

TheUno V2.0 - Building the board

Author:

Joel - MyFreescaleWebPage

<http://myfreescalewebpage.free.fr>

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Revisions

Version	Date	Changes
1.0	2012-04-01	First release of the document
1.1	2012-08-19	Minor updates
1.2	2013-03-16	Installation of CodeWarrior and USBDM removed, now referring to separated tutorials
1.3	2014-06-01	First programming of the microcontroller added

Introduction

This document explains how to build TheUno. It first shows step by step how to easily build the board and then how to install CodeWarrior developing environment and the USBDM debugging cable.

1 Building the board

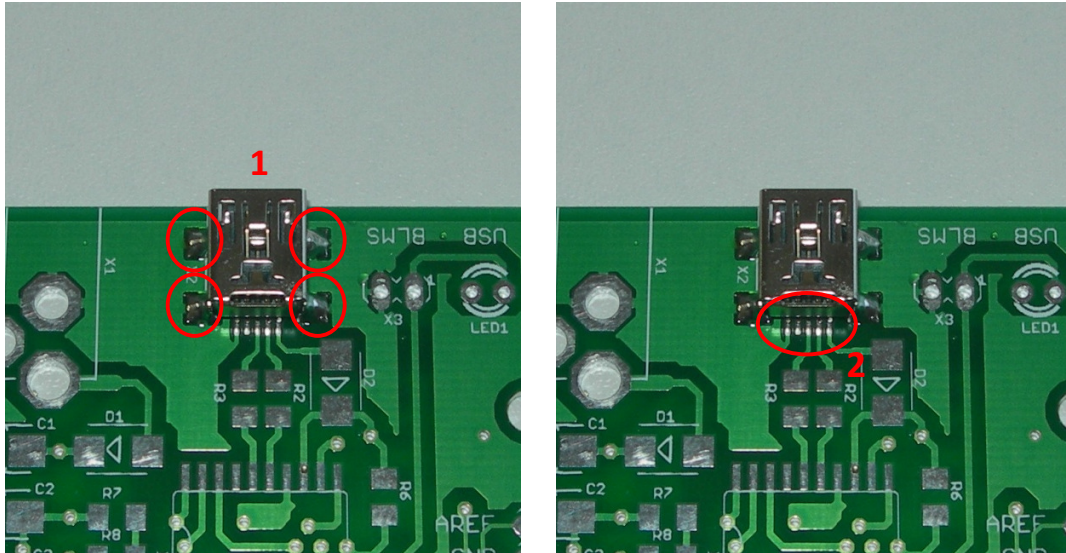
The board is very easy to build. You will need the components and the PCB, a simple soldering station, 0.02" solder and 0.1" desoldering braid.



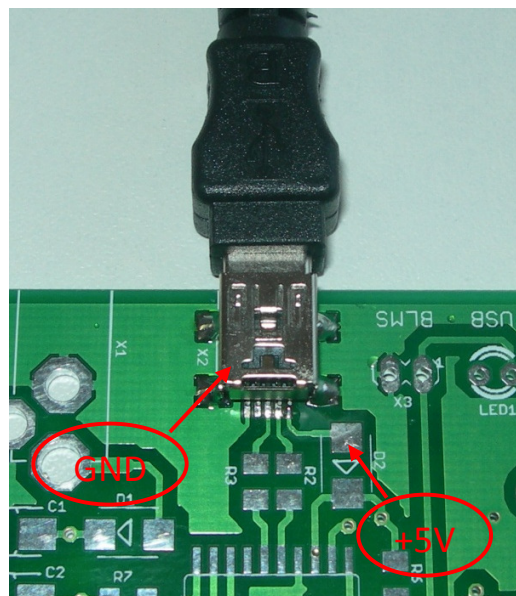
Carefully follow the following explanations to quickly get your board.

Step 1: X2.

The first step is to solder the USB connector. To do it, place the USB connector on the PCB and start fixing the 4 pads to maintain the connector on the PCB. Finally check that the 5 USB pins are correctly positioned on the PCB and solder them.

