



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





mikromedia™

for XMEGA®

Compact multimedia development system rich with on-board peripherals for all-round development on [ATxmega128A1](#) device



TO OUR VALUED CUSTOMERS

I want to express my thanks to you for being interested in our products and for having confidence in Mikroelektronika.

The primary aim of our company is to design and produce high quality electronic products and to constantly improve the performance thereof in order to better suit your needs.

A handwritten signature in white ink, appearing to read 'N. Matic', is positioned above the name and title of the General Manager.

Nebojsa Matic
General Manager

Table of Contents

Introduction to mikromedia for XMEGA®	4	step 5 - Uploading .HEX file	16
Package Contains	5	step 6 - Progress bar	17
Key Features	6	step 7 - Finishing upload	17
System Specification	7	Programming with external programmer	18
1. Power supply	8	4. Reset Button	20
USB power supply	8	5. Crystal Oscillators	22
Battery power supply	8	6. MicroSD Card Slot	23
2. ATxmega128A1 microcontroller	10	7. Touch Screen	24
Key microcontroller features	10	8. Audio Module	26
3. Programming the microcontroller	11	9. USB UART connection	28
Programming with mikroBootloader	12	10. Accelerometer	30
mikroBootloader software	12	11. Flash Memory	31
Identifying device COM port	14	12. Pads	32
step 1 - Choosing COM port	14	13. Pinout	33
step 2 - Establishing connection	15	14. Dimensions	34
step 3 - Browsing for .HEX file	15	15. Mikromedia Accessories	35
step 4 - Selecting .HEX file	16	16. What's Next	36

Introduction to mikromedia for XMEGA®

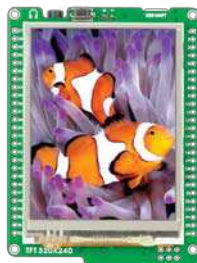
The **mikromedia for XMEGA®** is a compact development system with lots of on-board peripherals which allow development of devices with multimedia contents. The central part of the system is a 8-bit **ATxmega128A1** microcontroller. The mikromedia for XMEGA® features integrated modules such as stereo MP3 codec, **TFT 320x240** touch screen display, accelerometer, MMC/SD card slot, 8 Mbit flash memory, battery charger. The board also contains MINI-B USB connector, two 1x26 connection pads and other. It comes pre programmed with UART bootloader, but can also be programmed with external PDI programmers. Mikromedia is compact and slim, and perfectly fits in the palm of your hand, which makes it convenient platform for mobile devices.



