UNI-DS6™

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

MikroElektronika

SOFTWARE AND HARDWARE SOLUTIONS FOR EMBEDDED WORLD ...making it simple

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.

Nebojsa Matic
General Manager

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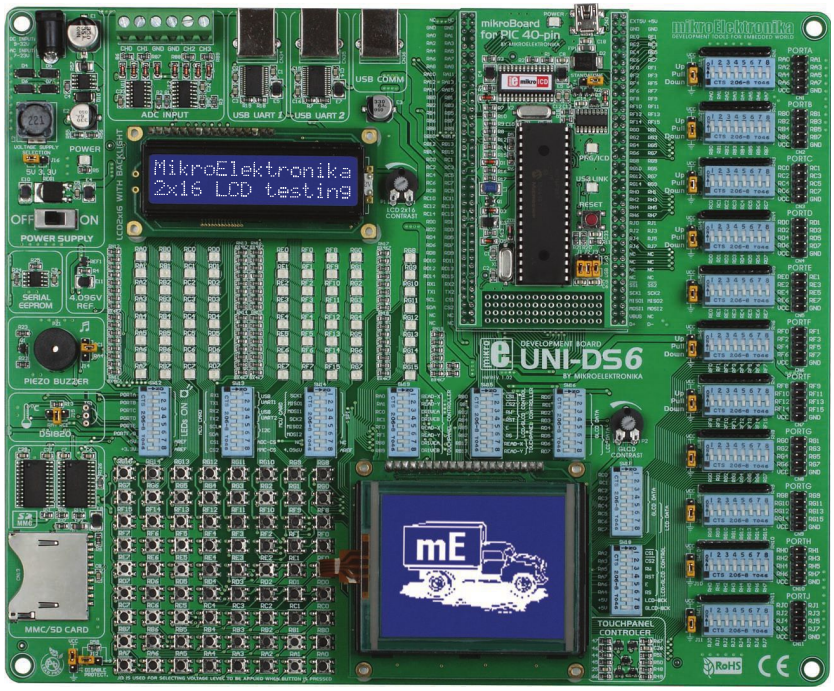
General information

The UNI-DS6 development system provides a development environment for programming and experimenting with various microcontrollers from different manufacturers. Numerous modules, such as 128x64 graphic LCD display, 2x16 alphanumeric LCD display, piezo buzzer, USB-UART, etc. are provided on the board and allow you to easily simulate the operation of your target device.



