

AVR- HX128A1 development board

Users Manual



All boards produced by Olimex are ROHS compliant

Rev. C, December 2011

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INTRODUCTION

AVR-HX128A1 board is entry level development board for the new AVR XMEGA™ A Microcontroller family of devices produced by Atmel Corporation.

With AVR-HX128A1 you can explore the features of XMEGA A family on budget, the board have everything necessary to build simple applications: reset and oscillator circuits, JTAG port for programming and debugging, status LED and user button.

Most of the GPIOs are on extension headers where you can connect your additional circuits.

BOARD FEATURES

- CPU: ATXMEGA128A1 AVR 8/16-bit XMEGA™
- JTAG connector with standard 2x5 pin layout for programming/debugging with JTAGICE mkII
- user button
- RESET button
- status LED
- power supply LED
- on board voltage regulator 3.3V with up to 800mA current
- single power supply: takes power from EXT1 pin 1 and pin 2.
- 8 Mhz crystal oscillator
- 32768 Hz crystal and RTC
- extension headers for all uC ports
- PCB: FR-4, 1.5 mm (0,062"), red soldermask, white silkscreen component print
- Dimensions: 48.3x 48.3mm (1.9 x 1.9")

ELECTROSTATIC WARNING

The AVR-HX128A1 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.

Hardware: Programmer/Debugger JTAGICE mkII.

Software: AVR C compiler.

PROCESSOR FEATURES

AVR-H128A1 board use High-performance, Low-power 8/16-bit AVR XMEGA Microcontroller ATXMEGA128A1 from Atmel Corporation with these features:

- Non-Volatile Program and Data Memories:
 - 128K Bytes of In-System Self-Programmable Flash
 - 8K Bytes Boot Section with Independent Lock Bits
 - 2K Bytes EEPROM.
 - 8K Bytes Internal SRAM.
 - External Bus Interface for up to 16M bytes SRAM
 - External Bus Interface for up to 128M bit SDRAM
- Peripheral Features:
 - Four-channel DMA Controller with support for external requests
 - Eight-channel Event System
 - Eight 16-bit Timer/Counters
 - Four Timer/Counters with 4 Output Compare or Input Capture channels
 - Four Timer/Counters with 2 Output Compare or Input Capture channels
 - High-Resolution Extension on all Timer/Counters
 - Advanced Waveform Extension on two Timer/Counters
 - Eight USARTs
 - IrDA modulation/demodulation for one USART
 - Four Two-Wire Interfaces with dual address match (I²C and SMBus compatible)
 - Four SPI (Serial Peripheral Interface) peripherals
 - AES and DES Crypto Engine
 - 16-bit Real Time Counter with separate Oscillator
 - Two Eight-channel, 12-bit, 2 Msps Analog to Digital Converters
 - Two Two-channel, 12-bit, 1 Msps Digital to Analog Converters
 - Four Analog Comparators with Window compare function
 - External Interrupts on all General Purpose I/O pins
 - Programmable Watchdog Timer with Separate On-chip Ultra Low Power Oscillator
- Special Microcontroller Features
 - Power-on Reset and Programmable Brown-out Detection
 - Internal and External Clock Options with PLL and Prescaler
 - Programmable Multi-level Interrupt Controller

