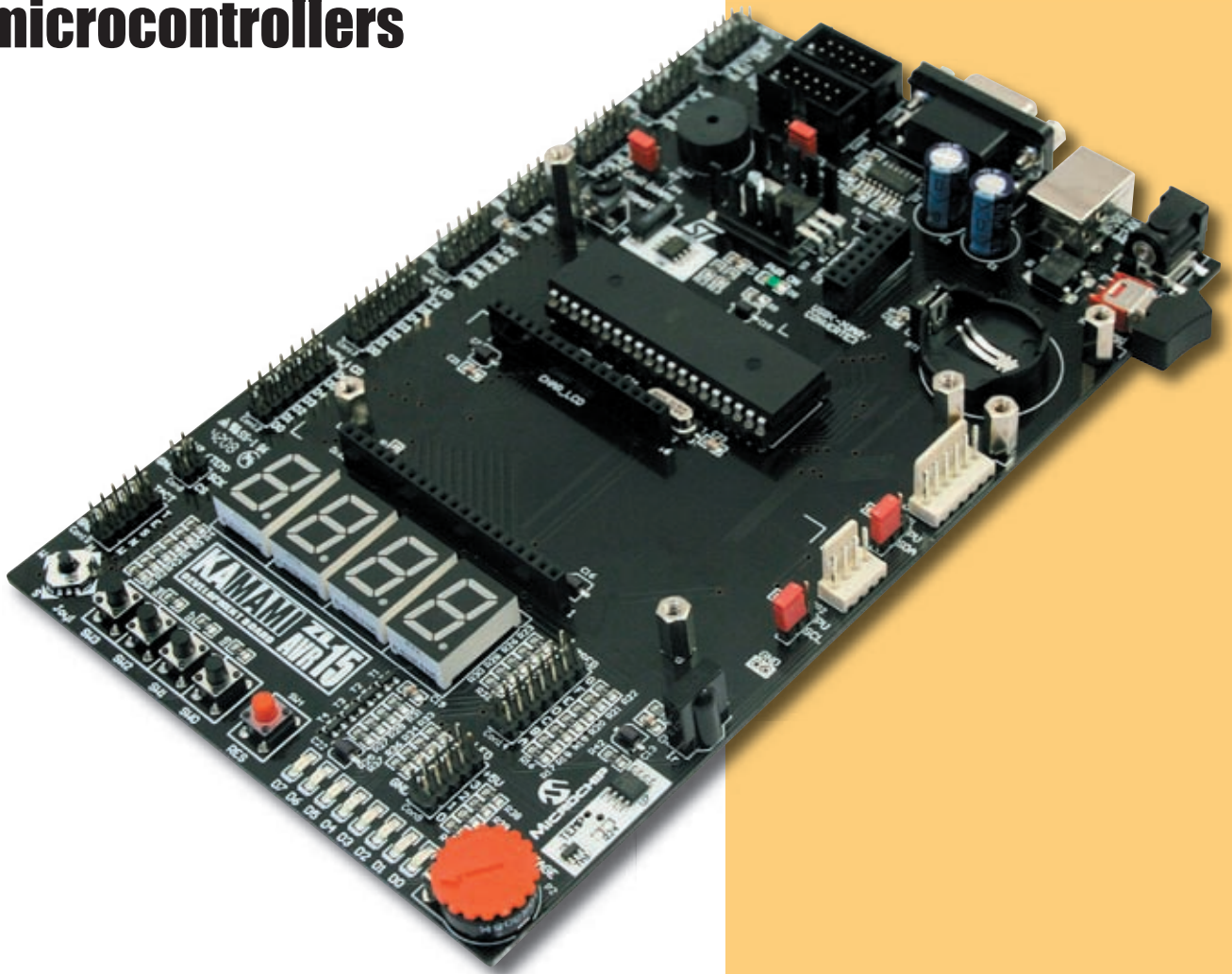


Development board for Atmel ATmega32 microcontrollers



ZL15AVR is an universal development board for ATmega32 (and other AVR microcontrollers in 40-pin package). With a wide range of peripherals it can be used as an environment for development of prototypes or as an education board.

Preface

The ZL15AVR board, thanks to its rich set of peripherals, can be used as environment for developing applications for ATmega32 microcontrollers and other in 40-pin package.

Basic features

- ▶ ATmega32 microcontroller in DIP package
- ▶ 4 switch keyboard
- ▶ 5-position joystick
- ▶ 8 LEDs
- ▶ four digit seven segment display
- ▶ connector for 2x16 characters LCD display (LCD1602)
- ▶ connector for graphic LCD display with KS0108 controller IC (LCD12864)
- ▶ M41T00 real time clock with socket for CR2032 battery
- ▶ TC77 digital thermometer with SPI interface
- ▶ thermistor
- ▶ TSOP31236 (36kHz) infrared receiver
- ▶ piezoelectric speaker
- ▶ connector for ZL1USB/ZL4USB module (USB<->UART converter)
- ▶ ISP connector
- ▶ JTAG connector
- ▶ USB connector for powering from PC
- ▶ DB9 connector with MAX232 voltage translator for RS232 transmission
- ▶ set of pin connectors with all I/O signals of microcontroller
- ▶ potentiometer

Standard equipment

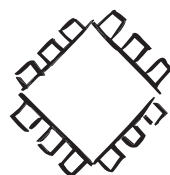
Code	Description
ZL15AVR	▶ Assembled ZL15AVR board

Technical assistance

For technical assistance, please contact support@kamami.com.

Please provide the following data:

- ▶ Version of the operating system
- ▶ Microcontroller type used in your system and its oscillator frequency
- ▶ Detailed description of the problem


btc

BTC Korporacja
05-120 Legionowo, Poland
ul. Lwowska 5
e-mail: office@kamami.com
<http://www.kamami.com>

Disclaimer

BTC Korporacja makes no warranty for the use of its products and assumes no responsibility for any errors which may appear in this document nor does it make a commitment to update the information contained herein.

BTC Korporacja products are not intended for use in medical, life saving or life sustaining applications.

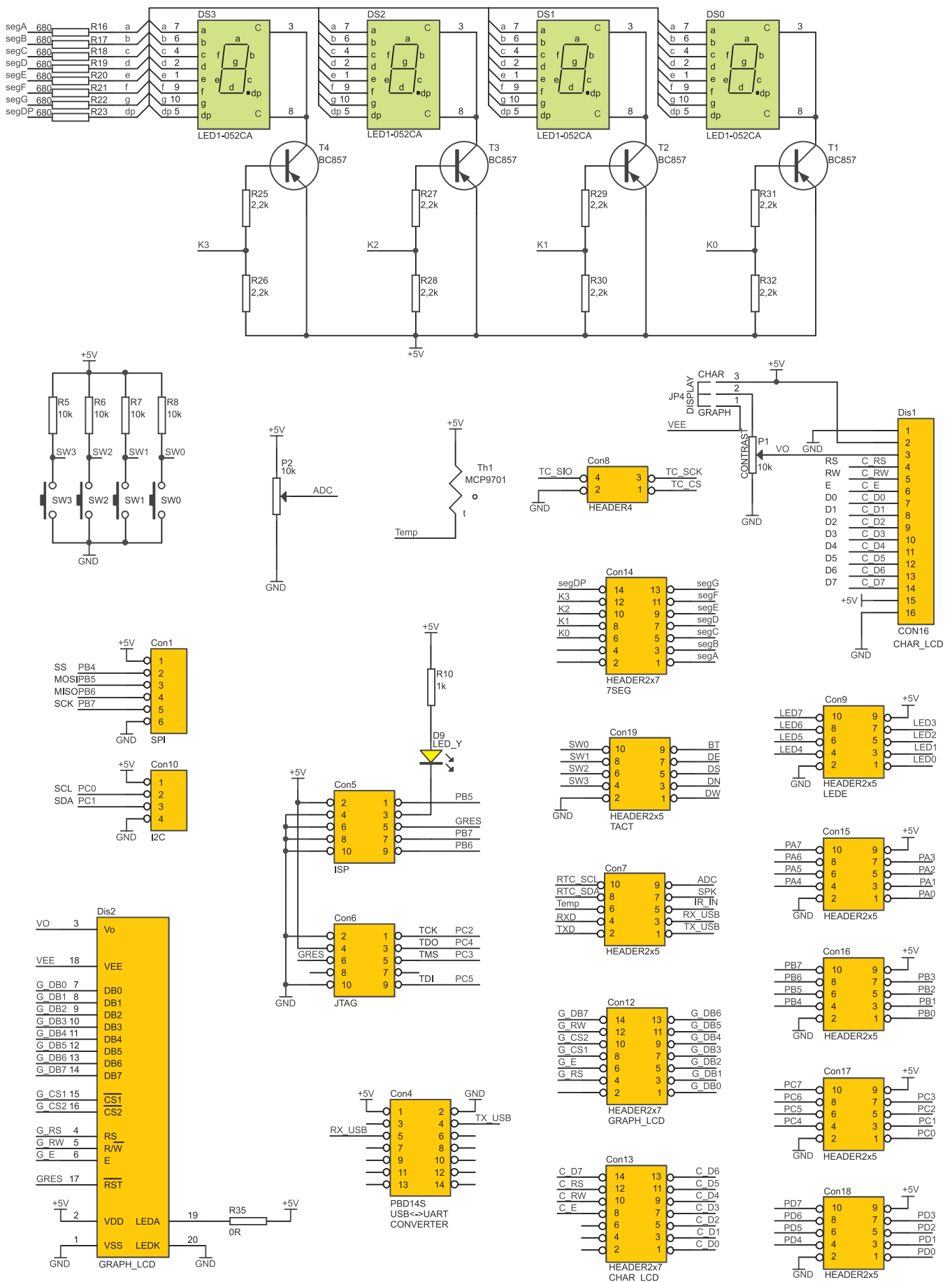
BTC Korporacja retains the right to make changes to these specifications at any time, without notice.