Full-featured development system for microcontroller based devices

USB TO UART

UART communication via USB connector

MMC/SD STORAGE

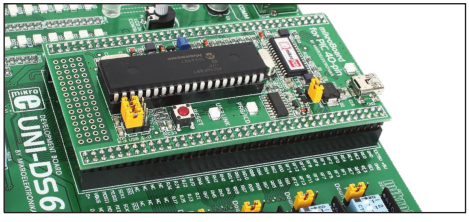
MMC/SD card connector

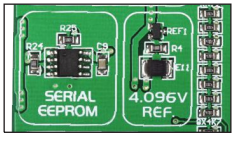
EEPROM BOARD

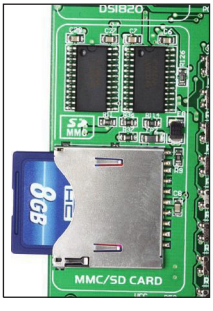
Integrated EEPROM module

GRAPHIC LCD CONNECTOR ON-BOARD

Graphic LCD display with backlight





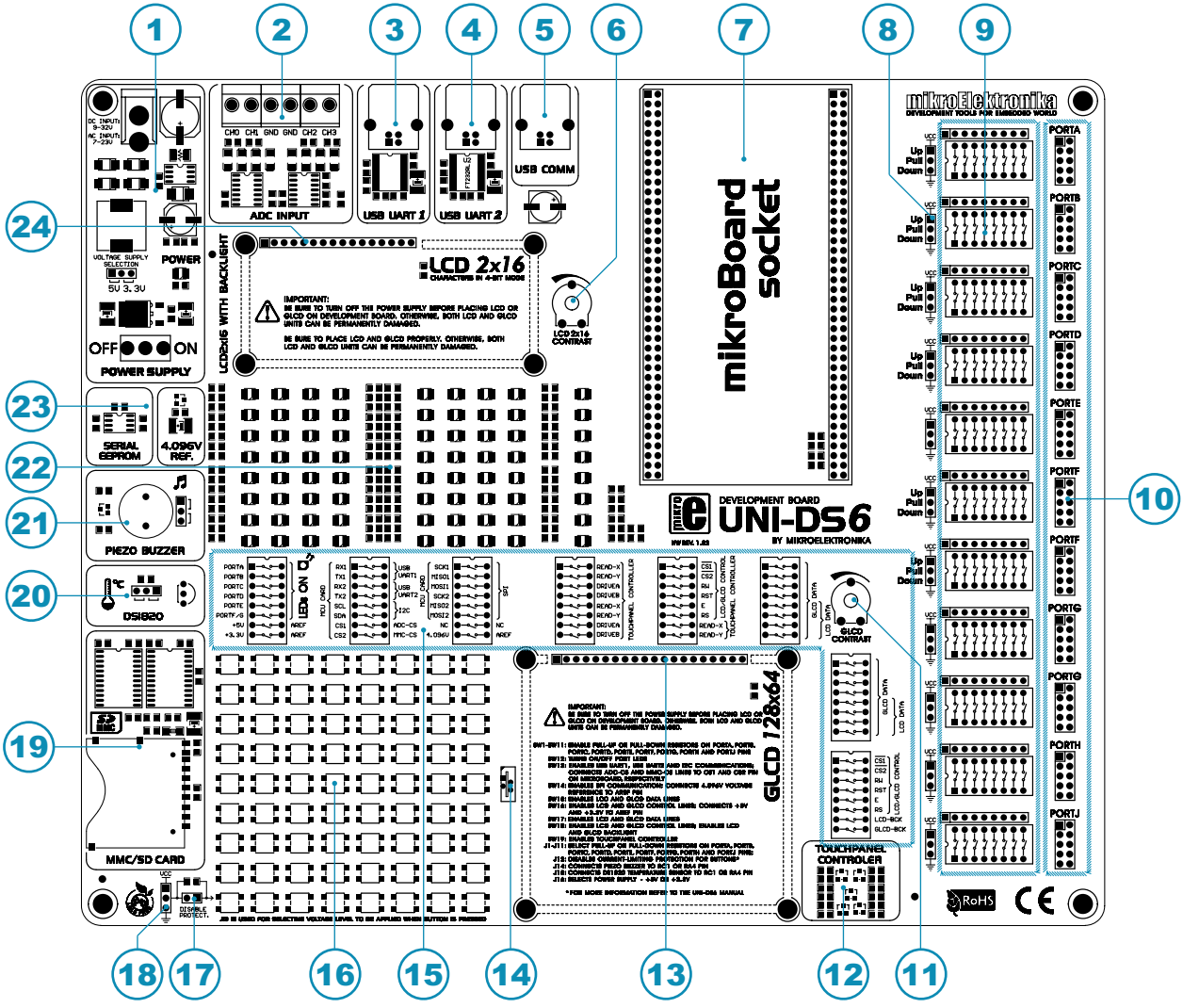


Package includes:

Development system:	UNI-DS6
CD:	product CD with relevant software
Cables:	USB cable
Documentation:	manual and electrical schematic for UNI-DS6

System specification:

Power supply:	over an AC/DC connector (7-23V AC or 9-32V DC) or a USB cable (5V DC)
Power consumption:	50mA when all on-board modules are off
Dimensions:	26,5 x 22cm (10,4 x 8,6inch)
Weight:	~420g (0.92lbs)



Key features

1. Power supply module
2. ADC input
3. USB UART1 module
4. USB UART2 module
5. USB communication connector
6. LCD2x16 display contrast potentiometer
7. mikroBoard socket
8. Jumpers used to select pull-up/pull-down resistors
9. DIP switches for enabling pull-up/pull-down resistors
10. I/O ports
11. GLCD contrast potentiometer
12. Touch panel controller
13. GLCD display connector
14. Touch panel connector
15. DIP switches for enabling on-board modules
16. Push buttons
17. Jumper used to shorten protective resistor
18. Jumpers used to select push buttons' logic state
19. MMC/SD card connector
20. Socket for DS1820 temperature sensor
21. Piezo buzzer
22. LEDs
23. Serial EEPROM module
24. LCD display connector

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1. Connecting UNI-DS6 to power supply module

In order to enable the development system to be turned on, it is necessary to provide the appropriate power supply voltage over an AC/DC connector CN19, Figure 1-1. When the development system is powered, it is necessary to set switch marked POWER SUPPLY to the ON position. The power supply voltage provided via the CN19 AC/DC connector may be in a range between 7 and 23V AC or 9 and 32V DC.