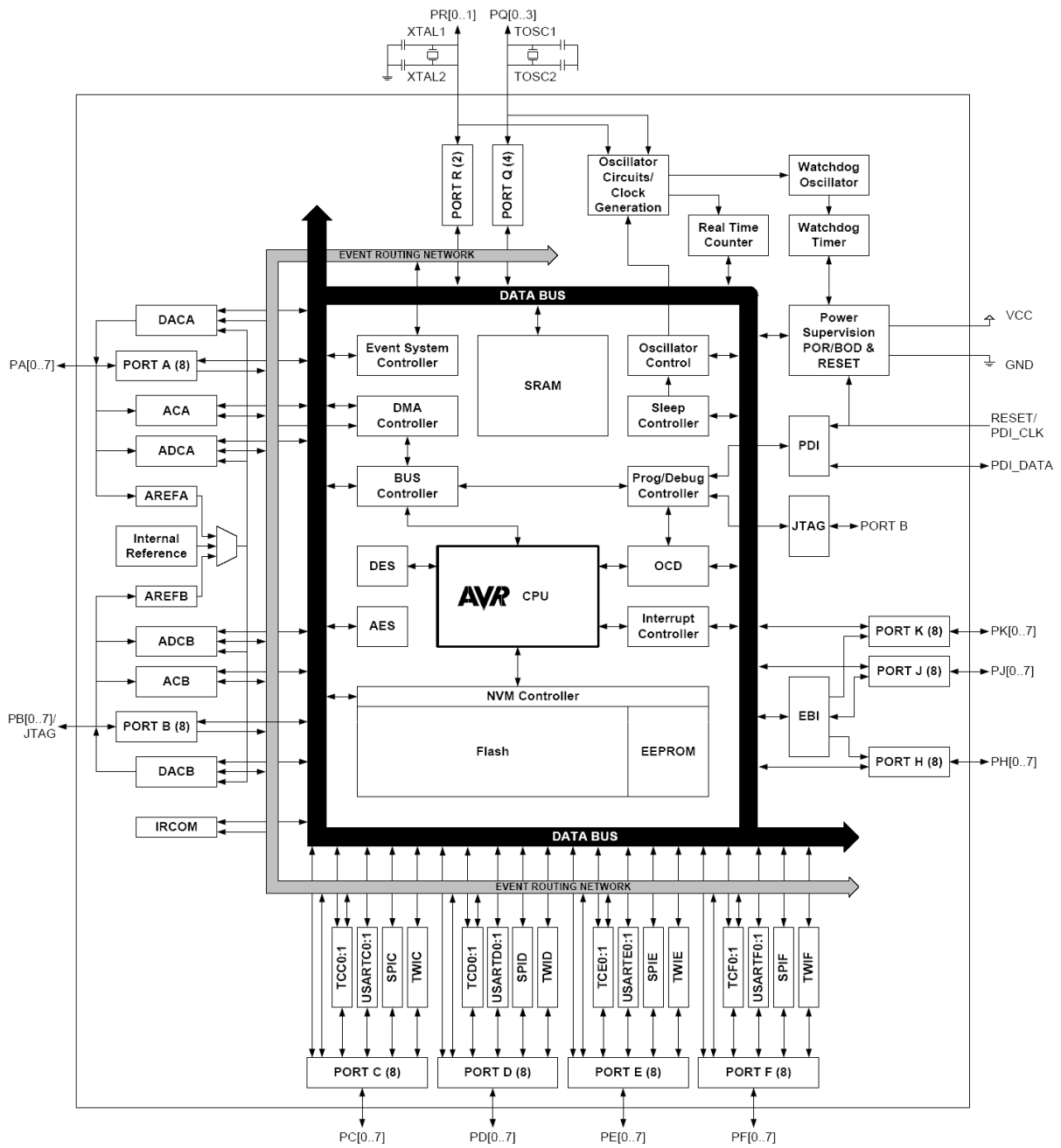
- Sleep Modes: Idle, Power-down, Standby, Power-save, Extended Standby
- Advanced Programming, Test and Debugging Interfaces

JTAG (IEEE 1149.1 Compliant) Interface for programming, test and debugging

PDI (Program and Debug Interface) for programming and debugging

- I/O
 - 78 Programmable I/O Lines
- Operating Voltage
 - 1.6 - 3.6V
- Speed performance
 - 0 - 12 MHz @ 1.6 - 3.6V
 - 0 - 32 MHz @ 2.7 - 3.6V

