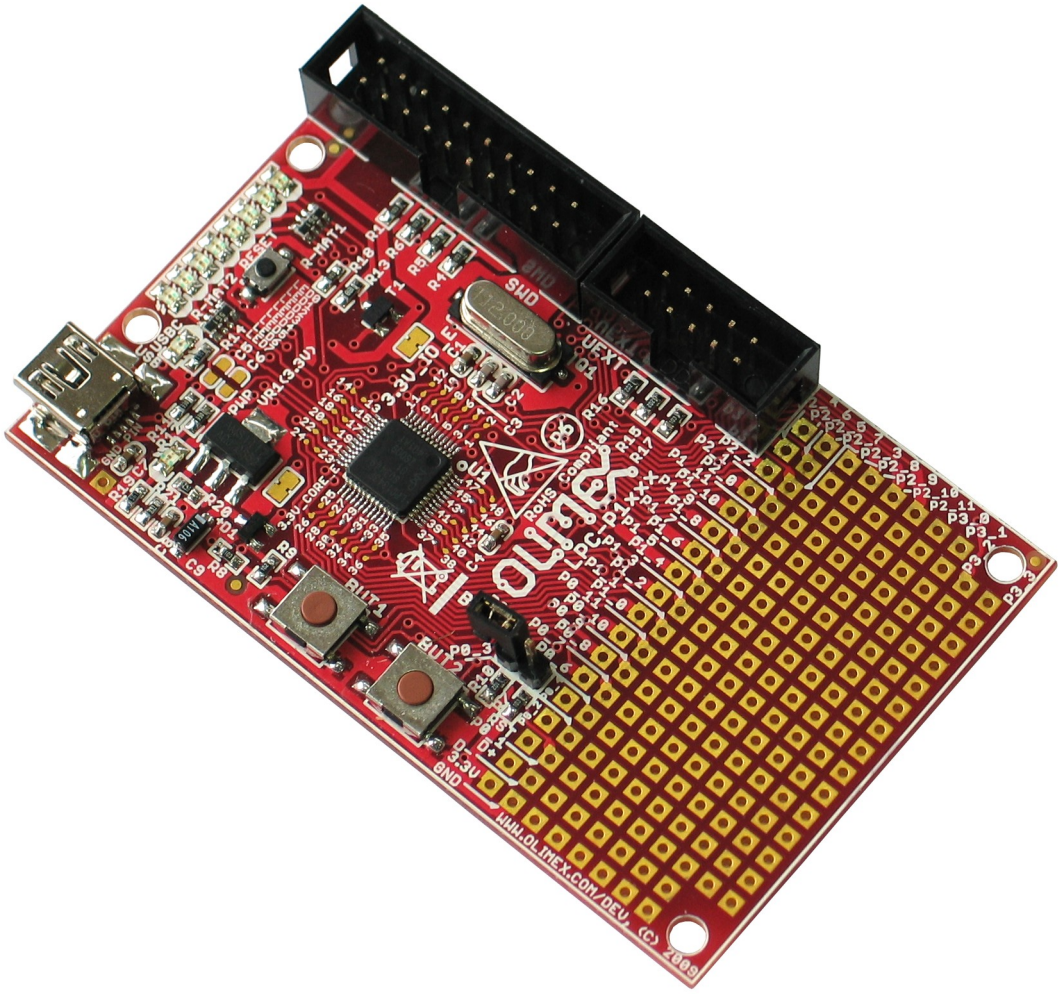


LPC-P1114 development board

Users Manual

Pb-free, Green All boards produced by Olimex are ROHS compliant

Revision Initial, December 2009

INTRODUCTION

LPC-P1114 is development board with LPC1114 ARM Cortex-M0 based microcontrollers for embedded applications from NXP. LPC-P1114 featuring a high level of integration and low power consumption. This microcontroller supports various interfaces such as one Fast-mode Plus I2C-bus interface, one RS-485/EIA-485 UART, two SSP interfaces, four general purpose timers, a 10-bit ADC. On the board are available UEXT, Debug Interface, user buttons and leds.