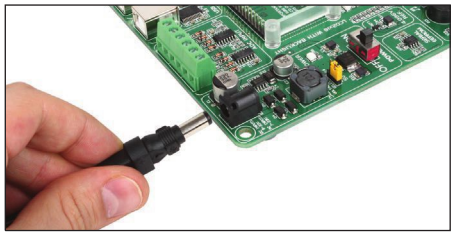


Figure 1-1: Powering the development system

A mikroBoard board with different voltage levels can be placed in the mikroBoard socket provided on the development system. The position of jumper J16 depends on the voltage level required. When a 5V mikroBoard is placed in the socket it is necessary to place jumper J16 in the 5V position. If a 3.3V mikroBoard is placed move jumper J16 in the 3.3V position.

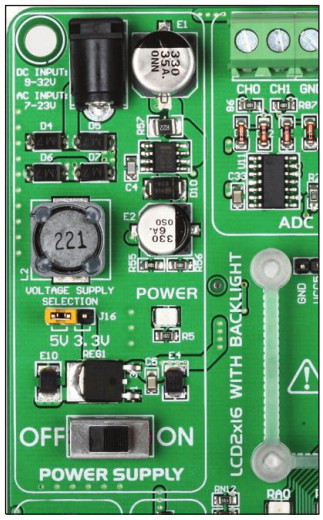


Figure 1-2: Power supply module

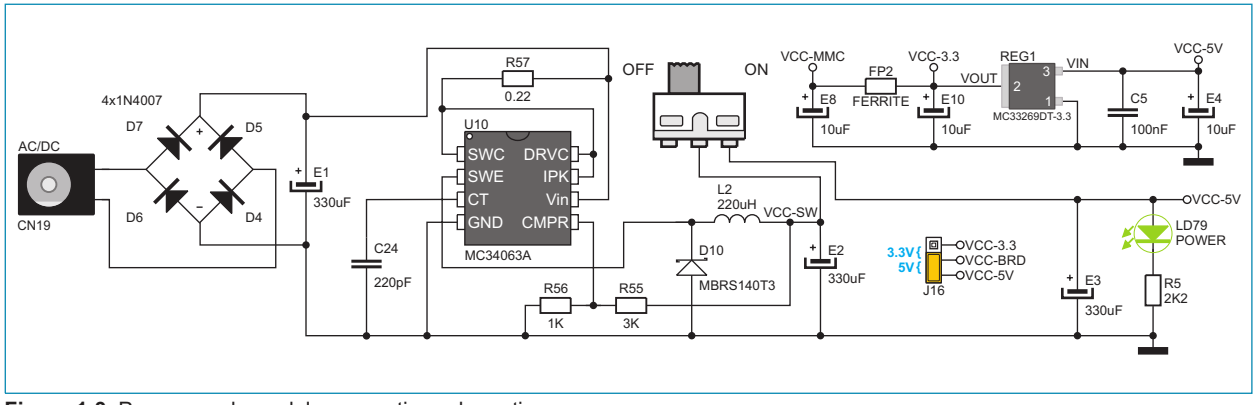


Figure 1-3: Power supply module connection schematic

2. mikroBoard

mikroBoard is designed for placing microcontroller on a development system. Every mikroBoard features an integrated programmer that is used for MCU programming. For connection with a development system, the mikroBoard uses two 2x40 male headers. In addition, the mikroBoard can be used as a standalone device.

There are several mikroBoard types: mikroBoard for 8051 40-pin, mikroBoard for AVR 64-pin, mikroBoard for dsPIC 80-pin, mikroBoard for PIC 40-pin, mikroBoard for PIC 80-pin, mikroBoard for ARM 64-pin, mikroBoard for ARM 144-pin and mikroBoard for PSoC.