BLOCK DIAGRAM

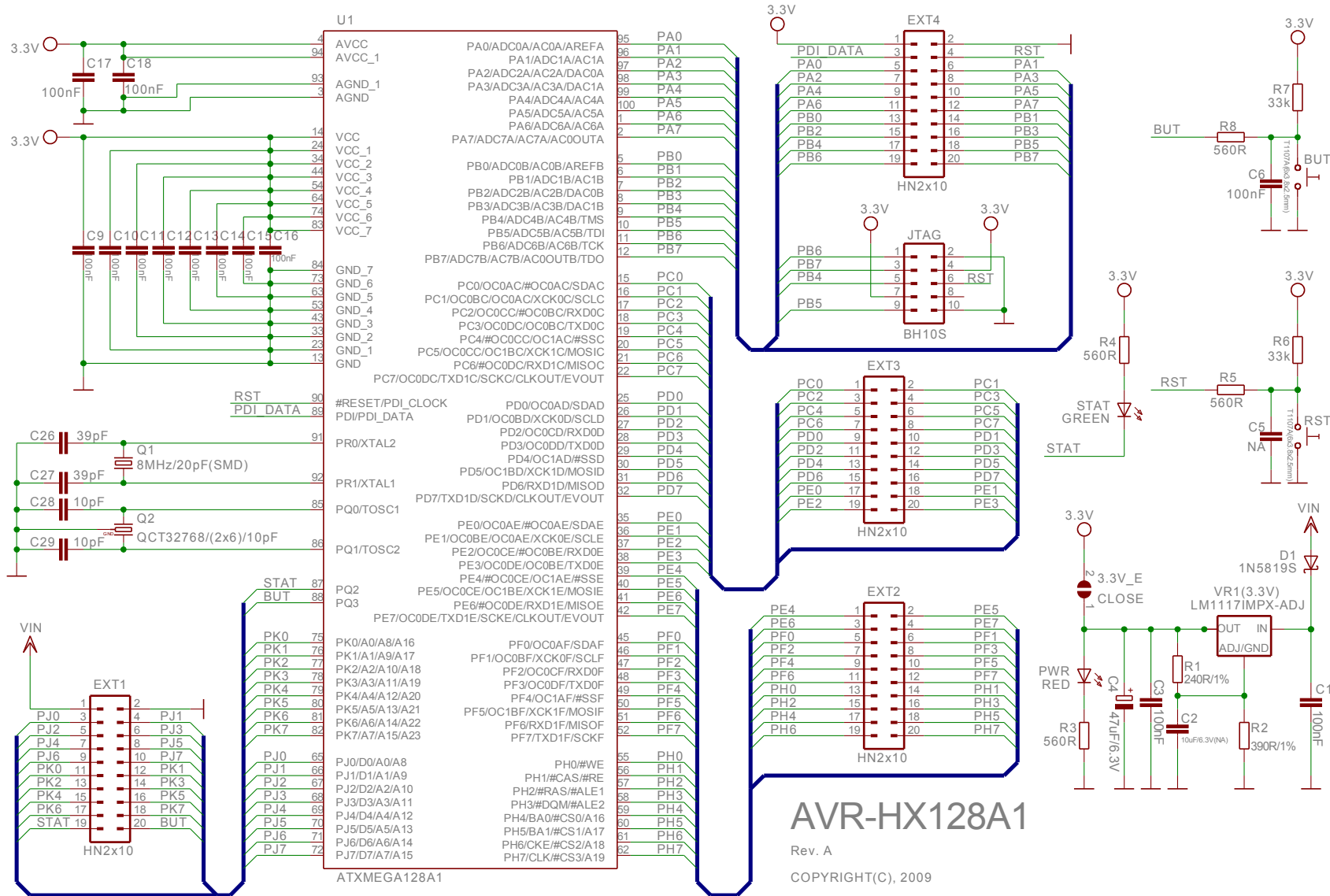


MEMORY MAP

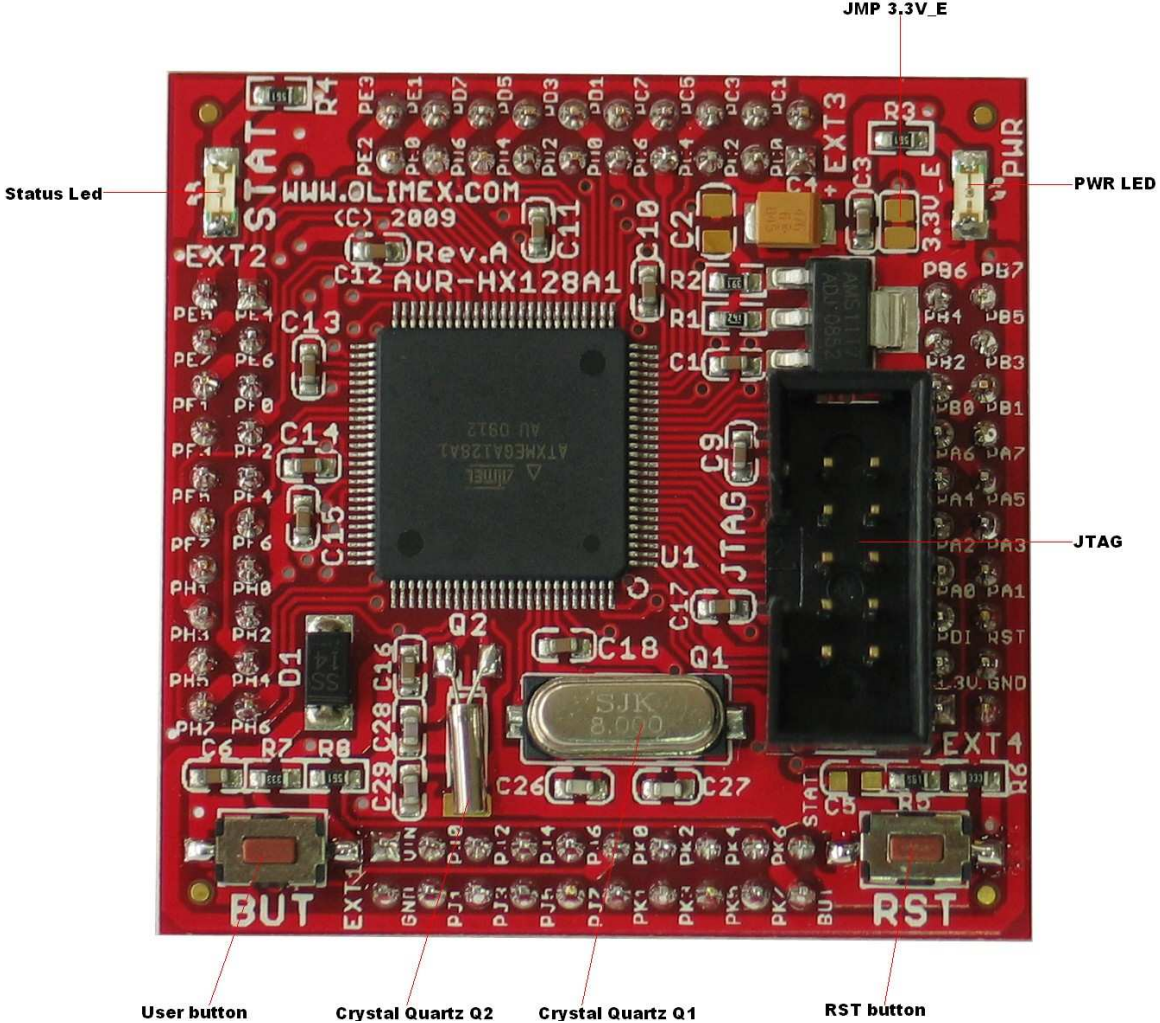
ATxmega128A1

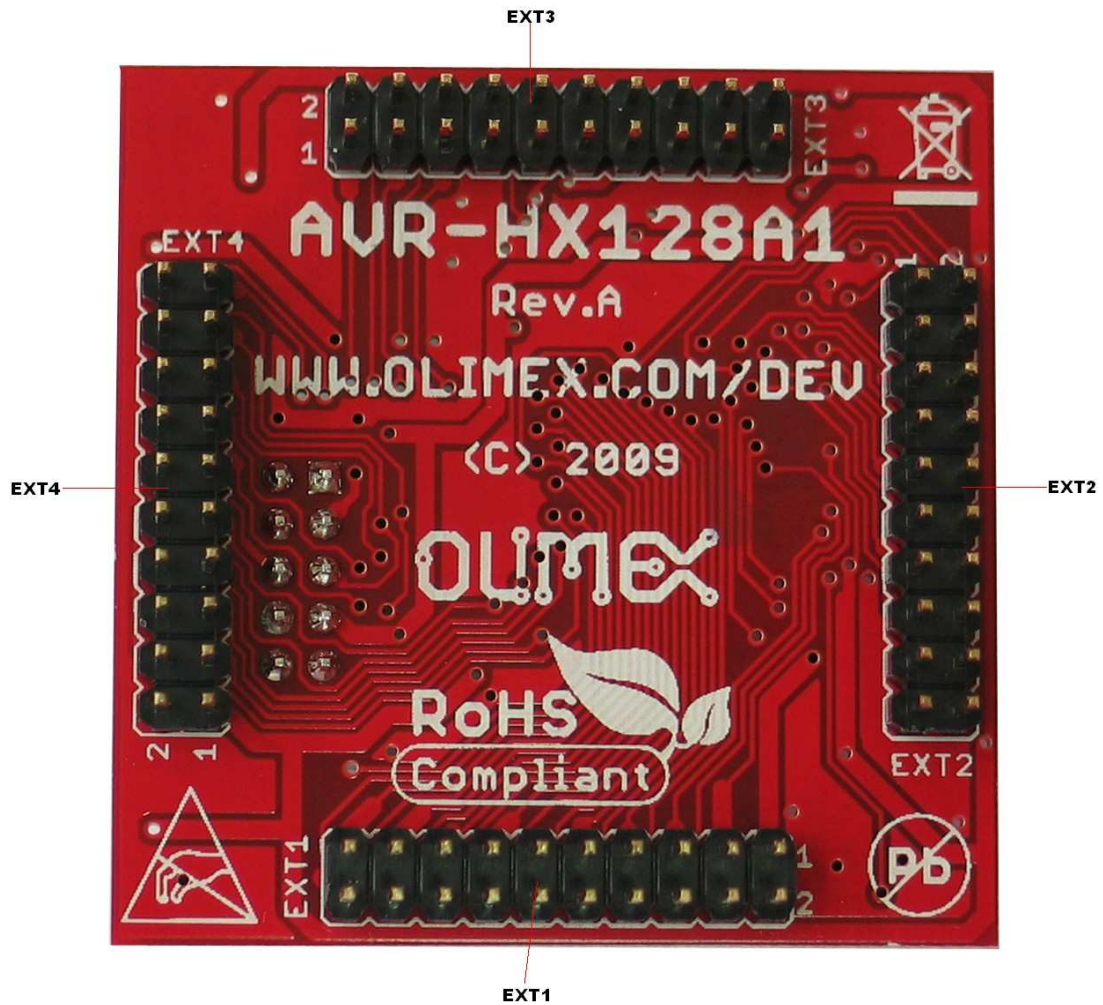
0	I/O Registers (4KB)
FFF	
1000	EEPROM (2K)
17FF	
	RESERVED
2000	Internal SRAM (8K)
3FFF	
4000	External Memory (0 to 16 MB)
FFFFFF	

SCHEMATIC



BOARD LAYOUT





POWER SUPPLY CIRCUIT

The board is power supplied from EXT1 pin 1 and pin 2 with 6-9 V DC.

RESET CIRCUIT

AVR-HX128A1 reset circuit includes pin 6 of JTAG connector, pin 4 of EXT4 connector, ATXMEGA128A1 pin 90 and Reset button.

