure 6. Assembly Diagram (TOP)

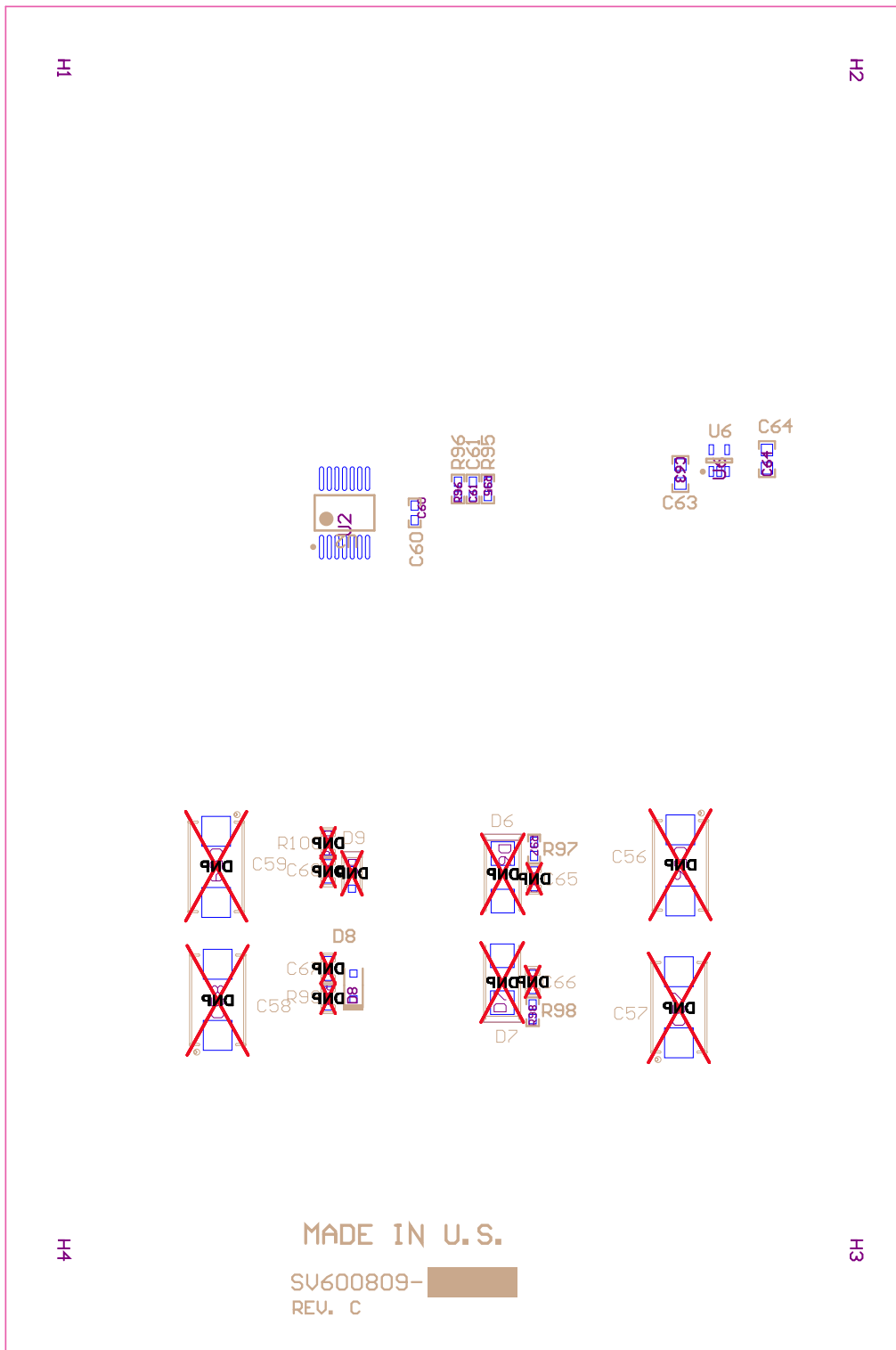


Figure 7. Assembly Diagram (BOTTOM)