Package Contains



- 01 Damage resistant protective box



- 02 mikromedia for XMEGA® development system



- 03 DVD with documentation and examples



- 04 mikromedia for XMEGA® user's guide



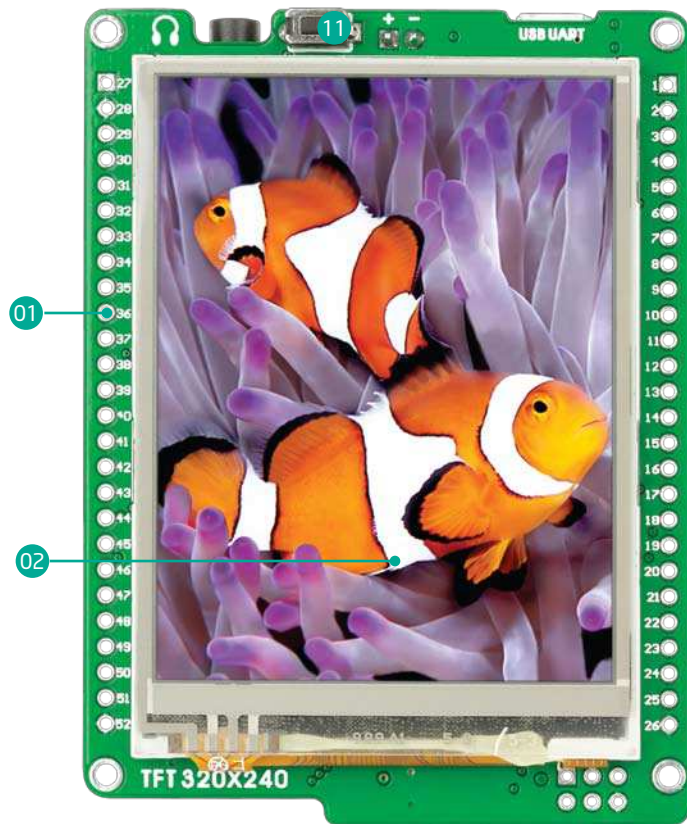
- 05 mikromedia for XMEGA® schematic

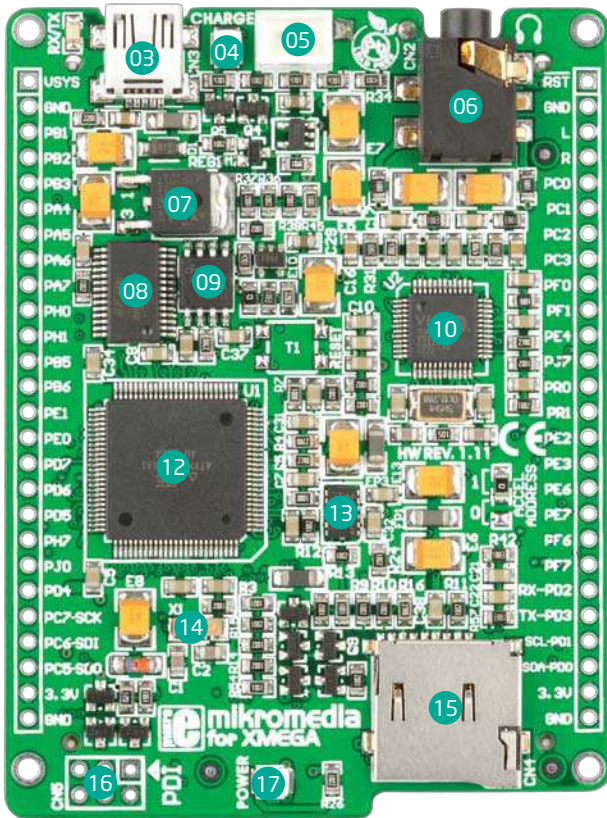


- 06 USB cable

Key Features

- 01 Connection Pads
- 02 TFT 320x240 display
- 03 USB MINI-B connector
- 04 Charge indication LED
- 05 Li-Polymer battery connector
- 06 3.5mm headphone connector
- 07 Power supply regulator
- 08 FTDI USB UART
- 09 Serial Flash memory
- 10 VS1053 Stereo mp3 coder/decoder
- 11 RESET button
- 12 ATxmega128A1 microcontroller
- 13 Accelerometer
- 14 Crystal oscillator
- 15 microSD Card Slot
- 16 PDI connector
- 17 Power indicator LED





System Specification



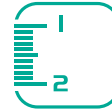
power supply

Over a USB cable (5V DC)



power consumption

87 mA with erased MCU
(when back-light is ON)



board dimensions

81.2 x 60.5 mm (3.19 x 2.38 inch)



weight

~45 g (0.10 lbs)

1. Power supply

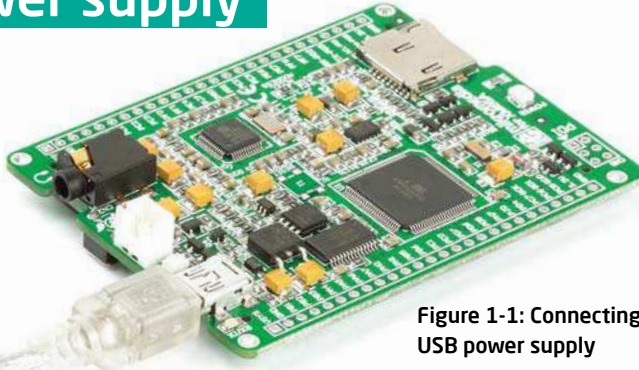


Figure 1-1: Connecting USB power supply

USB power supply

You can apply power supply to the board using **MINI-B USB** cable provided with the board. On-board voltage regulators provide the appropriate voltage levels to each component on the board. **Power LED (GREEN)** will indicate the presence of power supply.

Battery power supply

You can also power the board using **Li-Polymer** battery, via on-board battery connector. On-board battery charger circuit **MCP73832** enables you to charge the battery over USB connection. **LED diode (RED)** will indicate when battery is charging. Charging current is ~250mA and charging voltage is 4.2V DC.

