

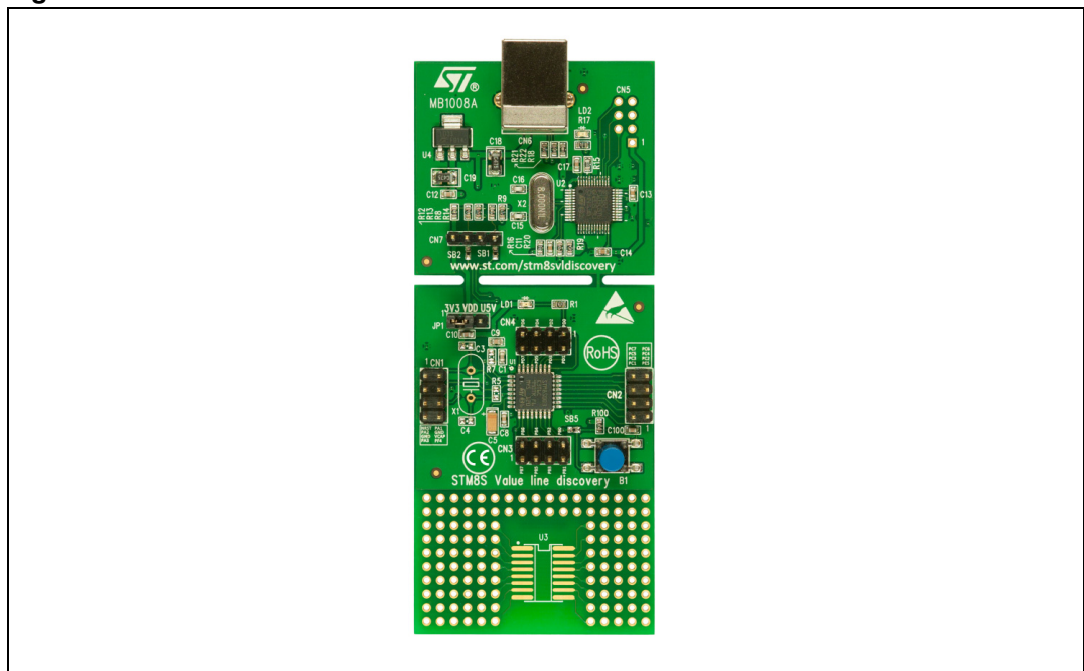
Introduction

The STM8SVLDISCOVERY is a quick start evaluation kit which helps you to discover the STM8S value line features, and to develop your own application. It is based on an STM8S003 and includes an embedded debugger, ST-LINK, and a user button. Numerous applications are available from www.st.com/stm8svldiscovery.

Features

- STM8S003K3T6 microcontroller, 8 KB Flash, 1 KB RAM, 128 bytes EEPROM
- Powered by USB cable between PC and STM8SVLDISCOVERY
- Selectable power of 5 V or 3.3 V
- Push button, B1
- User LED, LD1
- Extension header for all I/Os
- Wrapping area for users own application
- Embedded ST-LINK for STM8S
- USB interface for programming and debugging
- SWIM debug support

Figure 1. STM8SVLDISCOVERY evaluation board



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1 Quick start

It is very simple to get started using the STM8SVLDISCOVERY, just follow these four steps:

1. Connect the STM8SVLDISCOVERY to a PC with a USB cable.
2. Press the B1 button, and observe LED LD1 blinking.
3. Press the B1 button to change blinking speed.
4. Visit www.st.com/stm8svldiscovery and follow the tutorial, then discover other applications.

You can discover more of the STM8S features by downloading and executing the proposed programs in the project list.

Note: The software code corresponding to this application is available under the name **Discover (AN3996)** in the project list of the STM8SVLDISCOVERY web page.

2 Hardware and layout

The STM8SVLDISCOVERY is designed around the STM8S003K3T6 microcontroller in an LQFP32 package. It has two distinct sections that may be separated, the STM8S003K3T6 module and the ST-LINK module.