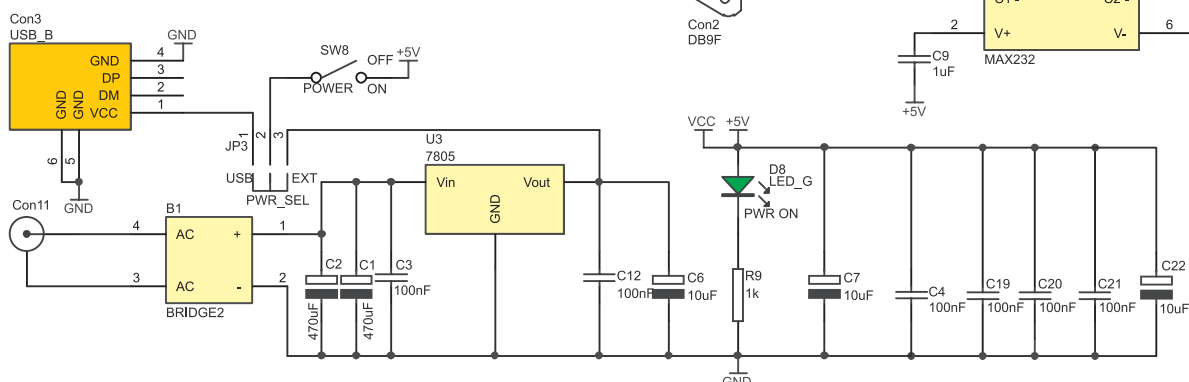
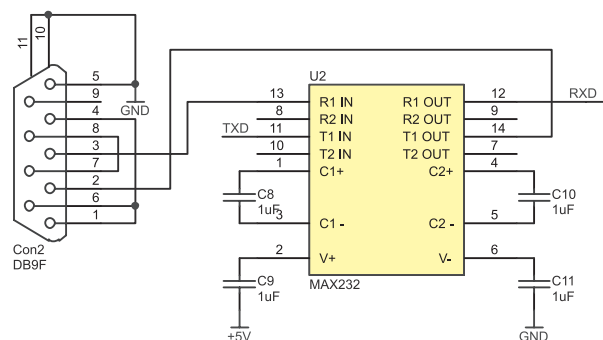
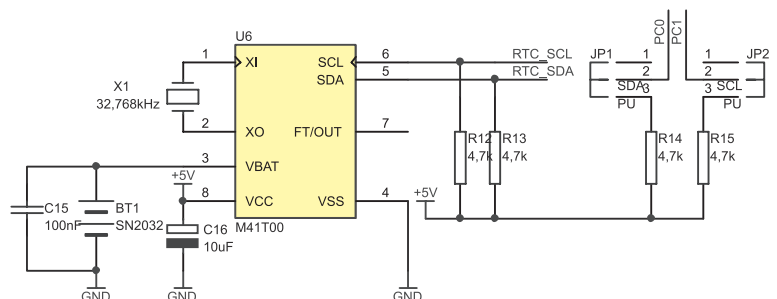
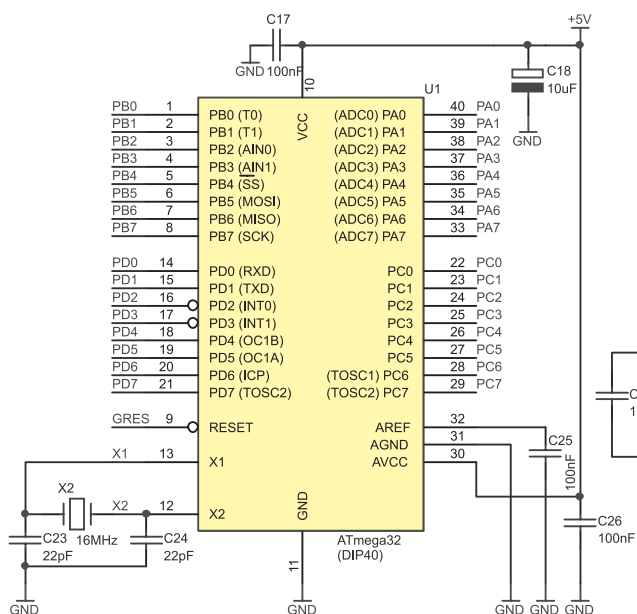
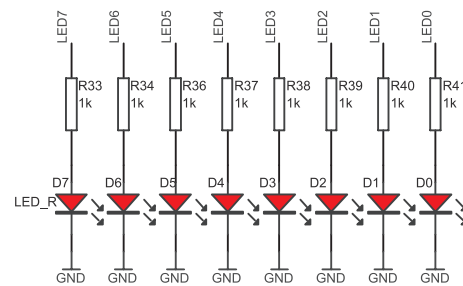
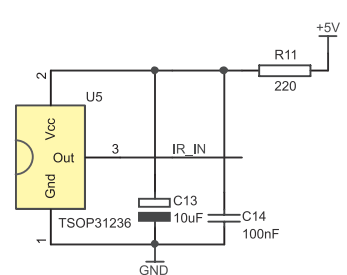
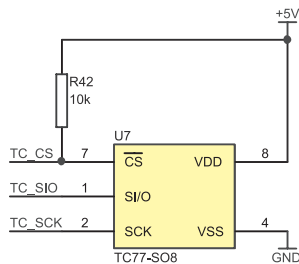
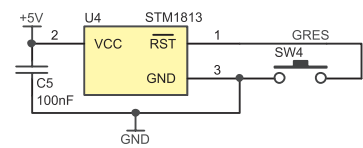
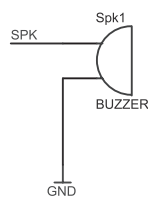
All product names referenced herein are trademarks of their respective companies.

Table of contents

▶ Electric schematic	4
▶ Power supply	6
▶ Keyboard	7
▶ Joystick	8
▶ LEDs	9
▶ LED display	10
▶ Potentiometer	11
▶ TC77 digital thermometer	12
▶ Thermistor	13
▶ Infrared receiver	14
▶ Connector for graphic LCD display	15
▶ Connector for alphanumerical LCD display	16
▶ I2C bus connector	17
▶ SPI bus connector	18
▶ USB<->UART converter connector	19
▶ M41T00 real time clock device	20
▶ Buzzer	21
▶ JTAG and ISP connectors	22
▶ RS232 connector	23

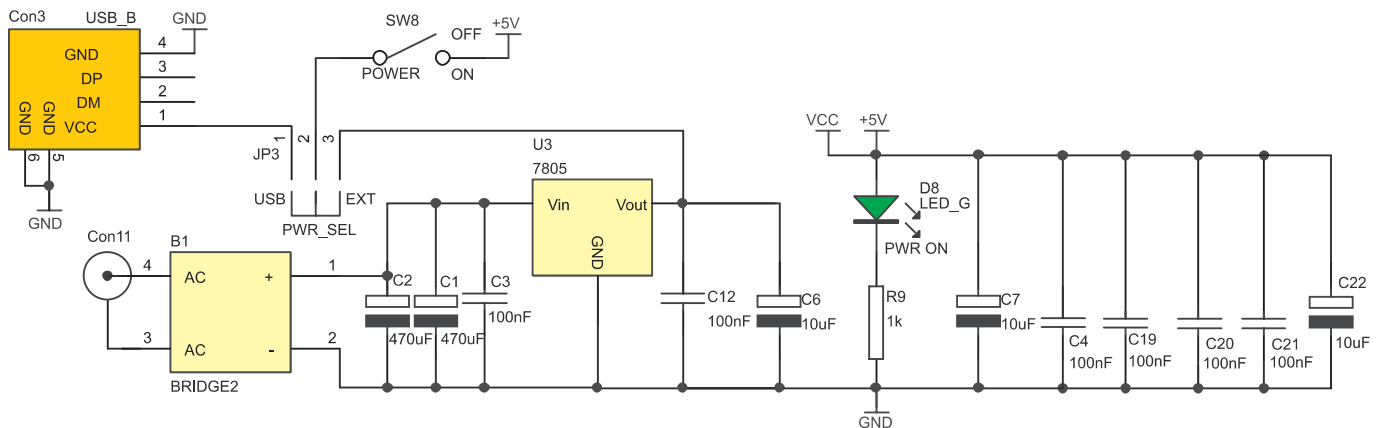
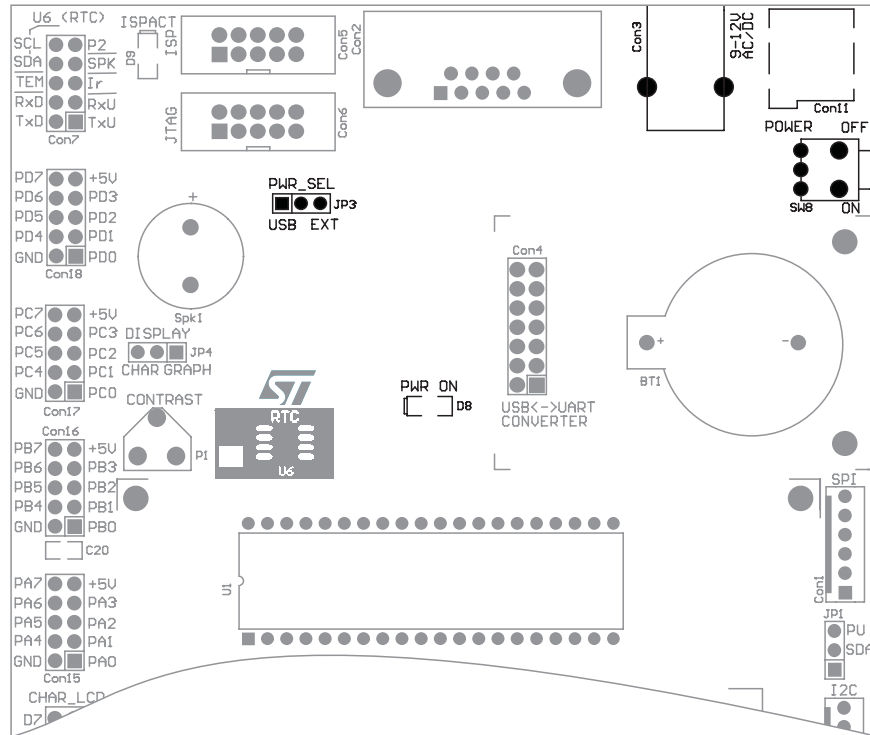
Electric schematic