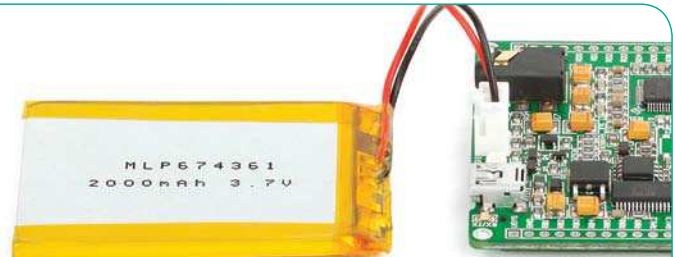


Figure 1-2: Connecting Li-Polymer battery

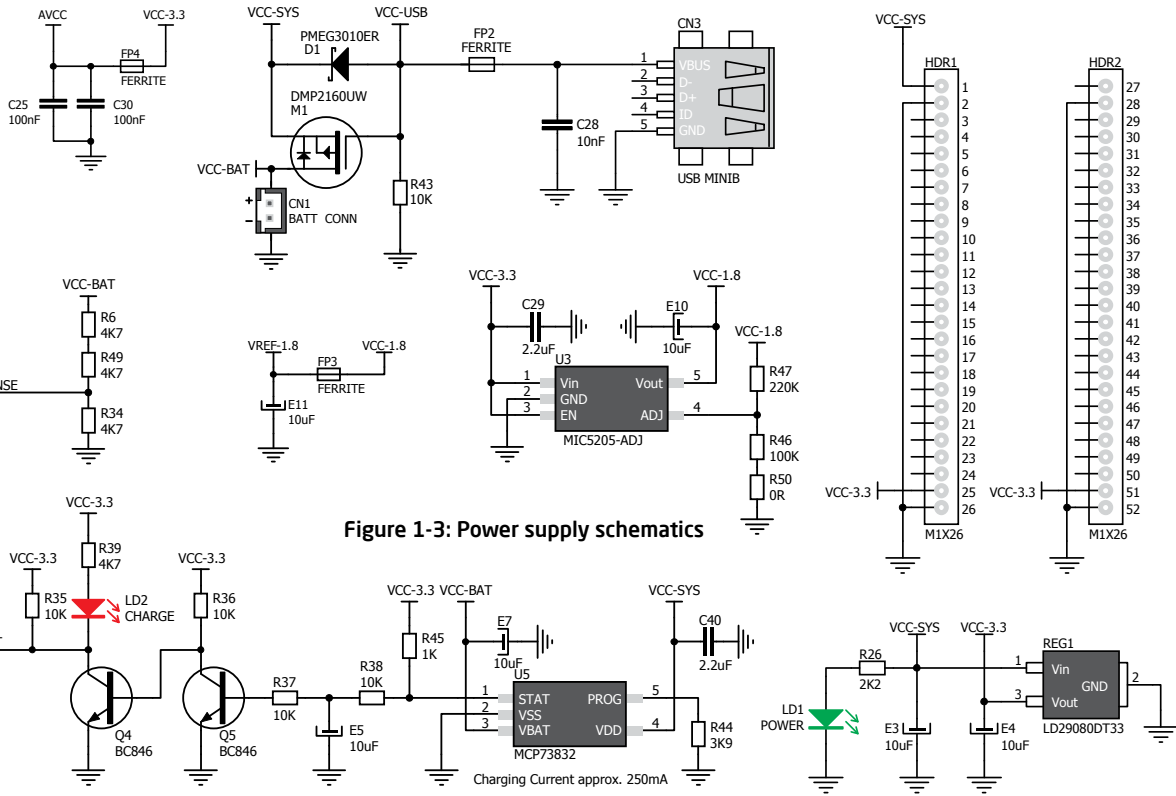


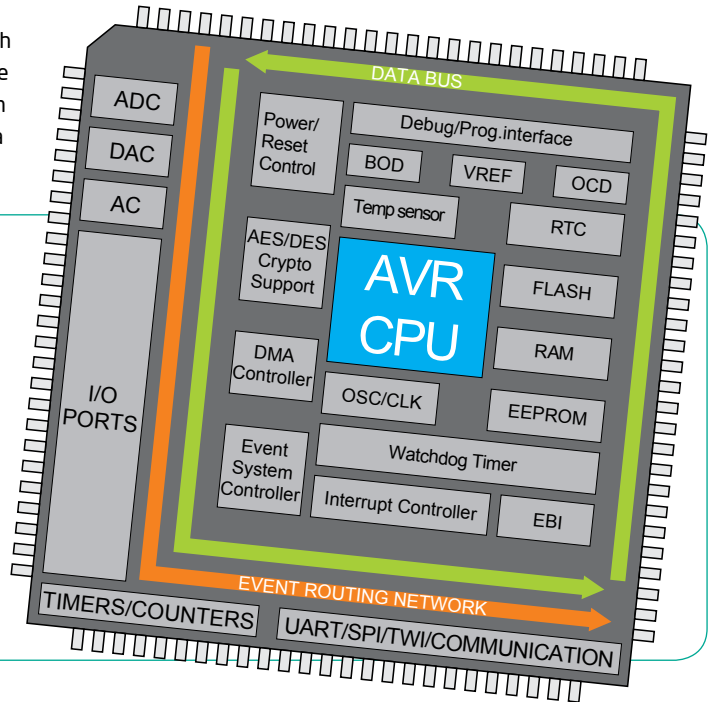
Figure 1-3: Power supply schematics

2. ATxmega128A1 microcontroller

The mikromedia for XMEGA® development system comes with the **ATxmega128A1** microcontroller. This high-performance **8-bit** microcontroller with its integrated modules and in combination with other on-board modules is ideal for multimedia applications.

Key microcontroller features

- Up to **32 MIPS** Operation;
- 8-bit architecture;
- 128 KB of Flash memory;
- 8 KB of SRAM memory;
- 2048 Bytes of EEPROM
- 78 I/O pins;
- 32kHz RTC;
- UART, SPI, ADC, DAC etc.



3. Programming the microcontroller

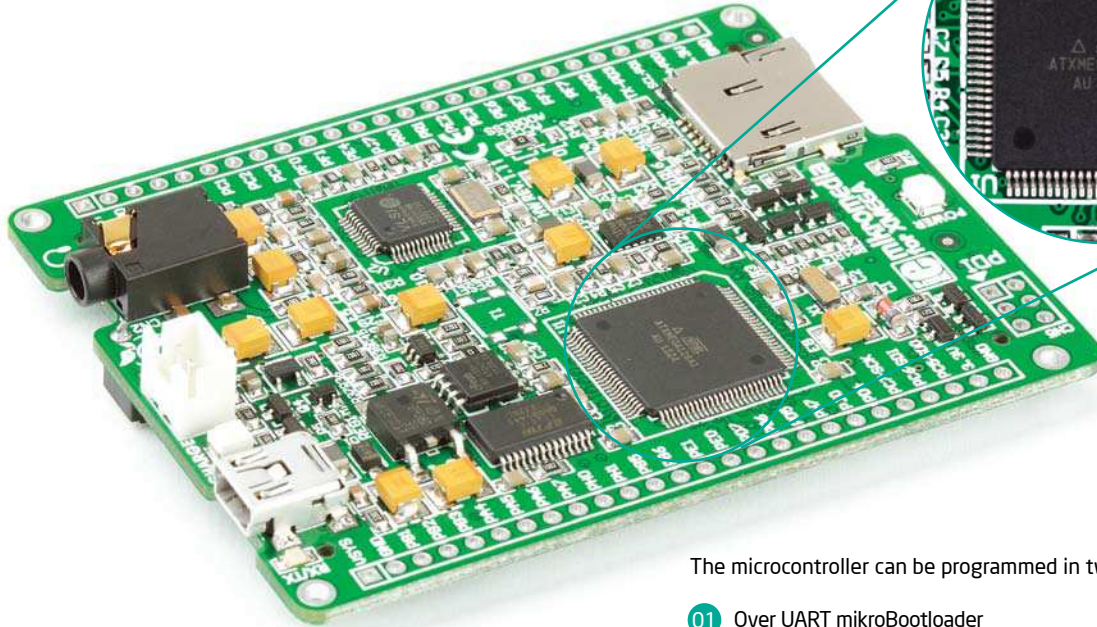


Figure 3-1:
ATxmega128A1
Microcontroller

The microcontroller can be programmed in two ways:

