DAC128S085EVM Booster Pack User’s Guide

User's Guide

Literature Number: SNAU164
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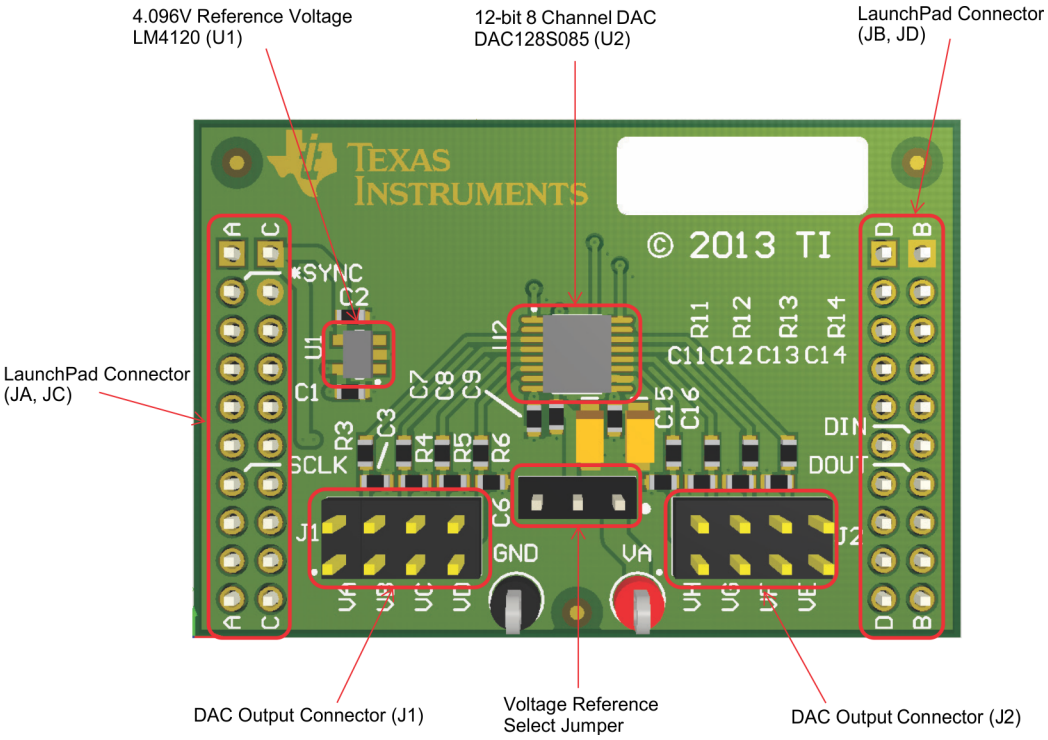

Figure 1-1. DAC128S085EVM Evaluation Board

Table 1-1. Device and Package Configurations

DEVICE	IC	Package
U1	LM4120IM5-4.1	SOT-23
U2	DAC128S085CIMT	TSSOP-16

Software Installation

2.1 Graphical User Interface (GUI)

To use the DAC128S085EVM install the DAC12xSxxx Software:

1. If you are receiving the DAC128S085EVM from a FAE the software GUI will be in a .zip file. Otherwise, click this link http://www.ti.com/product/dac128s085, scroll down to the “software” section, and download the latest evaluation software.
2. Unzip the downloaded file into a known directory, and run the “setup.exe” file located in [Unzip location]\ DAC12xSxxx \EVM_GUI\ DAC12xSxxx _Installer_v1.zip\ DAC12xSxxx _Installer\Installer\Volume. Follow the pop-screen instructions by clicking the “Next” button to install the software.

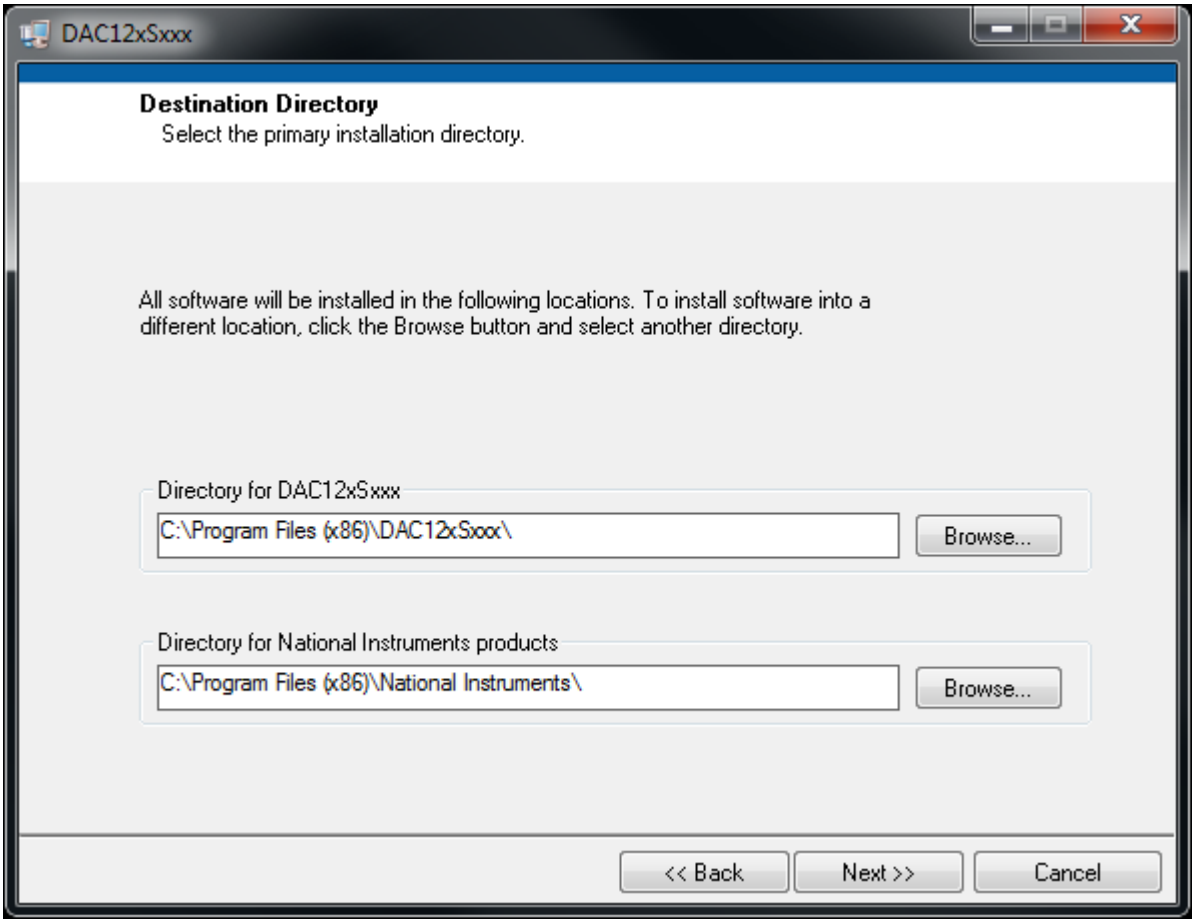

Figure 2-1. DAC12xSxxx Installation Directory

3. When the installation is finished, please click “Finish” button.

2.2 Launchpad Firmware Upgrade

Note: This section is only needed with a brand new Launchpad. If a Launchpad is shipped with an DAC128S085 EVM then skip section 2.2.