BOARD FEATURES

- MCU: **LPC1114** Cortex-M0, up to 50 Mhz, 32 kB Flash, 8kB SRAM, UART RS-485, two SSP, I^2C/Fast+, ADC
- Power supply circuit
- Power-on led
- USB connector only for power supply, not USB functionality
- Debug interface – SWD (Serial Wire Debug)
- UEXT connector
- Eight user leds
- Two user buttons
- Reset button
- Prototype area
- FR-4, 1.5 mm, soldermask, component print
- Dimensions:80x50mm (3.15 x 1.97")

ELECTROSTATIC WARNING

The **LPC-P1114** 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: USB-Mini cable is need as this board used power supply from the USB.

Hardware: To program this board you need JTAG and software which supports Cortex M0. For the moment we have tested this board with ARM-JTAG-EW and EW-ARM and our demo examples are made with EW-ARM.

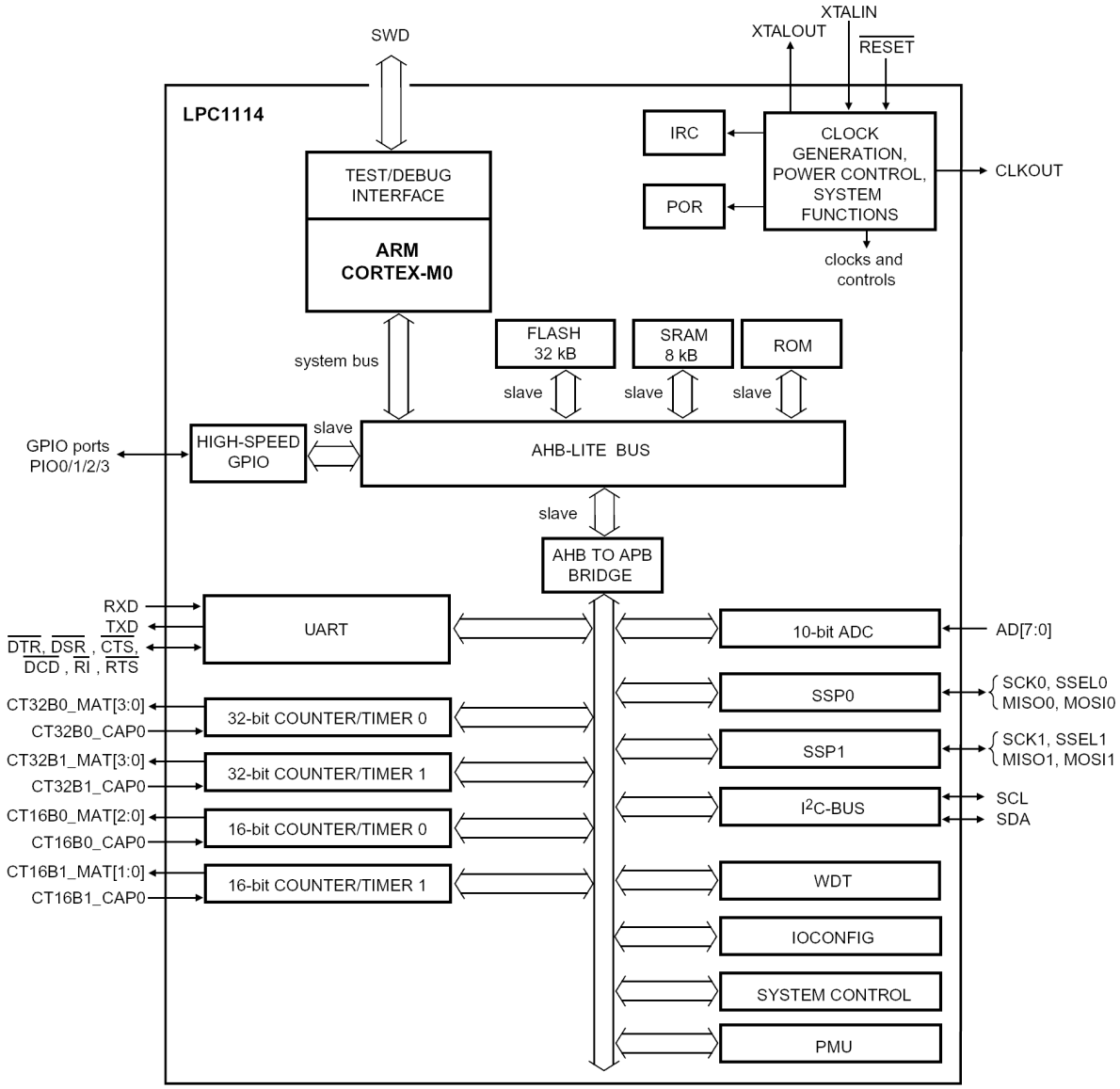
PROCESSOR FEATURES

LPC-P1114 board use ARM Cortex™-M0 microcontroller **LPC1114FBD48/301** from NXP Semiconductors with these features:

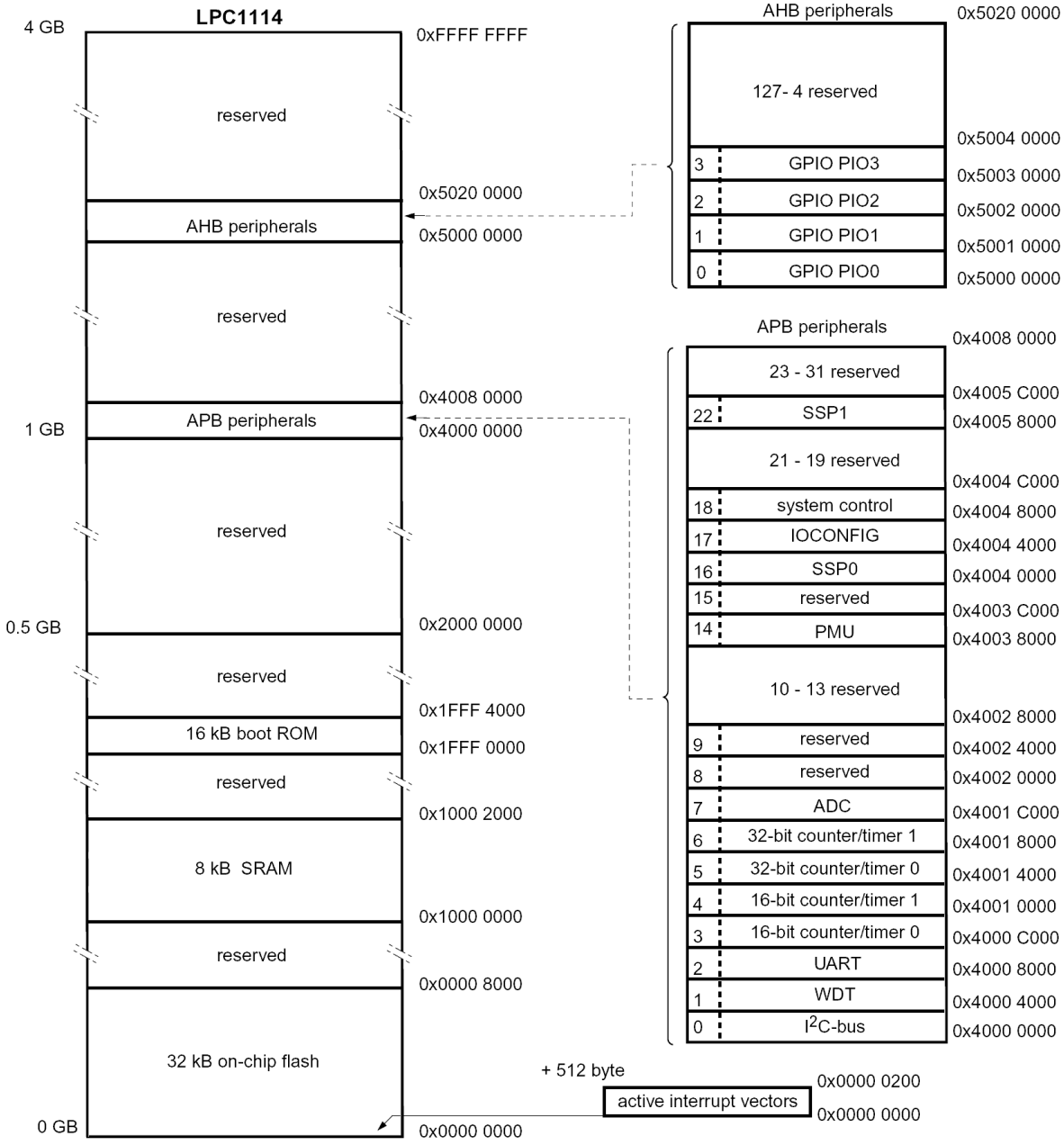
- ARM Cortex-M0 processor, running at frequencies of up to 50 MHz.
- ARM Cortex-M0 built-in Nested Vectored Interrupt Controller (NVIC).
- 32 kB on-chip flash programming memory.
- 8 kB SRAM.
- In-System Programming (ISP) and In-Application Programming (IAP) via on-chip bootloader software.
- Serial interfaces:
  - UART with fractional baud rate generation, internal FIFO, and RS-485 support.
  - Two SSP controllers with FIFO and multi-protocol capabilities
  - I^2C-bus interface supporting full I^2C-bus specification and Fast-mode Plus with a data rate of 1 Mbit/s with multiple address recognition and monitor mode.
- Other peripherals:
  - 42 General Purpose I/O (GPIO) pins with configurable pull-up/pull-down resistors.
  - Four general purpose timers/counters with a total of four capture inputs and 13 match outputs.
  - Programmable WatchDog Timer (WDT).
  - System tick timer.
- Serial Wire Debug.
- High-current output driver (20 mA) on one pin.