- 01 Over UART mikroBootloader
- 02 Using external PDI programmer

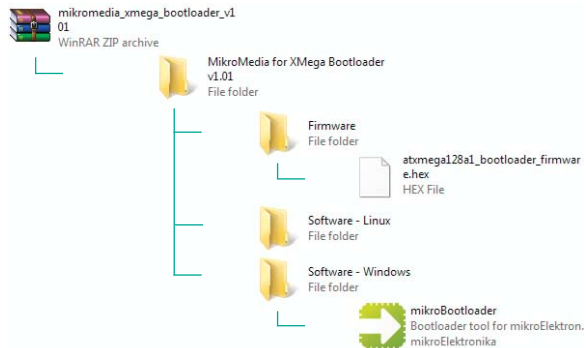
Programming with mikroBootloader

You can program the microcontroller with UART bootloader which is pre programmed by default. To transfer .hex file from a PC to MCU you need bootloader software (**mikroBootloader**) which can be downloaded from:



http://www.mikroe.com/downloads/get/1669/mikromedia_xmega_bootloader_v101.zip

After the mikroBootloader software is downloaded unzip it to desired location and start it.

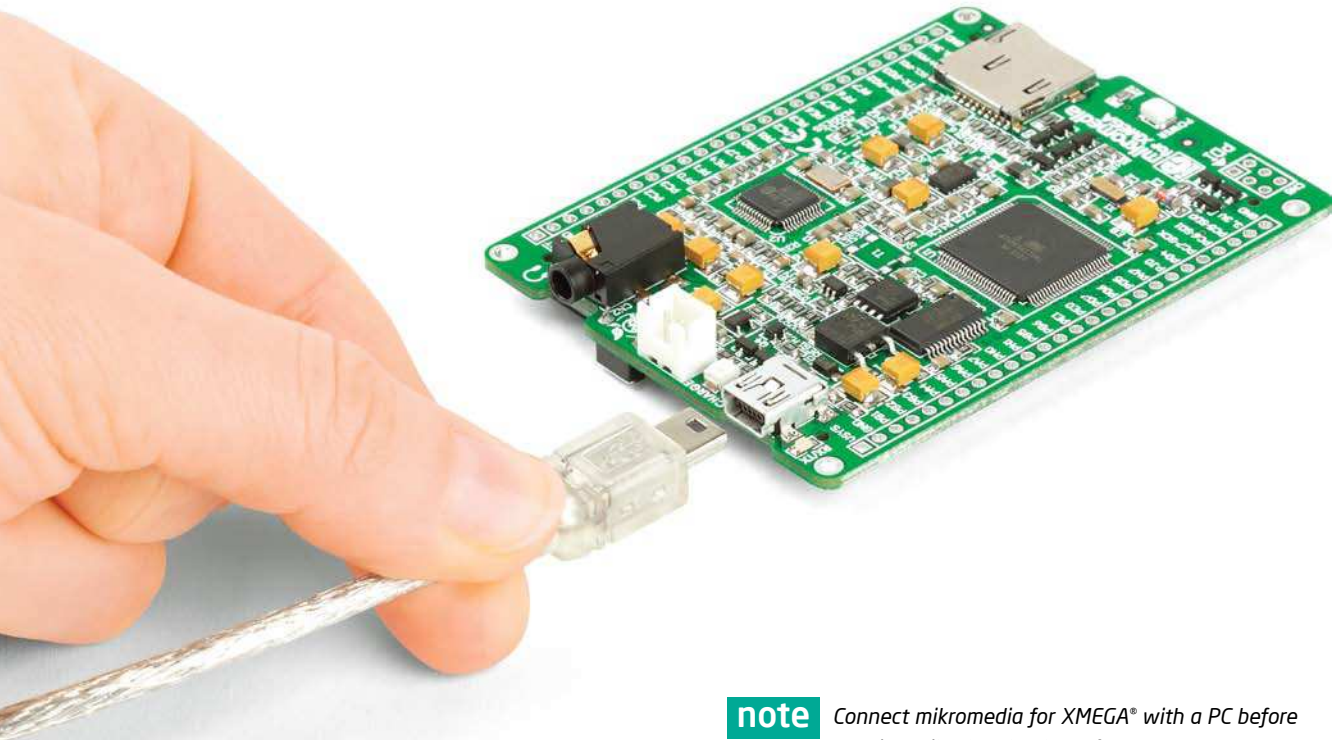


mikroBootloader software



Figure 3-2: mikroBootloader window

- 01 When you start mikroBootloader software, a window as shown in **Figure 3-2** should appear



note *Connect mikromedia for XMEGA® with a PC before starting mikroBootloader software*

