

## AVR-P40-USB-8535 development board Users Manual



All boards produced by Olimex are ROHS compliant

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## INTRODUCTION

The **AVR Microcontroller** are low-power CMOS 8-bit controller based on the RISC architecture. The AVR core combines a rich instruction set with general purpose working registers. All the registers are directly connected to the Arithmetic Logic Unit (ALU), allowing two independent registers to be accessed in one single instruction executed in one clock cycle. The resulting architecture is more code efficient while achieving throughputs up to ten times faster than conventional CISC microcontrollers.

**AVR-P40-USB-8535** is AVR Microcontroller prototype board with USB, JTAG and STKxx compatible 10 PIN ICSP. Supports all devices which are pin to pin compatible with AT90S8535 AVR microcontrollers.

## BOARD FEATURES

- Supports all devices which are pin to pin compatible with AT90S8535 AVR microcontrollers
- ICSP 5x2 pin connector for in-circuit programming with AVR-PG1 or AVR-PG2
- JTAG port 5x2 for in-circuit debugging/programming with AVR-JTAG and AVR-JTAG-USB (ATJTAGICE)
- USB to RS232 FT232 converter
- I2C EEPROM socket
- takes power from USB no need for external adapter
- power supply filtering capacitors
- Quartz crystal oscillator circuit 8Mhz
- reset IC ZM33064
- reset button
- general purpose push button
- status LED connected to PB0 via removable jumper
- DIL40 microcontroller socket
- extension pin headers for each uC pin
- four mounting holes 3.3 mm (0.13")
- Grid 100 mils
- GND bus
- Vcc bus
- FR-4, 1.5 mm (0,062"), green soldermask, white silkscreen component print
- dimensions 100x80 mm (3.9x3.15")

## **ELECTROSTATIC WARNING**

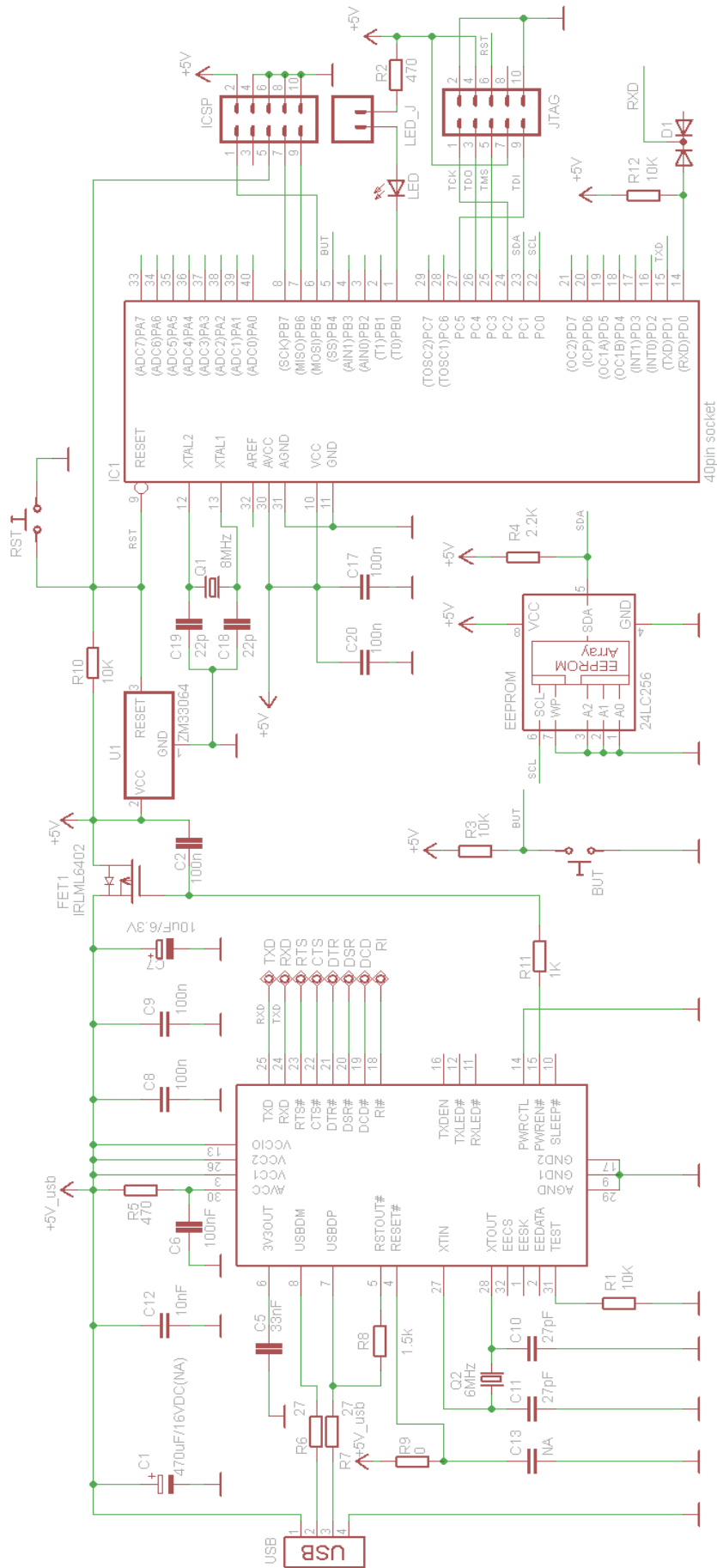
The AVR-P40-USB-8535 board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