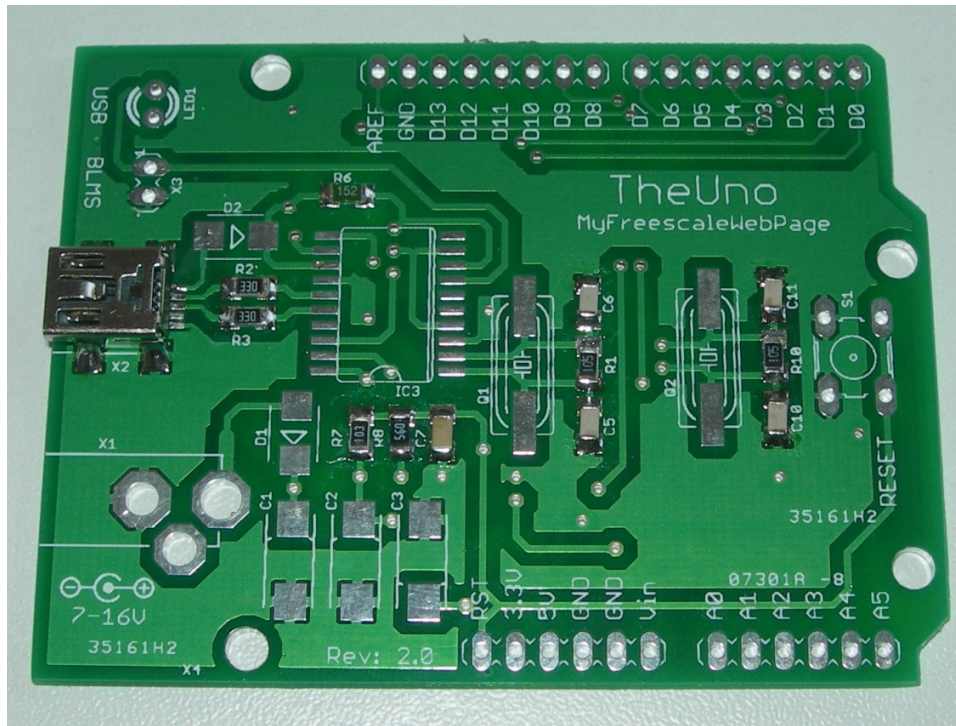


You can finally verify the presence of the 5 volts power supply on D2 connecting an USB cable between your computer and the board.



Step 2: R1, R2, R3, R6, R7, R8, R10, C5, C6, C7, C10, C11.

Thanks to the large packages, the resistors and capacitors are easy too solder on the board. You will get the following result.

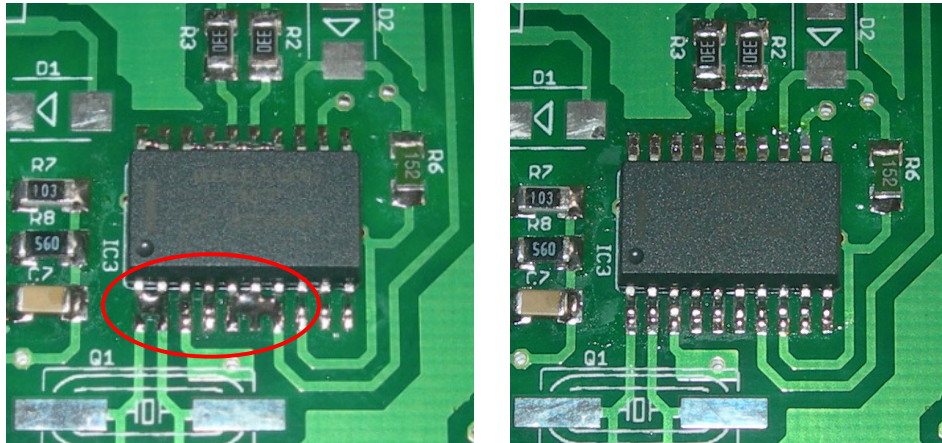


Step 3: IC3.