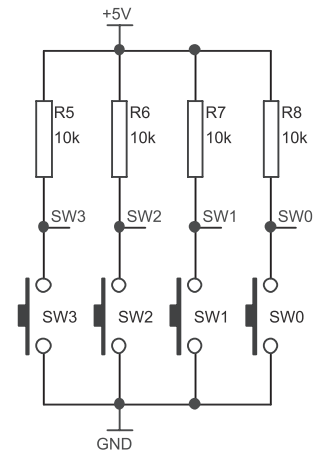
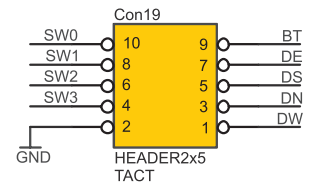
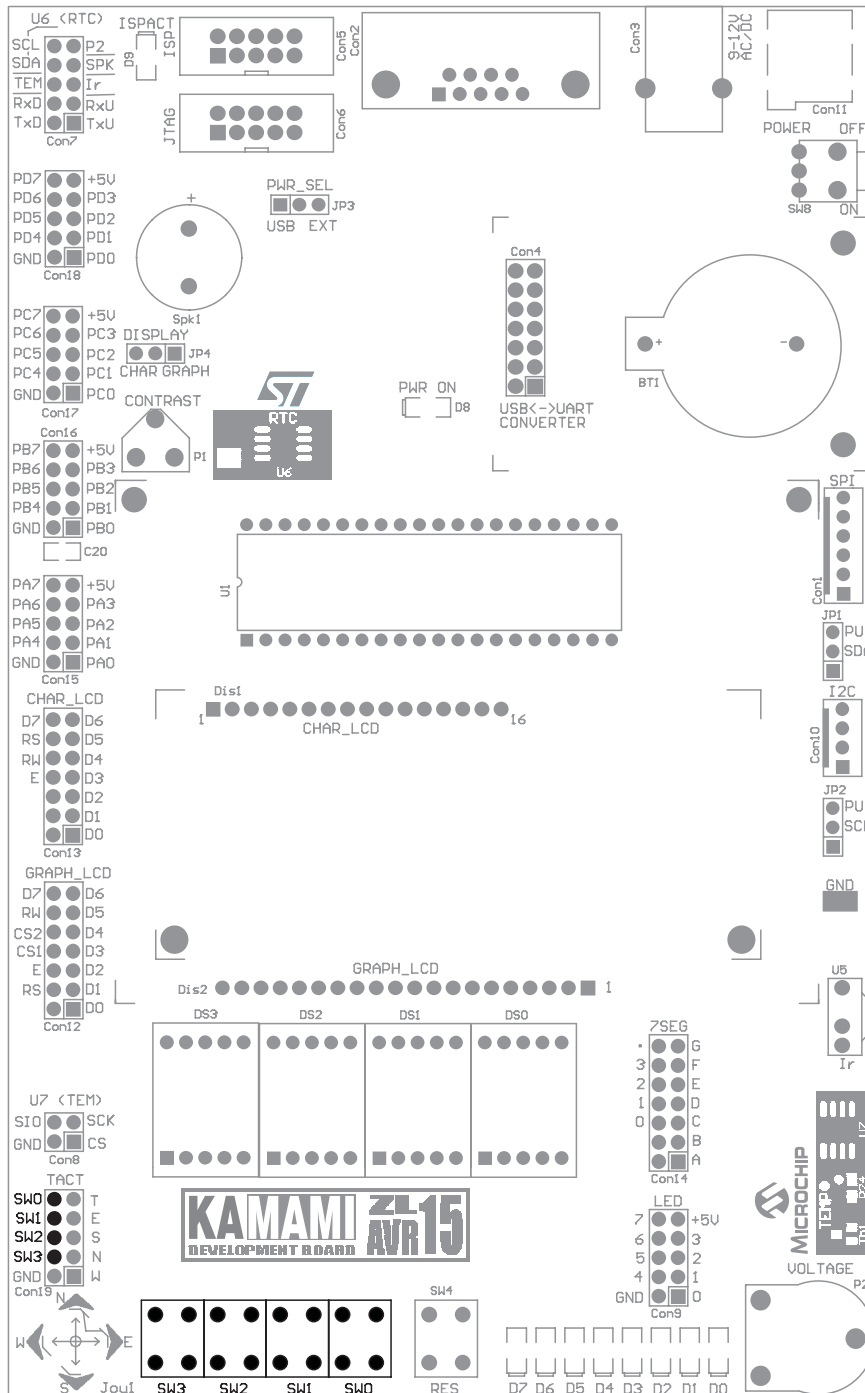
Power supply

The ZL15AVR board can be powered from the USB port of your PC (USB-B Con3, PWR_SEL pin header in the USB position) or an external voltage source with a value 9..12V (DC connector Con11, PWR_SEL pin header in position EXT). Board is equipped with a switch SW8 which allows to disconnect power without removing the plug from the connector Con3 or Con11. LED D8 indicates the inclusion of the supply voltage.



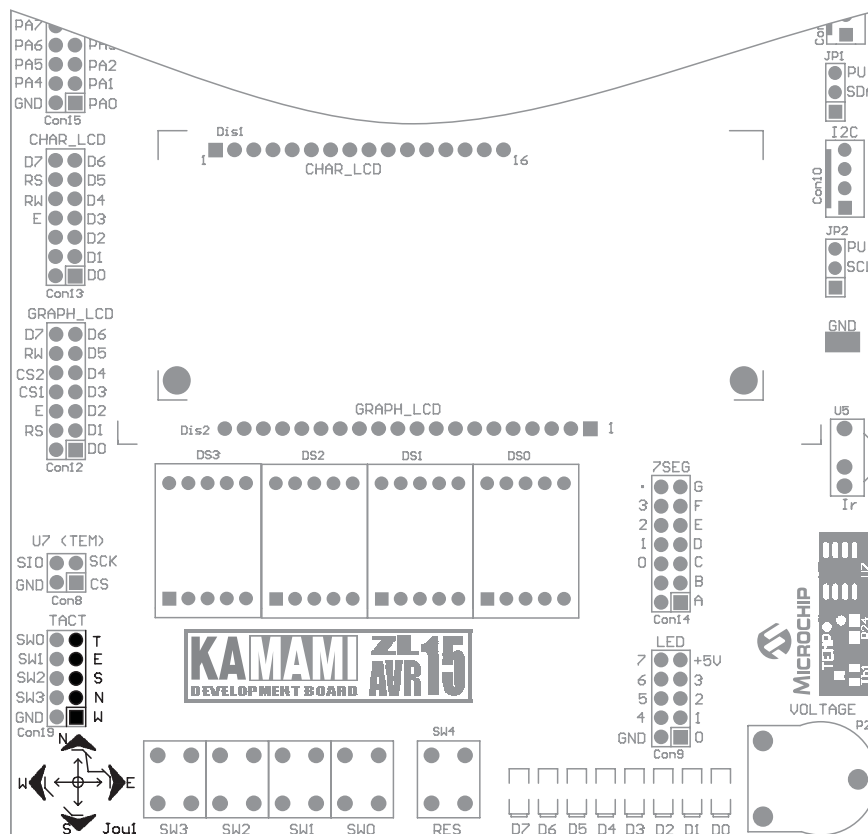
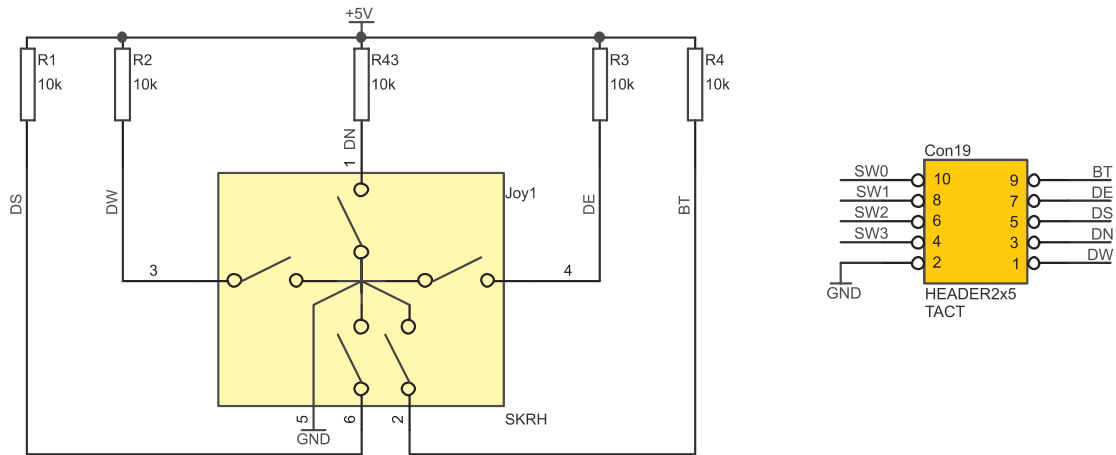
Keyboard

The ZL15AVR board is equipped with four switch keyboard (SW0-SW3). Each button has its own pull-up resistor. Switch lines are available on Con8 connector.



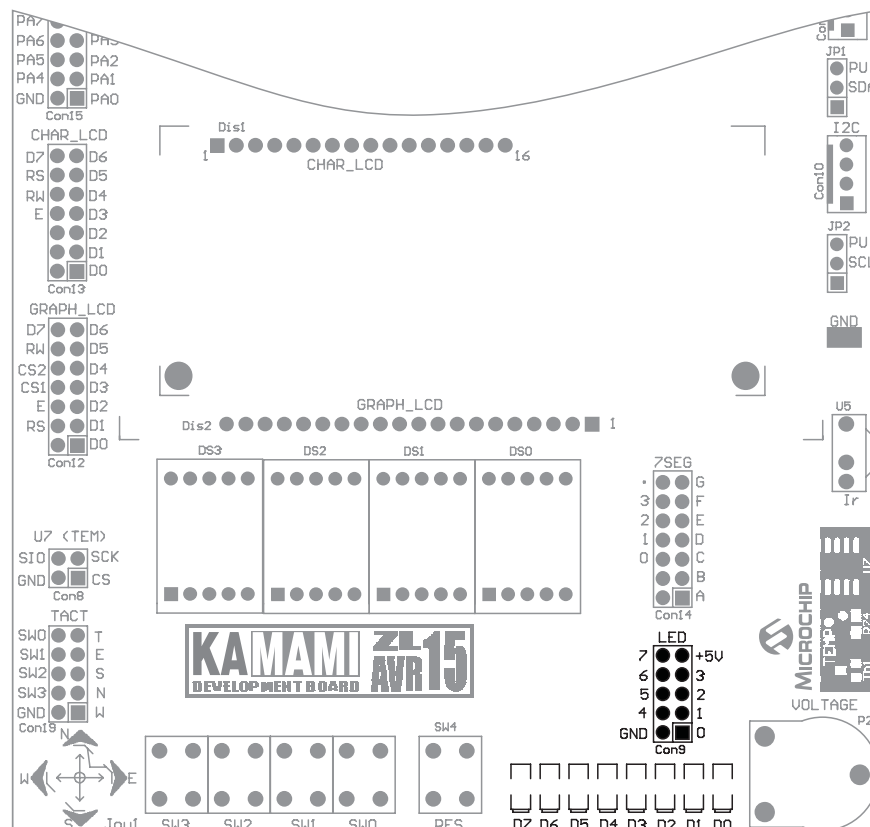
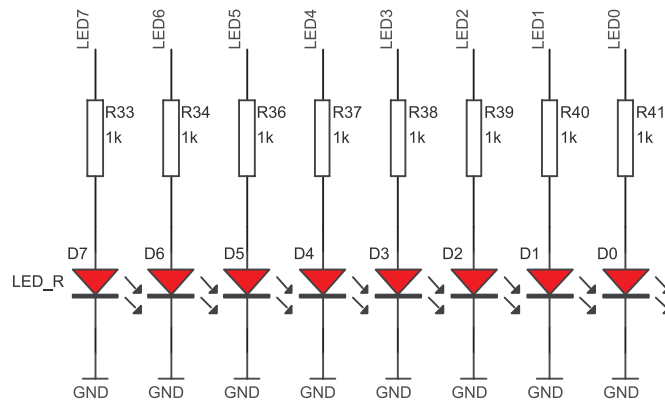
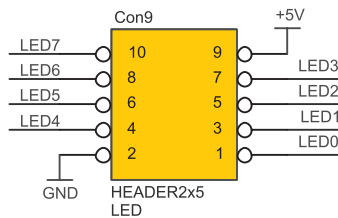
Joystick

The ZL15AVR board is equipped with 5-position joystick. Each position has its own pull-up resistor. Joystick lines are available on Con19 connector.