Figure 2-1: mikroBoard for PIC 40-pin

Figure 2-2: mikroBoard for 8051 40-pin

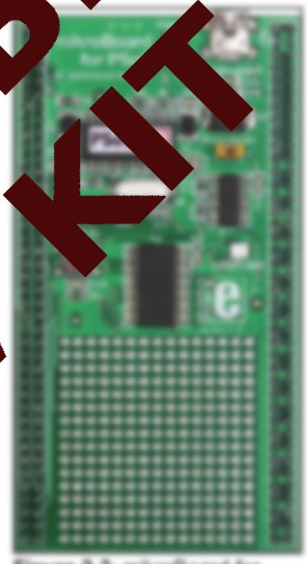
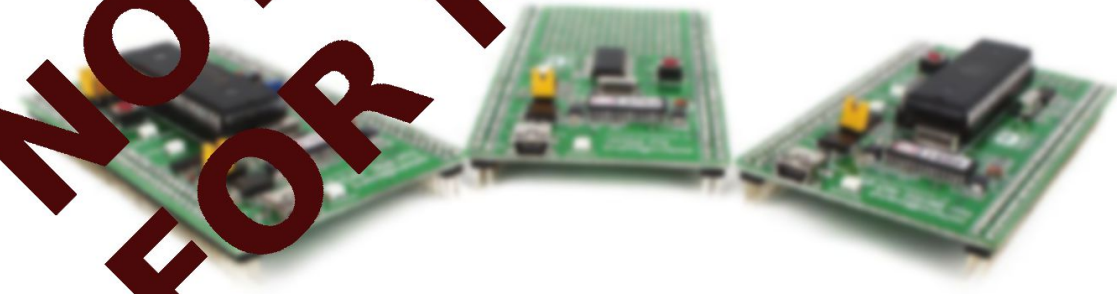


Figure 2-3: mikroBoard for PSoC



2. mikroBoard

mikroBoard is designed for placing microcontroller on the Uni-DS6 main board. mikroBoard features an integrated debugger/programmer that is used for MCU debugging/programming. For connection with the main board, the mikroBoard uses two 2x40 male headers.

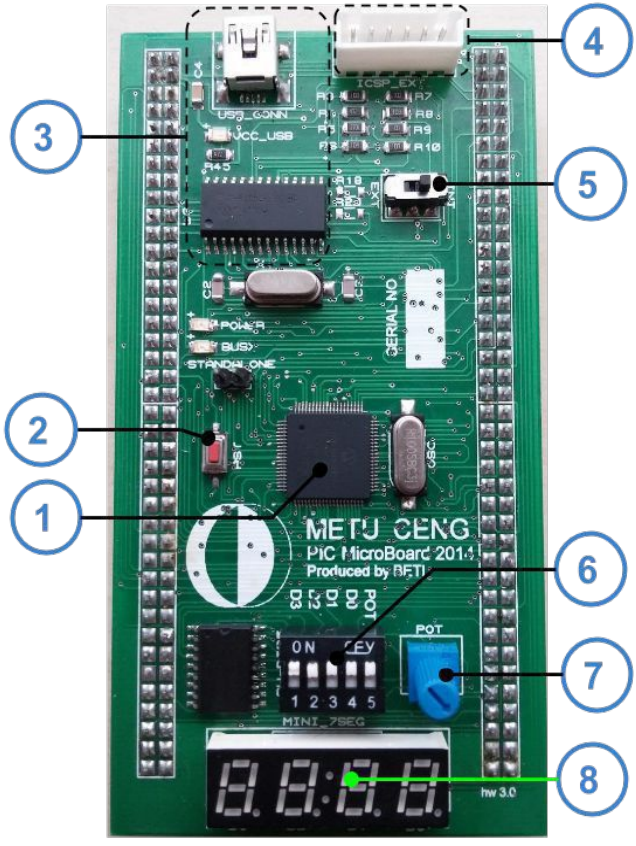


Figure 2 : mikroBoard for PIC18F8722

Key features

1. PIC18F8722 microcontroller, 80-pin
2. Reset button
3. Integrated PICkit2 debugger/programmer
4. Connector for external debugger/programmer
5. Switch for integrated/external debugger/programmer selection
6. DIP switches for enabling/disabling potentiometer and 7-Segment Displays
7. Potentiometer for ADC purposes
8. 7-Segment Displays

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3. Placing mikroBoard

The UNI-DS6 development system is designed for usage with various mikroBoards. All the mikroBoards are placed in a universal mikroBoard socket , Figure 3-1. This socket consists of two 2x40 female headers. To place mikroBoard in this socket follow the steps below:

Figure 3-1: mikroBoard placed in socket

4. Programming microcontroller

The mikroBoard on the development system uses a built-in programmer for MCU programming. All you need to do is to connect the mikroBoard to a PC via a USB cable (Figure 4-1), and to install the appropriate software on your PC.

Figure 4-1: Connecting mikroBoard to PC via USB cable

Depending on which mikroBoard is in use it is necessary to install the appropriate software for MCU programming:

- mikroBoard for 80-pin: 8051Flash
- mikroBoard for 64-pin: AVRFlash
- mikroBoard for dsPIC: dsPICFlash
- mikroBoard for PIC 20-pin, mikroBoard for PIC 40-pin, mikroBoard for PIC 80-pin: mikroProg Suite for PIC
- mikroBoard for ARM 64-pin, mikroBoard for 144-pin: ARMflash

To download flash software visit Mikroelektronika's website at www.mikroe.com

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5. USB UART1 and USB UART2 modules

USB UART modules enable the UNI-DS6 development system to be connected to a PC via a USB connector. In addition to PC, the development system can also be easily connected to other devices that use USB communication. USB UART modules are connected to the microcontroller supplied on the development system via #RX232A and #TX232A pins for USB UART1 or #RX232B and #TX232B for USB UART2.