Identifying device COM port

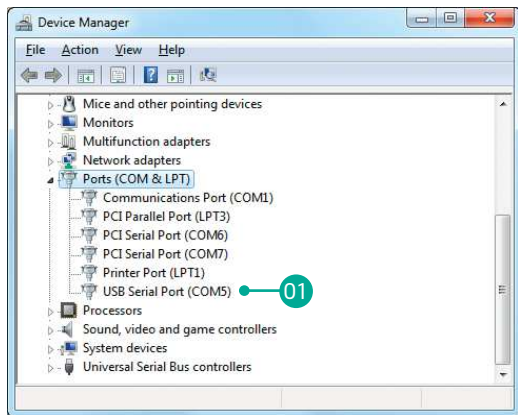


Figure 3-3: Identifying COM port

- 01 Open **Device Manager** window and expand **Ports section** to see which COM port is assigned to Ready for XMEGA® board (in this case it is COM5)

step 1 - Choosing COM port

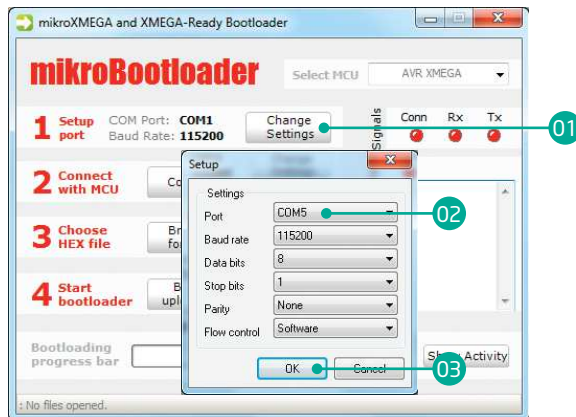


Figure 3-4: Choosing COM port

- 01 Click the **Change Settings** button
- 02 From the drop down list, select appropriate **COM port** (in this case it is COM5)
- 03 Click **OK**

step 2 - Establishing Connection



Figure 3-5: Connecting with mikroBootloader

- 01 Press the **Reset** button on Ready for XMEGA® board and click the **Connect** button within 5s, otherwise the existing microcontroller program will run. If connected, the button's caption will be changed to **Disconnect**

step 3 - Browsing for .HEX file



Figure 3-6: Browse for HEX

- 01 Click the **Browse for HEX** button and from a pop-up window (Figure 3-7) choose a .HEX file to be uploaded to MCU memory

step 4 - Selecting .HEX file

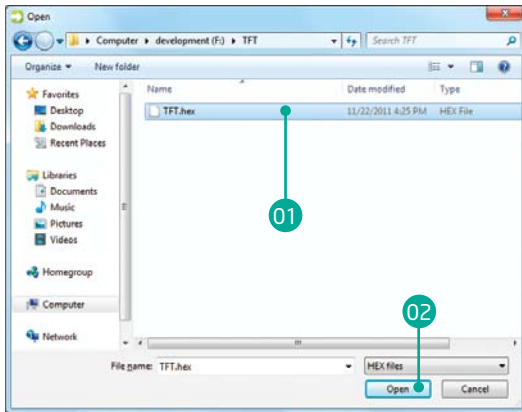


Figure 3-7: Locating and selecting .hex file

- 01 Select .HEX file using open dialog window.
- 02 Click the **Open** button

step 5 - Uploading .HEX file



Figure 3-8: Begin uploading

- 01 To start .HEX file bootlodging click the **Begin uploading** button

step 6 - Progress bar

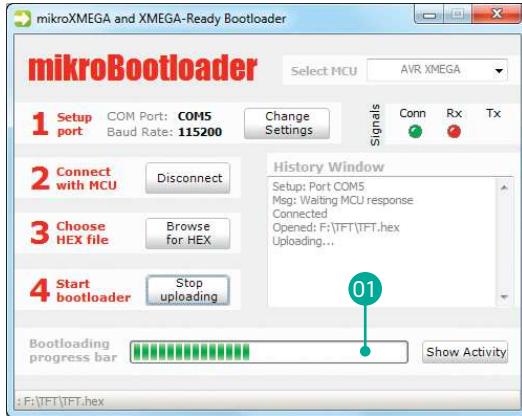


Figure 3-9: Progress bar

- 01 Progress bar enables you to monitor .HEX file uploading

step 7 - Finishing upload



Figure 3-10: Restarting MCU

- 01 Click **OK** button after the uploading process is finished
- 02 Press **Reset** button on Ready for XMEGA® board and wait for 5 seconds. Your program will run automatically

Programming with external programmer

The microcontroller can be programmed with external programmer (AVRISP mkII, AVR JTAGICE mkII or other supported programmer with PDI interface). The external programmer is connected to the development system via pads marked with **PDI (CN5)**, Figure 3-11. In order to connect the external programmer to the development system, it is necessary to solder a 2x3 male header on the pad (**CN5**). If bootloader program is accidentally erased you can upload it again via external PDI programmer. Program [atxmega128a1_bootloader_firmware.hex](#) can be found under Firmware folder (page 12).