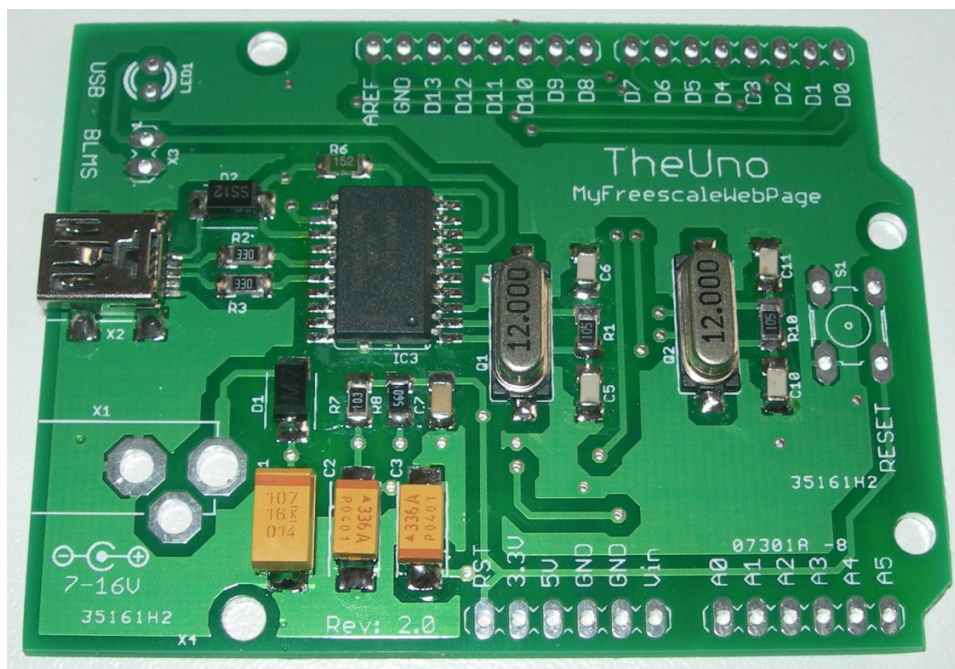
You can now fix the S08JS16 microcontroller on the PCB. Take care to the orientation of the component.

Several techniques can be used to fix integrated circuits. In any case, I recommend first to fix two pins in opposite corners and to verify the correct alignment of all the pins with the PCB before soldering the integrated circuit on the board.

If some pins are solder together as shown below on the left, you can simply use the desoldering braid to get the result on the right.