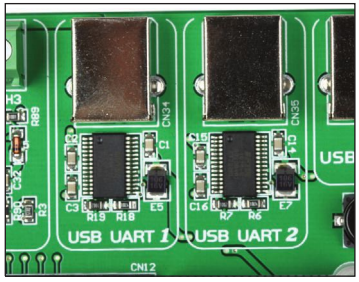

Figure 5-1: USB UART modules

In order to establish connection between the USB UART1 module and the microcontroller, it is necessary to set switches 1 and 2 on the DIP switch SW13 to the ON position. To connect the USB UART2 module and the microcontroller, it is necessary to set switches 3 and 4 on the DIP switch SW13 to the ON position.

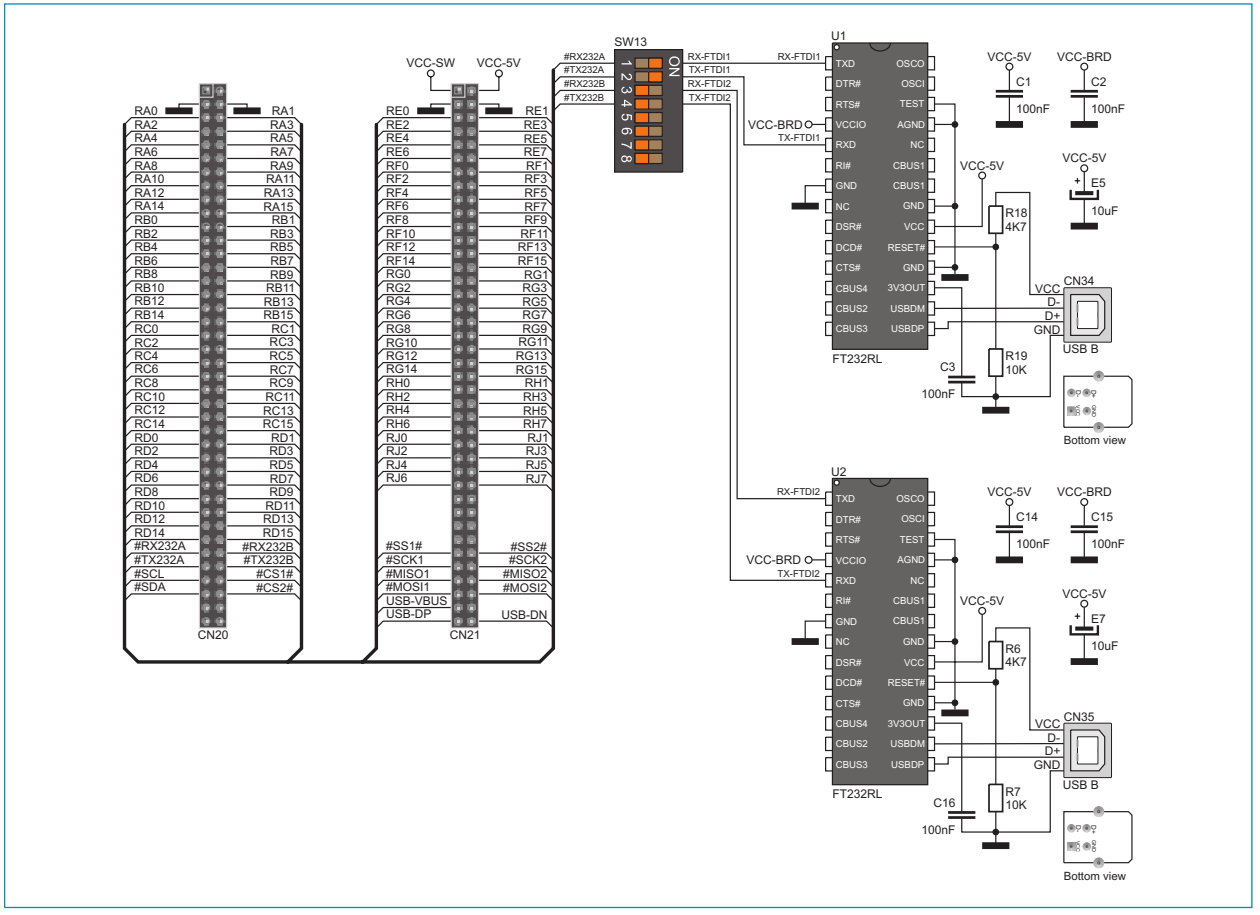

Figure 5-2: USB UART modules connection schematic

6. ADC module

The ADC module is used to convert an analog voltage level into the appropriate 12-bit digital value. The analog voltage is supplied via screw terminals CN15 and CN16. The voltage supplied via the VREF pin is used as a voltage reference. In order to use this voltage, switch 8 on the DIP switch SW14 should be set to the ON position.

Figure 6-1: ADC module

The potentiometer on the Mikroboard will be used for ADC purposes.