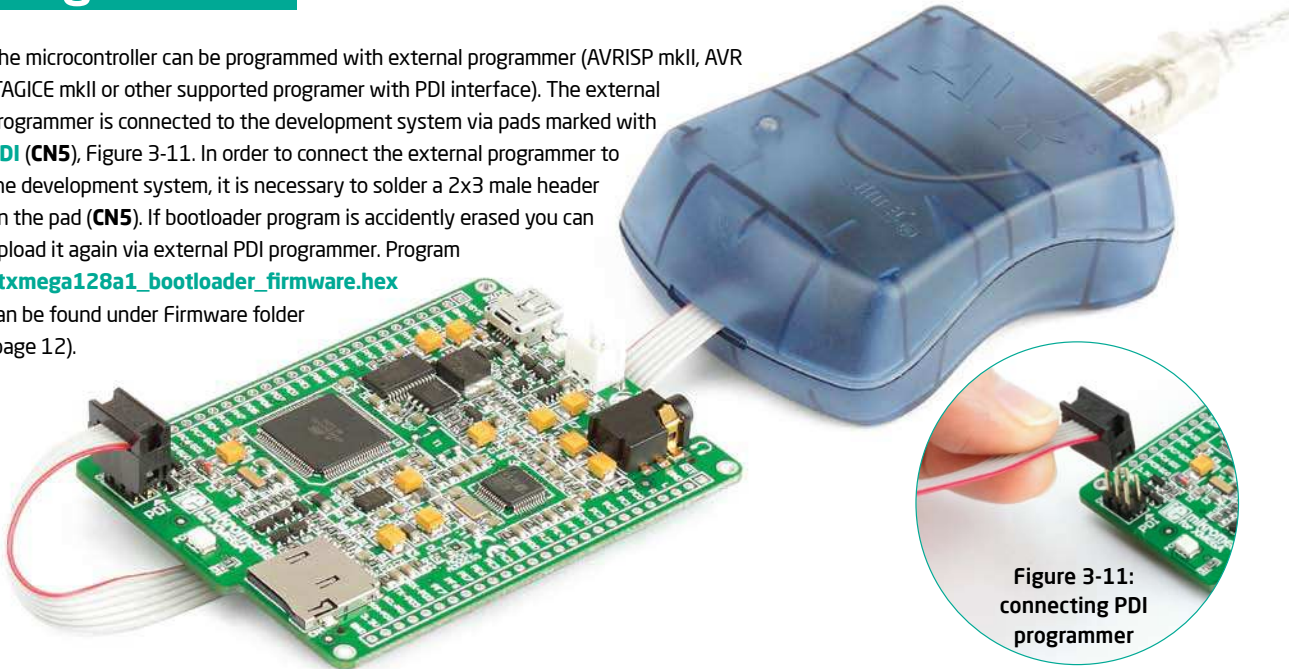


Figure 3-11:
connecting PDI
programmer

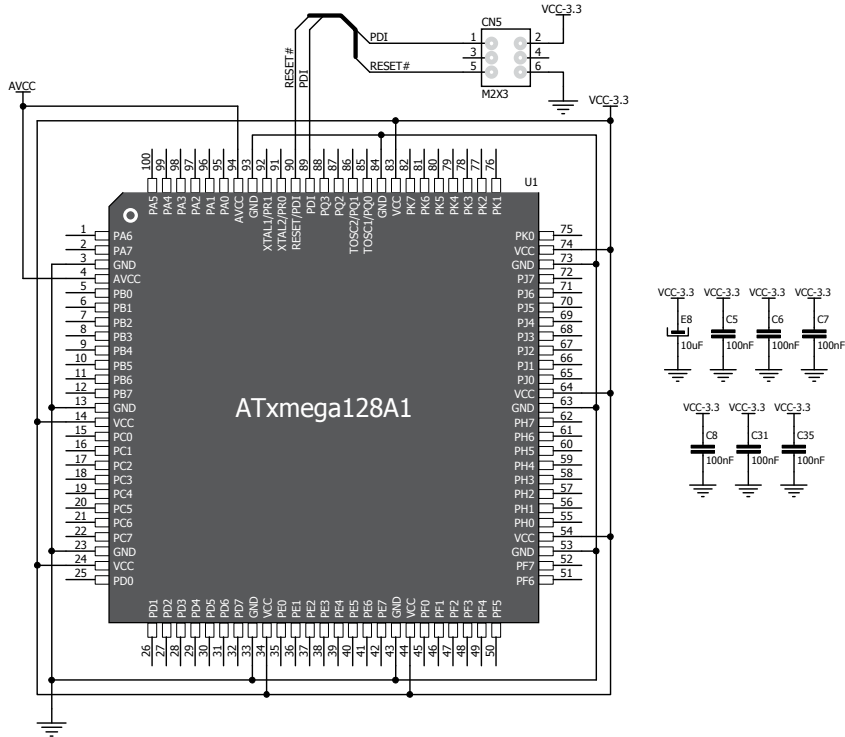
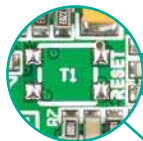


Figure 3-12: PDI programmer connection schematic

4. Reset Button

Board is equipped with reset button, which is located at the top of the front side (**Figure 4-2**). If you want to reset the circuit, press the reset button. It will generate low voltage level on microcontroller reset pin (input). In addition, a reset can be externally provided through **pin 27** on side headers (**Figure 4-3**).



NOTE

*You can also solder additional reset button on the appropriate place at the back side of the board, **Figure 4-1**.*