Figure 2 illustrates the connections between the STM8S003K3T6 and its peripherals (ST-LINK, user button, LED and connectors).

Figure 3 helps you to locate these features on the STM8SVLDISCOVERY board, as well as the potential point of separation (for more details refer to [Section 2.2.2: Using the ST-LINK on other STM8S applications](#)).

Figure 2. Hardware block diagram

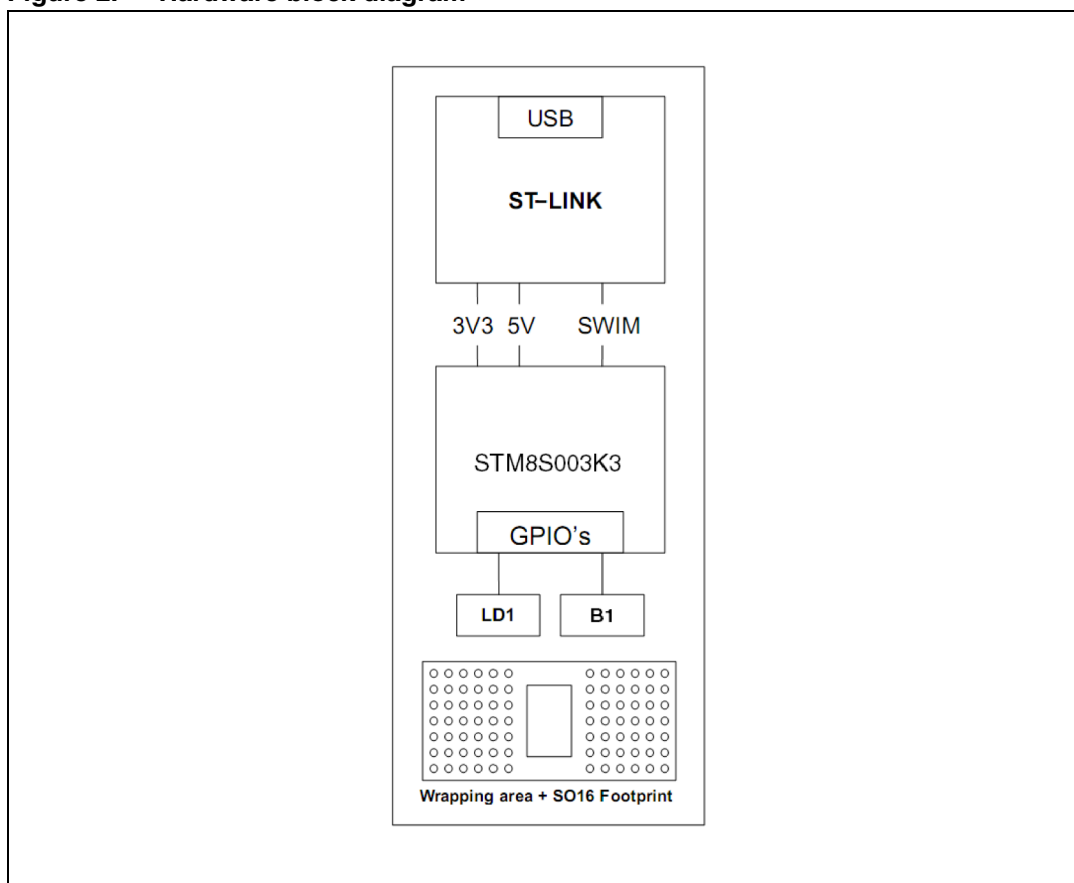
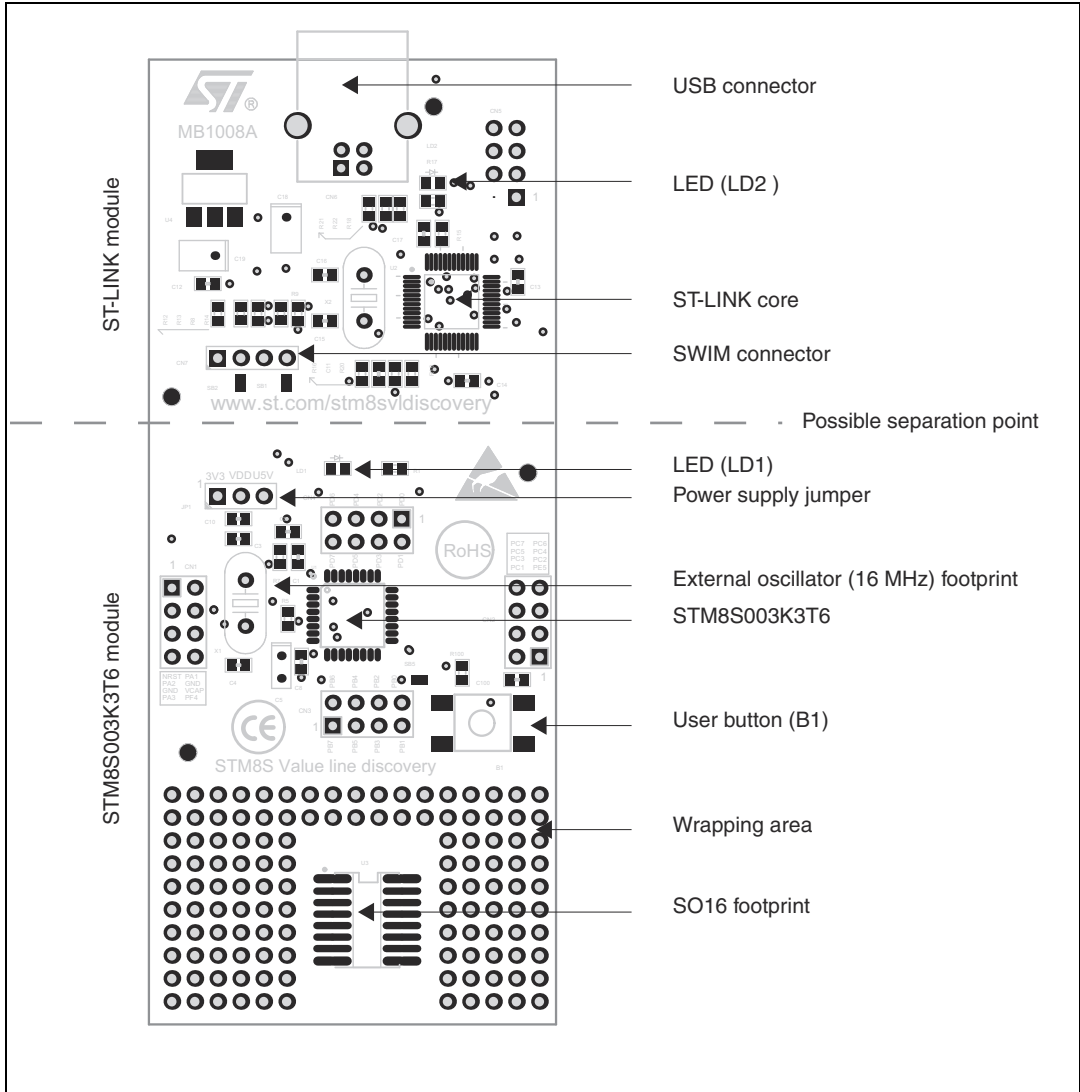
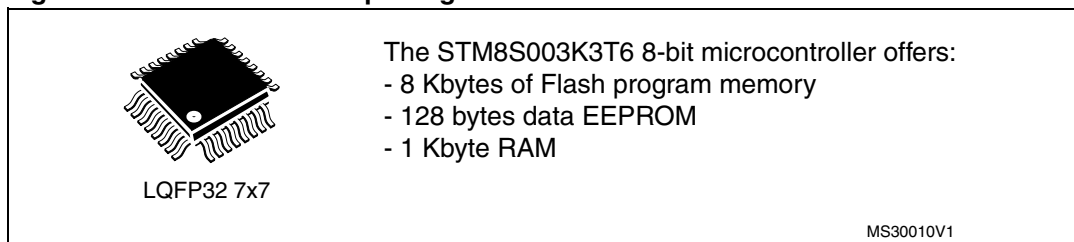