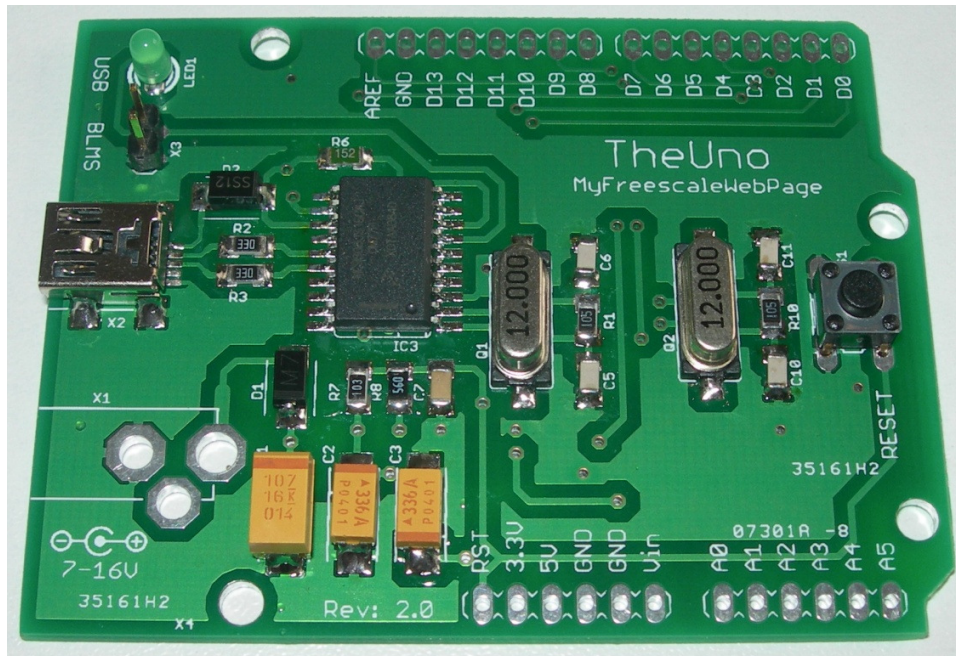


Step 4: D1, D2, C1, C2, C3, Q1, Q2.

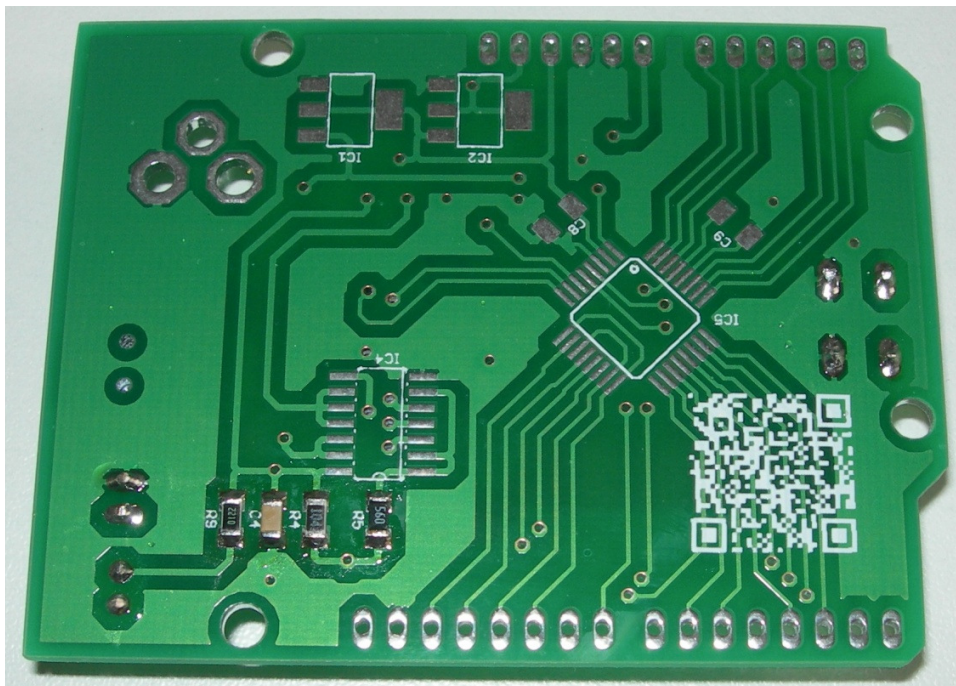


Step 5: LED1, X3, S1.

Take care to the orientation of the LED and to the length of the X3 connector (if the pins are too much long, they will touch the shield).

