

mikroBoard for ARM 144-pin™

User manual

All MikroElektronika's development systems represent irreplaceable tools for programming and developing microcontroller-based devices. Carefully chosen components and the use of machines of the last generation for mounting and testing thereof are the best guarantee of high reliability of our devices. Due to simple design, a large number of add-on modules and ready to use examples, all our users, regardless of their experience, have the possibility to develop their project in a fast and efficient way.

Development system

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Nebojsa Matic
General Manager

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1. General information

MikroBoard for ARM 144-pin is primarily intended to be connected to the EasyARM v6 development system but can also be used as a stand-alone device. The board features the LPC2214 microcontroller, flash module, USB connector, microSD connector, JTAG connector, USB UART, voltage regulator and connectors that enable connection with the development system.

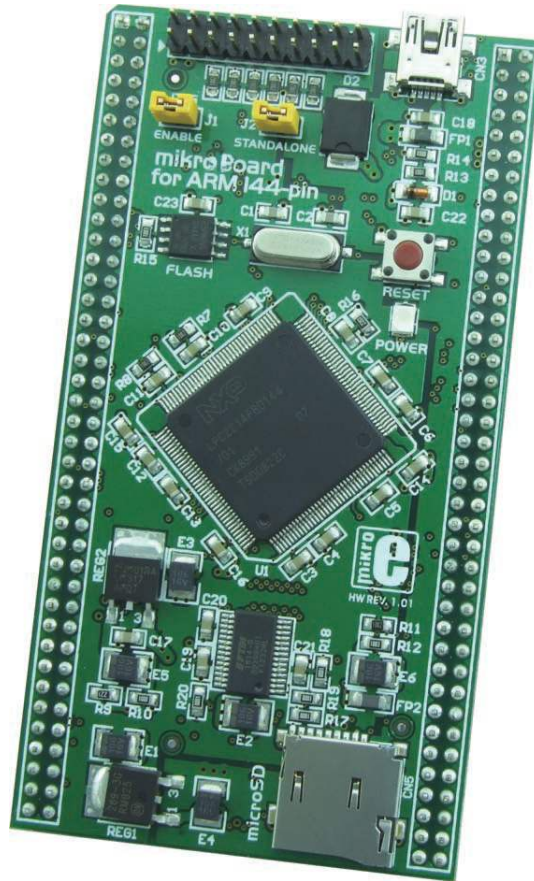


Figure 1-1: mikroBoard for ARM 144-pin

2. LPC2214 microcontroller

The LPC2214 microcontroller in 144-pin LQFP package is soldered on the mikoBoard for ARM 144-pin. Some of its key features are:

- 16/32-bit ARM7TDMI-S microcontroller in a LQFP144 package
- 16 kB on-chip static RAM and 256 kB on-chip flash program memory. 128-bit wide interface/accelerator enables high speed 60 MHz operation.
- In-System Programming (ISP) and In-Application Programming (IAP) via on-chip bootloader software.

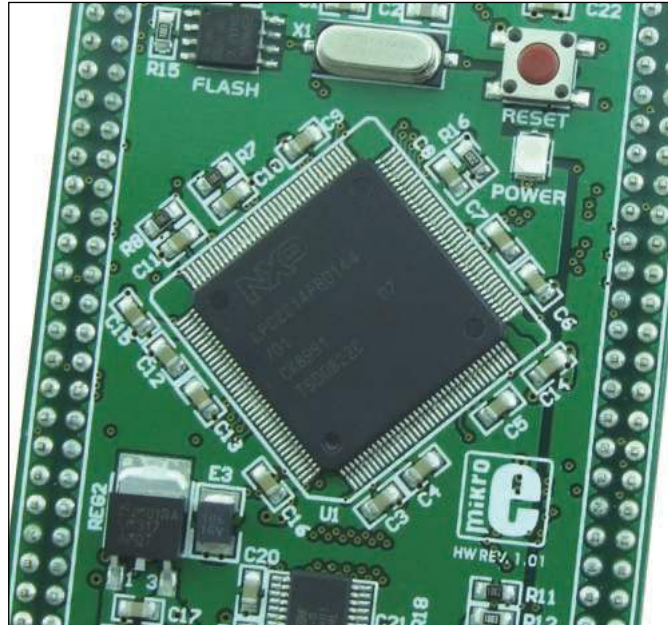


Figure 2-1: LPC2214 microcontroller

LPC2214 is connected to on board modules via pins which are also connected to CN1 and CN2 connectors. These two connectors enable the board to be connected to the EasyARM v6 development system or some other device.

