

## AVR-P40-8535 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.

The **AVR-P40-8535** is prototype board for 40 pin AVR microcontrollers with STKxxx compatible 10 pin ICSP connector.

## BOARD FEATURES

- STK200 compatible ICSP 5x2 pin connector for in-circuit programming with AVR-PG1 or AVR-PG2
- JTAG 5x2 pin connectr for in-circuit programming and debugging with AVR-JTAG-USB and AVR-JTAG-L
- RS232 Tx, Rx interface with MAX232 IC on socket
- 8 MHz crystal on socket (user can replace with any value)
- reset IC ZM33064
- reset button
- general purpose push button
- status LED connected to PB0 via removable jumper
- DIL40 microcontroller socket
- Power plug-in jack
- selectable +3.3V / +5V power supply voltage regulator
- extension pin headers for each uC pin
- four mounting holes 3.3 mm (0.13")
- 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**

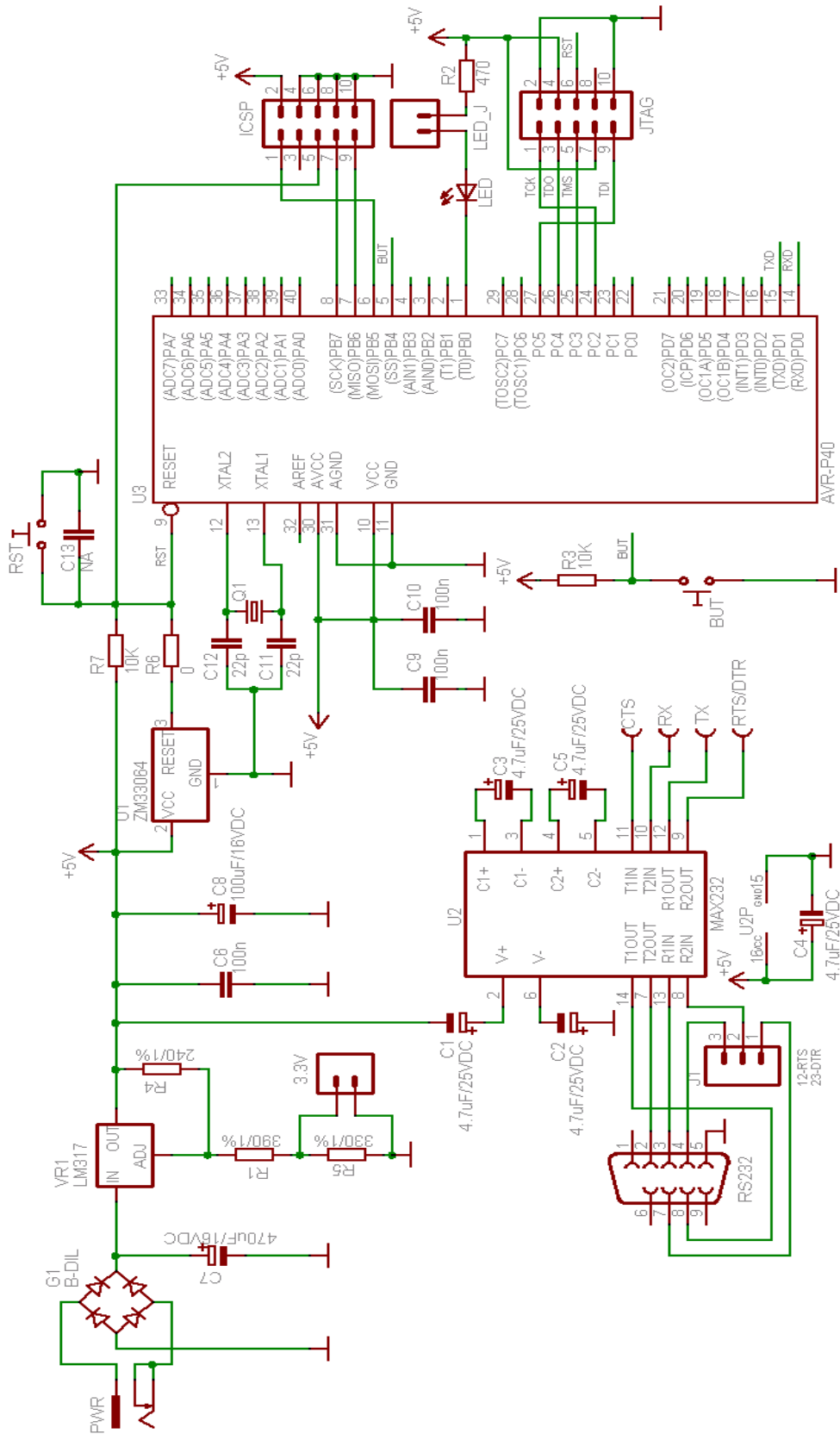
The AVR-P40-8535 board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