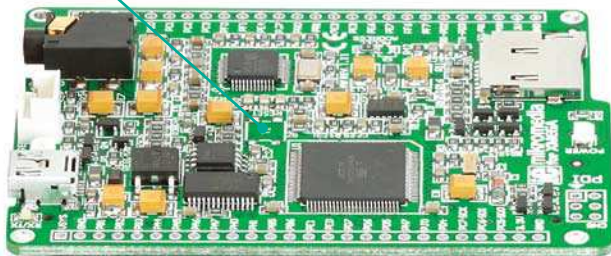


Figure 4-1: Location of additional reset button

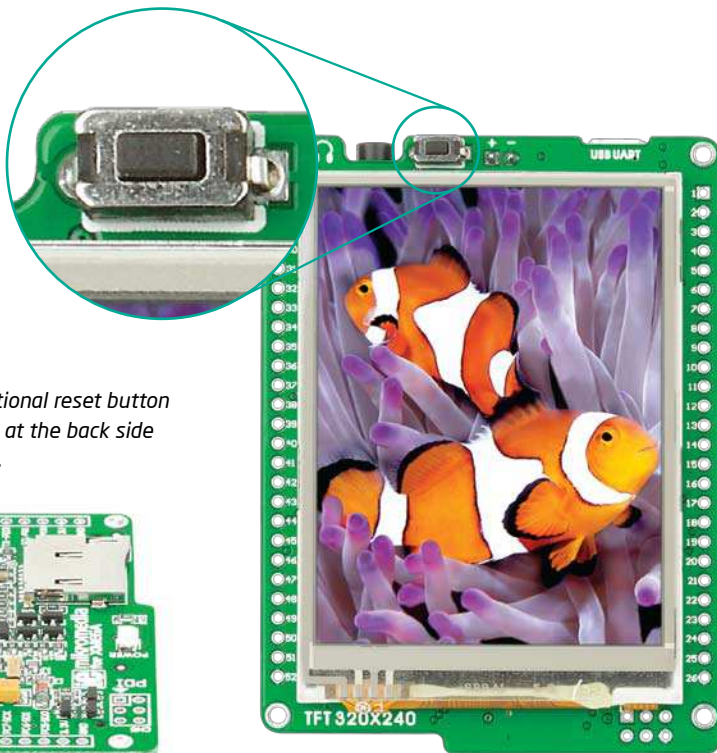


Figure 4-2: Frontal reset button

5. Crystal oscillators

ATxmega128A1 uses internal 2MHz and 32MHz oscillators that provide the necessary clock frequency. In combination with prescalers and multipliers it gives you a wide range of output frequencies, which ensures proper operation of bootloader and your custom applications. Board contains **32.768kHz Crystal oscillator (X1)** which provides external clock for internal **RTCC** module.

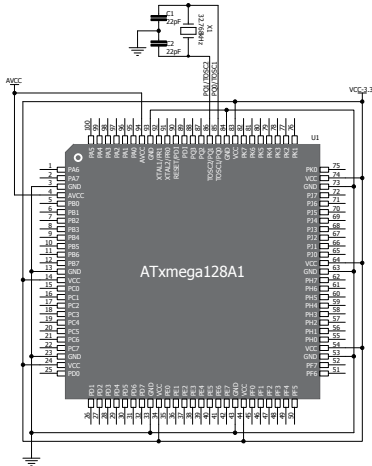
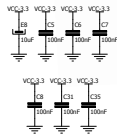


Figure 5-2:
Crystal oscillator schematic



NOTE: *The use of crystal in all other schematics is implied even if it is purposely left out because of the schematics clarity.*

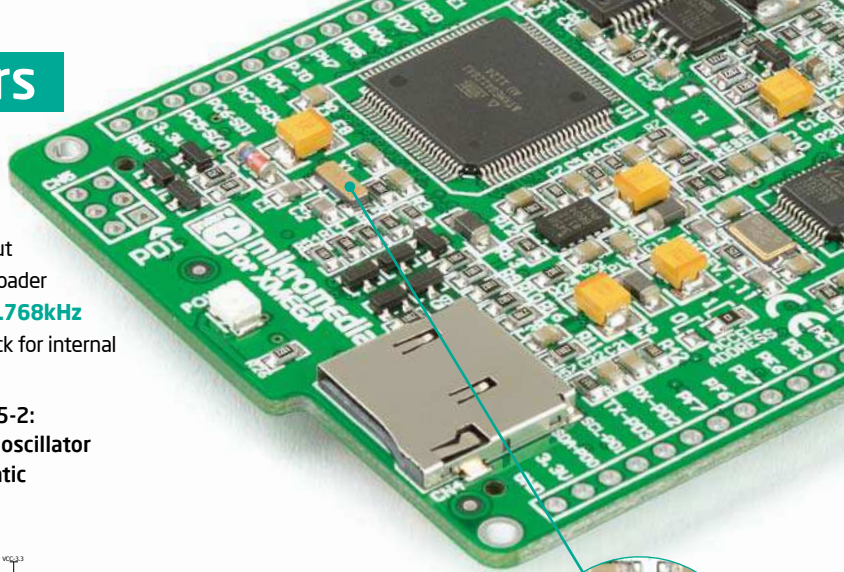
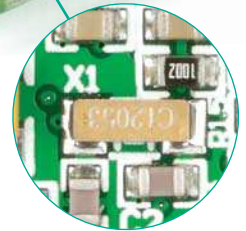


Figure 5-1:
32.768kHz crystal oscillator connected to RTCC module (X1)



6. microSD Card Slot

Board contains **microSD card slot** for using microSD cards in your projects. It enables you to store large amounts of data externally, thus saving microcontroller memory. microSD cards use Serial Peripheral Interface (**SPI**) for communication with the microcontroller.