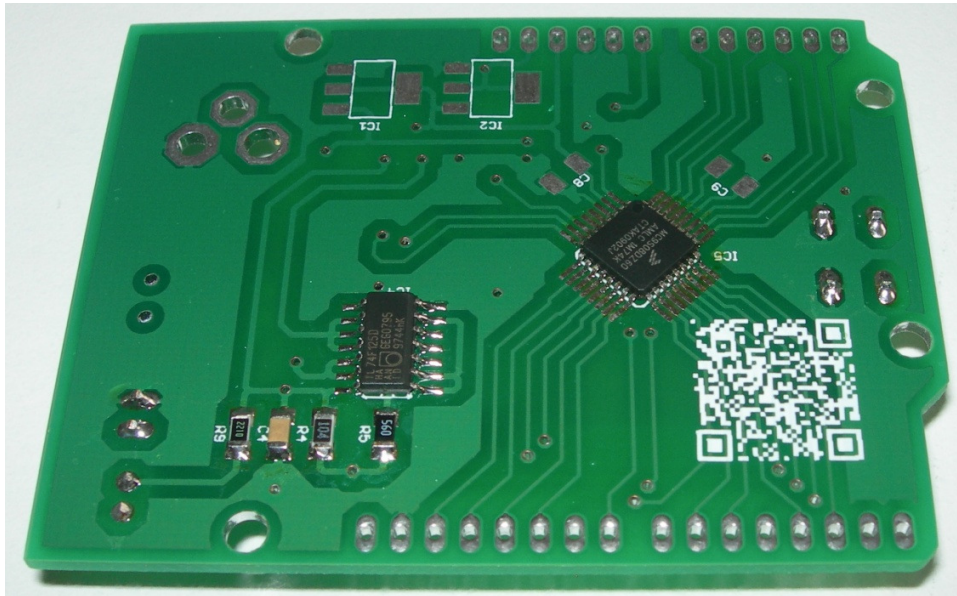


Step 6: R5, R4, C4, R9.

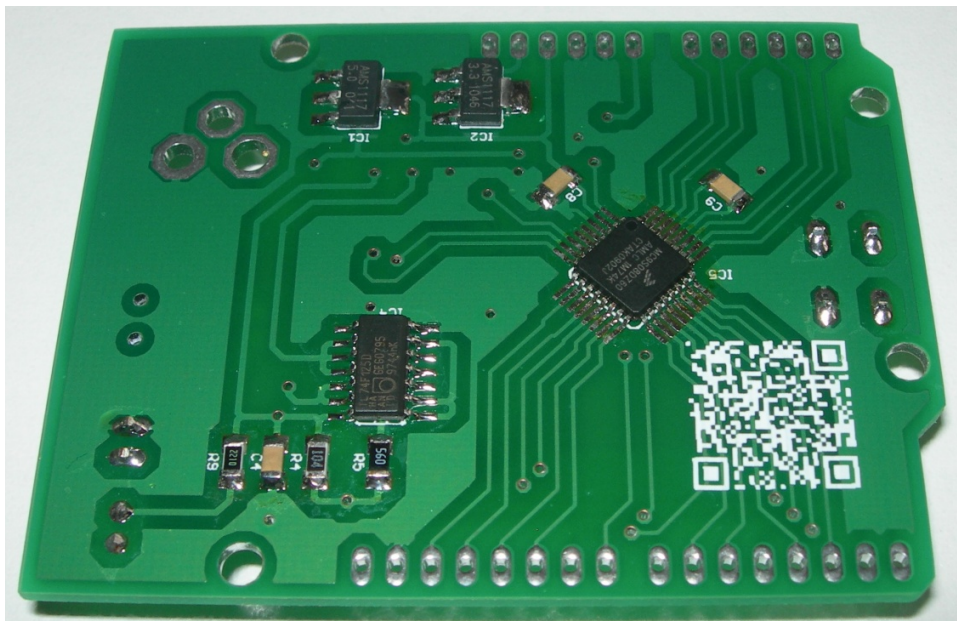


Step 7: IC4, IC5.

You can now solder the 74125 and S08DZ60 integrated circuits as previously done with the S08JS16 microcontroller. Again, take care to the orientation of the components.

