Features

- Atmel ATSHA204 CryptoAuthentication IC
  - SWI (Single wire interface)
- Atmel AT90USB162 AVR
  - 16K Flash, 512 EEPROM, 512 SRAM
  - USB 2.0 full speed device
- Power LED
- Two users definable LEDs
- On-board RESET button
- On-board HWB button (Dual functionality)
  - DFU button and general purpose
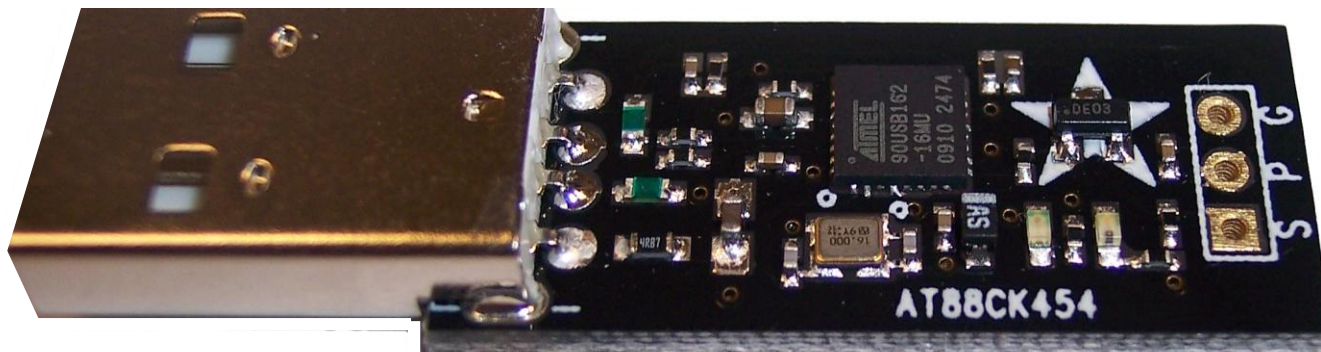- 3-pin interface header

Contents

- Atmel AT88CK454BLACK USB Dongle
- Quick start guide

Introduction

Atmel® AT88CK454BLACK is an Atmel CryptoAuthentication™ evaluation kit, which can be used as a reference design for an USB application requiring the Atmel CryptoAuthentication product family. This kit includes an Atmel AT90USB162 microcontroller which provides a convenient USB interface allowing users to understand and experiment with CryptoAuthentication on their personal computer. Developers can also use the provided 3-pin interface header to directly connect the CryptoAuthentication device to their existing project. Complete source code for the Atmel AVR® and CryptoAuthentication devices, documentation for the kit, as well as the schematic, Gerber files and bill of materials are all downloadable at www.atmel.com/cryptokits.