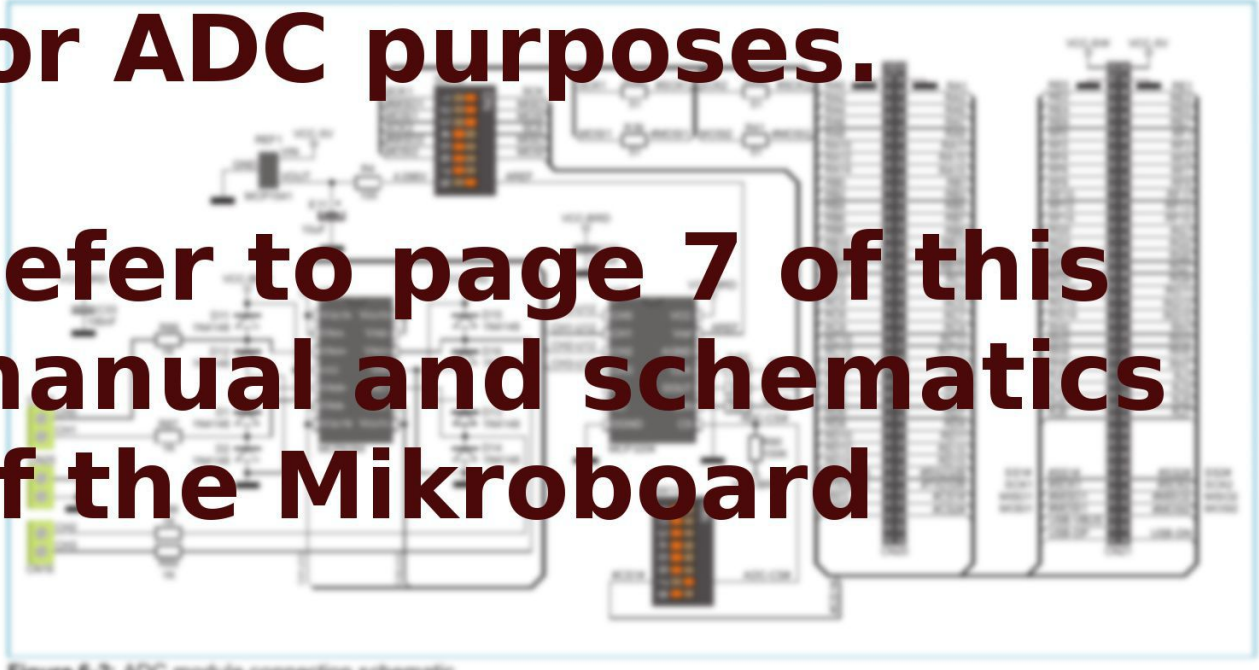

Figure 6-2: ADC module connection schematic

Refer to page 7 of this manual and schematics of the Mikroboard

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7. USB communication

The UNI-DS6 development system can communicate with external devices via the USB connector used for USB communication. The USB connector is directly connected to the microcontroller pins used for USB communication.

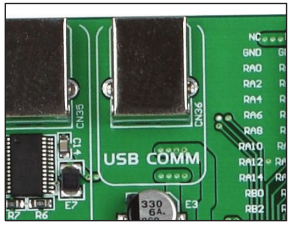

Figure 7-1: USB connector of B type

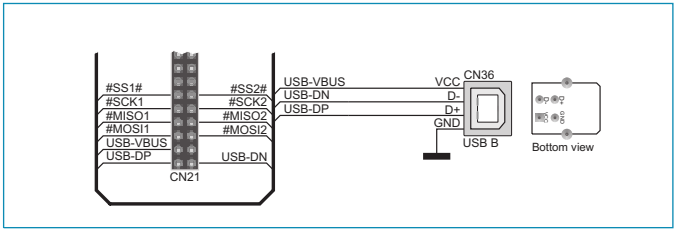

Figure 7-2: USB connector connection schematic

8. EEPROM module

EEPROM module enables the microcontroller to use additional 1Kbit EEPROM memory via I2C serial connection. To establish connection between this memory module and the microcontroller, it is necessary to set switches 5 and 6 on the DIP switch SW13 to the ON position.