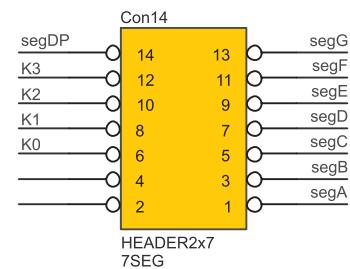
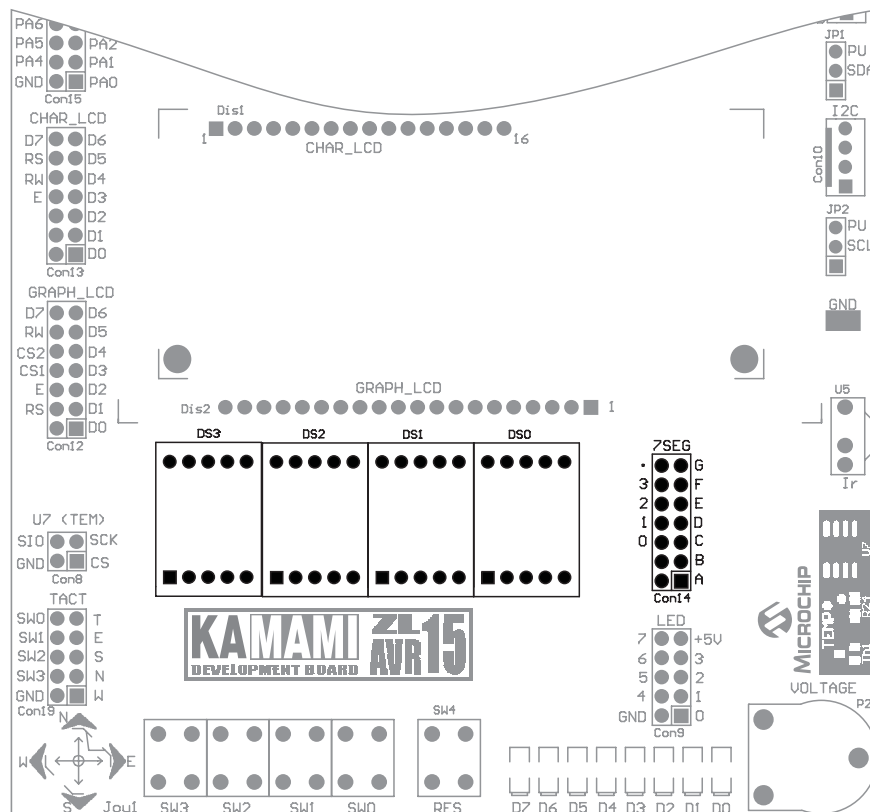
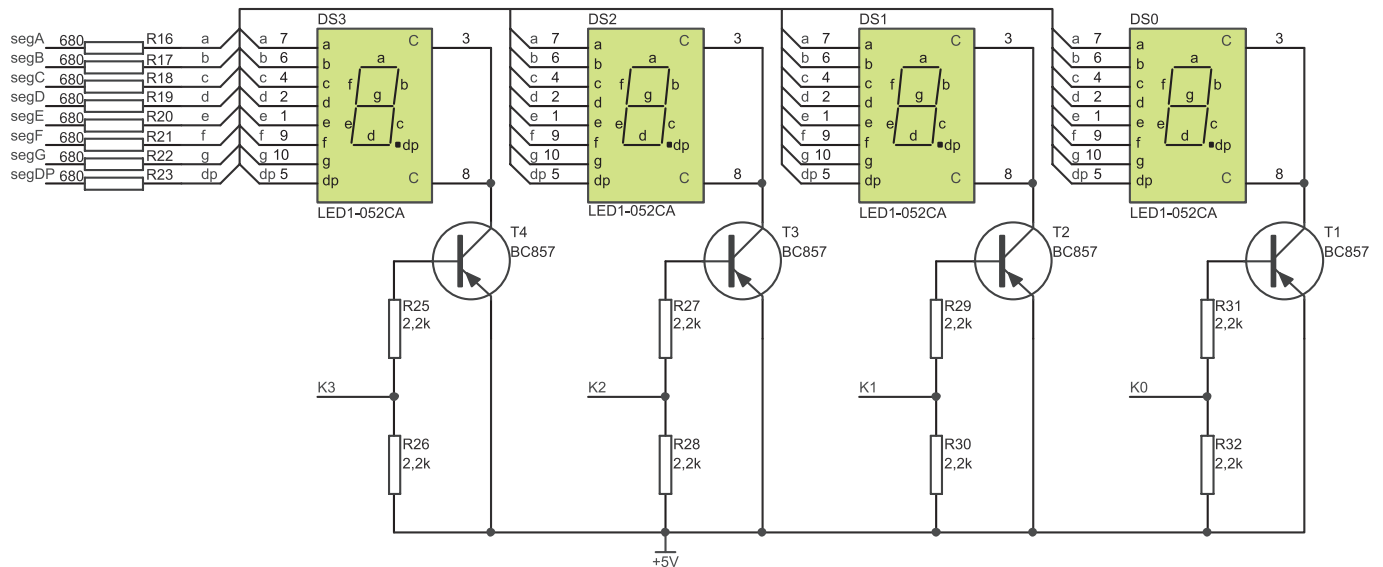
LEDs

The ZL15AVR board is equipped with 8 LEDs (active state: high). Control lines for LEDs are available on Con9 connector.



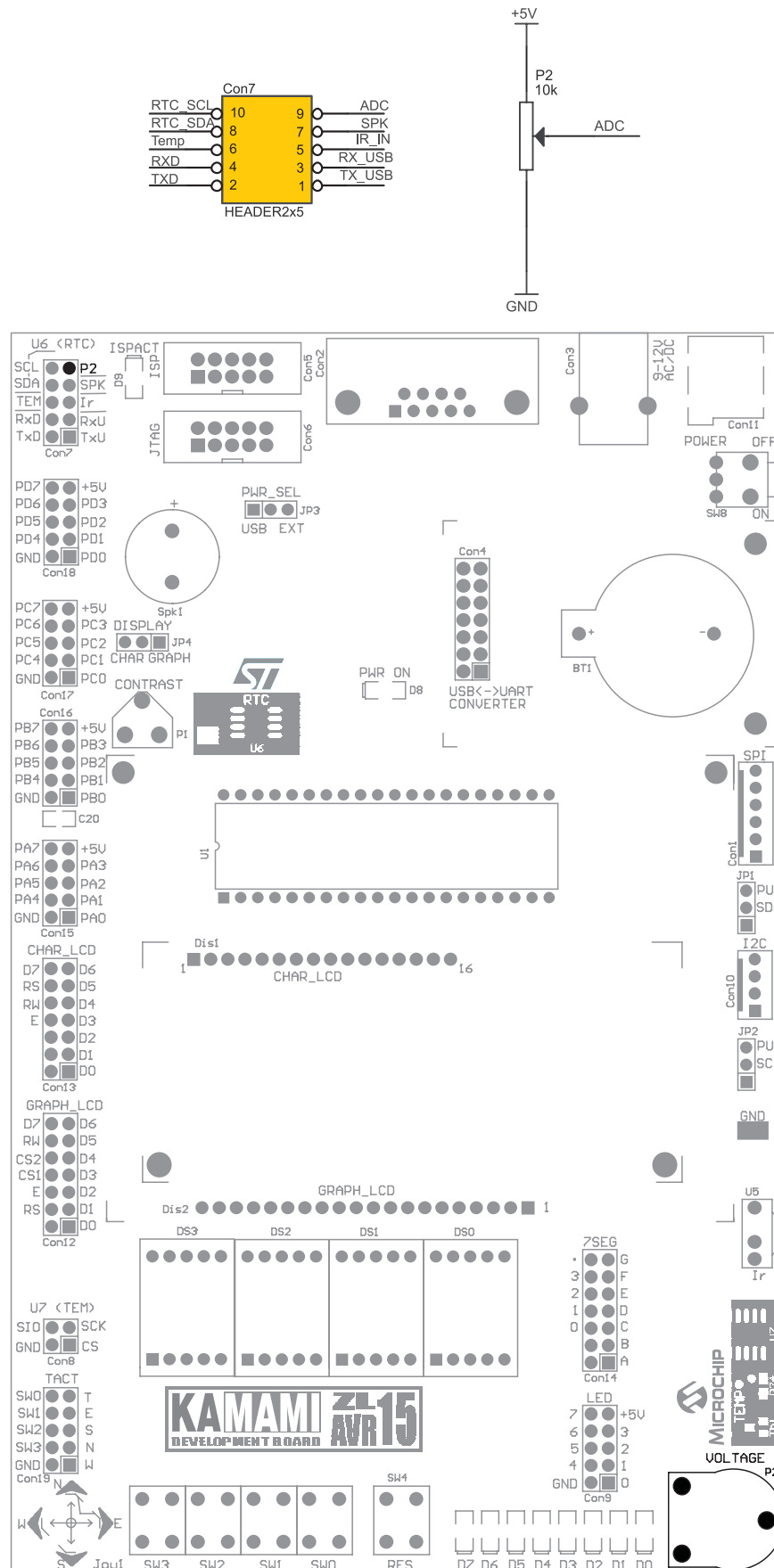
LED display

The ZL15AVR board is equipped with four-digit seven segment LED display (DS0-DS3). Control signals for LED display are available on Con14 connector.