CLOCK CIRCUIT

Quartz crystal 8MHz is connected to ATXMEGA128A1 pin 91 (PR0/XTAL2) and pin 92 (PR1/XTAL1).

JUMPER DESCRIPTION

3.3V_E



Enable the main 3.3 V regulator VR1(3.3V) - LM1117.

Default state is closed.

INPUT/OUTPUT

Status LED (green) with name **STAT** connected to ATXMEGA128A1 pin 87 (PQ2) and EXT1 pin 19.

Power-on LED (red) with name **PWR** - this led shows that +3.3V is applied to the board.

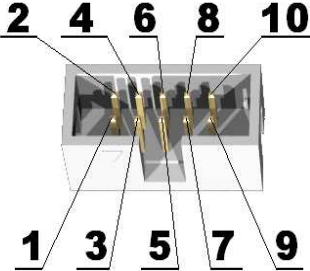
User button with name **BUT** connected to ATXMEGA128A1 pin 88 (PQ3) and EXT1 pin 20.

Reset button with name **RST** connected to ATXMEGA128A1 pin 90 (#RESET/PDL_CLOCK).

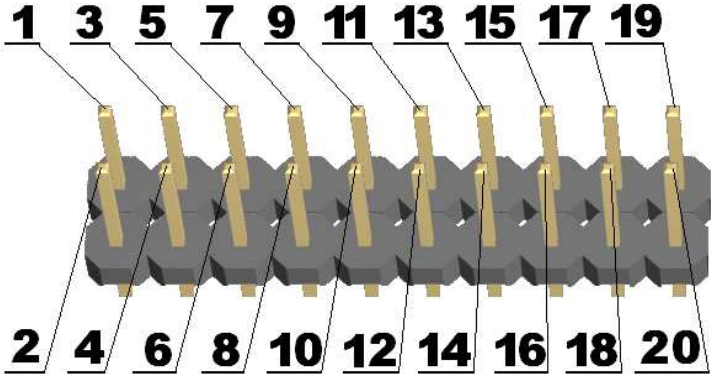
CONNECTOR DESCRIPTIONS

JTAG

Pin #	Signal Name
1	PB6
2	GND
3	PB7
4	3.3V
5	PB4
6	RST
7	3.3V
8	NC
9	PB5
10	GND



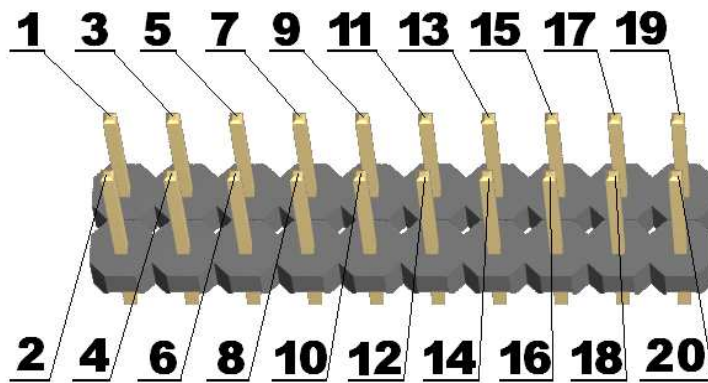
EXT1



Pin #	Signal Name	Pin #	Signal Name
1	VIN	2	GND
3	PJ0	4	PJ1
5	PJ2	6	PJ3
7	PJ4	8	PJ5
9	PJ6	10	PJ7