2.2.1 MSP430 Firmware Upgrade Application Installation

1. 1. Navigate to http://www.ti.com/tool/msp430usbdevpack and click on Get Software.
2. 2. Scroll-down to the end of the page to find the USB Collateral Installers section.
3. 3. Click on MSP430_USB_Firmware_Upgrade_Example-x-x-x-Setup.exe to download the tool; the page will redirect to a submission form.
4. 4. Complete the information requested and submit the form; if approved, a download button will appear.
5. 5. Run the installation file and follow the on-screen instructions until completion. When asked about the setup type, select Application Only. Click Finish when done.

2.2.2 Firmware upgrade

1. If you are receiving the DAC128S085EVM from a FAE the firmware is a text file “DAC128S085EVM_Firmware-v0.87.txt”
2. Open the MSP430 USB Firmware Upgrade application. By default, the application can be launched from Start >> Programs >> Texas Instruments >> MSP430 USB Firmware Upgrade Example.
3. Click Next to proceed on the first prompt; read and accept the license agreement and click Next to continue.

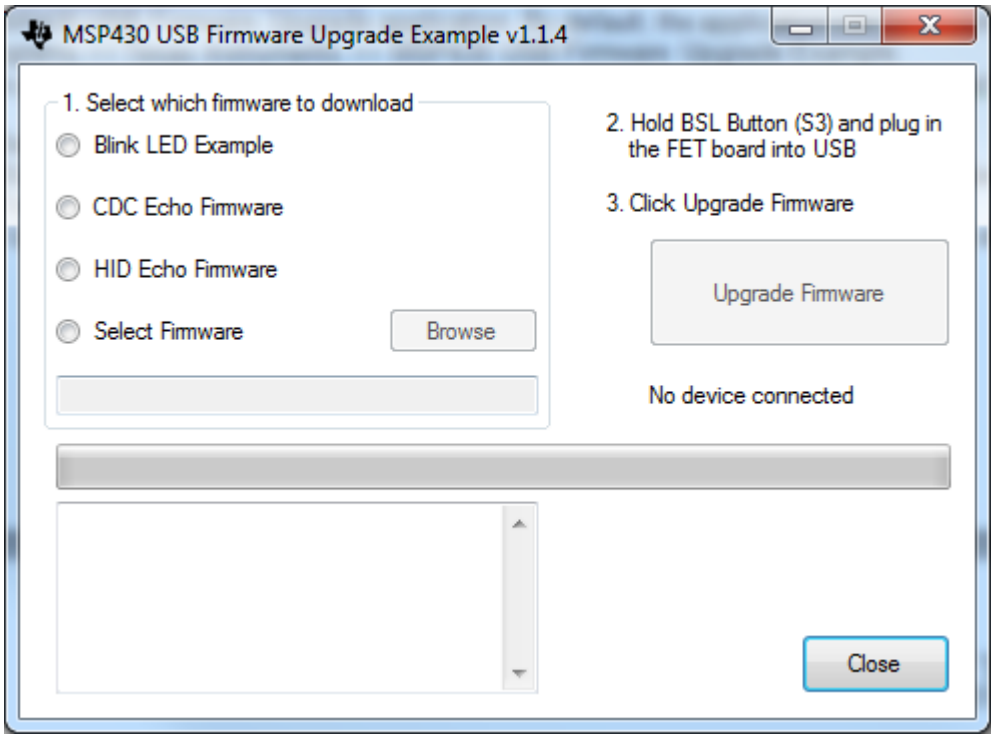

Figure 2-2. USB Firmware Upgrade Window

4. Enable the Select Firmware button and browse to open the downloaded firmware “DAC128S085EVM_Firmware-v0.87.txt”.
5. Press the BSL button on the MSP430 LaunchPad and connect to the PC with a USB cable; if detected, the text on the Firmware Upgrade tool will change from No device connected to Found 1 device.

6. Click on the Upgrade Firmware button to program the LaunchPad. Close the application when done.

Update USB Driver

1. Before launching the DAC12xSxxx software, connect the DAC128S085EVM board to a USB port of your PC. Go to Device Manager and find “MSP43-USB Example”. Right click and select Update Driver Software.