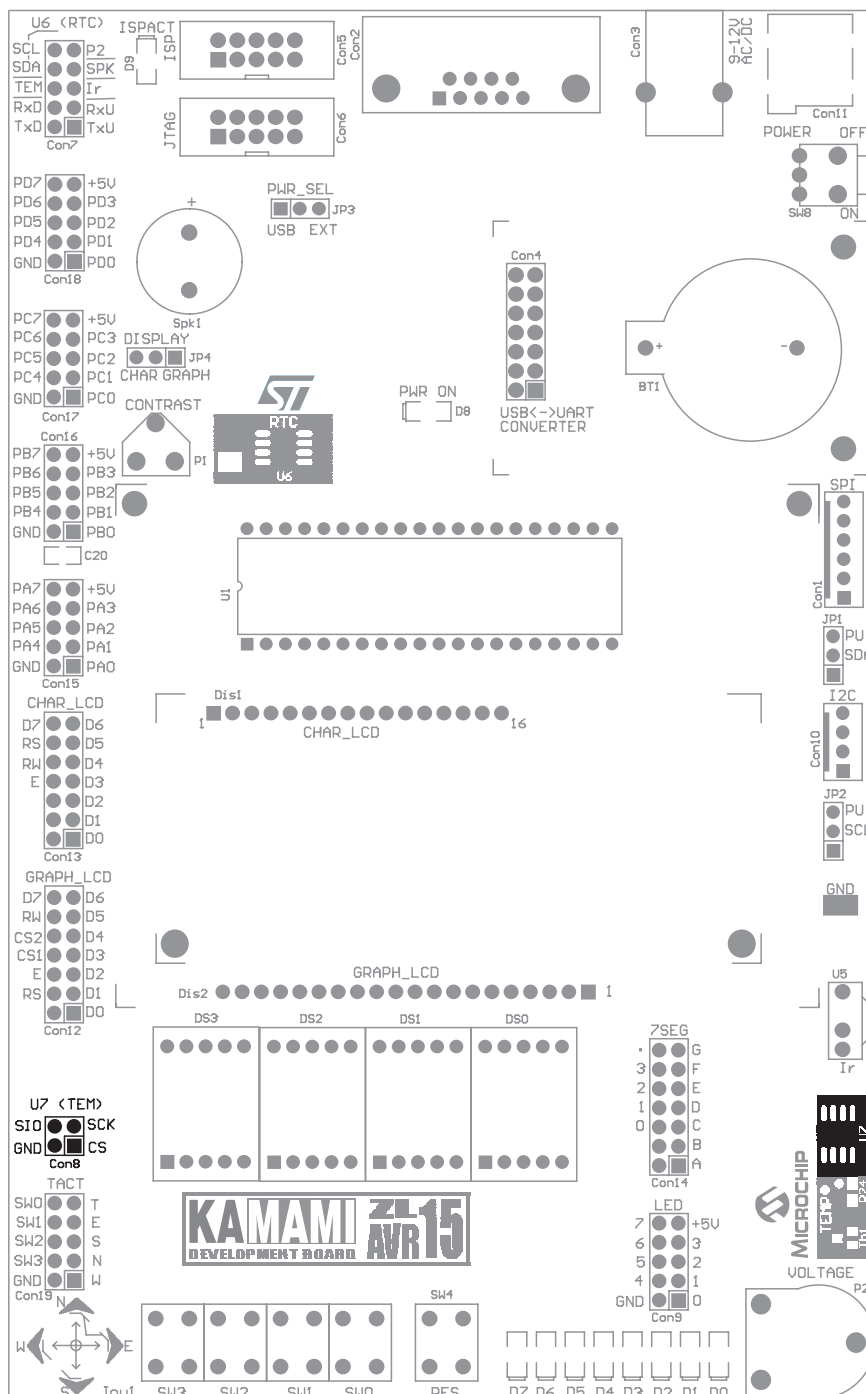
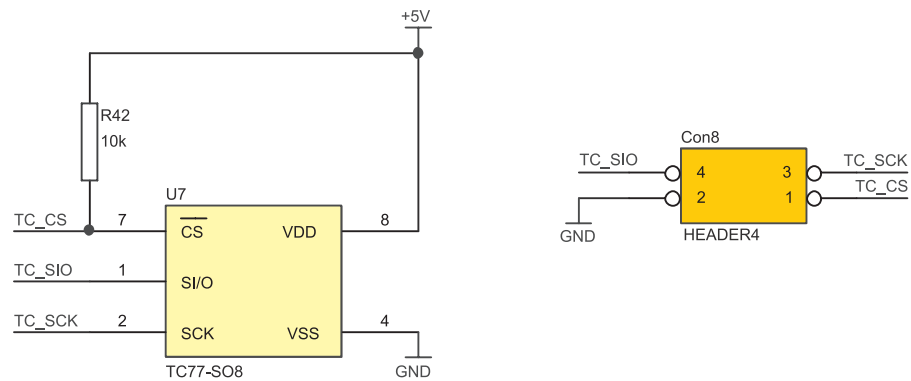
Potentiometer

The ZL15AVR board is equipped with potentiometer, which can be used for setting voltage on input of analog to digital converter. The slider of potentiometer is available on Con7 connector (marked as P2).



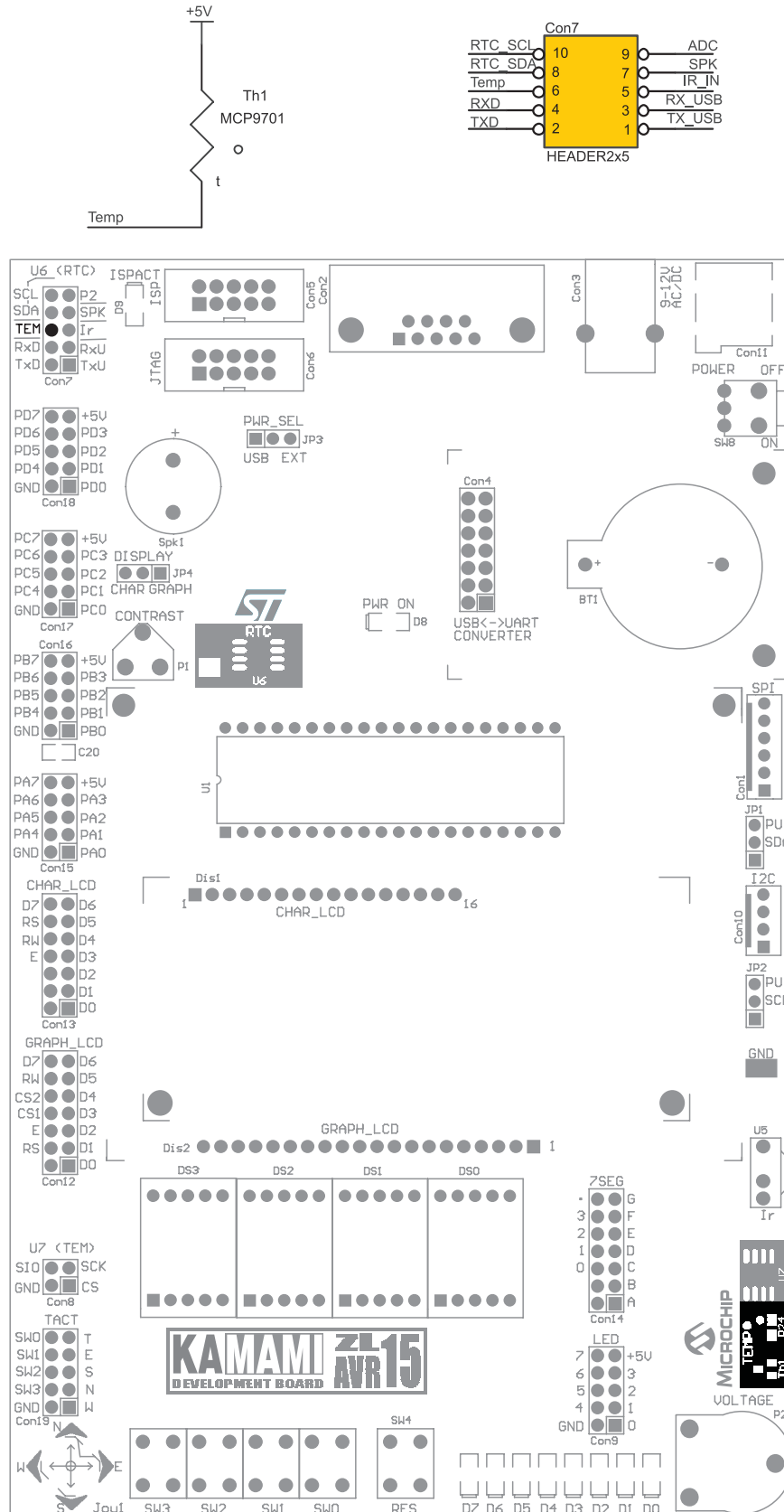
TC77 digital thermometer

The ZL15AVR board is equipped with TC77 digital thermometer device (Microchip). TC77 device works on SPI bus. SPI lines (SCK, SIO, CS) are available on Con8 connector.



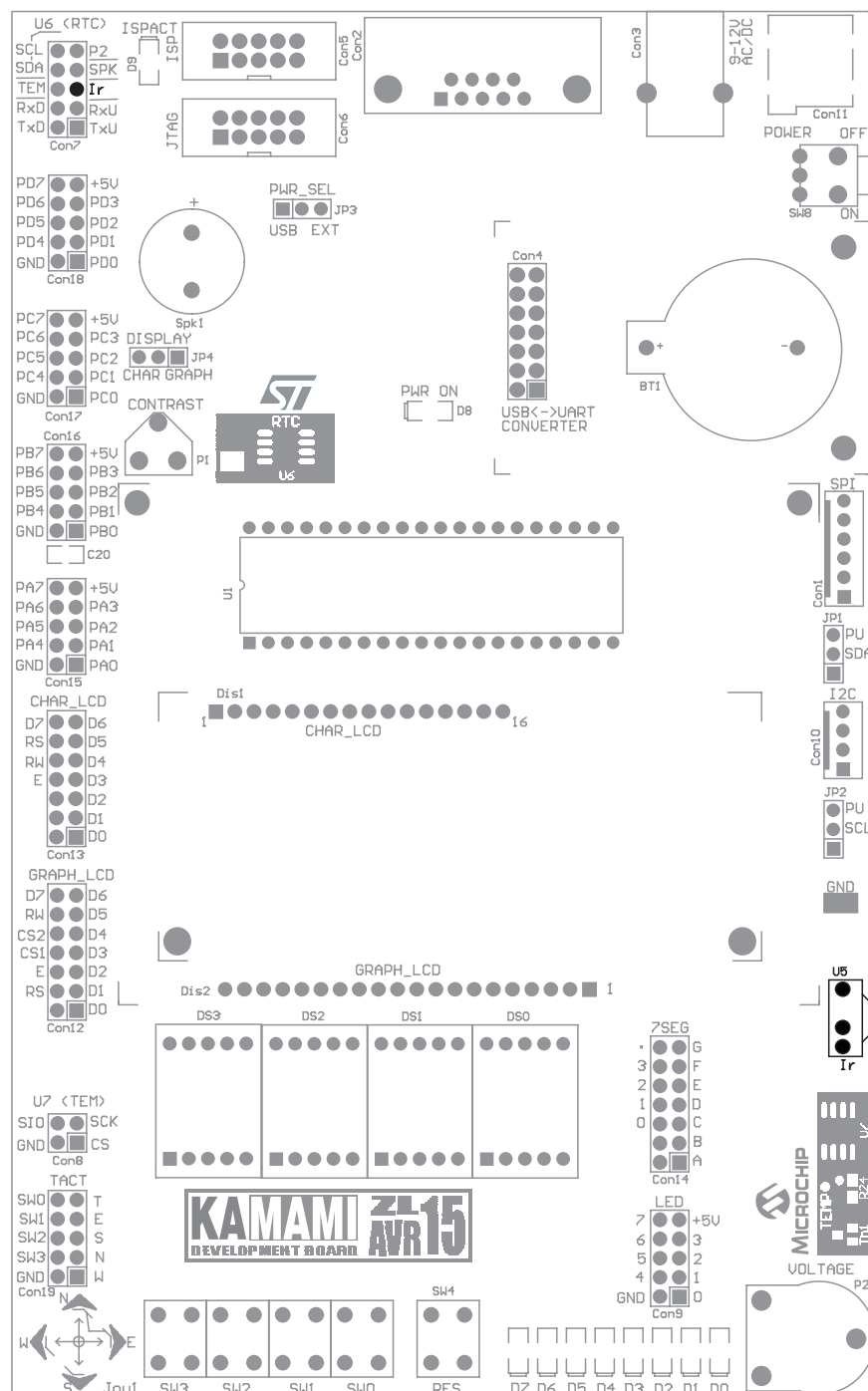
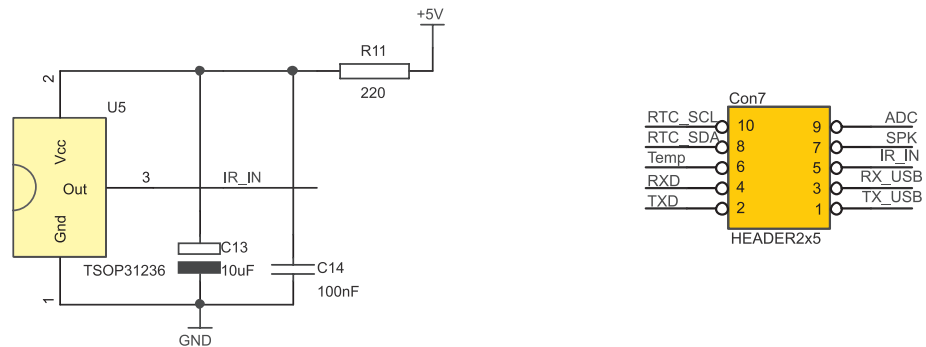
Thermistor

The ZL15AVR board is also equipped with thermistor MCP9701 (Microchip) Output voltage is available on Con7 connector (marked TEM).