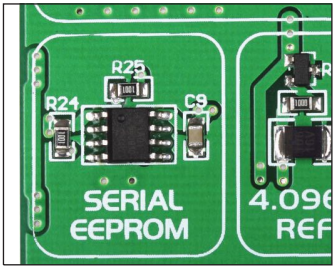

Figure 8-1: EEPROM module

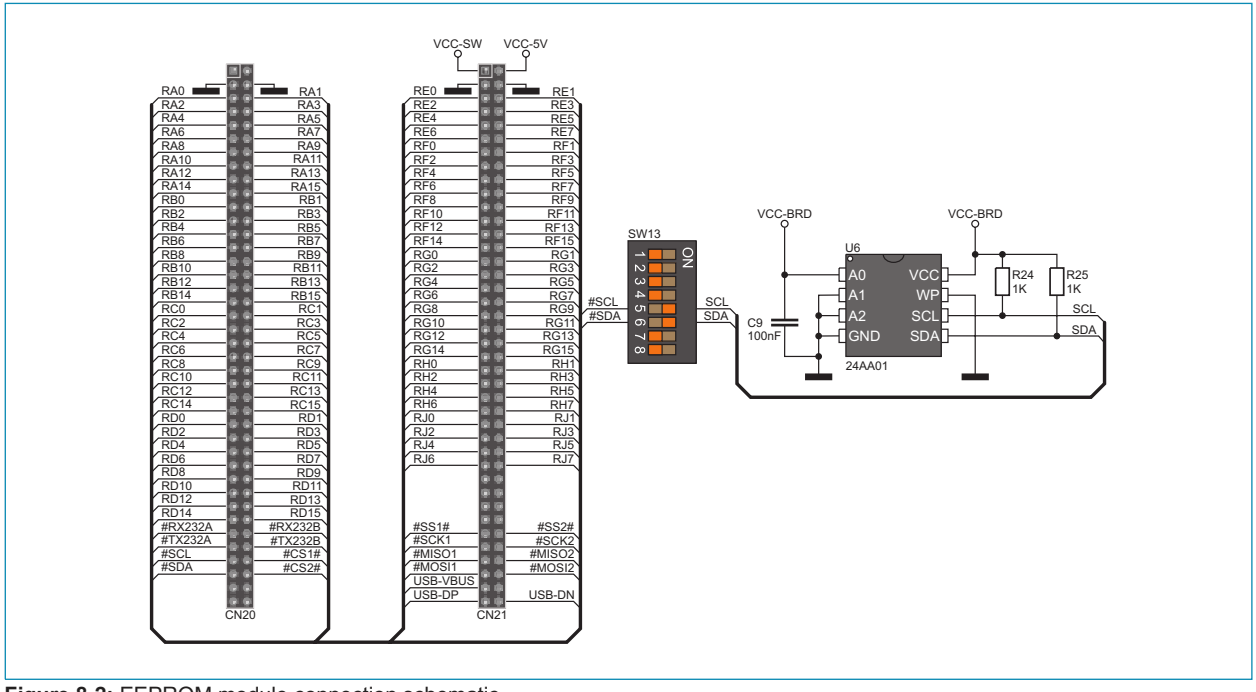

Figure 8-2: EEPROM module connection schematic

9. Piezo buzzer

Due to a built-in piezo buzzer, the UNI-DS6 development system is capable of emitting audio signals. In order to enable the piezo buzzer to operate properly it is necessary to generate a voltage signal of specific frequency. Remember, when writing code for voltage signal generation, that the piezo buzzer's resonant frequency is 3.8kHz. Other frequencies in the range between 20Hz and 20kHz can also be used, but the best performance is provided with frequencies ranging between 2kHz and 4kHz. To establish connection between the piezo buzzer and the microcontroller, it is necessary to place jumper J14 in adequate position. If jumper J14 is placed in the RC1 position the RC1 MCU pin is used for signal generation, Figure 9-2. Otherwise place jumper J14 in the RA4 position in order to use the RA4 MCU pin for signal generation, Figure 9-3.