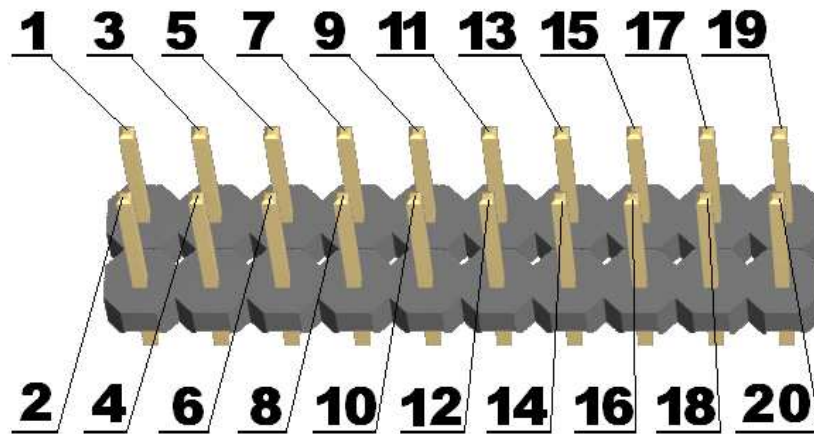
11	PK0	12	PK1
13	PK2	14	PK3
15	PK4	16	PK5
17	PK6	18	PK7
19	STAT	20	BUT

EXT2



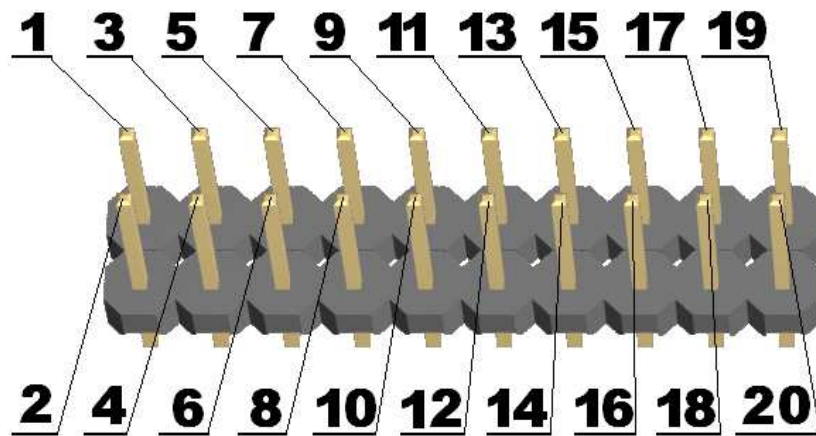
Pin #	Signal Name	Pin #	Signal Name
1	PE4	2	PE5
3	PE6	4	PE7
5	PF0	6	PF1
7	PF2	8	PF3
9	PF4	10	PF5
11	PF6	12	PF7
13	PH0	14	PH1
15	PH2	16	PH3
17	PH4	18	PH5
19	PH6	20	PH7