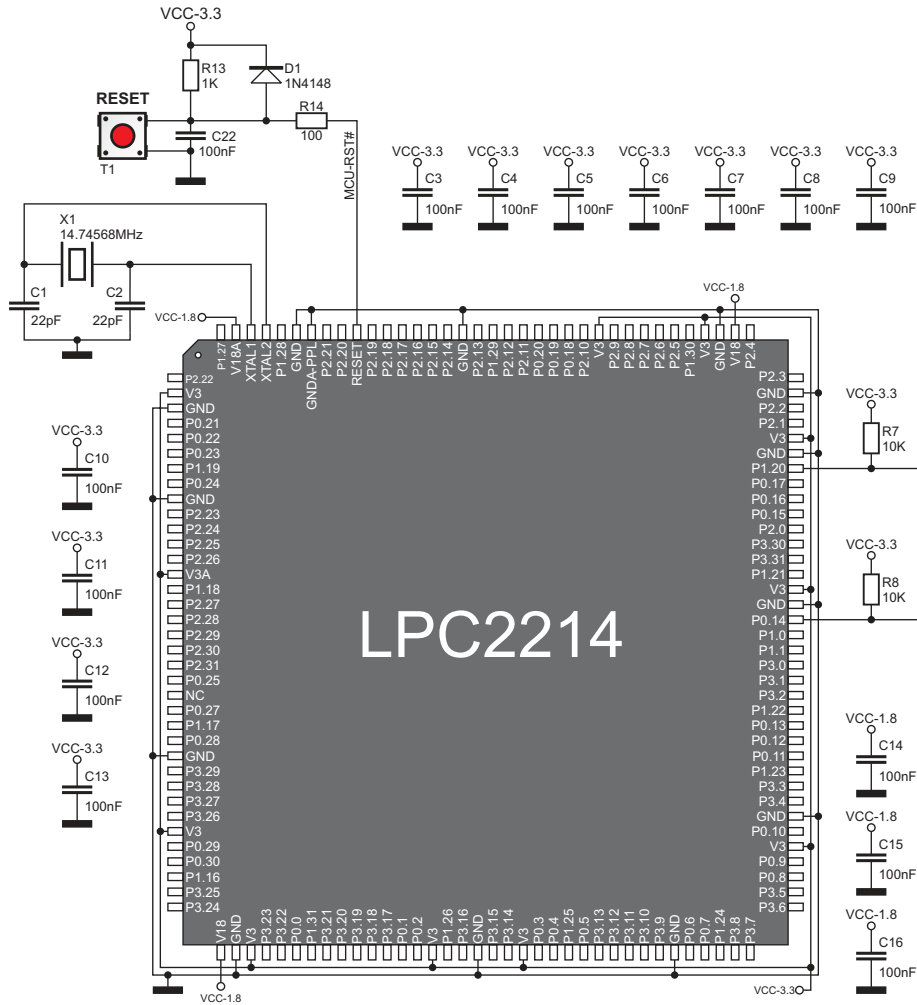


Figure 2-2: LPC2214 microcontroller with oscillators connection schematic

The LPC2214 microcontroller is connected to the X1 oscillator. The X1 oscillator generates a clock used for the operation of the microcontroller. The microcontroller can be cleared by feeding the reset pin with a logic 0, i.e. by pressing the RESET button.