## **BOARD USE REQUIREMENTS**

**Cables:** The cable you will need depends on the programmer/debugger you use. If you use [AVR-PG1](#), or [AVR-JTAG-L](#), you will need RS232 cable, if you use [AVR-PG2](#), you will need LPT cable, if you use [AVR-ISP500](#), [AVR-ISP500-TINY](#), [AVR-ISP500-ISO](#), or [AVR-USB-JTAG](#) you will need 1.8 meter USB A-B cable.

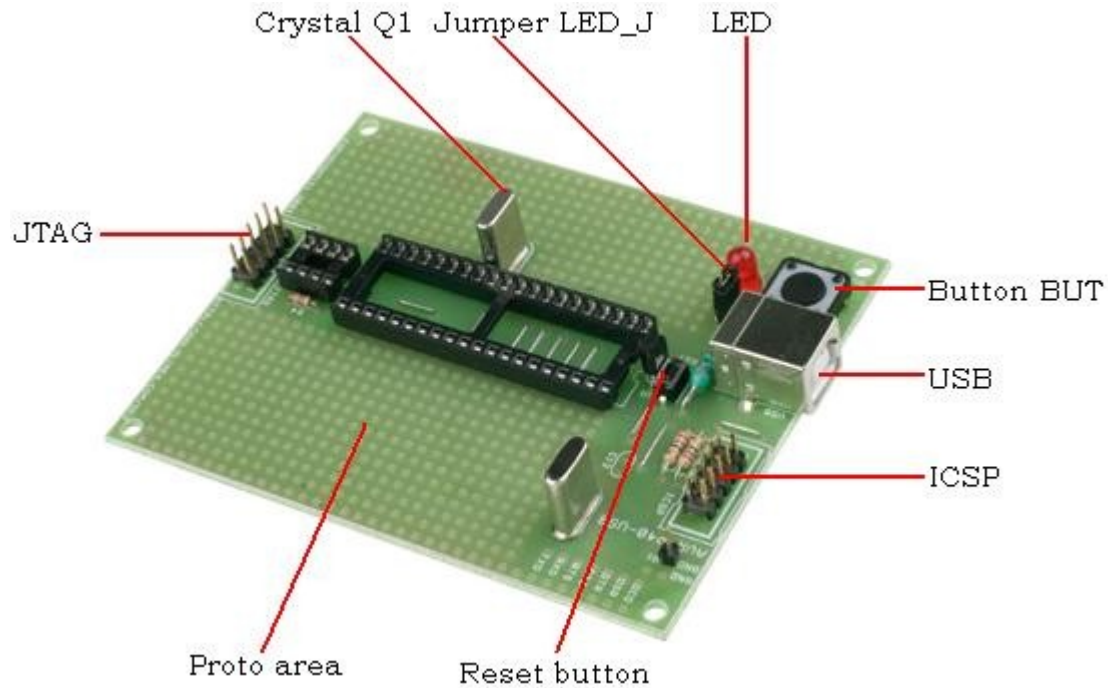
**Hardware:** Programmer/Debugger – one of the Olimex AVR Programmers: AVR-PG1, AVR-PG2, AVR-ISP500, AVR-ISP500-TINY, AVR-ISP500-ISO, AVR-JTAG-L, AVR-USB-JTAG.

# SCHEMATIC



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## BOARD LAYOUT



## POWER SUPPLY CIRCUIT

AVR-P40-USB-8535 power supply is taken from USB port, so no need for external adapter.