- High-current sink drivers (20 mA) on two I^2C-bus pins in Fast-mode Plus.
- Integrated PMU (Power Management Unit) to minimize power consumption during Sleep, Deep-sleep, and Deep power-down modes.
- Three reduced power modes: Sleep, Deep-sleep, and Deep power-down.
- Single 3.3 V power supply (2.0 V to 3.6 V).
- 10-bit ADC with input multiplexing among 8 pins.
- GPIO pins can be used as edge and level sensitive interrupt sources.
- Clock output function with divider that can reflect the system oscillator clock, IRC clock, CPU clock, and the Watchdog clock
- Processor wake-up from Deep-sleep mode via a dedicated start logic using up to 13 of the functional pins.
- Brownout detect with four separate thresholds for interrupt and one threshold for forced reset.
- Power-On Reset (POR).
- Crystal oscillator with an operating range of 1 MHz to 25 MHz.
- 12 MHz internal RC oscillator trimmed to 1 % accuracy that can optionally be used as a system clock.
- PLL allows CPU operation up to the maximum CPU rate without the need for a high-frequency crystal. May be run from the main oscillator, the internal RC oscillator, or the watchdog oscillator.

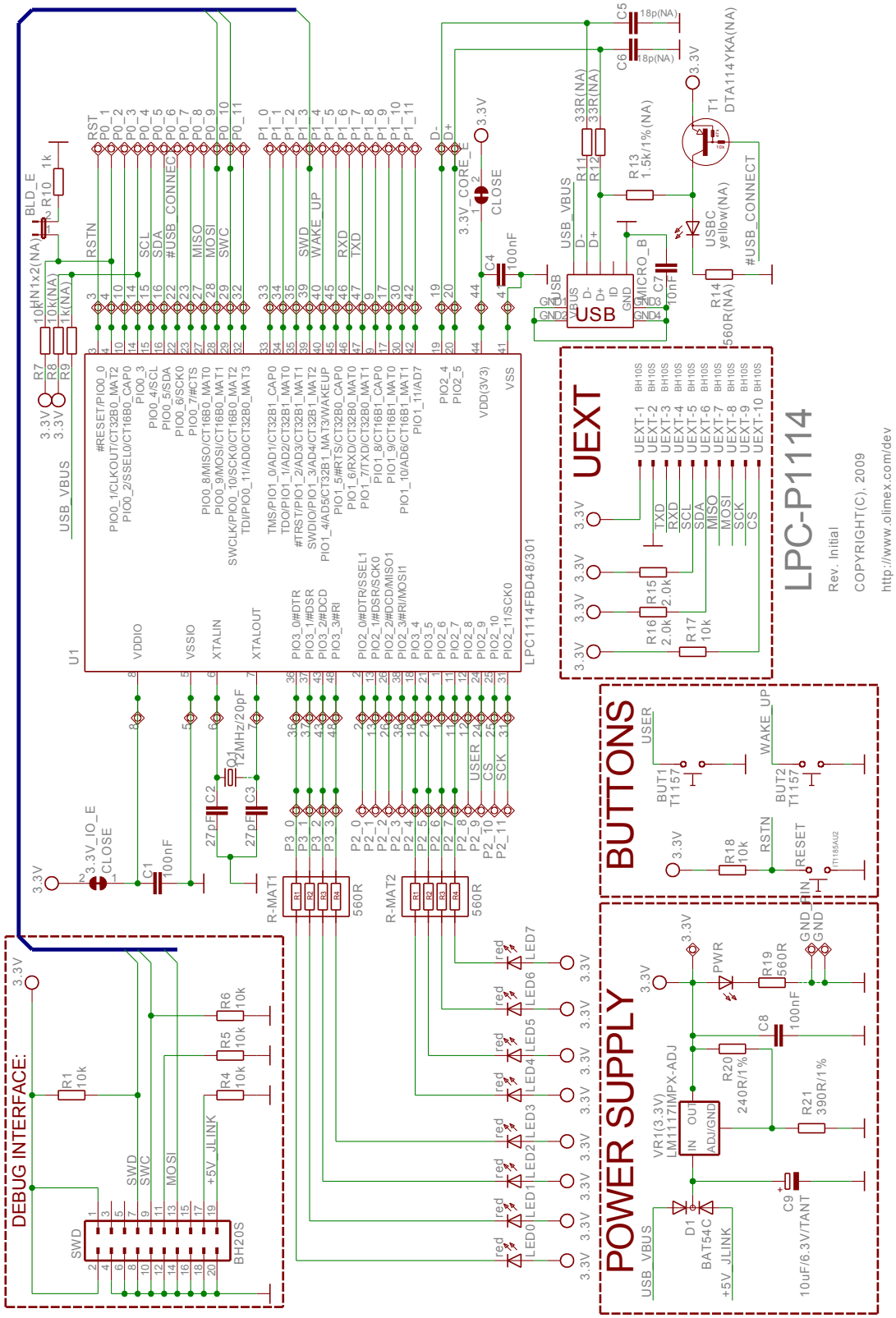
BLOCK DIAGRAM



MEMORY MAP


LPC1114
4 GB
0xFFFF FFFF
reserved
0x5020 0000
AHB peripherals
0x5000 0000
reserved
1 GB
0x4008 0000
APB peripherals
0x4000 0000
reserved
0.5 GB
0x2000 0000
reserved
0x1FFF 4000
16 kB boot ROM
0x1FFF 0000
reserved
0x1000 2000
8 kB SRAM
0x1000 0000
reserved
0x0000 8000
32 kB on-chip flash
0 GB
0x0000 0000
+ 512 byte
active interrupt vectors
0x0000 0200
0x0000 0000
AHB peripherals
0x5020 0000
127- 4 reserved
0x5004 0000
3 GPIO PIO3 0x5003 0000
2 GPIO PIO2 0x5002 0000
1 GPIO PIO1 0x5001 0000
0 GPIO PIO0 0x5000 0000
APB peripherals
0x4008 0000
23 - 31 reserved
0x4005 C000
22 SSP1 0x4005 8000
21 - 19 reserved