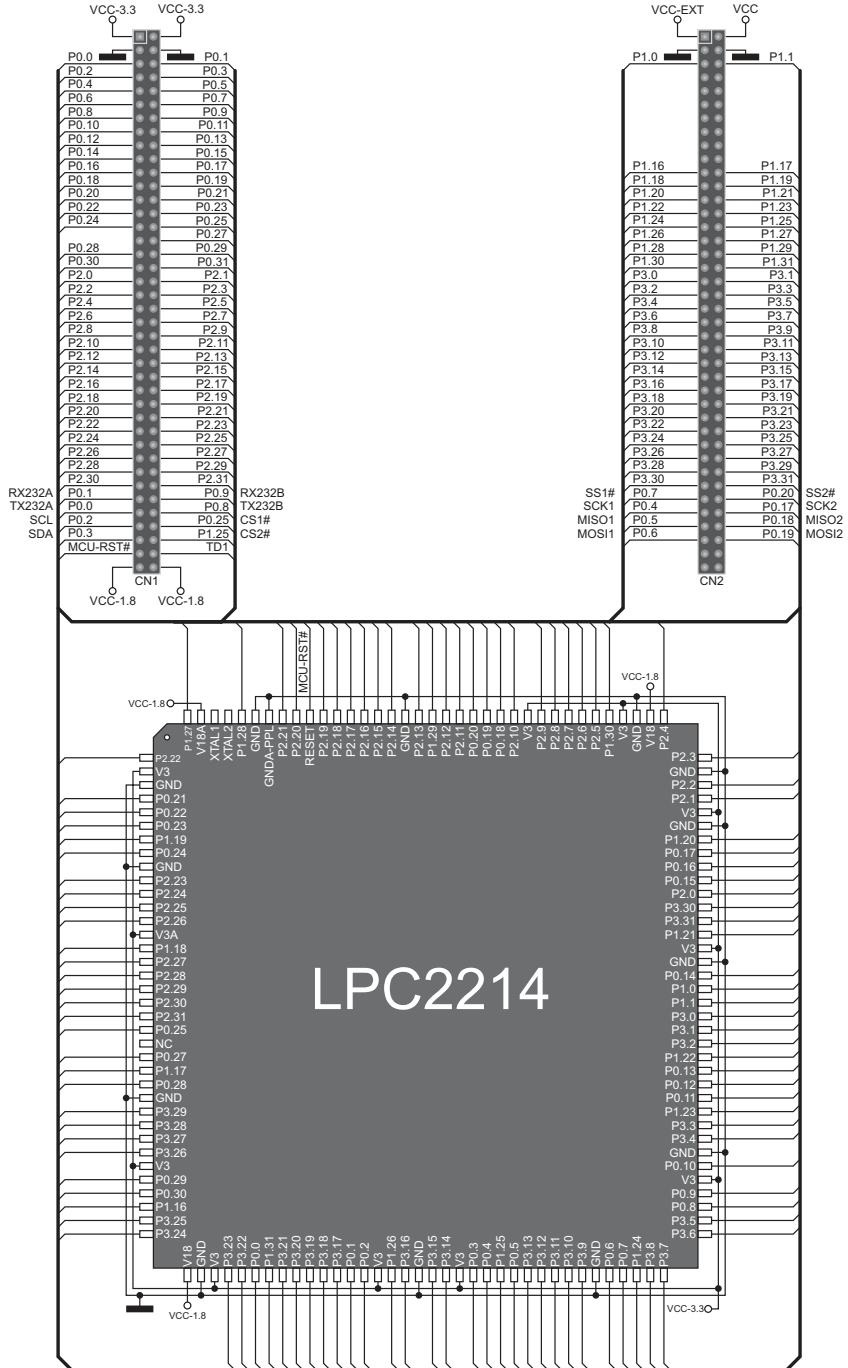


Figure 2-3: LPC2214 microcontroller with connectors connection schematic

3. Programming the microcontroller

The microcontroller can be programmed with a bootloader or the JTAG programmer. The use of bootloader is enabled due to the bootloader code that is loaded into the microcontroller. In order to program the microcontroller with the bootloader, it is necessary to connect the board to a PC via the CN3 connector and USB cable, Figure 3-1. A .hex code is transferred from the PC to the microcontroller by using some of the bootloader programs, such as Flash Magic.