## **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.

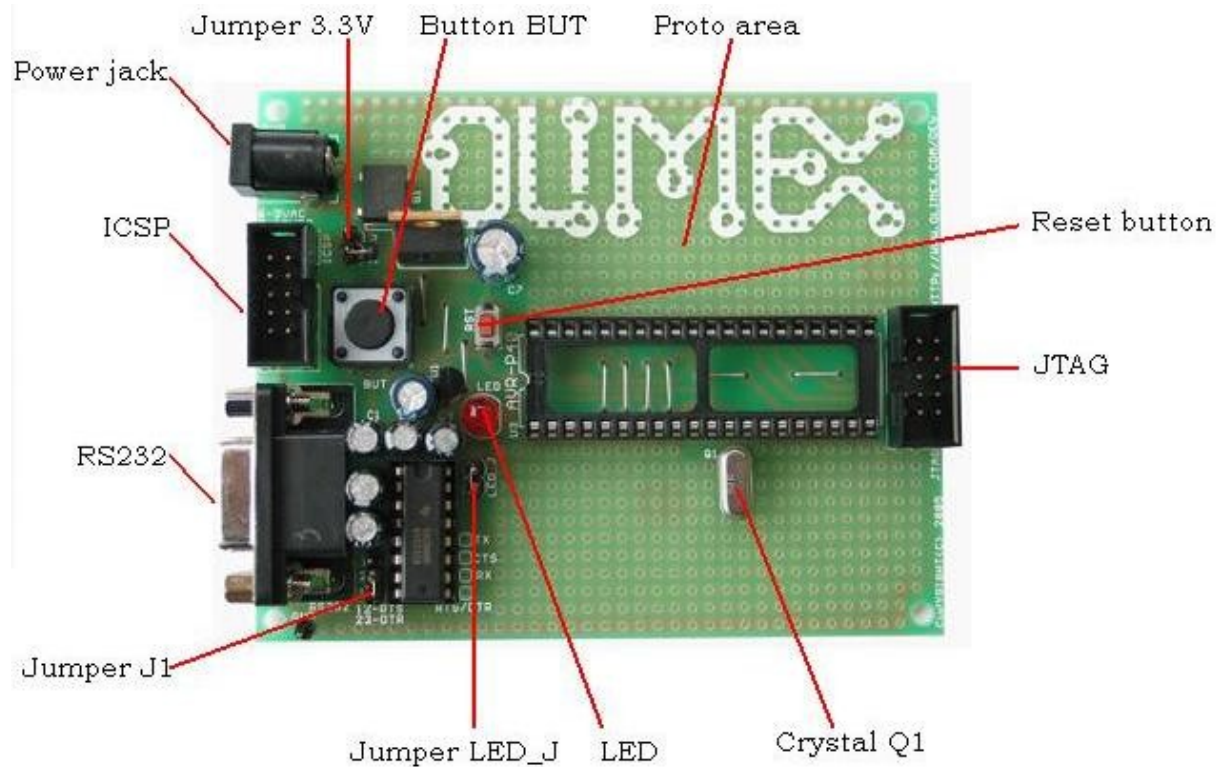
**Hardware:** Programmer/Debugger – one of the Olimex AVR Programmers: AVR-PG1, AVR-PG2, AVR-ISP500, AVR-ISP500-TINY, AVR-ISP500-ISO, AVR-JTAG-L, AVR-USB-JTAG.

# SCHEMATIC



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## BOARD LAYOUT



## POWER SUPPLY CIRCUIT

AVR-P40-8535 is typically power supplied with min 9.0V DC max 12.0V DC, or min 6.0V AC max 9.0V AC.