Infrared receiver

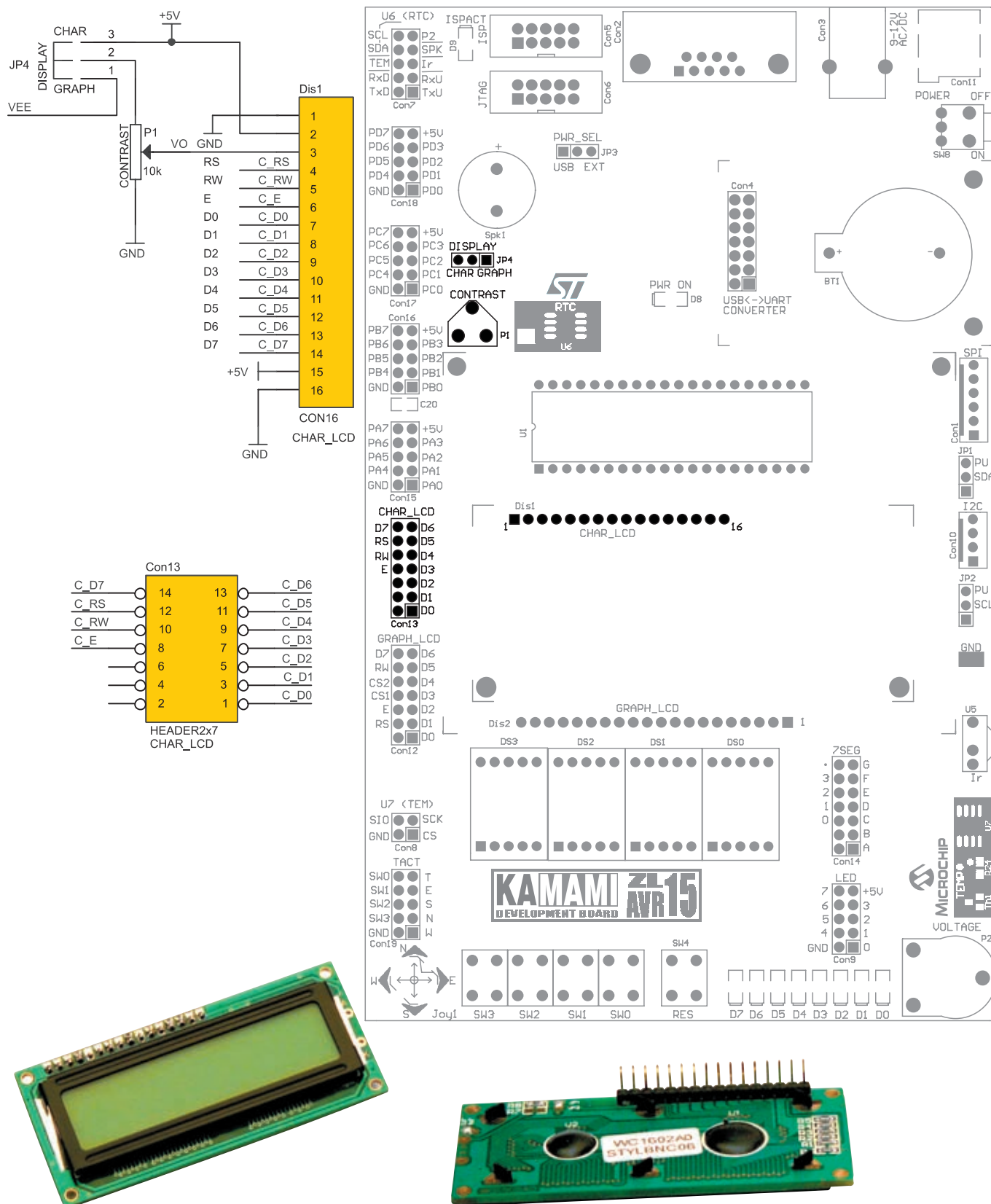
The ZL15AVR board is equipped with TSOP31236 infrared receiver (36kHz). This device can be used to receiving signals sent by RTV equipment remote controllers. Receiver output is available on Con7 connector (marked as Ir).



KAMAMI**KAMAMI**

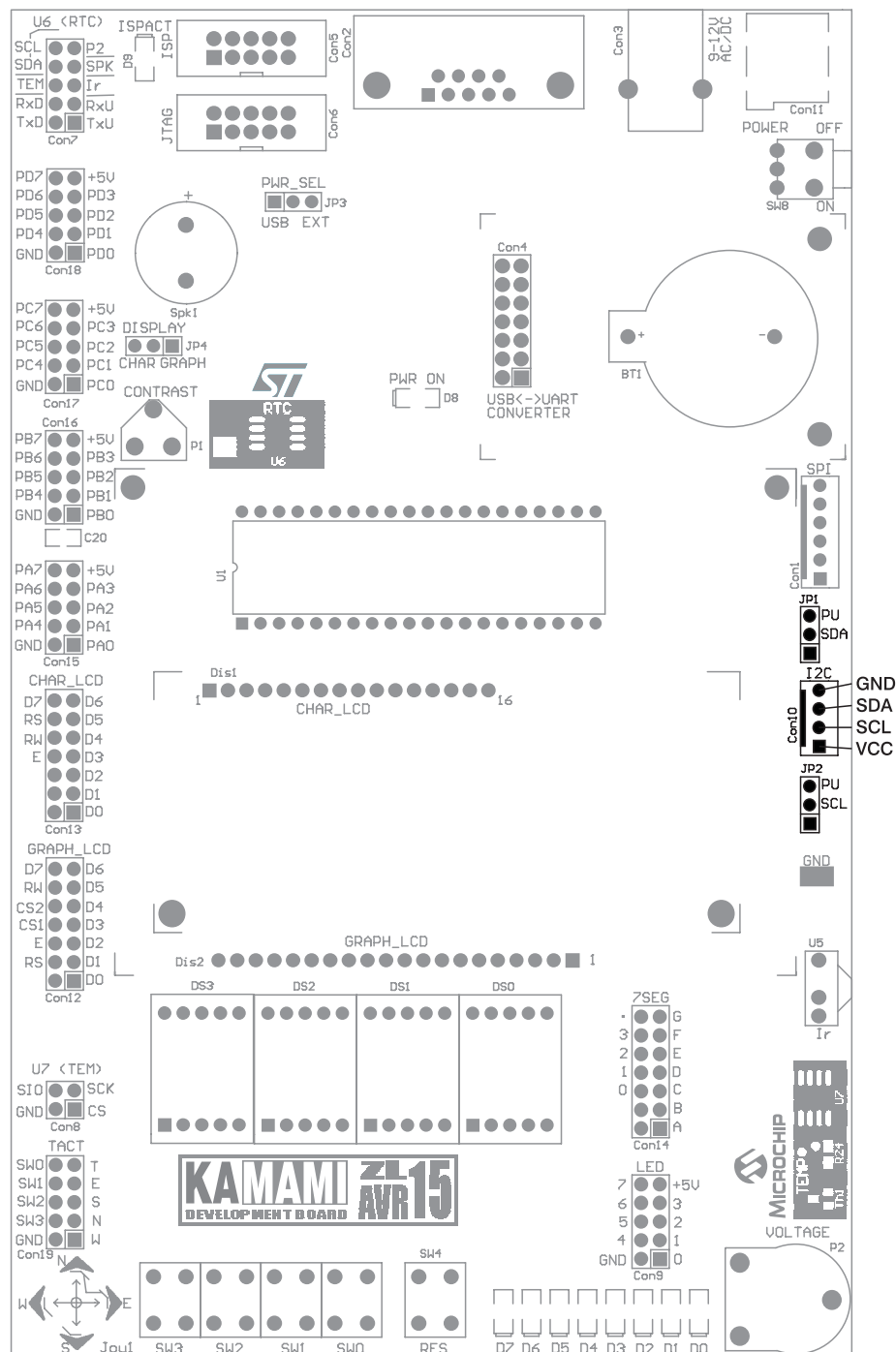
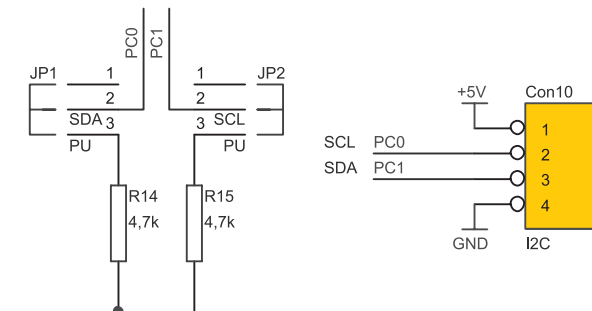
Connector for alphanumerical LCD display