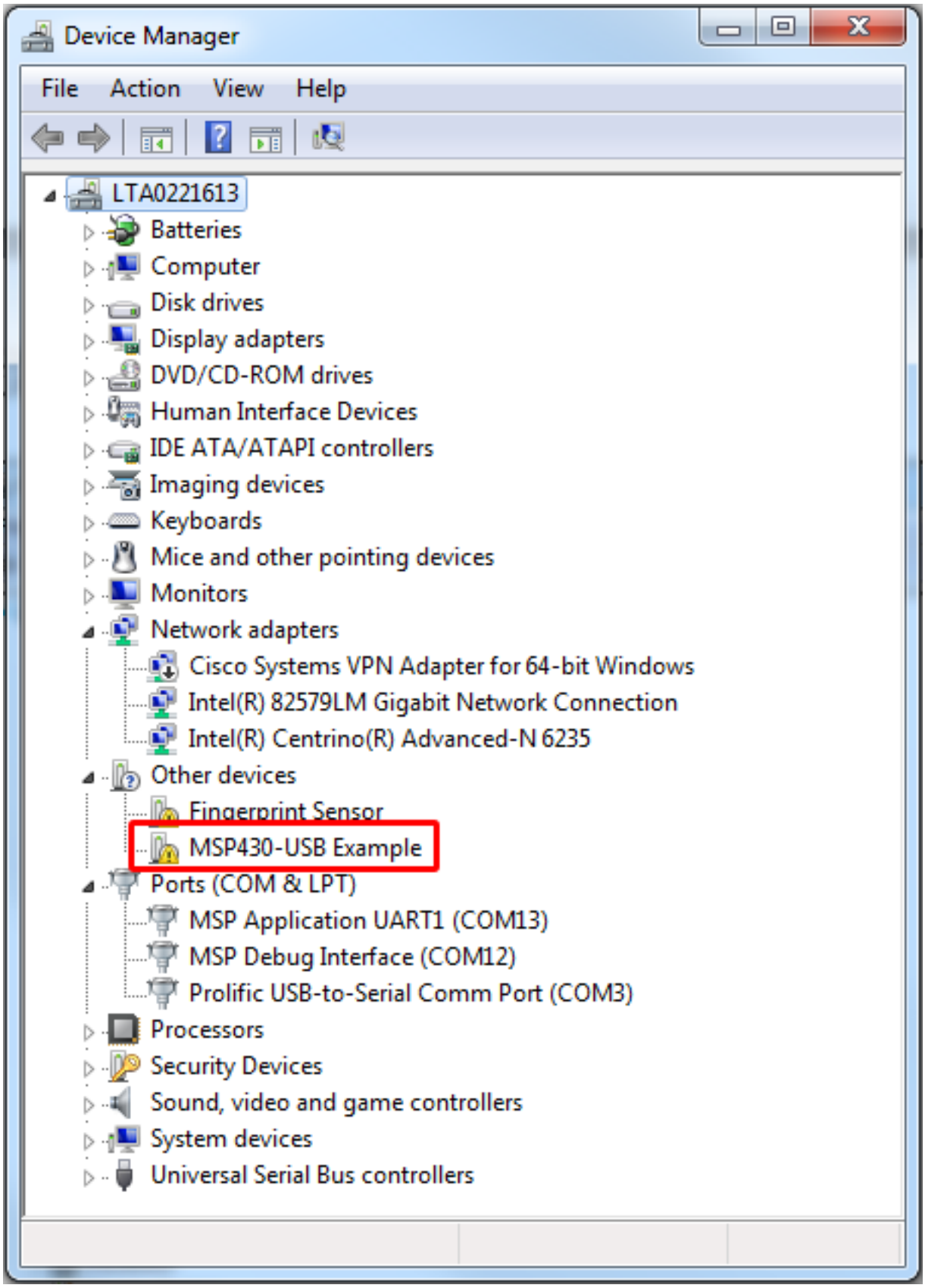

Figure 2-3. Driver Not Installed

2. On the next screen, select the “Browse my computer for driver software” option and go to the directory of your install files and select the “TI_ADC_DAC_EVMs_Driver.inf” file.
3. 3. If prompted with a warning window select “Install this Driver Anyway”. Close the installation window when it is done. The device manager should now display a “TI_ADC_DAC_EVMs” item followed by a COM port number.