## RESET CIRCUIT

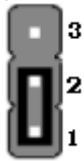
AVR-P40-8535 reset circuit includes pin 5 of ICSP connector, pin 6 of JTAG connector, pin 9 of U3, Reset scheme - U1 and RESET button (RST).

## CLOCK CIRCUIT

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

## JUMPER DESCRIPTION

### J1



When 1-2 are shorted - RTS is connected to terminal pin RTS/DTR.  
When 2-3 are shorted - DTR is connected to terminal pin RTS/DTR.  
Default state is 1-2.

### LED\_J



When this jumper is open - LED is not connected.  
When this jumper is closed - LED is connected to pin1 (T0/PB0) of the Microcontroller.  
Default state is closed.

### 3.3V



When this jumper is open - LM317 output is 5V DC.  
When this jumper is closed - LM317 output is 3.3V DC.  
Default state is open.

### WARNINGS!!!

**1. The 3.3V jumper selects the power voltage to be 5V (open) or 3.3V (closed). MAX232 can operate only at 5V power supply so if you are working with 3.3V you should replace it with MAX3232 which works at 3.3V power supply.**

**2. If you want to operate with 3,3V power supply, remove R6 resistor.**

## INPUT/OUTPUT

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

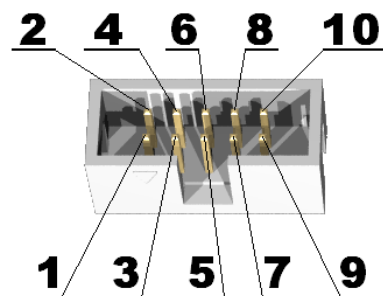
**User button** with name **BUT** - connected to PIN5 (SS / PB4 ).

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

## CONNECTOR DESCRIPTIONS

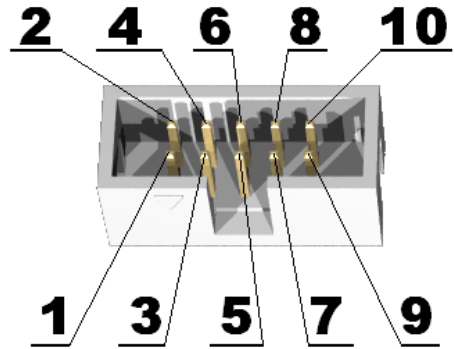
### ICSP

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



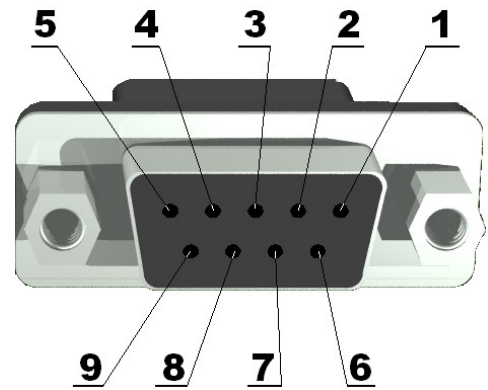
## JTAG

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



## RS232

PIN #	Signal Name
1	CD - Not connected
2	RXD
3	TXD
4	DTR
5	GND
6	DSR - Not connected
7	RTS
8	CTS
9	RI - Not connected