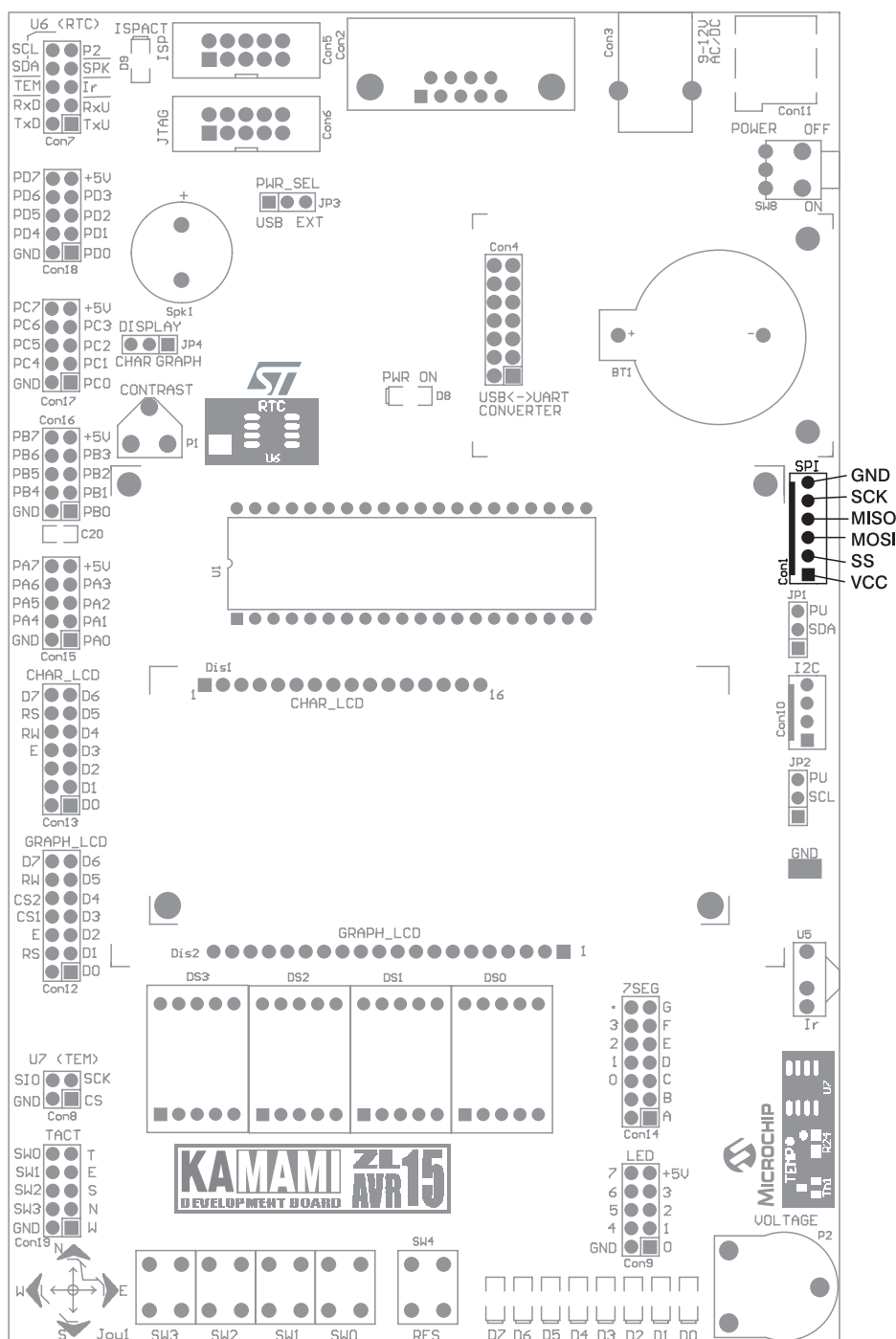
The ZL15AVR board is equipped with connector for alphanumerical LCD display with HD44780 controller (LCD1602). Display contrast can be adjusted by P1 potentiometer (JP4 DISPLAY pin header in CHAR position). Control signals for display are available on Con13 connector.



I2C bus connector

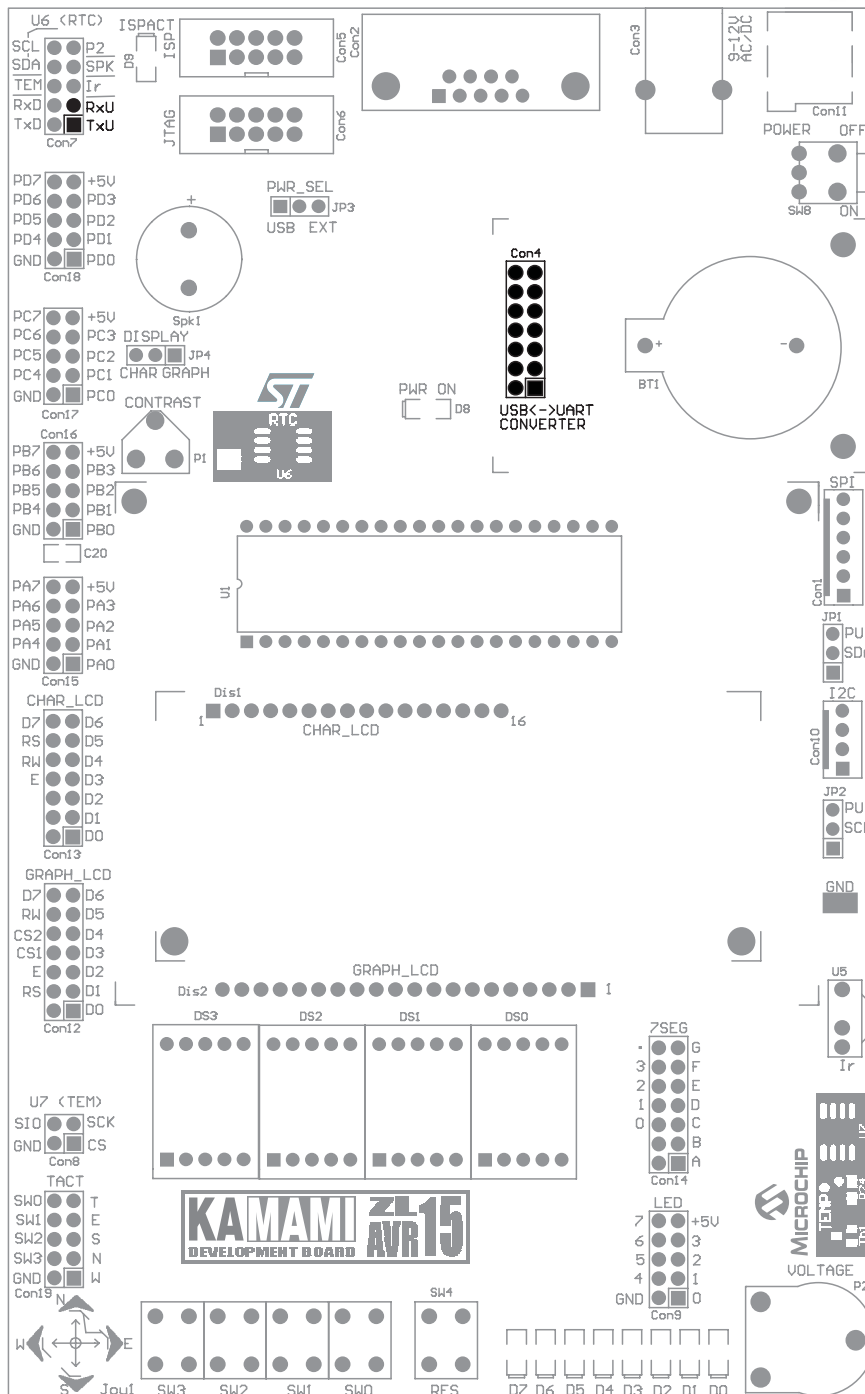
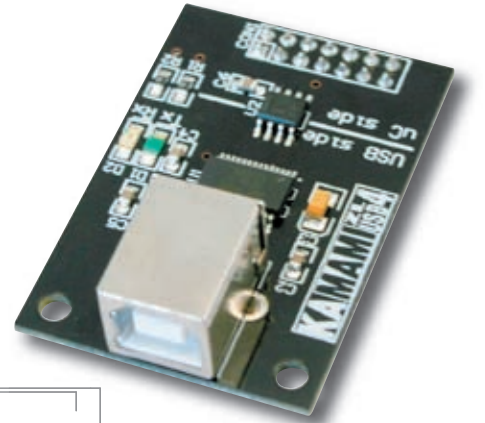
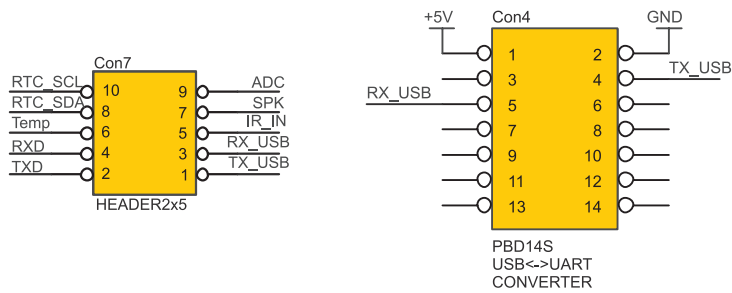
The ZL15AVR board is equipped with connector Con10/I2C which can be used for connecting external devices with I2C interface. It is possible to connect pull-up resistor by using JP1 and JP2 pin header in PU/SDA and PU/SCL positions.





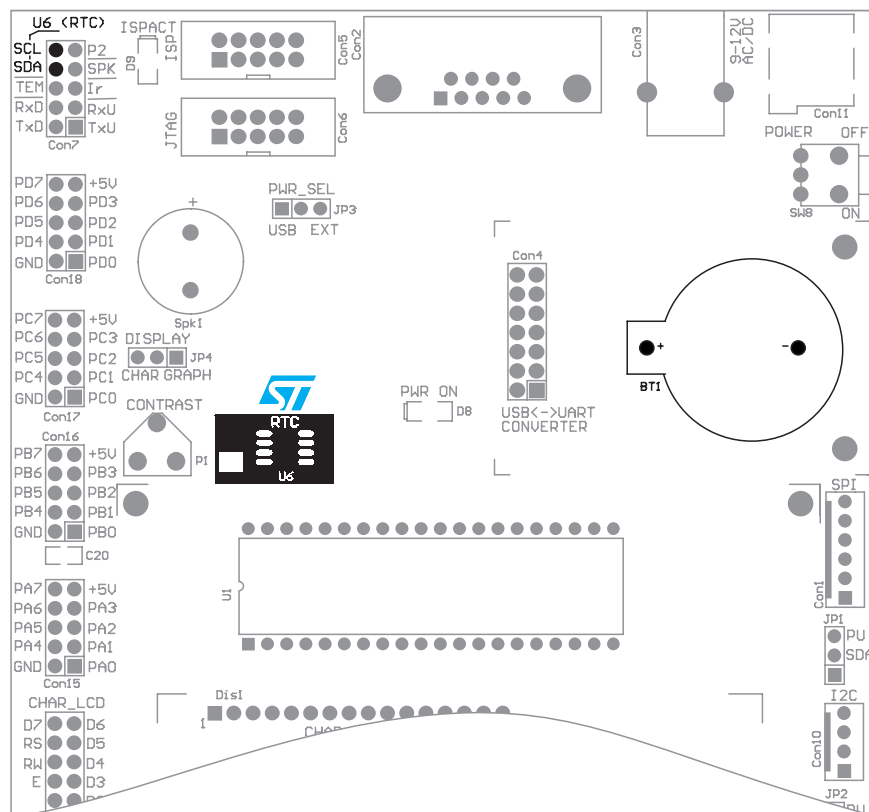
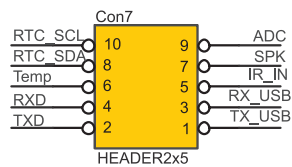
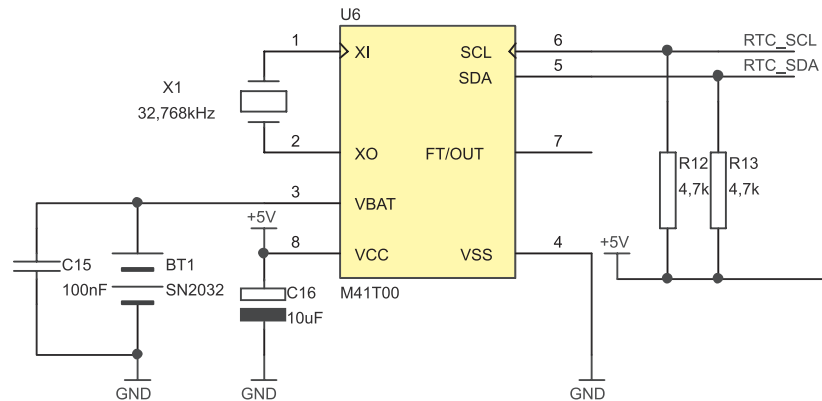
USB<->UART converter connector

The ZL15AVR board is equipped with connector Con4 which can be used for connecting USB<->UART converter module (for example: ZL1USB_A, ZL4USB). UART lines are available on Con7 connector (marked as TxU and RxU).