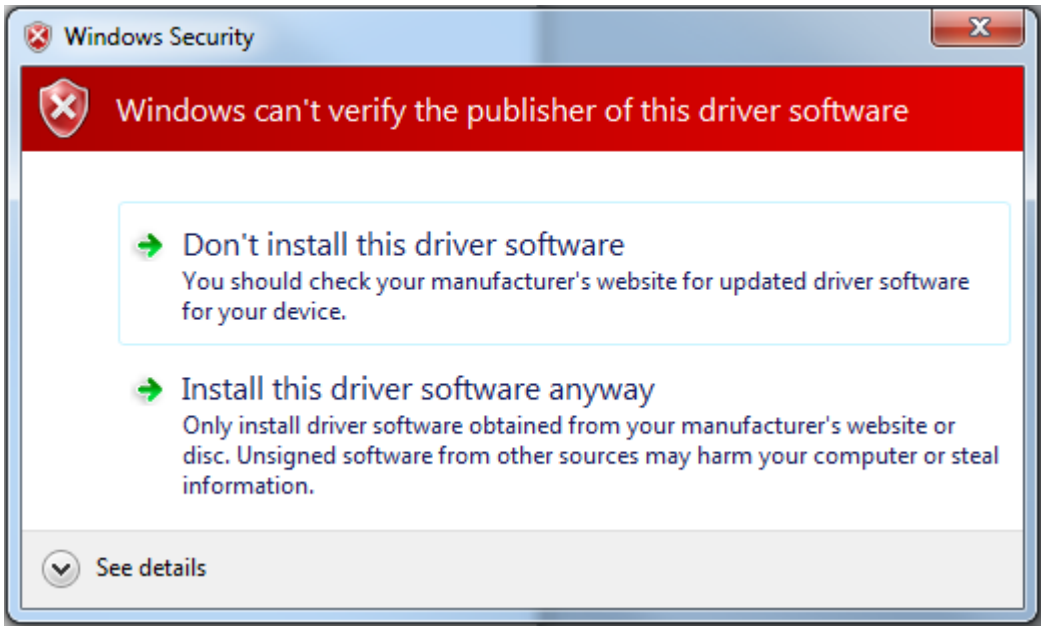

Figure 2-4. Driver Authentication Warning

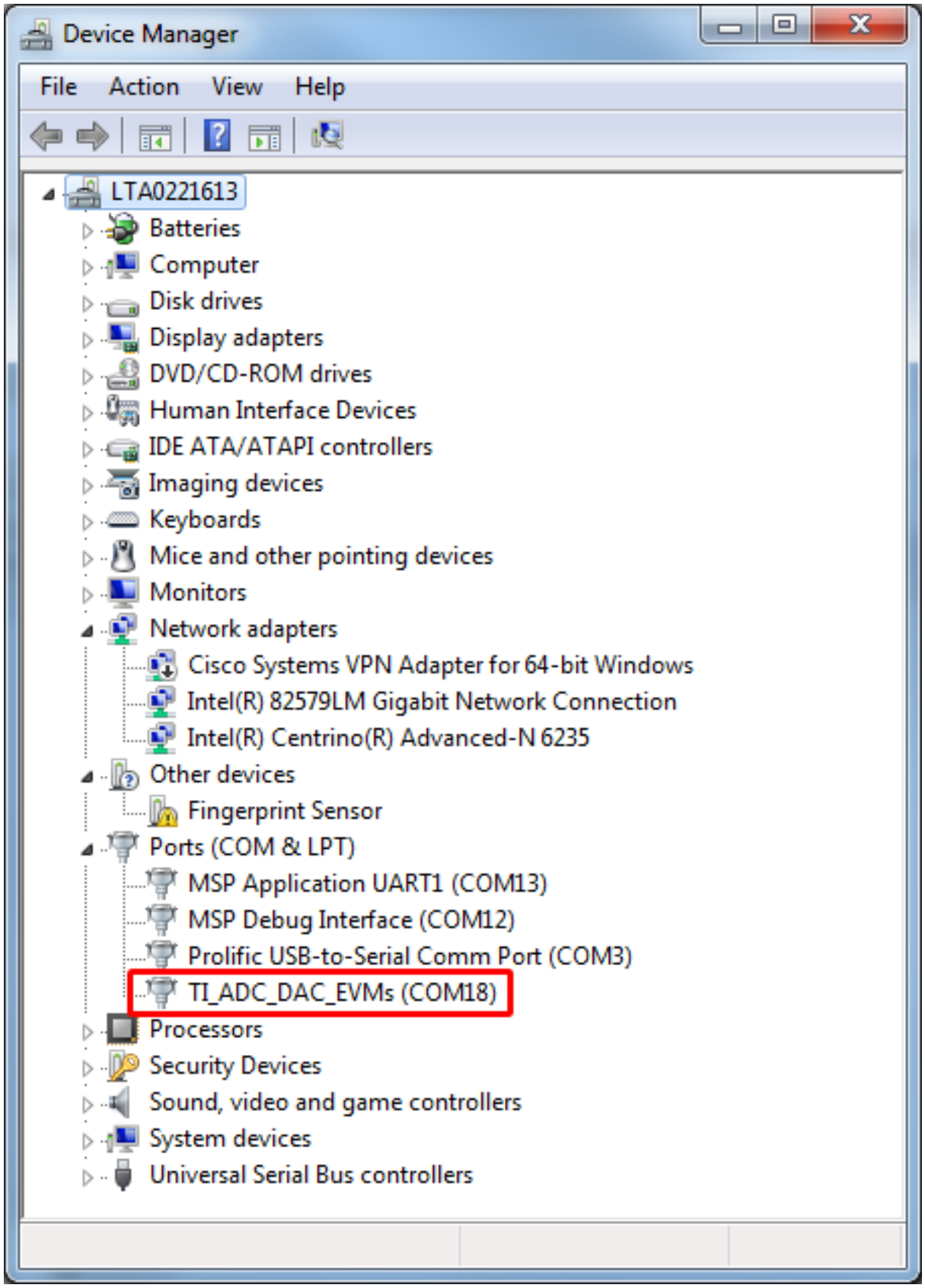

Figure 2-5. Driver Installed

DAC128S085 BoosterPack Setup and Operation

3.1 Connections

1. Attach the DAC128S085EVM BoosterPack onto the MSP430 LaunchPad using connectors JA, JB, JC, JD. The proper orientation of the Launchpad and DAC128S085EVM is when the text “LaunchPad” and “2013 TI” are in the same direction.

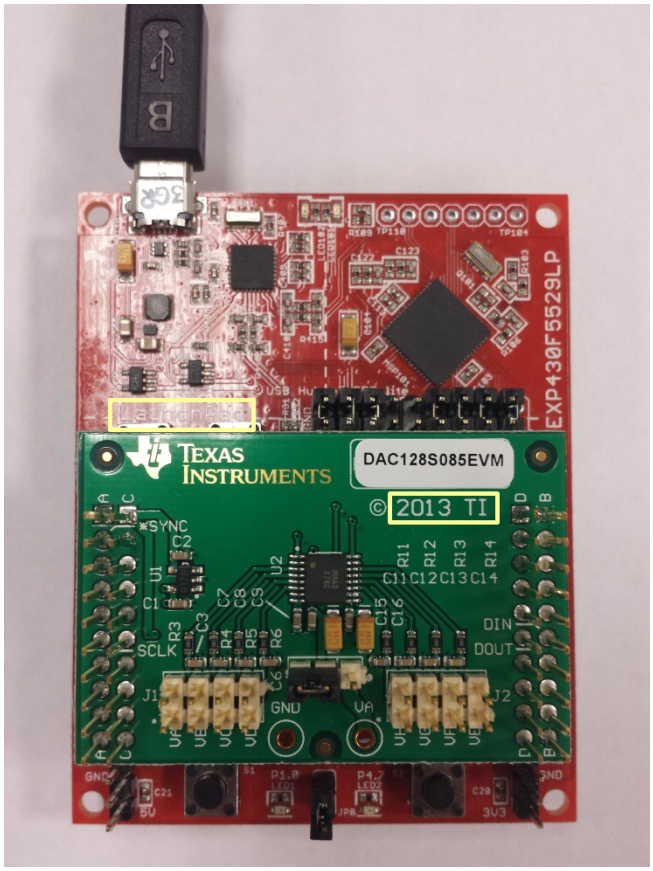

Figure 3-1. DAC128S085EVM Attached to MSP430

2. Connect the USB cable from the LaunchPad to the PC

3.2 Launching the Software

1. The DAC12xSxxx GUI software can be run by clicking on Start >> All Program >> DAC12xSxxx. After running the GUI select DAC128S085.

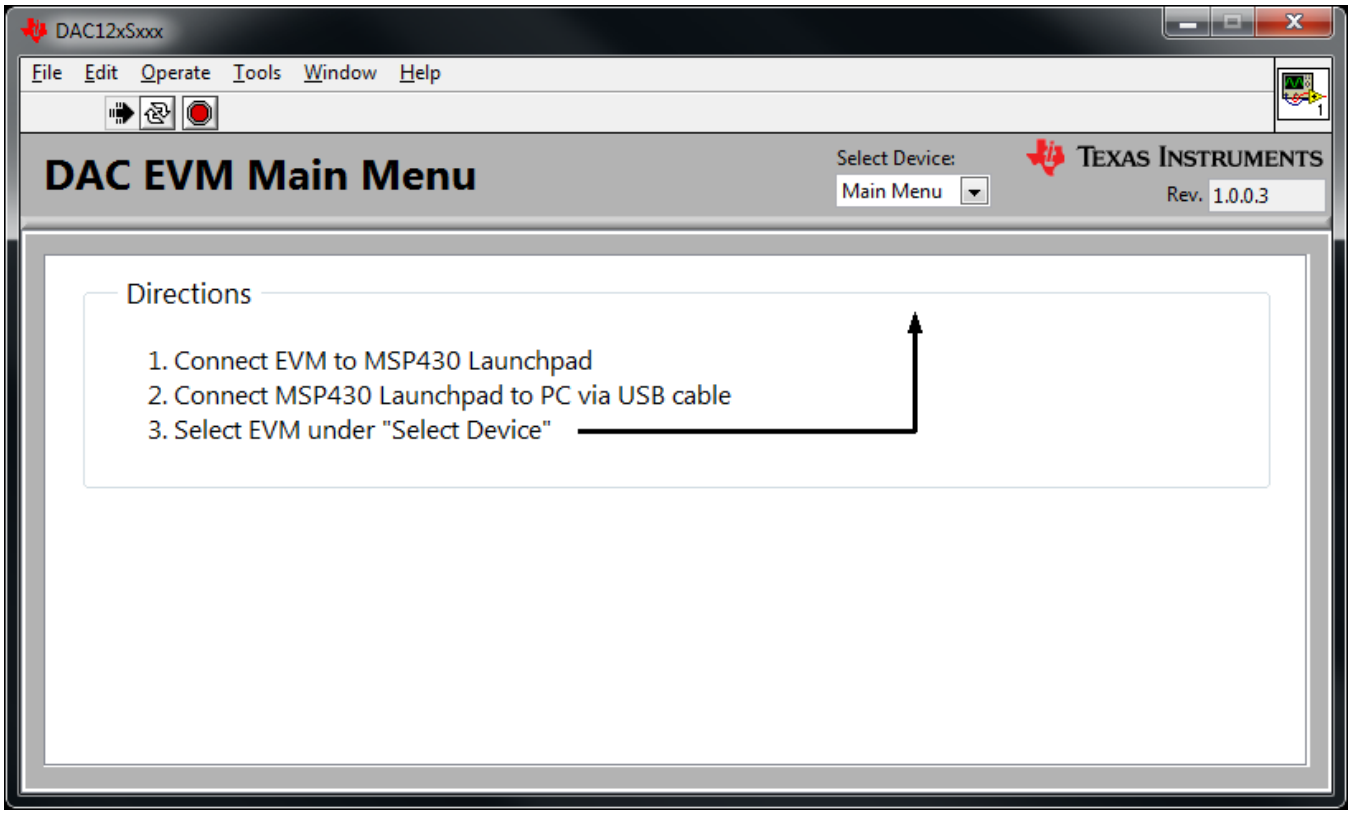

Figure 3-2. Part Select

2. GUI Descriptions
   - • DB[15:12]: These 4 bits control different write modes, channel selects, and special operation modes. See the DAC128S085 datasheet for more details.
   - • DB[11:0]: These 12 bits are for setting the DAC output codes.
   - • DB[11:0] Output Type: This field changes DB[11:0] to either binary, decimal, or hexadecimal type.