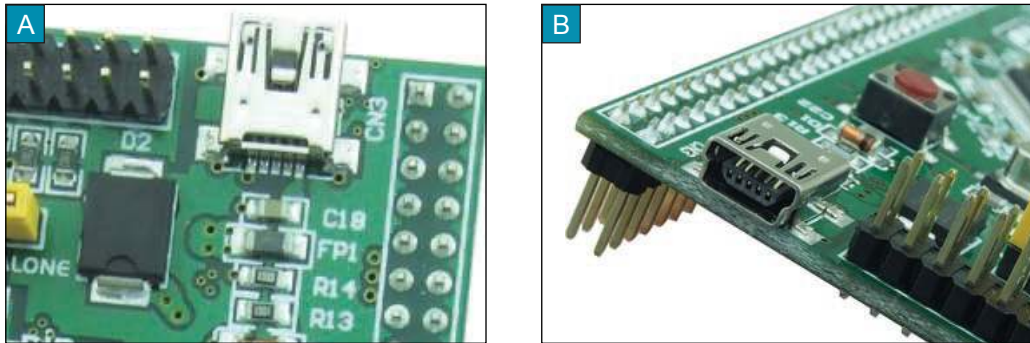


Figure 3-1: USB connector for programming

The CN3 USB connector is connected to the UART module built into the microcontroller via FTDI module (FT232RL).

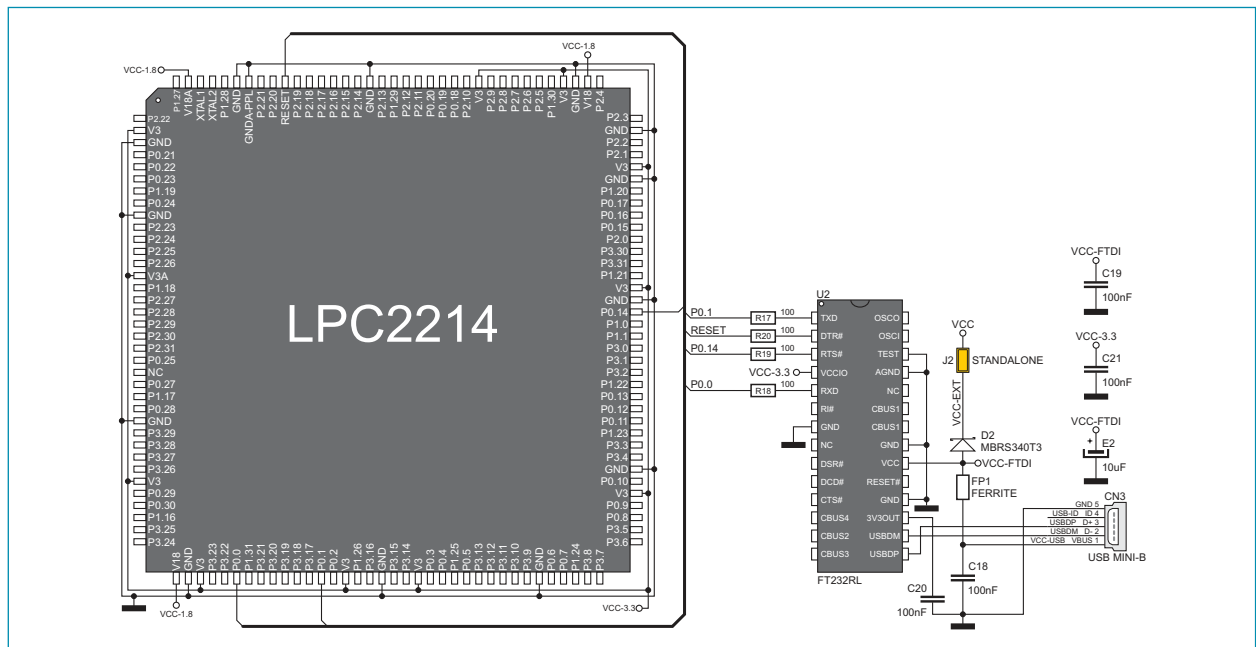
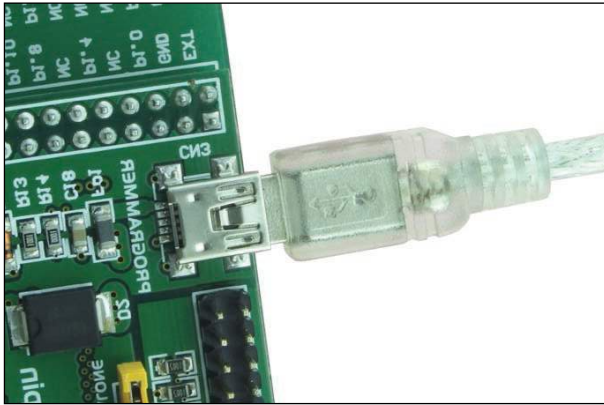


Figure 3-2: USB UART module connection schematic

When the mikroBoard for ARM 144-pin operates as a stand-alone device, it is necessary to place jumper J2 on the board. If the board is connected to the EasyARM v6 development system, jumper J2 should be removed.