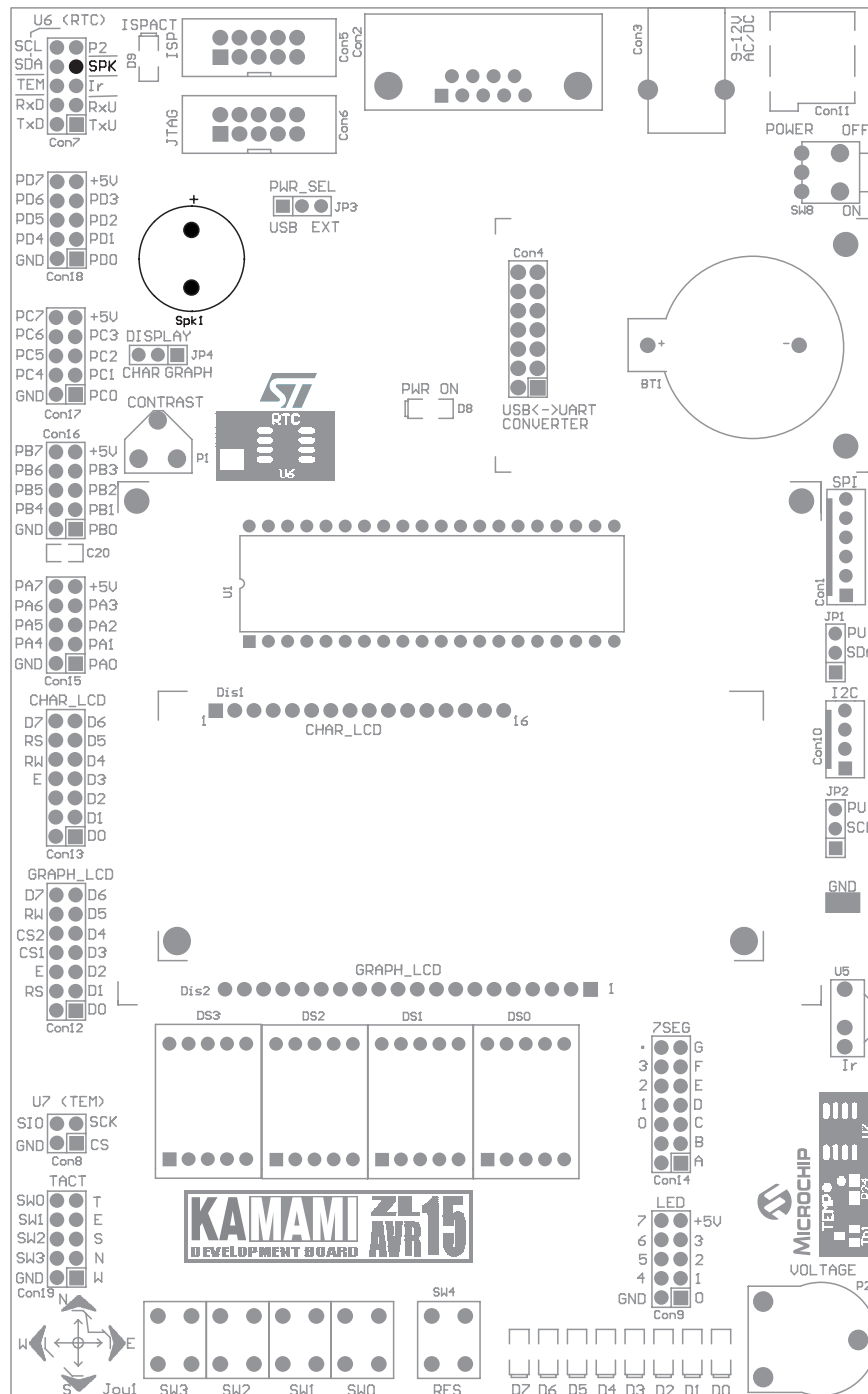
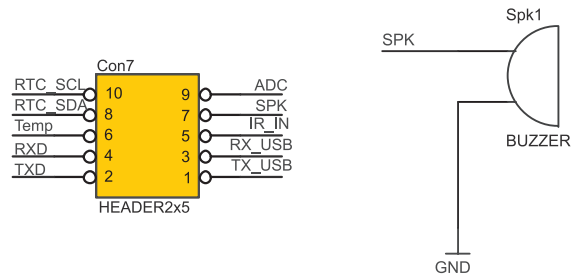
M41T00 real time clock device

The ZL15AVR board is equipped with M41T00 RTC device. In addition to RTC device on the board there are also socket for battery (CR2032) and crystal oscillator. Control signals (SDA and SCL) are available on Con7 connector.



Buzzer

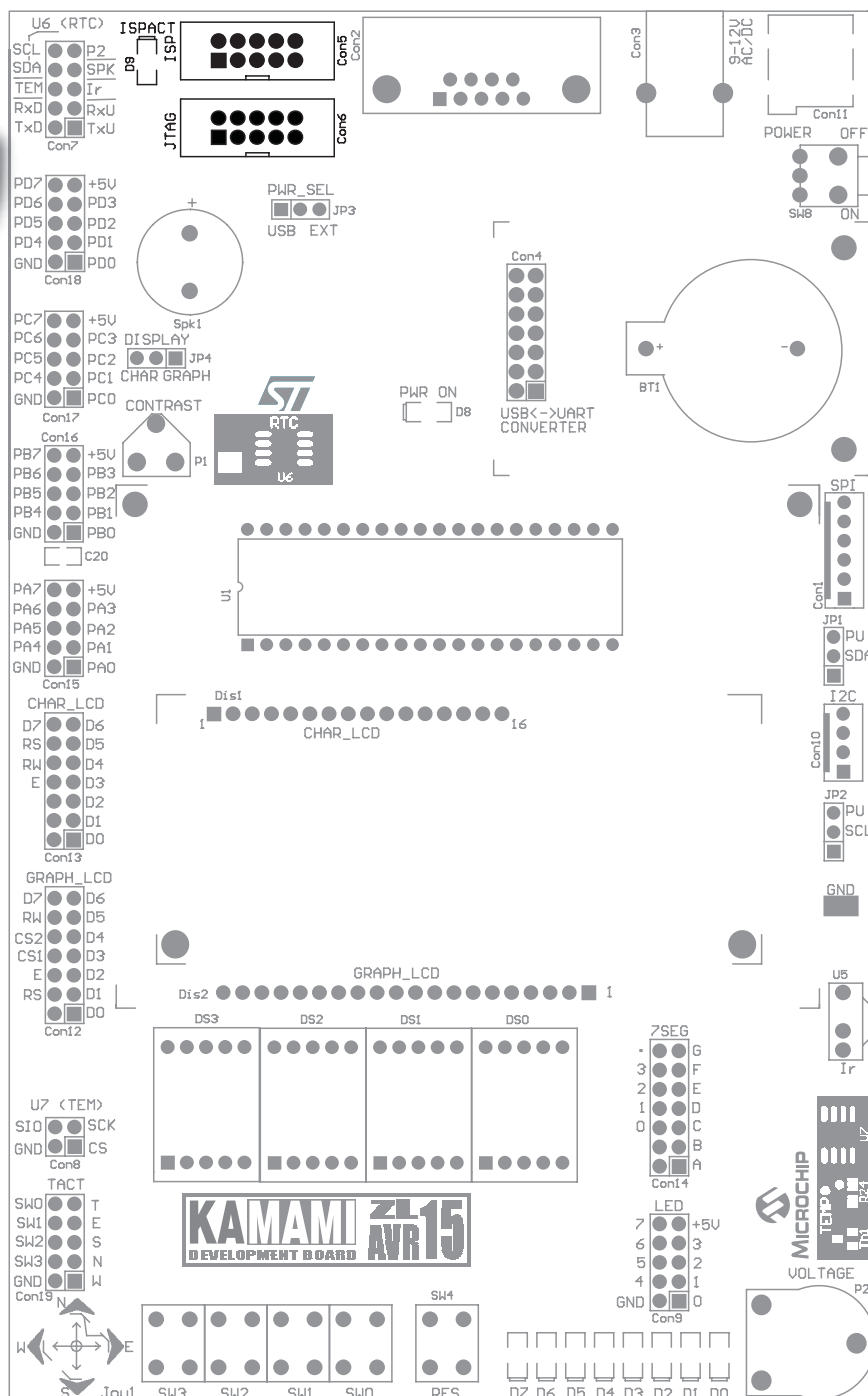
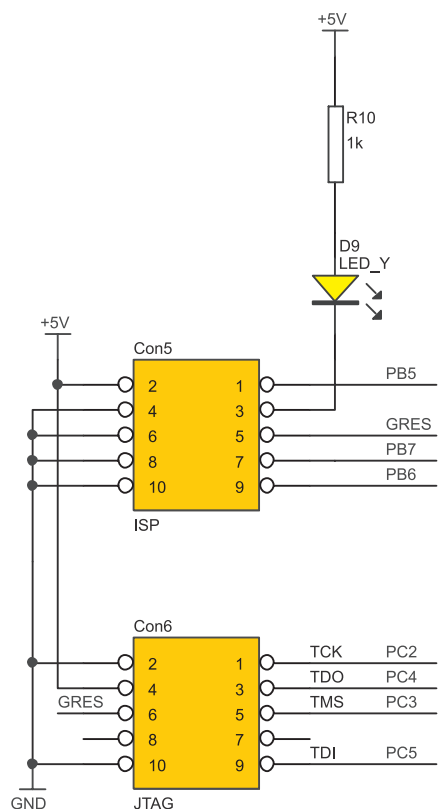
The ZL15AVR board is equipped with piezoelectric buzzer Spk1. Control signal for buzzer is available on Con7 connector (marked as SPK).



JTAG and ISP connectors

The ZL15AVR board is equipped with Con6 connector which can be used for programming and debugging using JTAG interface (for example: ZL16PRG). Before connecting JTAG tool make sure that PC port is not connected with any low impedance load circuits. If JTAG is enabled, lines TCK, TDI, TDO and TMS are unavailable for other purposes.

The ZL15AVR board is equipped with Con5 connector which can be used for programming using ISP interface (for example: ZL20PRG, ZL2PRG). Before connecting ISP tool make sure that lines PB5...PB7 are not connected with any low impedance load circuits.



RS232 connector

The ZL15AVR board is equipped with DB9F connector (Con2). This connector can be used to exchange data with PC by RS232 interface. RxD and TxD signals are available on Con7 connector.