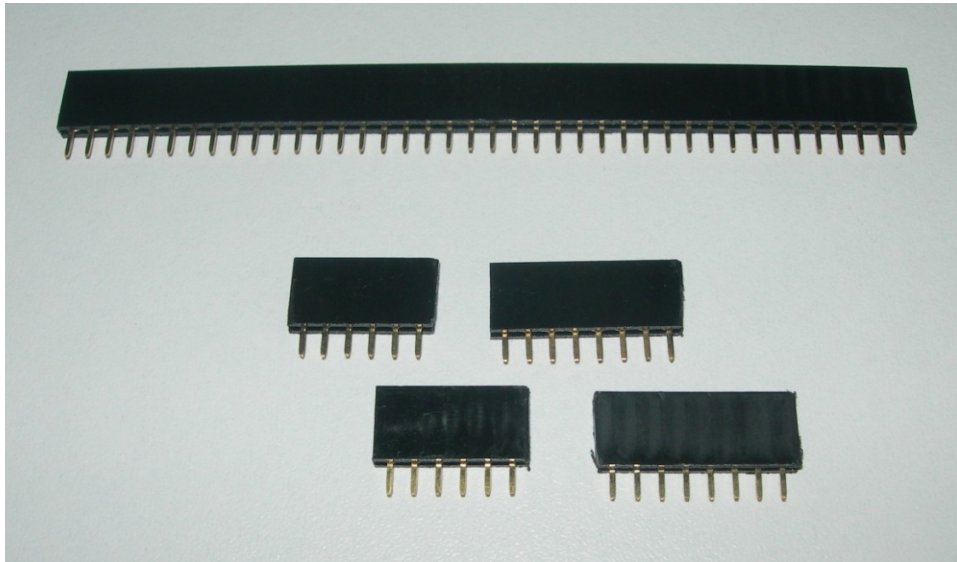


Step 8: C8, C9, IC1, IC2.

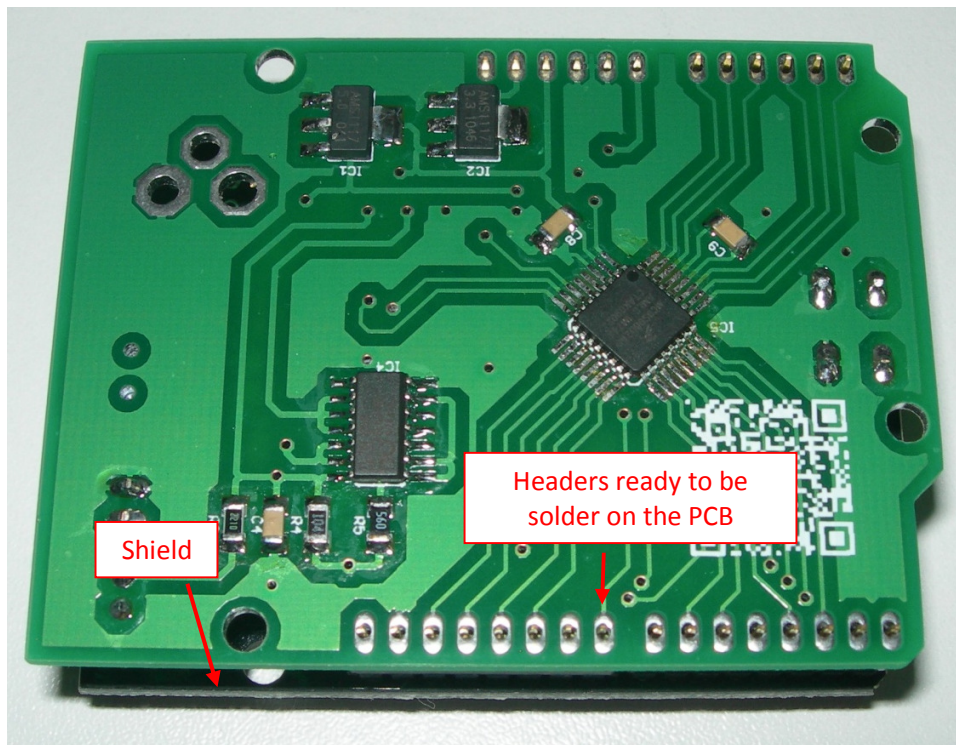


Step 9: X4.