In next few steps is explained how to program microcontroller with bootloader via Flash Magic application.

STEP 1: Connect the system to a PC



Connect the mikroBoard for ARM 144-pin to available USB port on your PC.

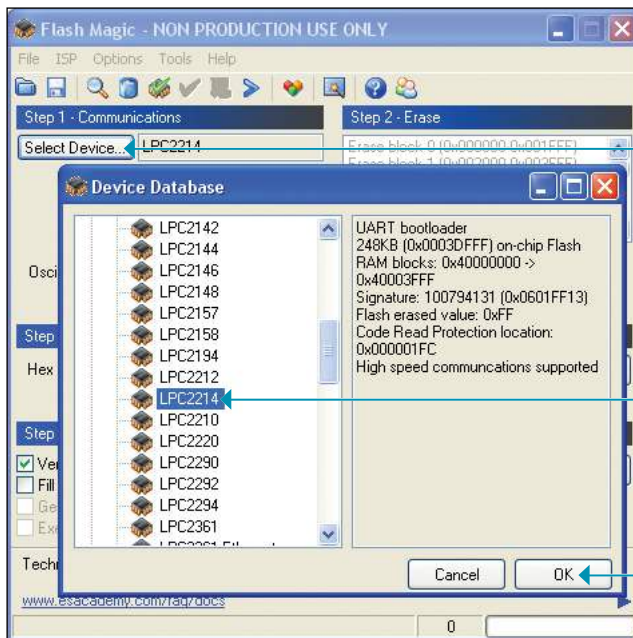
STEP 2: Start Flash Magic

Download the Flash Magic application from <http://www.flashmagictool.com/download.html&d=FlashMagic.exe> and install it on your PC

When the installation is finished double click on the Flash Magic icon



STEP 3: Select MCU

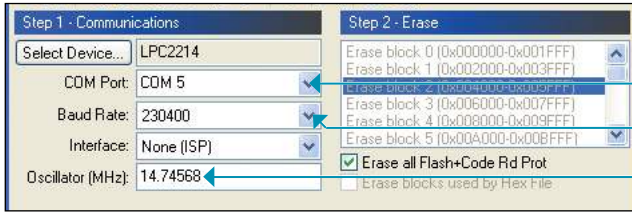


Click on the Select Device button

Select MCU from the list

Click OK

STEP 4: Settings



From drop-down menu select the COM port on your PC

Set Baud Rate to 230400

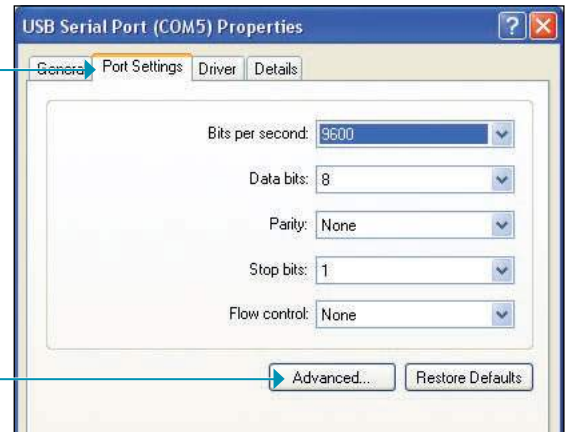
Enter 14.74568 (if you use different oscillator set the appropriate value in MHz)

Device Manager on your PC contains information on which COM port is used for USB communication with the mikroBoard for ARM 144-pin development system. In this case the COM5 port is used.