0x4004 C000
18 system control 0x4004 8000
17 IOCONFIG 0x4004 4000
16 SSP0 0x4004 0000
15 reserved 0x4003 C000
14 PMU 0x4003 8000
10 - 13 reserved
0x4002 8000
9 reserved 0x4002 4000
8 reserved 0x4002 0000
7 ADC 0x4001 C000
6 32-bit counter/timer 1 0x4001 8000
5 32-bit counter/timer 0 0x4001 4000
4 16-bit counter/timer 1 0x4001 0000
3 16-bit counter/timer 0 0x4000 C000
2 UART 0x4000 8000
1 WDT 0x4000 4000
0 I2C-bus 0x4000 0000

SCHEMATIC


LPC-P1114
Rev. Initial
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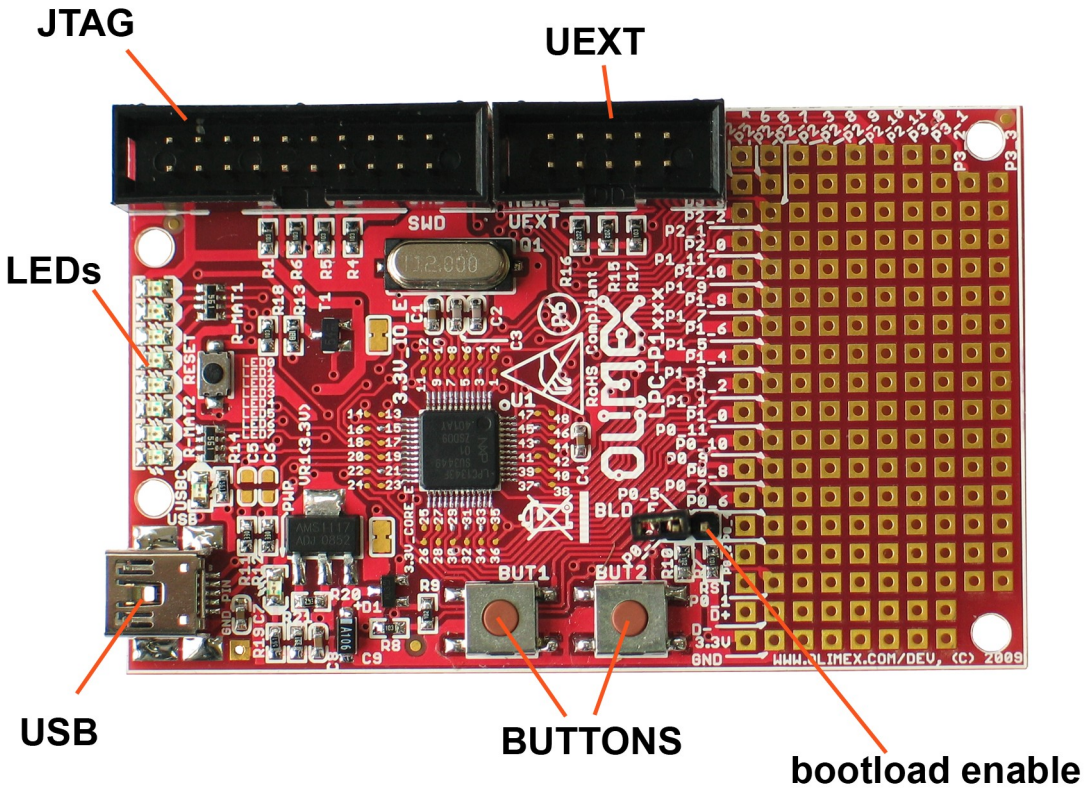
http://www.olimex.com/dev
LPC1114FBD48/301
U1
UEXT
BUTTONS
POWER SUPPLY
DEBUG INTERFACE:
USB
R-MAT1
R-MAT2
560R
BH20S
BAT54C
LM1117IMPX-ADJ
DTA114YKA(NA)
MICRO_B
USB_VBUS
3.3V
GND
SWD
SWC
MOSI
RSTN
SCL
SDA
MISO
SCK
CS
TXD
RXD
WAKE_UP
#USB_CONNECT
+5V_JLINK
12MHz/20pF
27pF
100nF
10uF/6.3V/TANT
USER
RESET
PWR
LED0
LED1
LED2
LED3
LED4
LED5
LED6
LED7
red