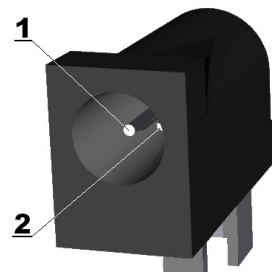


**Note1:** RTS and DTR is connected to terminal pins via jumper J1, which position is describe bellow.

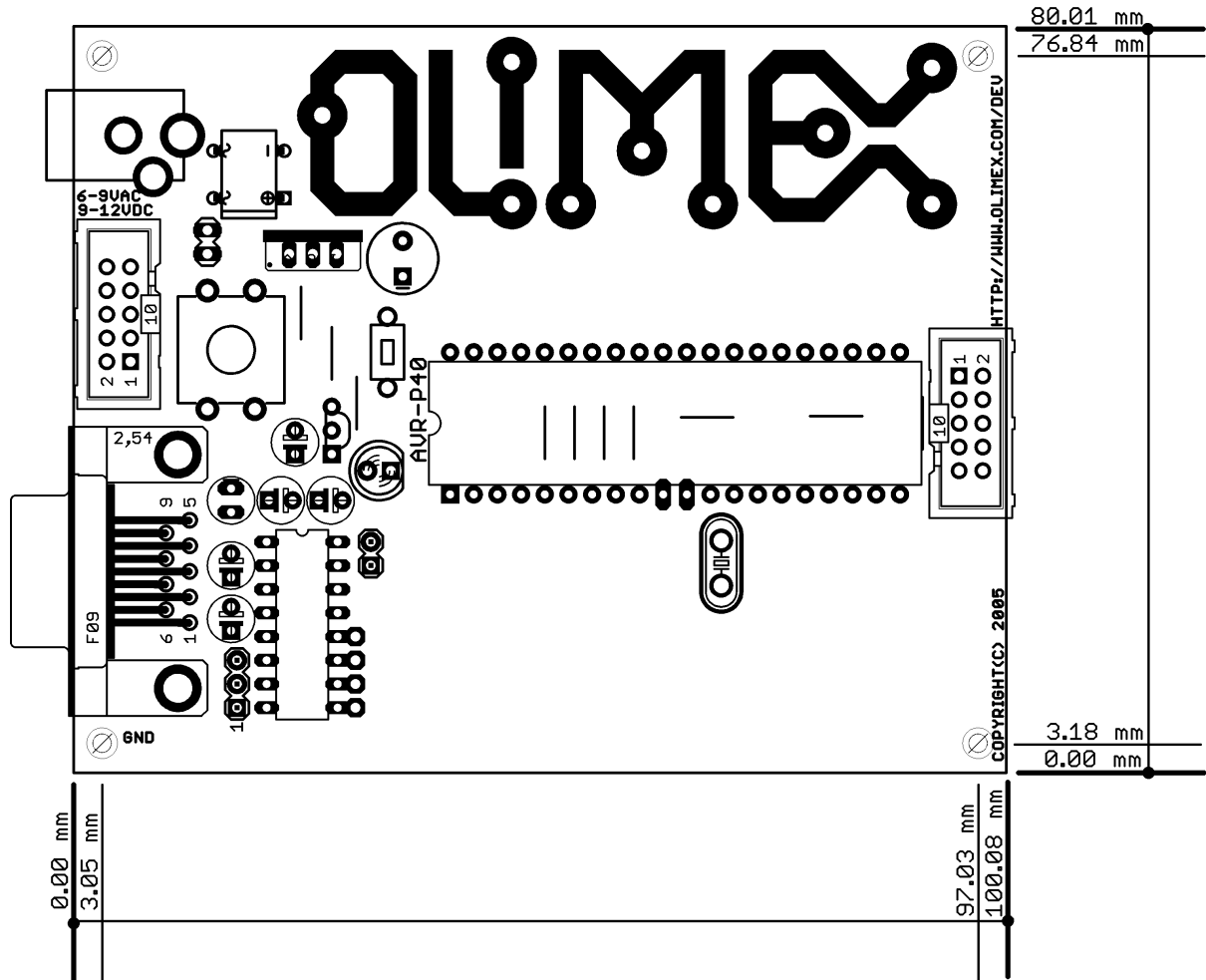
**Note2:** RX RS232 driver pins have to be connected to AVR microcontroller pin - TXD/PD1 (PIN 15).  
TX RS232 driver pins have to be connected to AVR microcontroller pin - RXD/PD0 (PIN 14).

## PWR

PIN #	Signal Name
1	Power Input
2	GND



# MECHANICAL DIMENSIONS





## AVAILABLE DEMO SOFTWARE

- AVR-P40-8535 + ATmega16 blink LED ([C source](#) and [HEX](#))
- AVR-P40-8535 + ATmega16 UART demo code ([C source](#) and [HEX](#))
- AVR-P40-8535 + ATmega16 Button demo code ([C source](#) and [HEX](#))
- AVR-P40-8535 + ATmega16 UART menu demo code ([C source](#) and [HEX](#))

## **ORDER CODE**

**AVR-P40-8535-8MHz** completely assembled and tested with 8Mhz oscillator  
**AVR-P40-8535/PCB ONLY**

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 October 2009

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