EXT3



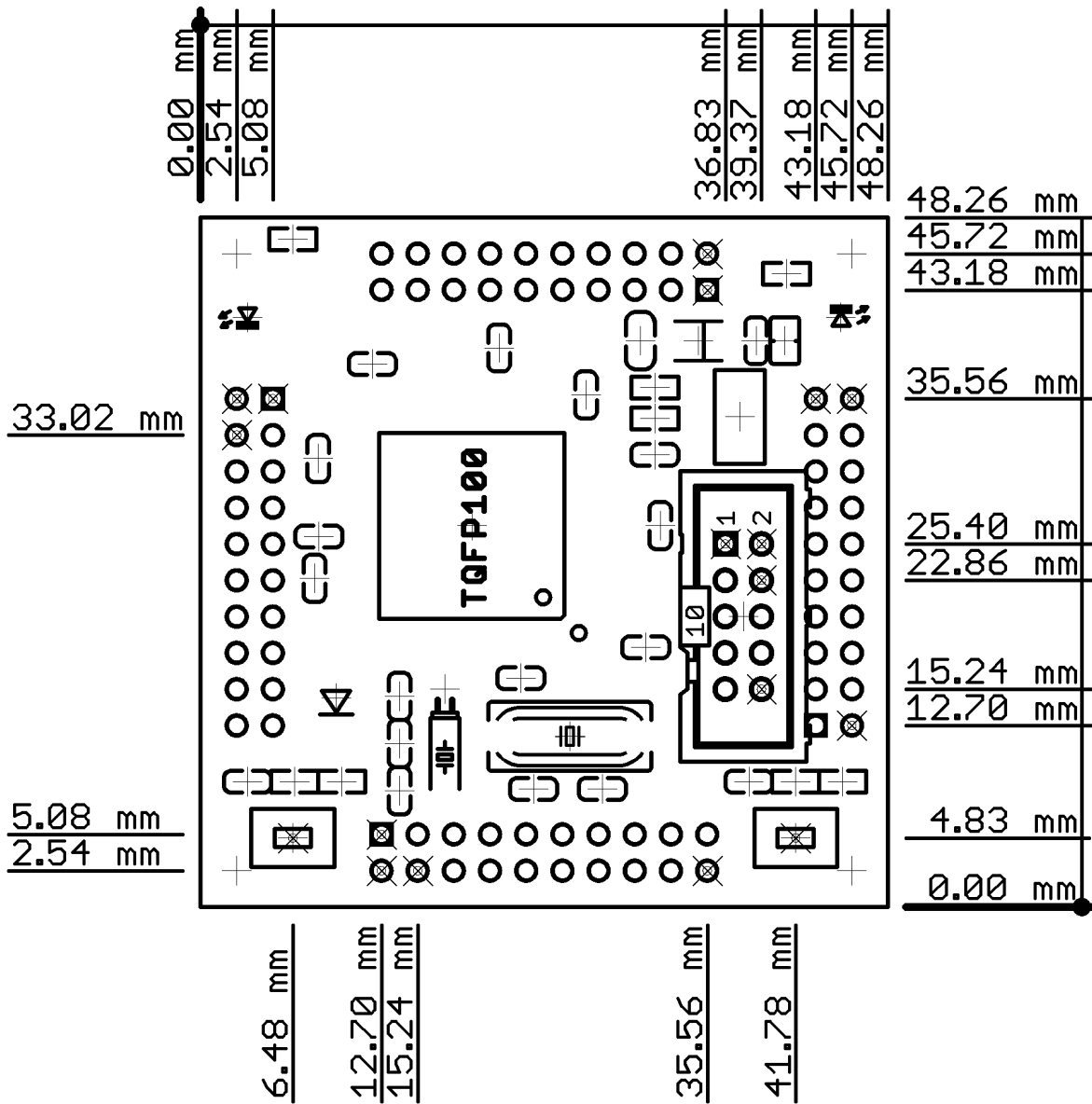
Pin #	Signal Name	Pin #	Signal Name
1	PC0	2	PC1
3	PC2	4	PC3
5	PC4	6	PC5
7	PC6	8	PC7
9	PD0	10	PD1
11	PD2	12	PD3
13	PD4	14	PD5
15	PD6	16	PD7
17	PE0	18	PE1
19	PE2	20	PE3

EXT4



Pin #	Signal Name	Pin #	Signal Name
1	3.3V	2	GND
3	PDI_DATA	4	RST
5	PA0	6	PA1
7	PA2	8	PA3
9	PA4	10	PA5
11	PA6	12	PA7
13	PB0	14	PB1
15	PB2	16	PB3
17	PB4	18	PB5
19	PB6	20	PB7

MECHANICAL DIMENSIONS



AVAILABLE DEMO SOFTWARE

- AVR-HX128A1 ADC interrupt and ADC polled examples C source and HEX
- AVR-HX128A1 UART interrupt and UART polled examples C source and HEX
- AVR-HX128A1 DAC example C source and HEX
- AVR-HX128A1 GPIO ports example C source and HEX

ORDER CODE

AVR-HX128A1 - assembled and tested (no kit, no soldering required)

How to order?

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

Check our web www.olimex.com/dev for more info.

Revision history:

Board's revision:	Rev. A	- create	May 2009
Manual's revision:	Rev. B	- created	October 2011 - in "POWER SUPPLY CIRCUIT" - removed AC power supply.
	Rev. C	- edited	December 2011 - added more detailed Mechanical Dimensions

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