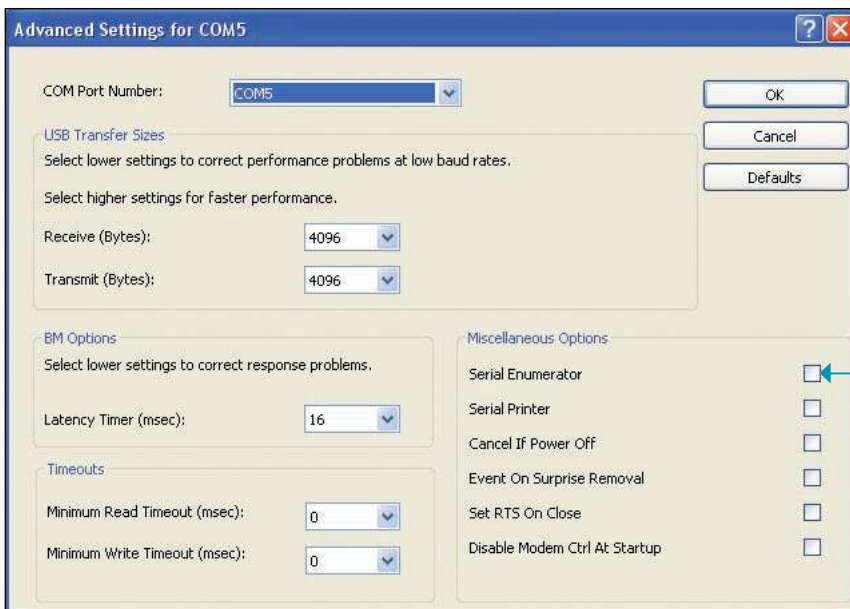


Right click on USB port, then on Properties

From pop-up window select the Port Settings tab

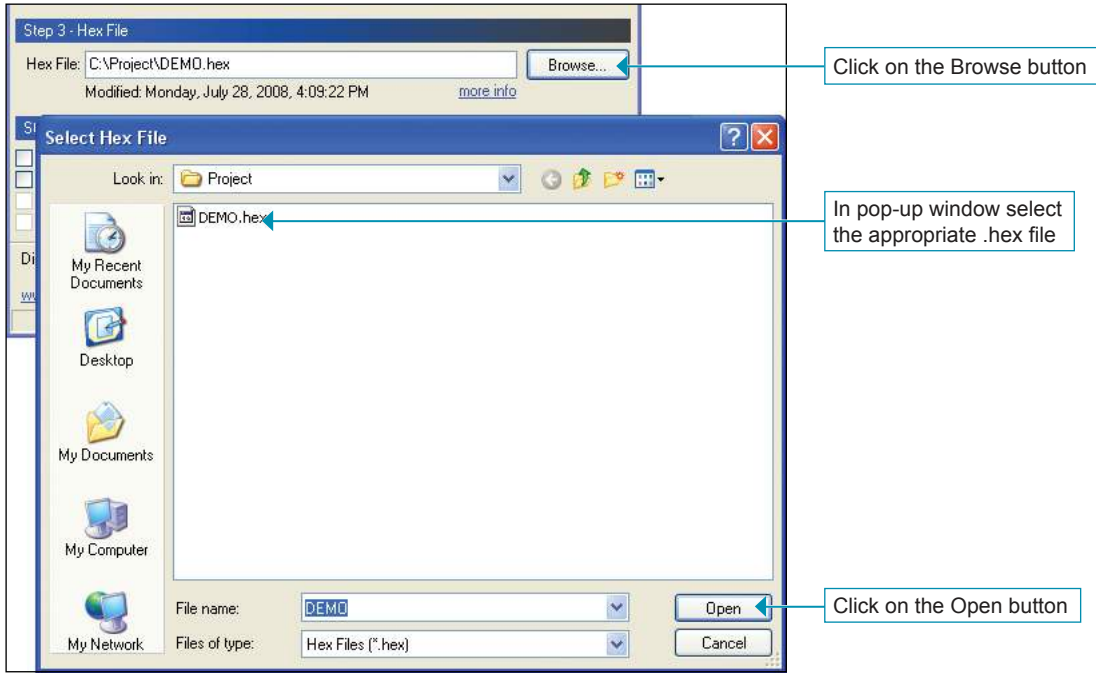


Click on the Advanced... button

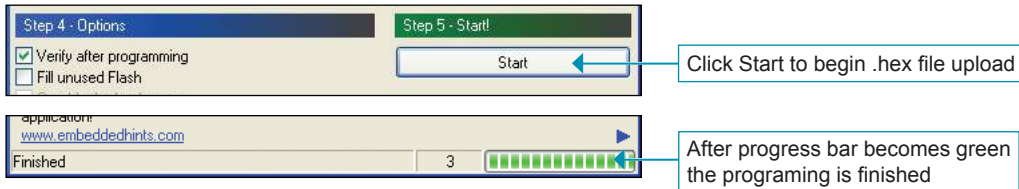


In pop-up window uncheck the Serial Enumeration option and click OK

STEP 5: Browse for .hex file



STEP 6: Upload .hex file



4. Voltage regulator

The microcontroller require dual power supply: 1.8V for CPU and 3.3V for I/O. The board is powered with the 5V power supply voltage via the CN3 USB connector supplied on the board.