BOARD LAYOUT



POWER SUPPLY CIRCUIT

LPC-P1114 is power supplied +5V via USB, or via JTAG.

RESET CIRCUIT

LPC-P1114 reset circuit includes LPC1114 pin 3 (#RESET/PIO0_0), R18 (10k) and RESET button.

CLOCK CIRCUIT

Quartz crystal 12 MHz is connected to LPC1114 pin 6 (XTALIN) and pin 7 (XTALOUT).

JUMPER DESCRIPTION

3.3V_CORE_E

This jumper, when closed, enables microcontroller 3.3V power supply.
Default state is closed.

3.3V(I/O)_E

This jumper, when closed, supplies 3.3 V voltage to LPC1114 pin 8 (VDDIO).
Default state is closed.

INPUT/OUTPUT

LED0 (red) connected via R-MAT1 to LPC1114 pin 36 (PIO3_0/#DTR).

LED1 (red) connected via R-MAT1 to LPC1114 pin 37 (PIO3_1/#DSR).

LED2 (red) connected via R-MAT1 to LPC1114 pin 43 (PIO3_2/#DCD).

LED3 (red) connected via R-MAT1 to LPC1114 pin 48 (PIO3_3/#RI).

LED4 (red) connected via R-MAT2 to LPC1114 pin 18 (PIO3_4).

LED5 (red) connected via R-MAT2 to LPC1114 pin 21 (PIO3_5).

LED6 (red) connected via R-MAT2 to LPC1114 pin 1 (PIO2_6).

LED7 (red) connected via R-MAT2 to LPC1114 pin 11 (PIO2_7).

Power-on LED (red) – this LED shows that +3.3V is applied to the board.

User button with name **BUT1** (USER) connected to **LPC1114** pin 24 (PIO2_9).

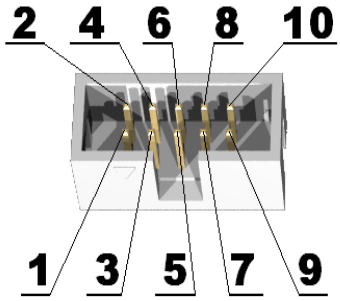
User button with name **BUT2** connected to **LPC1114** pin 40 (WAKEUP).

Reset button with name **RESET** connected to LPC1114 pin 3 (#RESET/PIO0_0).