Figure 1. Atmel AT88CK454BLACK CryptoAuthentication evaluation kit

1. Board overview

1.1. Components placement

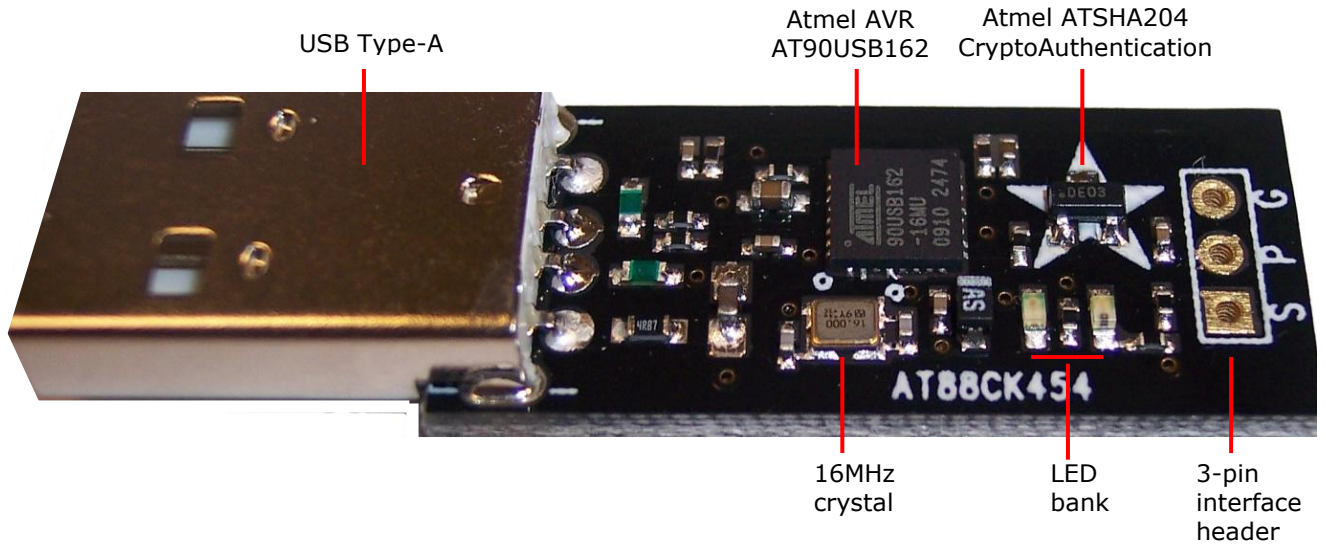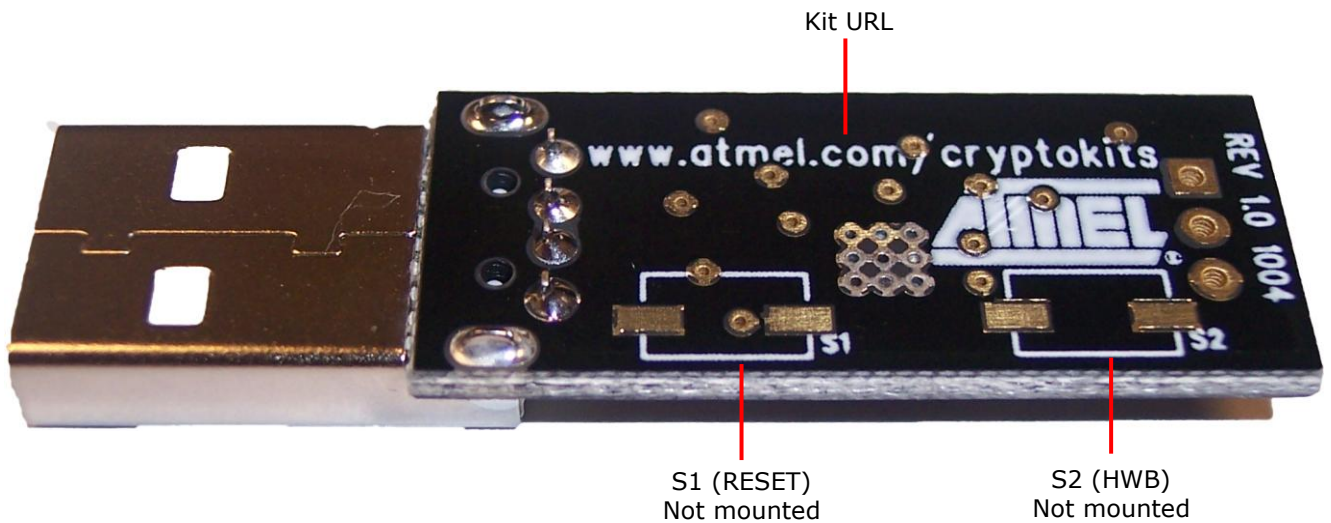Figure 1-1.   Top side components placement

USB Type-A

Atmel AVR
AT90USB162

Atmel ATSHA204
CryptoAuthentication

16MHz
crystal

LED
bank

3-pin
interface
header

Figure 1-2.   Bottom side components placement

Kit URL

S1 (RESET)
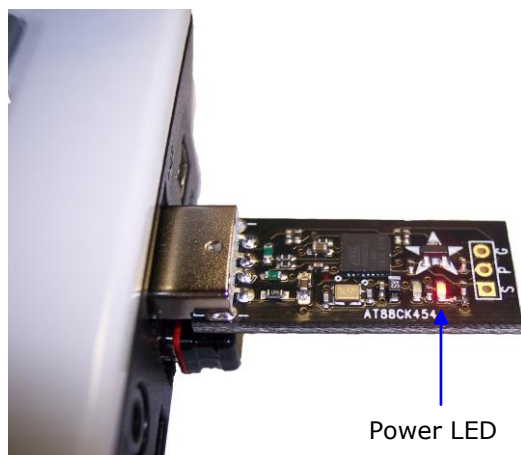Not mounted

S2 (HWB)
Not mounted

1.2. Powering up the board

The Atmel AT88CK454BLACK is a USB powered device.

- Simply insert the board into an open USB port

Figure 1-3.   Atmel AT88CK454BLACK USB powered device

Power LED

1.3. User definable LEDs

The AT88CK454BLACK includes general purpose LEDs, which are connected to PD4. Both LEDs will light when PD4 is configured as an input (Hi-Z); otherwise, the LEDs will toggle according to Table 1-1. This configuration also serves as a power indicator since at least one LED is always on.