## RESET CIRCUIT

AVR-P40-USB-8535 reset circuit is made by ZM33064 reset IC. There is possibility to apply external RESET by rest Button.

## CLOCK CIRCUIT

Quartz crystal 8MHz is connected to AVR Microcontroller pin 12 (XTAL2) and pin 13 (XTAL1).

## JUMPER DESCRIPTION

### **LED\_J**



When this jumper is open – LED is not on.

When this jumper is closed – LED is on.

Default state is closed.

## INPUT/OUTPUT

**Status Led** with name **LED (red)** – this led is connected to PIN1 (T0 / PB0) and is voltage supplied via jumper LED\_J.

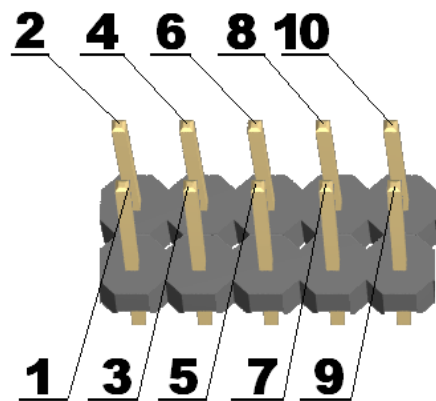
**User button** with name **BUT** - Pushbutton with active low level and pull-up resistor connected to PB4.

**Reset button** with name **RST** - connected to PIN9 (RESET).

## CONNECTOR DESCRIPTIONS

### ICSP

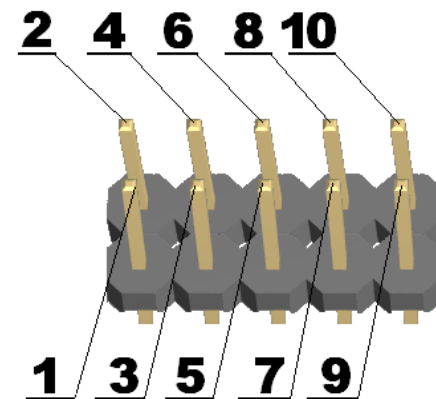
PIN #	Signal Name	Functionality
1	MOSI	MOSI / PB5
2	VCC	+5V DC
3	Not connected	-
4	GND	Ground
5	RST	RESET
6	GND	Ground
7	SCK	SCK / PB7
8	GND	Ground
9	MISO	MISO / PB6
10	GND	Ground



The **ICSP** connector is 2x5 pin with 0,1" step and Atmel STKxxx compatible layout. The PIN.1 is marked with square pad on bottom and arrow on top.

### JTAG

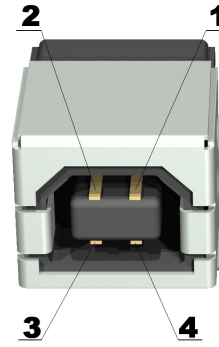
PIN #	Signal Name	Functionality
1	TCK	PC2
2	GND	Ground
3	TDO	PC4
4	VREF	+5V DC
5	TMS	PC3
6	NSRST	Reset
7	VCC	+5V DC
8	NTRST	Not connected
9	TDI	PC5
10	GND	Ground



The **JTAG** connector is 2x5 pin with 0,1" step and Atmel's compatible layout. The PIN.1 is marked with square pad on bottom and arrow on top.

## USB

PIN #	Signal Name
1	+5V_USB
2	USBDM
3	USBDP
4	GND



Around USB to RS232 convertor IC FT232 is designed RS232 interface. More information about this IC you can find from manufacturer's web site <http://www.ftdi.com/>. You should also download the proper drivers for your OS from the same internet site. All RS232 modem signals are available around FT232 IC for connection.

RS232 Rx signal is connected directly to PD1 (AVR Tx) and RS232 Tx signal is connected directly to PD0 (AVR Rx)





## AVAILABLE DEMO SOFTWARE

- AVR-P40-USB + ATmega16 blink LED demo code ([C source](#) and [HEX](#))
- AVR-P40-USB + ATmega16 button demo code ([C source](#) and [HEX](#))
- AVR-P40-USB + ATmega16 UART demo code ([C source](#) and [HEX](#))

## **ORDER CODE**

**AVR-P40-USB-8535-8MHz** - assembled and tested board with 8Mhz oscillator

How to order?

You can order to us directly or by any of our distributors.

Check our web [www.olimex.com/dev](http://www.olimex.com/dev) for more info.

### **Revision history:**

REV.A            - created June 2007

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