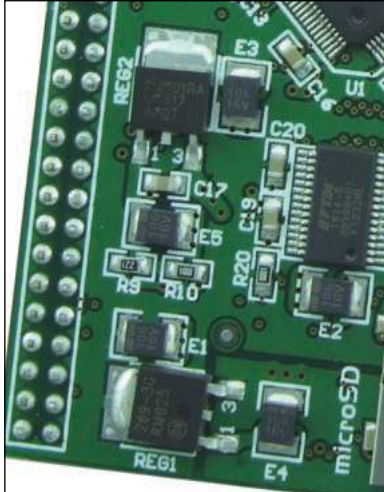


Figure 4-1: Voltage regulator

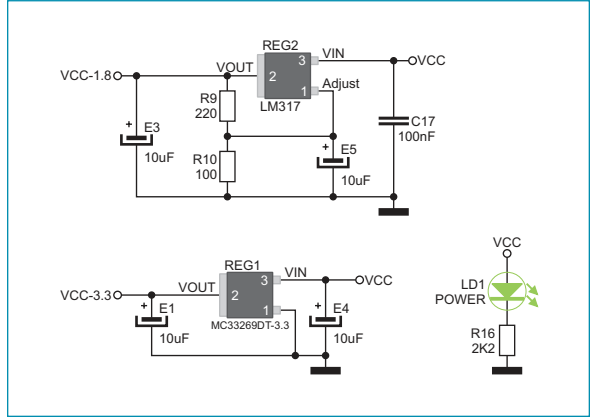


Figure 4-2: Voltage regulator connection schematic

If the board is powered by the development system (EasyARM v6), the function of the voltage regulator remains the same. In this case, it is necessary to remove jumper J2 (STANDALONE), Figure 4-3.



Figure 4-3: Standalone mode disabled



Figure 4-4: Standalone mode enabled

6. Flash module

Flash module provides additional 8Mbit of flash memory that the microcontroller can use via the Serial Peripheral Interface (SPI).