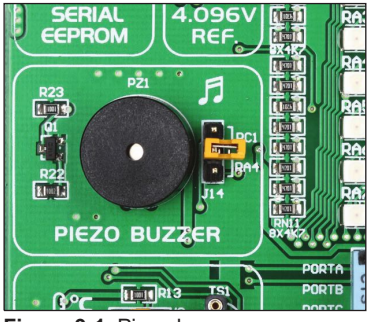

Figure 9-1: Piezo buzzer

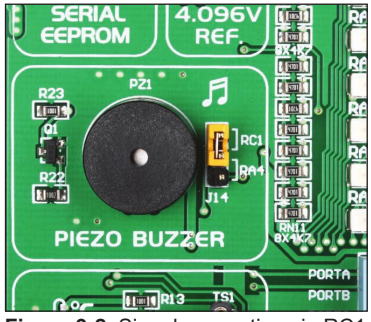

Figure 9-2: Signal generation via RC1

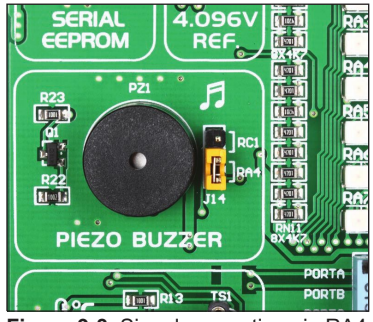

Figure 9-3: Signal generation via RA4

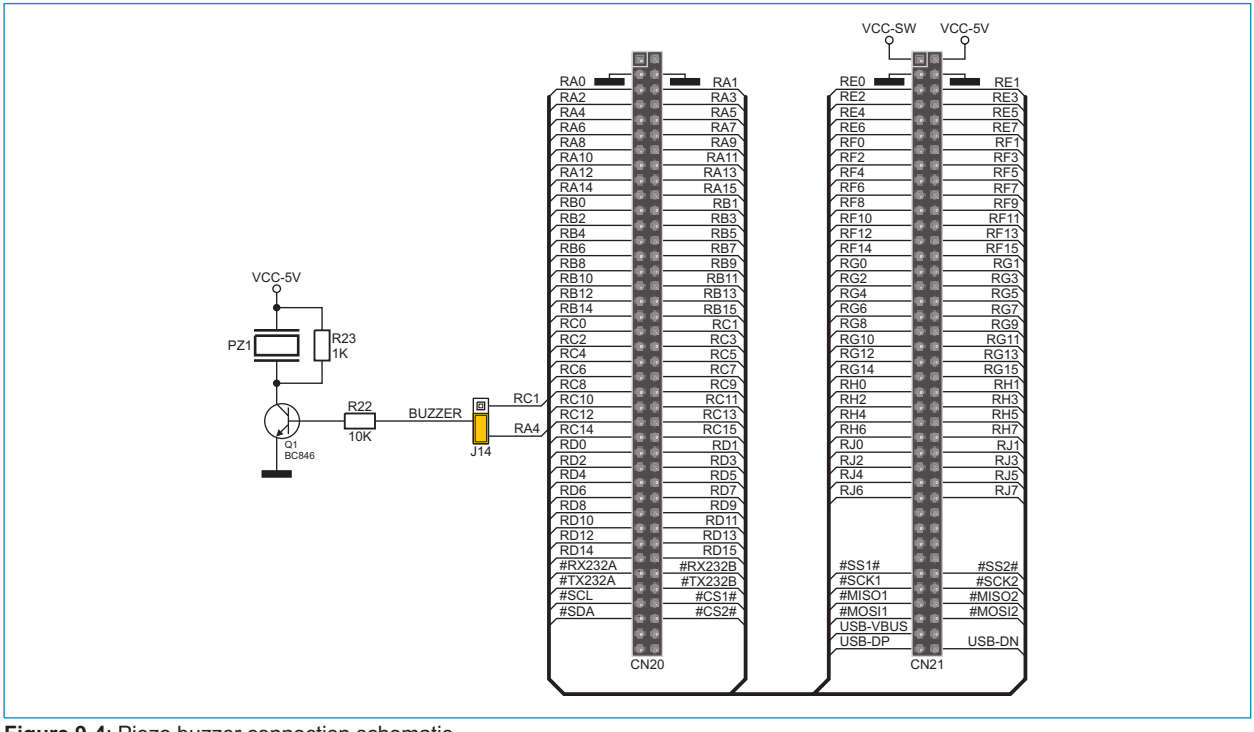

Figure 9-4: Piezo buzzer connection schematic