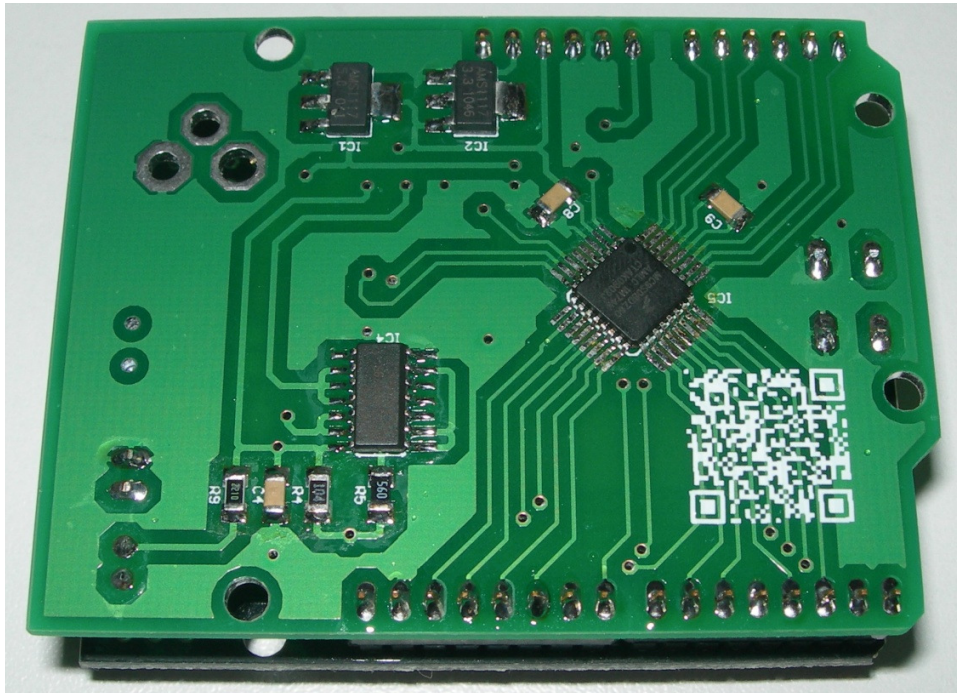
We are now going to install the shield connectors. First prepare two 6-pins and two 8-pins female headers as shown below.



Install the headers on the board. In order to get a perfect result, I recommend you to use a shield. Connect the female headers on the shield and then place the shield on TheUno as shown below.

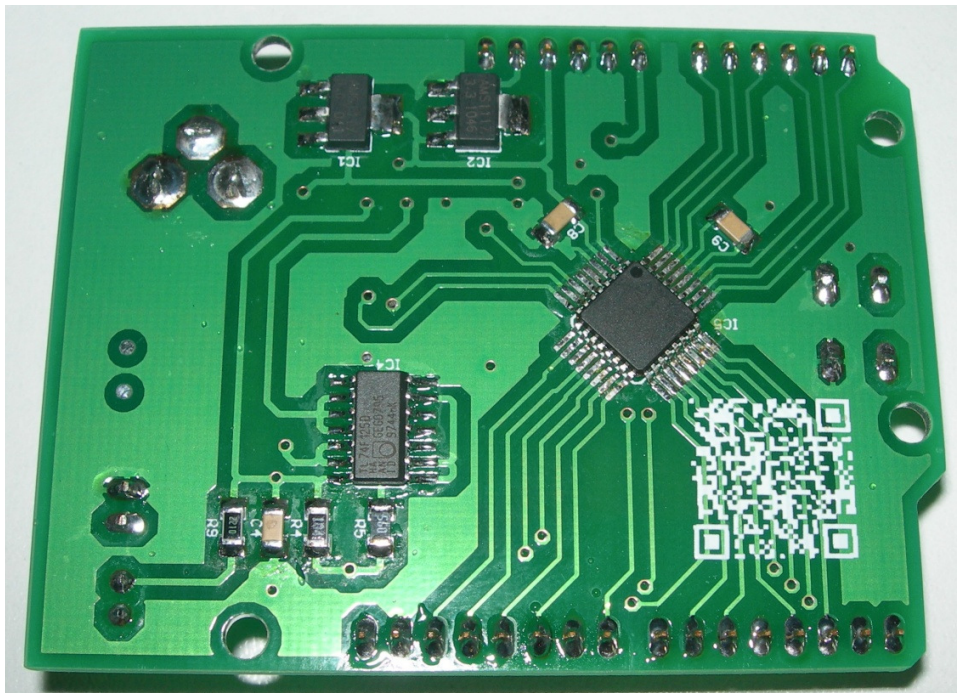


Finally solder the headers and then remove the shield.