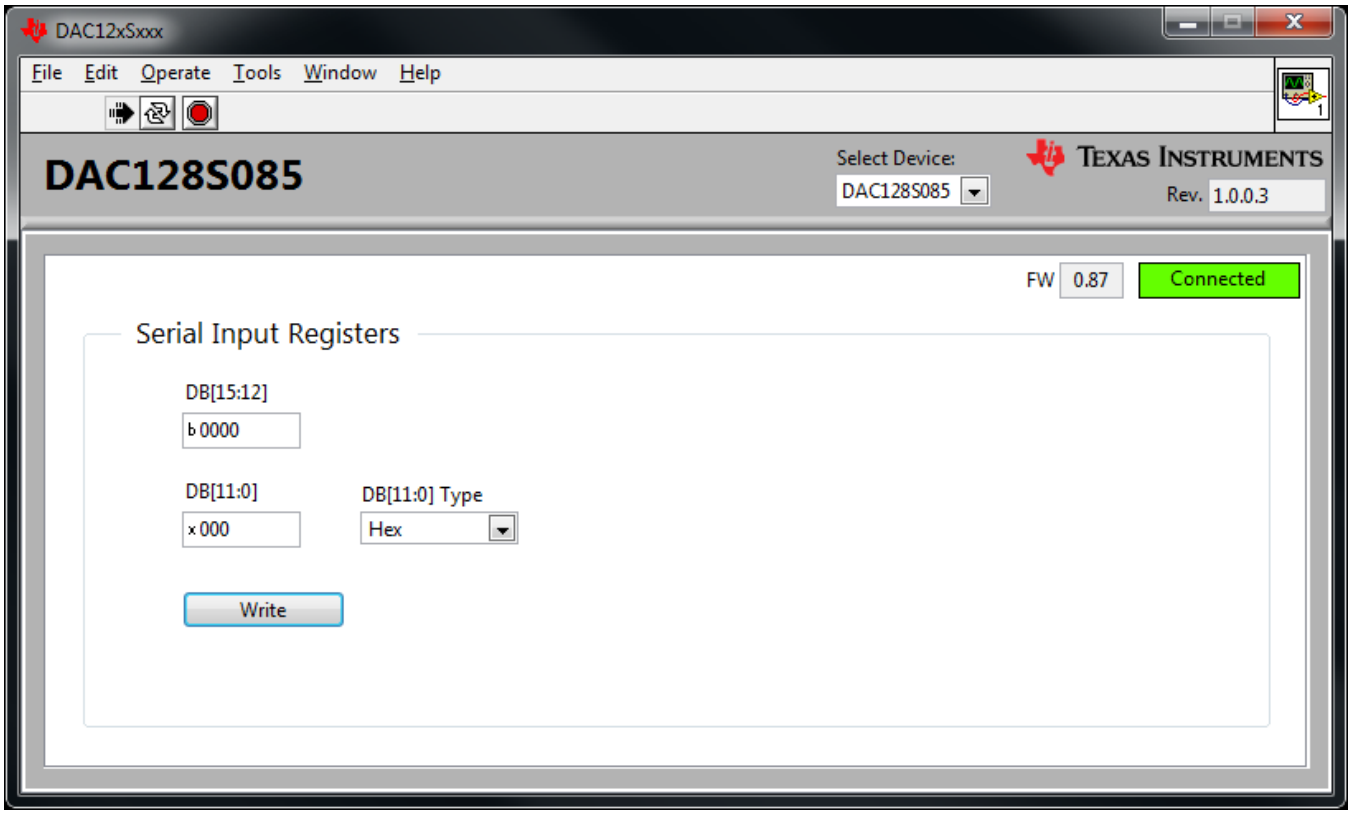

Figure 3-3. Selectable Fields in GUI

3. 3. Quick start:
   - a. Write “1001” to DB[15:12] to switch into WTM mode
   - b. Write “0000” to DB[15:12] and “800” to DB[11:0] to select channel A and set channel A output to Vref/2 of 2.048V.