Figure 6-1: Flash memory

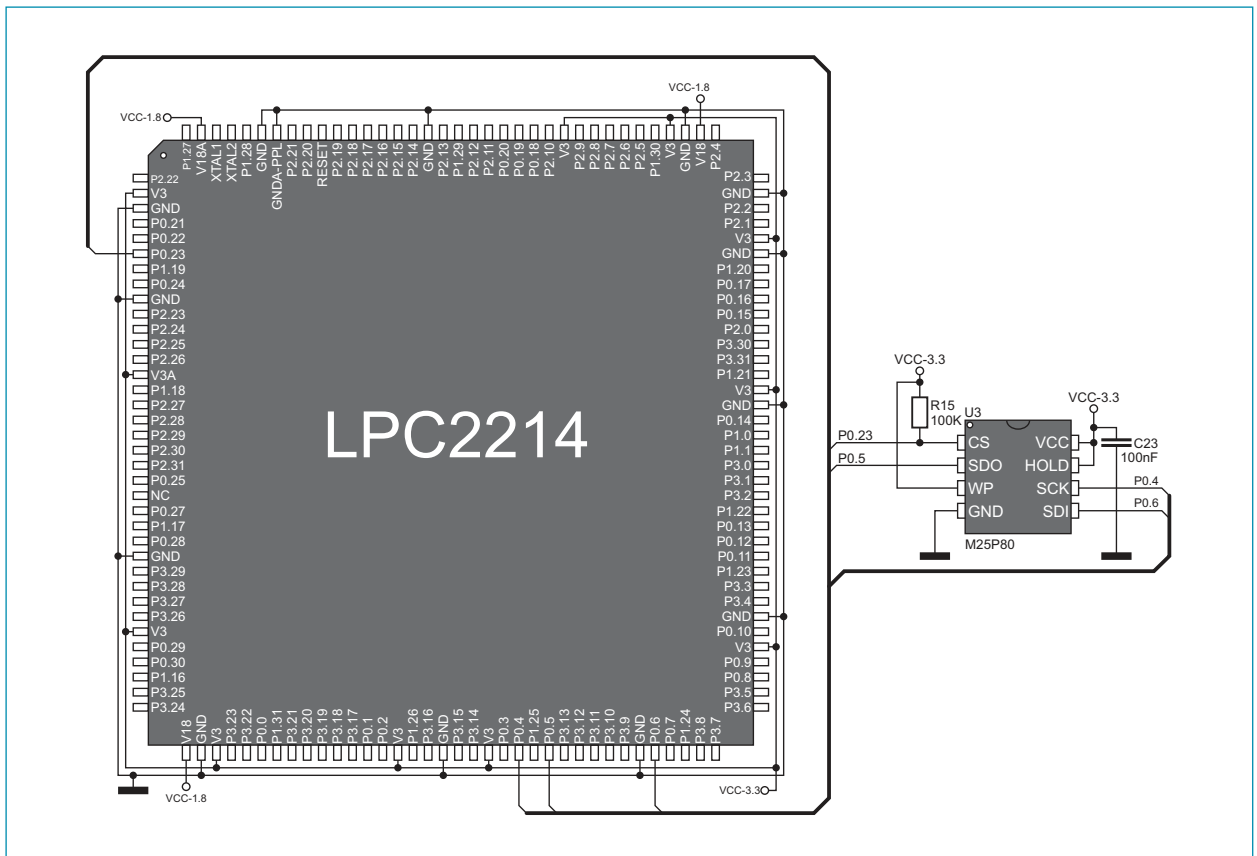


Figure 6-2: Flash module connection schematic

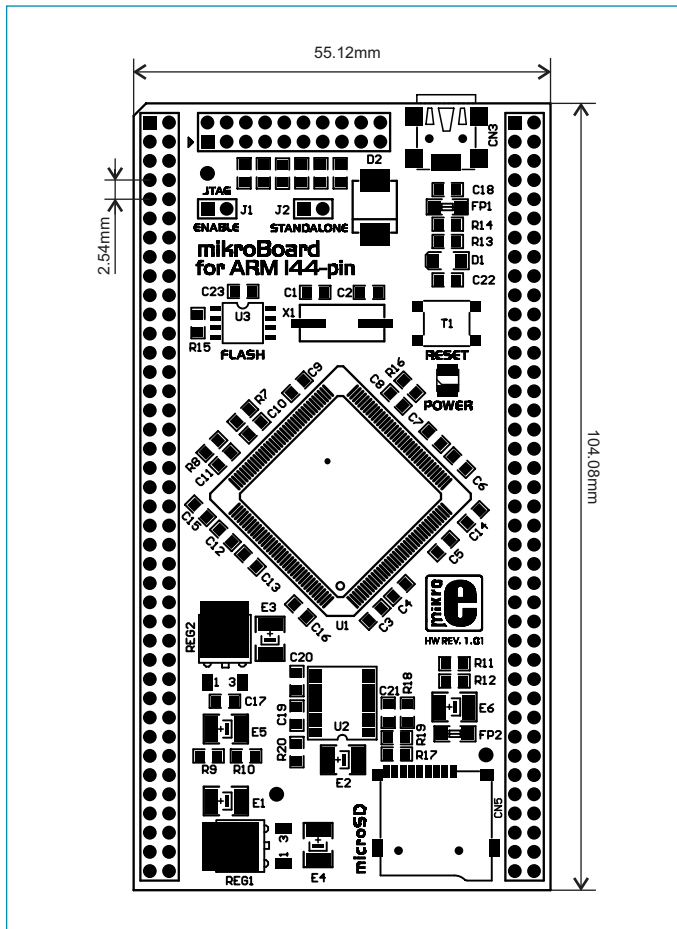


Figure 6-3: Dimensions of the mikroBoard for ARM 144-pin

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