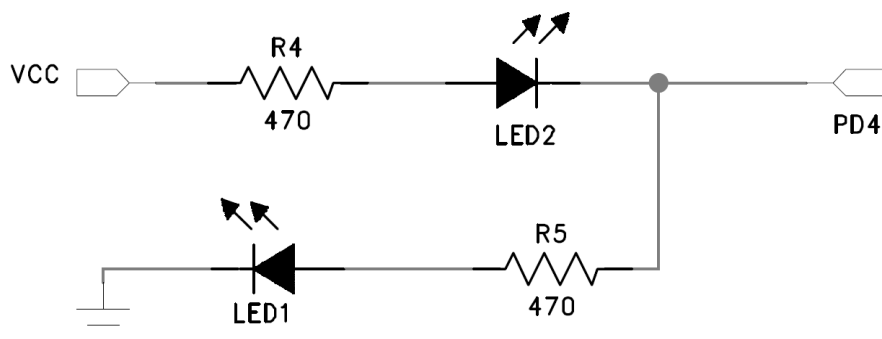Figure 1-4.   LEDs implementation schematic


Table 1-1. Table 1-0 LEDs logic

PD4	LED1 (BLUE)	LED2 (RED)
0	ON	OFF
1	OFF	ON
Hi-Z	ON	ON

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1.4. 3-pin interface header

Header H1 enables the user to interface directly with the Atmel ATSHA204 IC with an external microcontroller Figure 1-5. At power-up, PD3 (onboard AVR) is tri-stated and therefore will not interfere with the external microcontroller driving the SIG line. Although not necessary, R8 can be removed to eliminate any possibility of drive contention on the SIG line between the PD3 and an external microcontroller.

Figure 1-5. 3-pin interface header schematic
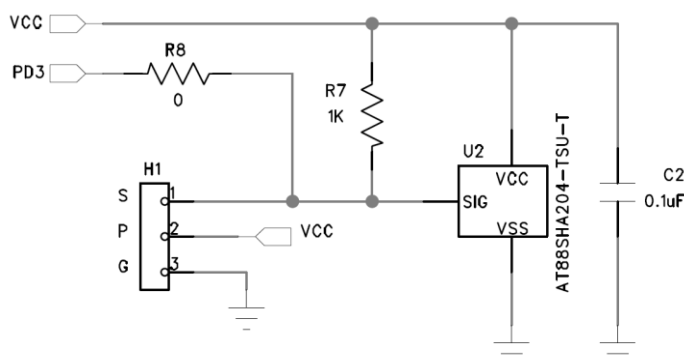
2. RESET

Although the Atmel AT90USB162 has its on-chip RESET circuitry, (c.f. Atmel AT90USB162 datasheet, section "System control and reset"), the AT88CK454BLACK provides two additional means to reset the AT90USB162.

- Power-on RESET: The on-board RC network acts as power-on RESET
- RESET Push Button (S1): The Atmel AT88CK454BLACK is shipped without S1 mounted. Once S1 has been mounted, it provides the Atmel AT88CK454BLACK with the option to perform a warm RESET of the Atmel AT90USB162 AVR. See bill of material S1 part number.

3. Debugging

The AT90USB162 debugWIRE is not accessible on the AT88CK454BLACK and therefore not suitable for code development. It is recommended that firmware development be done with the Atmel STK526 or the Atmel STK600 routing card (STK600-RC032U-20) and the socket card (STK00-TQFP32).

The Atmel STK526 starter kit is dedicated to the AT90USB82/162 microcontrollers. It supports JTAGICE mkII and AVRISP mkII via AVR Studio®. It includes a number demonstration program with source and hex files. The parts can be directly programmed through the USB port with FLIP in-system programming utility.

4. Firmware Upgrade

See application note doc8746, "Upgrading Crypto Kits Firmware."

5. References and further information

Schematics, Gerber files, bill of materials (BOM), development and demonstration software is conveniently downloadable from the Atmel website at www.atmel.com/cryptokits.

6. EVALUATION BOARD/KIT IMPORTANT NOTICE

This evaluation board/kit is intended for **ENGINEERING, DEVELOPMENT, DEMONSTRATION** or **EVALUATION PURPOSE ONLY**.   It is not a finished product and may not (yet) comply with some or any technical or legal requirements that are applicable to finished products, including, without limitations, directives regarding electromagnetic compatibility, recycling (WEEE), FCC, CE or UL (except as may be otherwise noted on the board/kit). Atmel® supplied this board/kit "AS IS," without any warranties, with all faults, at the buyer's and further users' sole risk. The user assumes all responsibly and liability for proper and safe handling of goods. Further, the user indemnifies Atmel from claims arising from the handling or use of goods. Due to open construction of the product, it is the user's responsibility to take any and all appropriate precautions with regard to electrostatic discharge and any other technical or legal concerns.

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