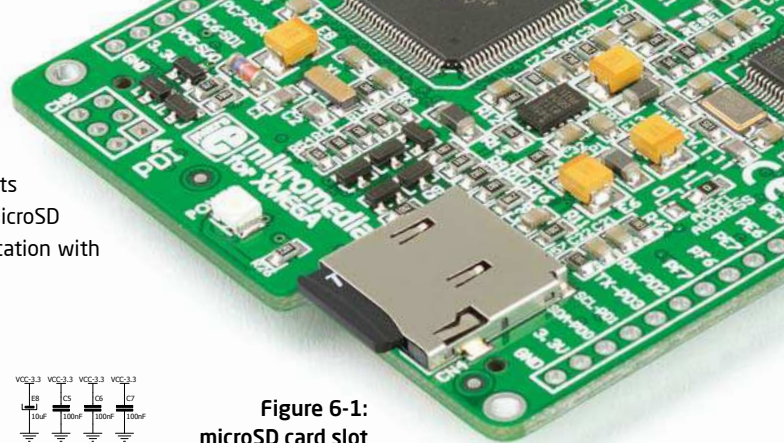


Figure 6-1:
microSD card slot

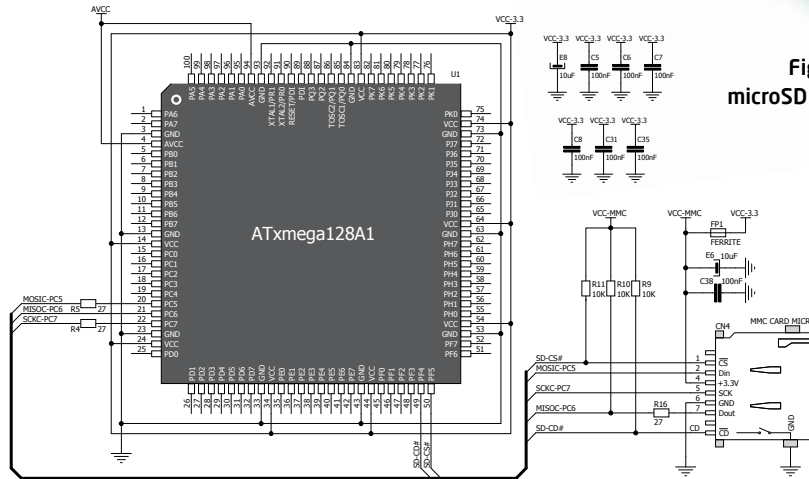


Figure 6-2: microSD Card Slot module connection schematic

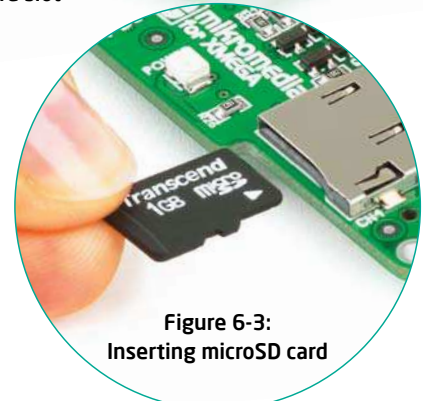


Figure 6-3:
Inserting microSD card

7. Touch Screen

Figure 7-1:
Touch Screen



The development system features a **TFT 320x240 display** covered with a **resistive** touch panel. Together they form a functional unit called a **touch screen**. It enables data to be entered and displayed at the same time. The TFT display is capable of showing graphics in **262.144** different **colors**.

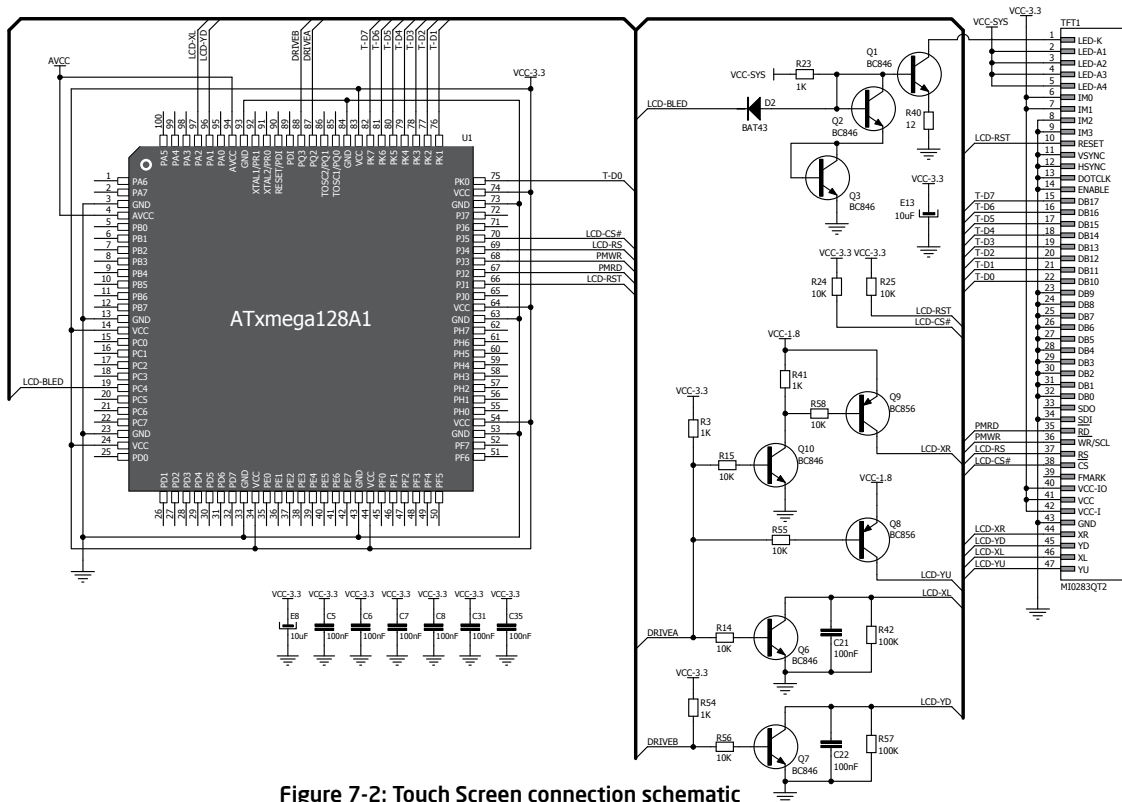


Figure 7-2: Touch Screen connection schematic