Board Layout

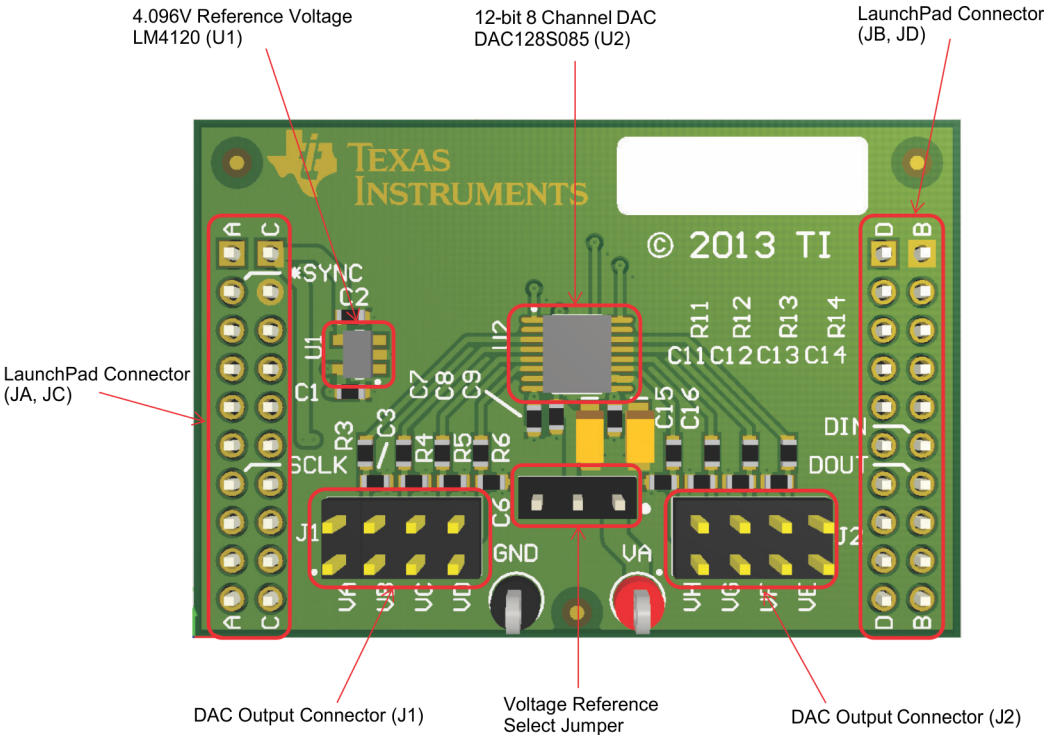

Figure 4-1. Top Assembly Layer

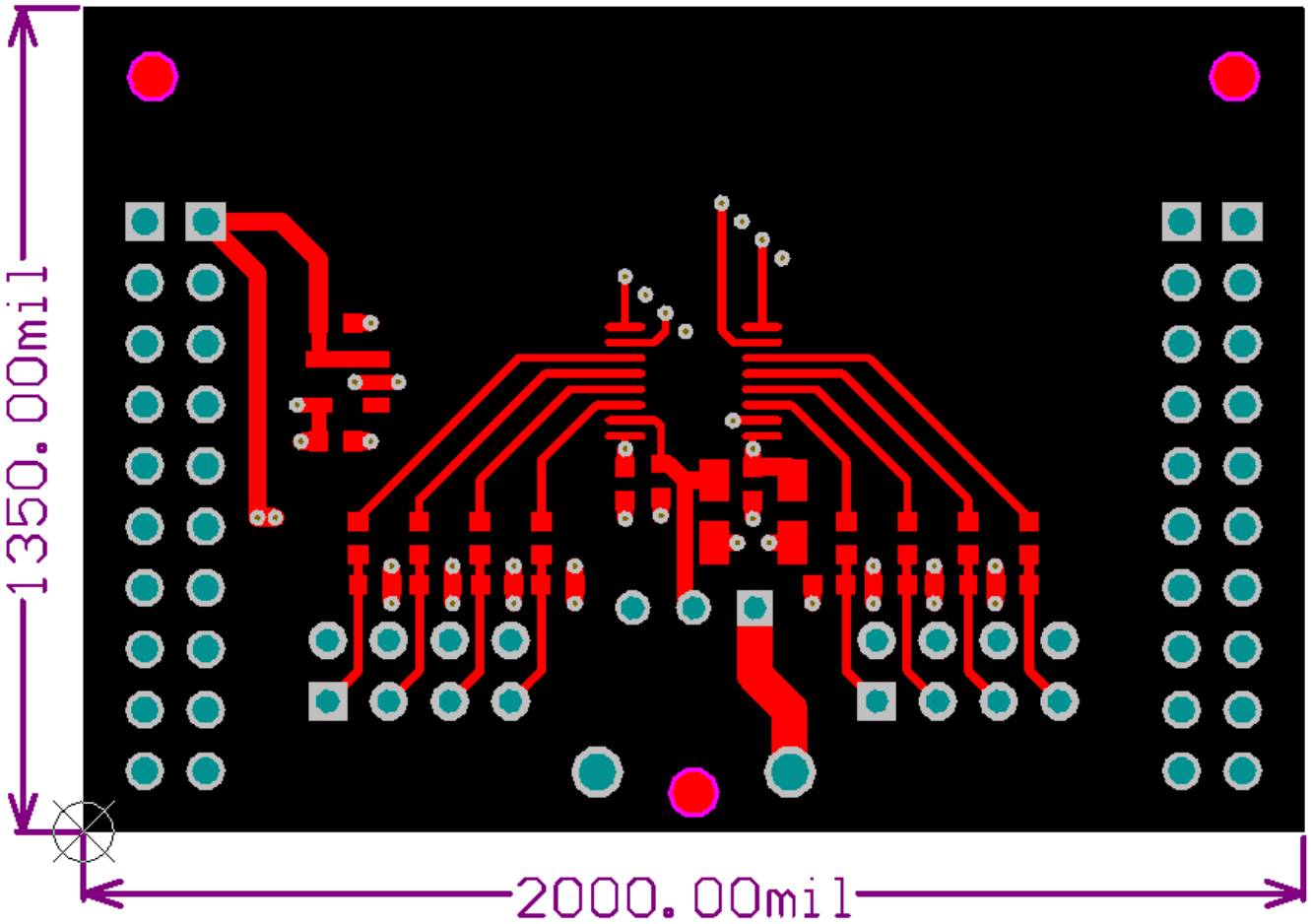

Figure 4-2. Top Layer Routing

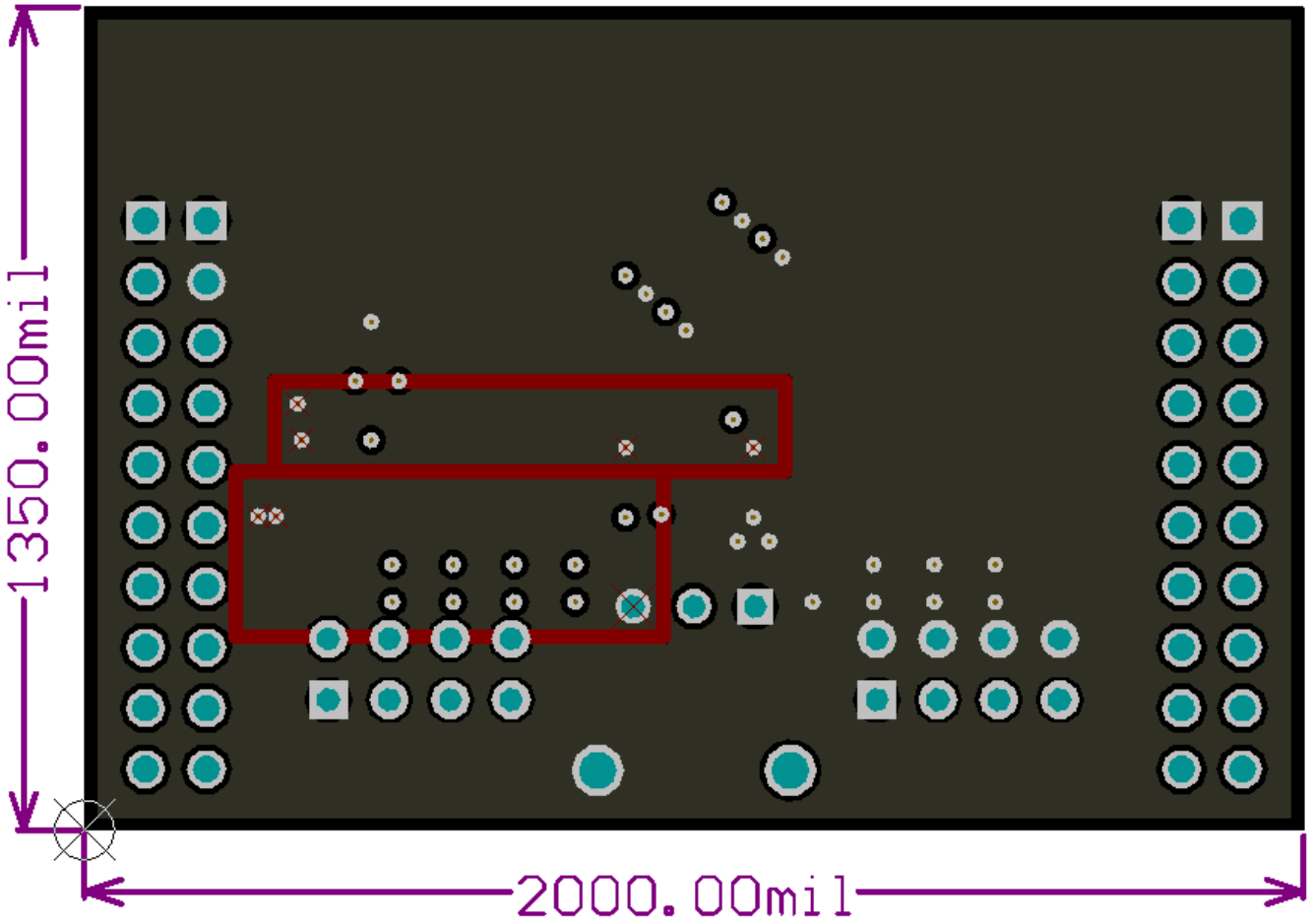

Figure 4-3. Power Layer Routing

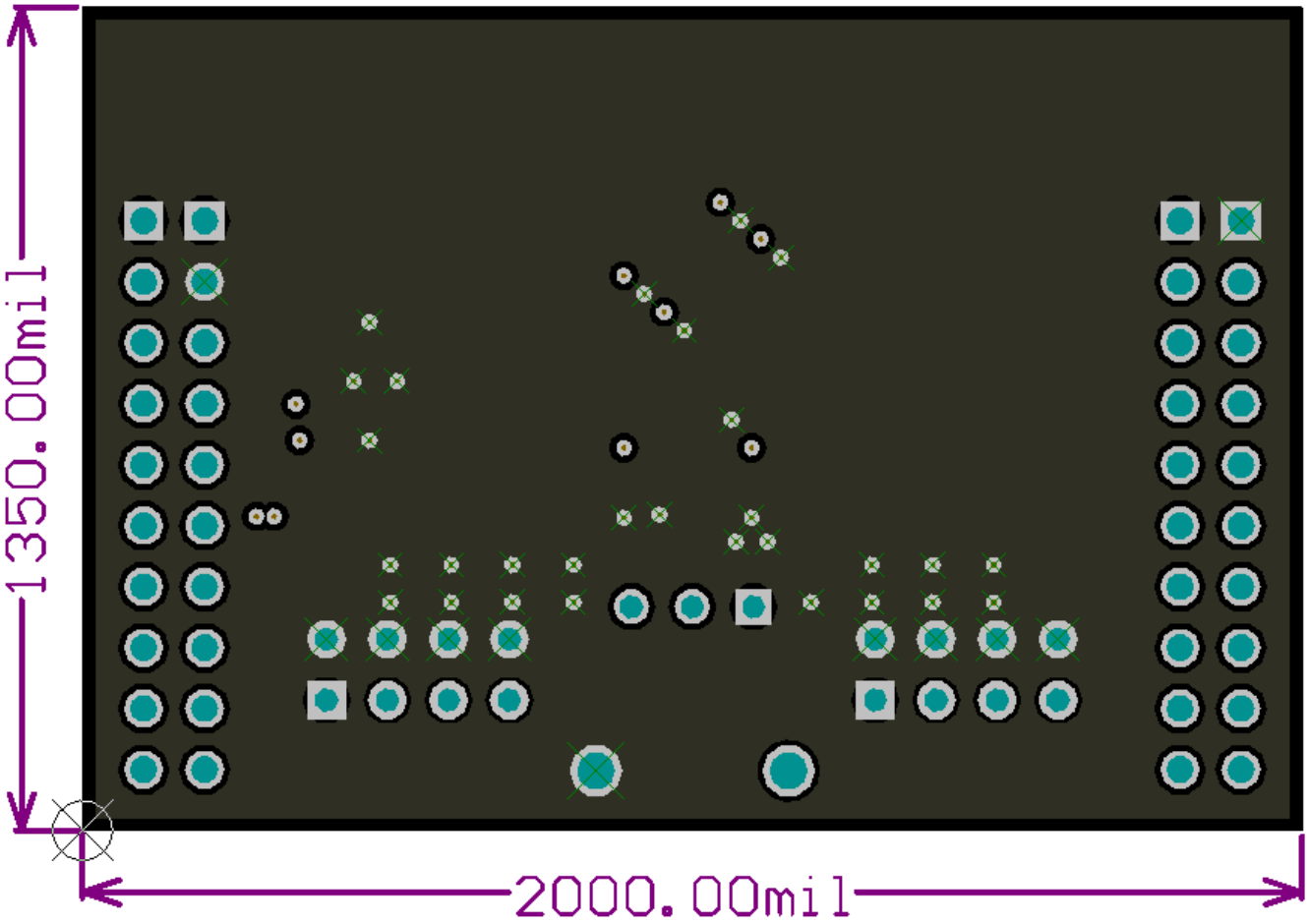

Figure 4-4. Ground Layer Routing

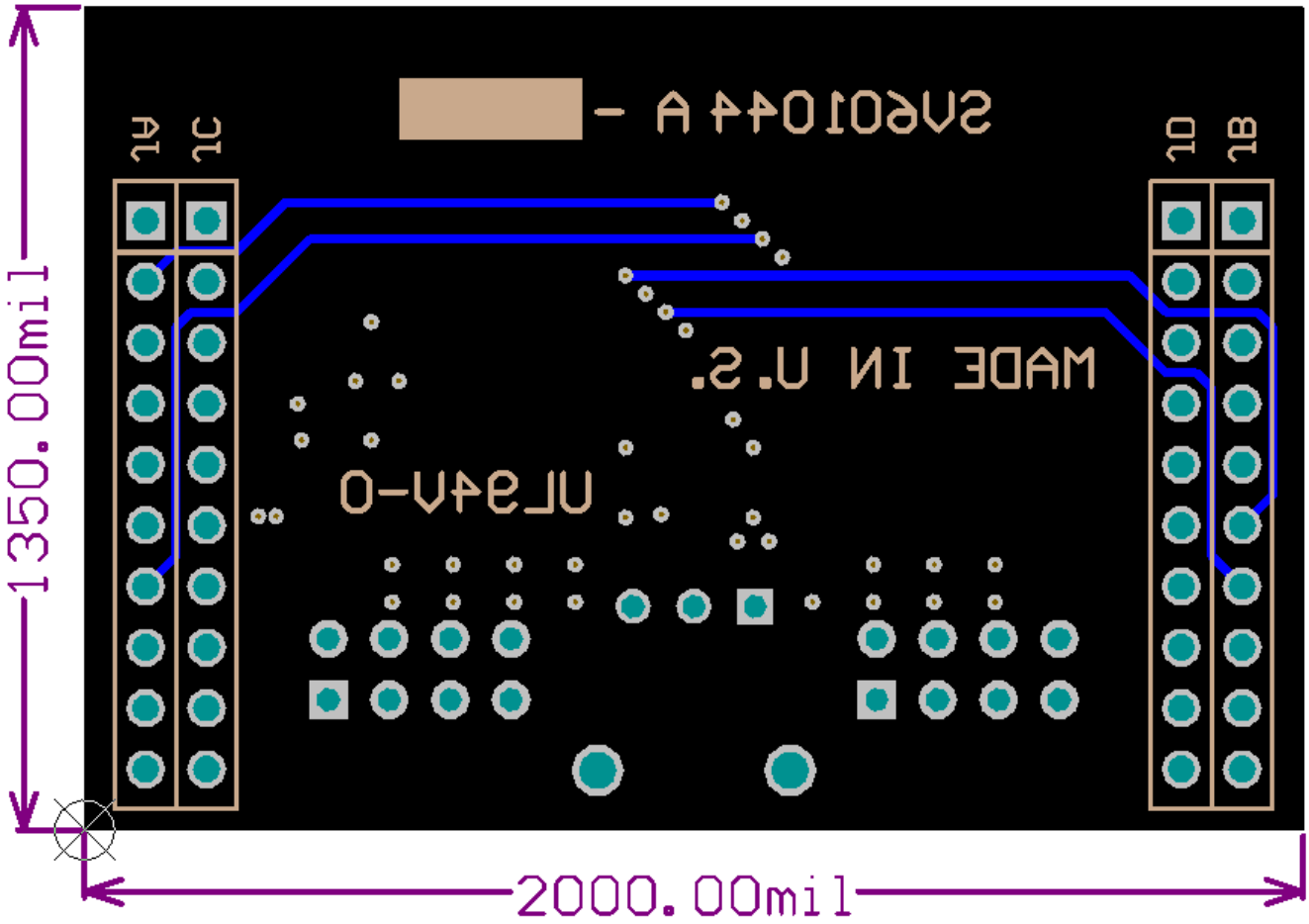

Figure 4-5. Bottom Layer Routing

Schematic

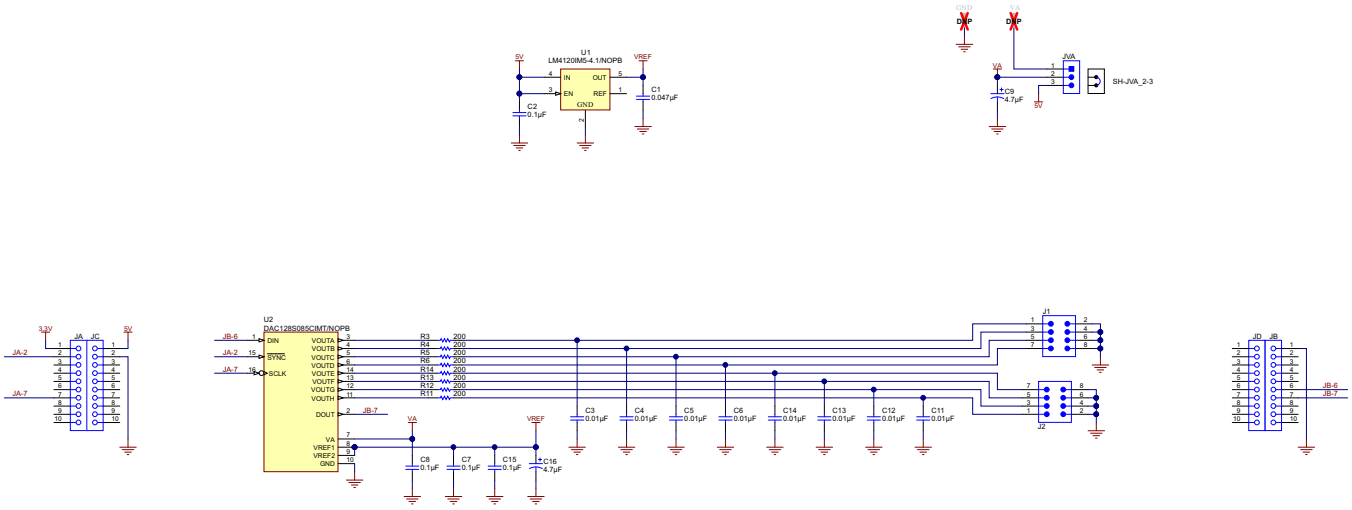

Figure 5-1. DAC128S085EVM Schematic

Bill Of Materials

Table 6-1. DAC128S085 Bill of Materials

Designator	Quantity	Value	Description	PartNumber	Manufacturer
!PCB	1		Printed Circuit Board	SV601044	Any
C1	1	0.047uF	CAP, CERM, 0.047uF, 6.3V, +/-10%, X7R, 0603	GRM188R70J473KA01D	MuRata