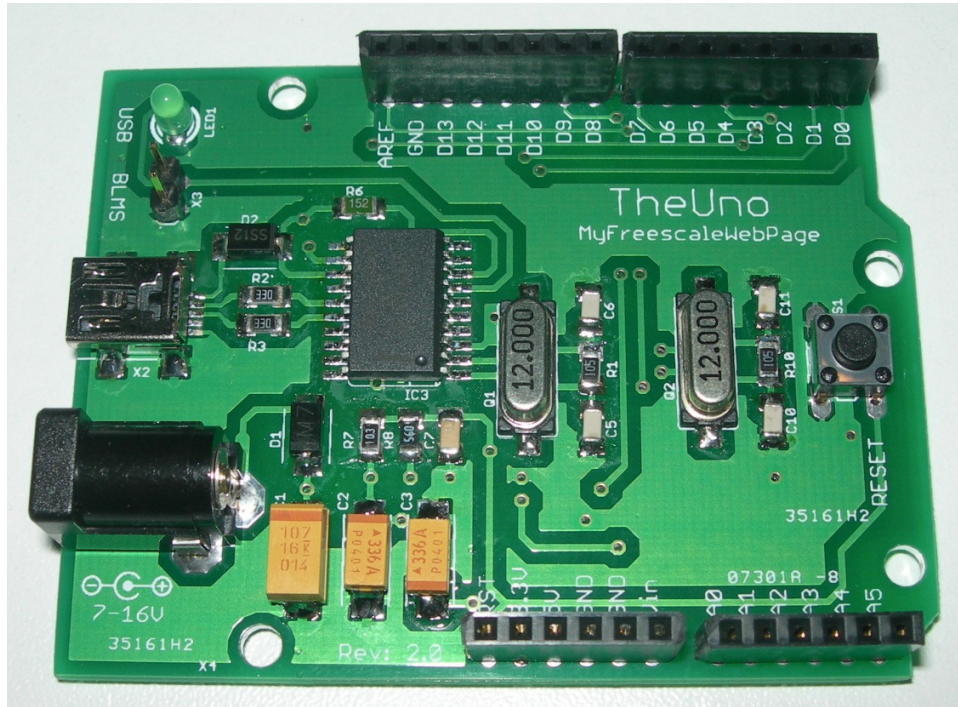


Step 10: X1.

You finally need to fix the power supply connector on the PCB. The holes in the PCB are very large, take care to not put too much solder.



The board is finished.



2 Installation and usage of the USBDM

The installation and usage of the USBDM is now detailed on my website:

<http://myfreescalewebpage.free.fr/toolbox/usbdm/usbdm.htm>.

Note that the S08DZ60 microcontroller may be "secured" the first time you attempt to perform the programming. This means that the content of the Flash memory is protected and the USBDM fails to program the microcontroller in this case. To unsecure the device, first power off the board, make a short circuit on BKGD signal (available on R4 or R5) with the ground and connect the board to you computer with an USB cable throw X2. Finally remove the short circuit and load your program. This should now succeed. This step is no more required after that, following programming can be done as usual.

Conclusion

You are now ready to use TheUno and create powerful projects with all the shields available today. Thanks to the integrated USBDM, you will be able to debug your applications easily.

If you have never worked with the USBDM or with CodeWarrior environment, you can visit my website and find tutorials at: <http://myfreescalewebpage.free.fr/theuno/index.htm>.