## 9 Power Connector List

CONNECTOR NAME	FUNCTION	COMMENT
J1	Power input	
J18	Vin source selector	Connect jumper to select source for the IC's VIN pin.
J19	Power input	Positions 1,3,5,7 connect to PVIN12 Positions 9,11,13 connect to PVIN34 Positions 2,4,6,8,10,12,14 connect to PGND
J2	Power output	Positions 1-4 connect to OUT1+ Positions 5-10 connect to PGND (for OUT1- and OUT2-) Position 11-14 connect to OUT2+
J3	Power output	Positions 1 and 2 connect to OUT3+ Positions 3-5 connect to PGND (for OUT3- and OUT4-) Positions 6 and 7 connect to OUT4+
TP9	OUT2+	
TP13	OUT1- OUT2-	
TP10	OUT3+	
TP11	OUT4+	
TP15	OUT3- OUT4-	

## 10 Signal Connector List

CONNECTOR NAME	FUNCTION	COMMENT
J11	Enable source for SW1	Connect one (and only one) jumper across the row according to required operation. The absence of jumper leads to a disabled switcher
J12	Enable source for SW2	See comment for J11
J13	Enable source for SW3	See comment for J11
J14	Enable source for SW4	See comment for J11
J15	Current sharing mode selector SW12	Connect a jumper between the pins to enable current sharing function for SW1&2
J16	Current sharing mode selector SW34	Connect a jumper between the pins to enable current sharing function for SW3&4
J8	Connector for USB2ANY interface	See schematic for the list of signals available on this connector. Each pin can be used individually when the USB2ANY is not connected
J9	Connector for USB2ANY interface	See schematic for the list of signals available on this connector. Each pin can be used individually when the USB2ANY is not connected
J10	Connector for USB2ANY interface	See schematic for the list of signals available on this connector. Each pin can be used individually when the USB2ANY is not connected
TP1	PGND	
TP12	AGND	
TP16	OUT1	Un-mounted
TP17	OUT2	Un-mounted
TP18	OUT3	Un-mounted
TP19	OUT4	Un-mounted

## IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

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.

### Products

Audio	<a href="http://www.ti.com/audio">www.ti.com/audio</a>
Amplifiers	<a href="http://amplifier.ti.com">amplifier.ti.com</a>
Data Converters	<a href="http://dataconverter.ti.com">dataconverter.ti.com</a>
DLP® Products	<a href="http://www.dlp.com">www.dlp.com</a>
DSP	<a href="http://dsp.ti.com">dsp.ti.com</a>
Clocks and Timers	<a href="http://www.ti.com/clocks">www.ti.com/clocks</a>
Interface	<a href="http://interface.ti.com">interface.ti.com</a>
Logic	<a href="http://logic.ti.com">logic.ti.com</a>
Power Mgmt	<a href="http://power.ti.com">power.ti.com</a>
Microcontrollers	<a href="http://microcontroller.ti.com">microcontroller.ti.com</a>
RFID	<a href="http://www.ti-rfid.com">www.ti-rfid.com</a>
OMAP Applications Processors	<a href="http://www.ti.com/omap">www.ti.com/omap</a>
Wireless Connectivity	<a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a>

### Applications

Automotive and Transportation	<a href="http://www.ti.com/automotive">www.ti.com/automotive</a>
Communications and Telecom	<a href="http://www.ti.com/communications">www.ti.com/communications</a>
Computers and Peripherals	<a href="http://www.ti.com/computers">www.ti.com/computers</a>
Consumer Electronics	<a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>
Energy and Lighting	<a href="http://www.ti.com/energy">www.ti.com/energy</a>
Industrial	<a href="http://www.ti.com/industrial">www.ti.com/industrial</a>
Medical	<a href="http://www.ti.com/medical">www.ti.com/medical</a>
Security	<a href="http://www.ti.com/security">www.ti.com/security</a>
Space, Avionics and Defense	<a href="http://www.ti.com/space-avionics-defense">www.ti.com/space-avionics-defense</a>
Video and Imaging	<a href="http://www.ti.com/video">www.ti.com/video</a>

### TI E2E Community

[e2e.ti.com](http://e2e.ti.com)