C2, C7, C8, C15	4	0.1uF	CAP, CERM, 0.1uF, 10V, +/-10%, X7R, 0603	C0603C104K8RACTU	Kemet
C3, C4, C5, C6, C11, C12, C13, C14	8	0.01uF	CAP, CERM, 0.01uF, 25V, +/-10%, X7R, 0603	GRM188R71E103KA01D	MuRata
C9, C16	2	4.7uF	CAP, TA, 4.7uF, 10V, +/-10%, 1.4 ohm, SMD	TPSA475K010R1400	AVX
J1, J2	2		Header, TH, 100mil, 4x2, Gold plated, 230 mil above insulator	TSW-104-07-G-D	Samtec
JA, JB, JC, JD	4		Connector, Receptacle, 100mil, 10x1, Gold plated, TH	SSW-110-23-F-S	Samtec
JVA	1		Header, 100mil, 3x1, Tin plated, TH	PEC03SAAN	Sullins Connector Solutions
LBL1	1		Thermal Transfer Printable Labels, 0.650" W x 0.200" H - 10,000 per roll	THT-14-423-10	Brady
R3, R4, R5, R6, R11, R12, R13, R14	8	200	RES, 200 ohm, 1%, 0.1W, 0603	CRCW0603200RFKEA	Vishay-Dale
SH-JVA_2-3	1	1x2	Shunt, 100mil, Gold plated, Black	382811-6	AMP
U1	1		Precision Micropower Low Dropout Voltage Reference, 5-pin SOT-23, Pb-Free	LM4120IM5-4.1/NOPB	Texas Instruments
U2	1		12-Bit Micro Power OCTAL Digital-to-Analog Converter with Rail-to-Rail Outputs, 16-pin TSSOP, Pb-Free	DAC128S085CIMT/NOPB	Texas Instruments
FID1, FID2, FID3	0		Fiducial mark. There is nothing to buy or mount.	N/A	N/A
GND	0	Black	Test Point, TH, Multipurpose, Black	5011	Keystone Electronics
VA	0	Red	Test Point, TH, Multipurpose, Red	5010	Keystone Electronics

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