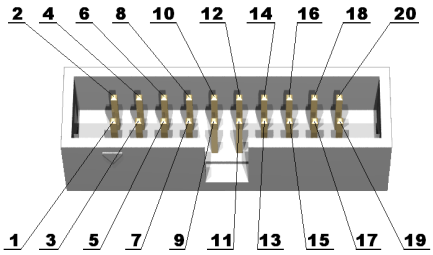
EXTERNAL CONNECTORS DESCRIPTION

UEXT

Pin #	Signal Name
1	3.3V
2	GND
3	TXD
4	RXD
5	SCL
6	SDA
7	MISO
8	MOSI
9	SCK
10	CS



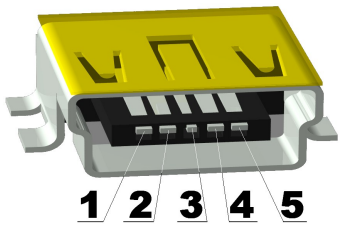
SWD



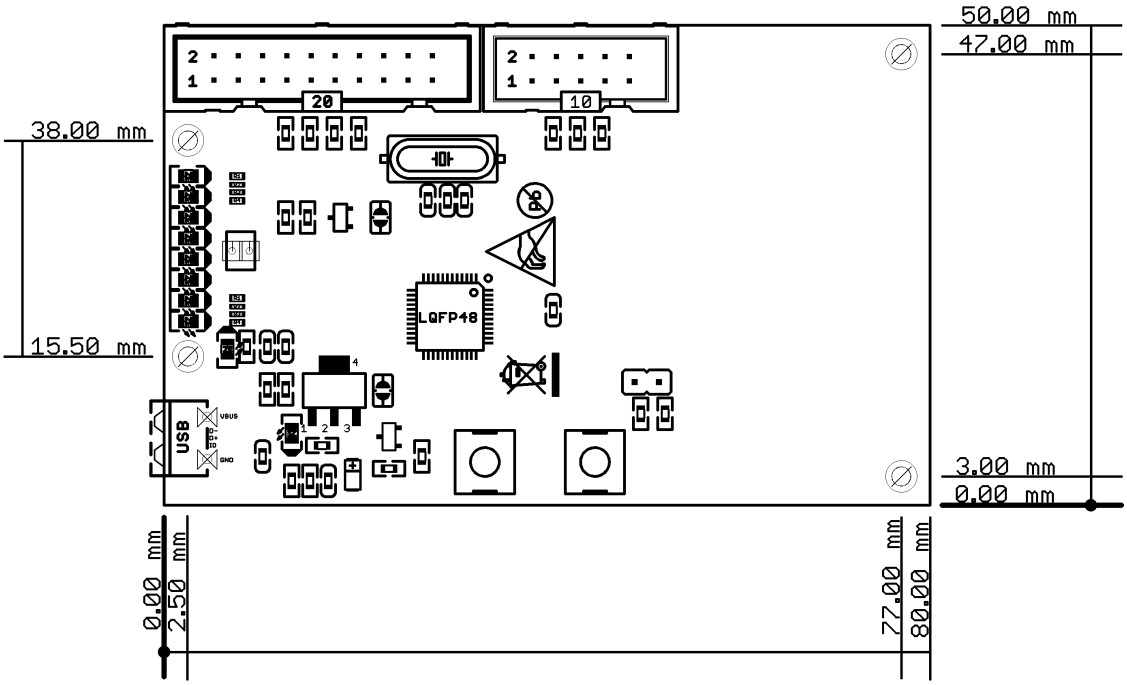
Pin #	Signal Name	Pin #	Signal Name
1	3.3V	2	3.3V
3	NC	4	GND
5	NC	6	GND
7	SWD	8	GND
9	SWC	10	GND
11	pull-down	12	GND
13	MOSI	14	GND
15	NC	16	GND
17	pull-down	18	GND
19	+5V_JLINK	20	GND

USB connector

Pin #	Signal Name
1	USB_VBUS
2	NC
3	NC
4	NC
5	GND



MECHANICAL DIMENSIONS



AVAILABLE DEMO SOFTWARE

ORDER CODE

LPC-P1114 - assembled and tested board

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

Revision Initial, December 2009

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