Figure 3. Top layout



2.1 STM8S003K3T6 microcontroller

Figure 4. STM8S003K3T6 package



This device provides the following key features:

- High-performance proprietary 8-bit core with excellent code density
- Innovative design architecture, 16-bit index registers, 32-bit memory interface and 3-stage pipeline
- Leading-edge embedded Flash memory technology
- Advanced clock controller to optimize power consumption and noise control
- Large set of embedded peripherals: UART, I²C, SPI, timers, analog, and debugging function

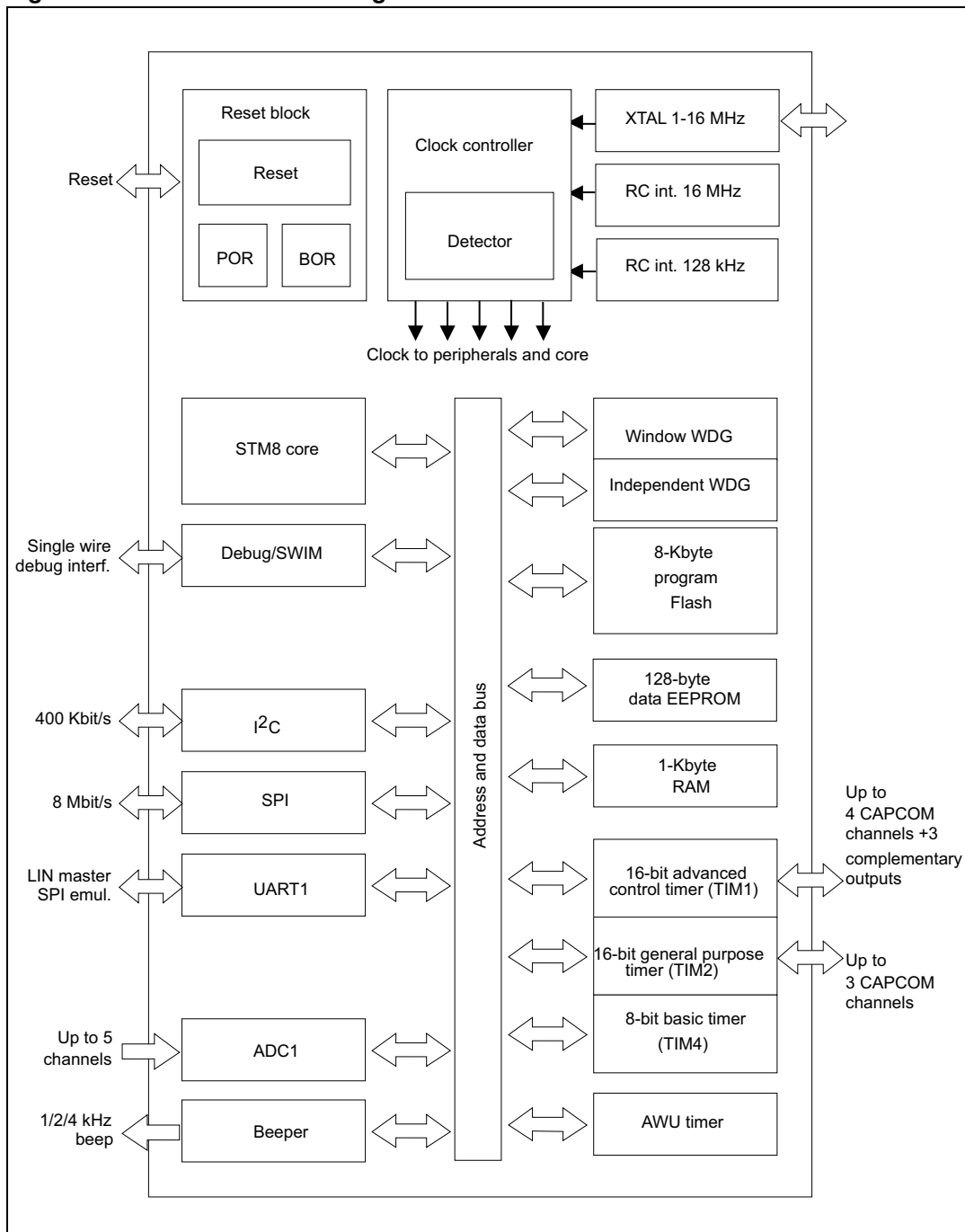
These features provide the following benefits:

- Cost efficiency based on optimized product manufacturing flow
- Lower system cost with embedded peripherals
- Full compatibility with existing STM8S product portfolio
- Efficient power management
- Easy-to-use, non-intrusive, and low-cost development environment

It is particularly suitable for applications such as:

- Consumer electronics
- Large-volume industrial equipment
- PC peripherals
- All mass market electronics

Figure 5. STM8S003 block diagram



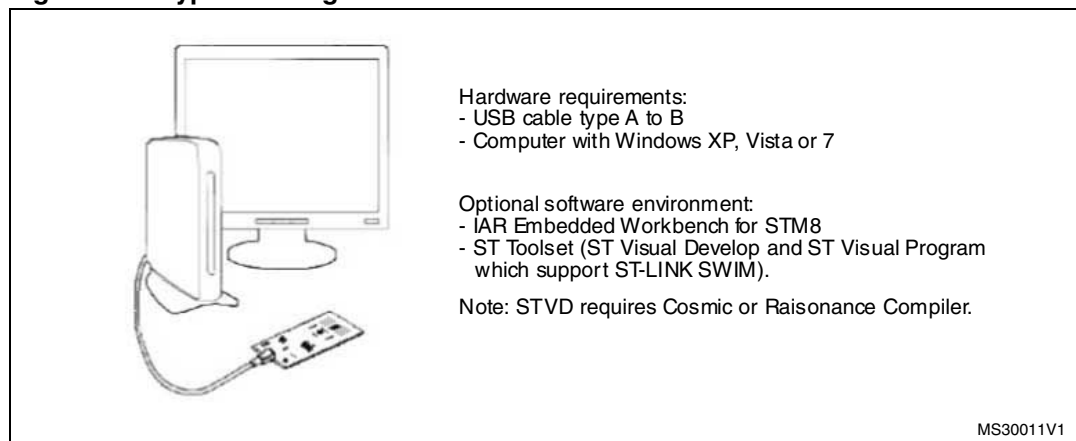
For more information see the STM8S003xx datasheet (Doc ID 018576) on the ST website.

2.2 ST-LINK

The ST-LINK provides a USB interface for programming and debugging using a single wire interface module (SWIM). The ST-LINK module of the STM8SVLDISCOVERY also supplies 5 V and 3.3 V to the STM8S003K3T6 module.

2.2.1 Using the ST-LINK

Figure 6. Typical configuration



Note: The driver for ST-LINK is installed automatically when the USB is connected.

For information about debugging and programming features refer to ST-LINK, STVD, STVP and SWIM on www.st.com.

2.2.2 Using the ST-LINK on other STM8S applications

You can connect your ST-LINK to other STM8S applications in 2 ways:

- By removing the solder bridges: This way uses the ST-LINK without breaking the PCB. Unsolder the two solder bridges SB1 and SB2 under the SWIM connector. See [Figure 7](#). You can re-solder the two bridges at a later date thus keeping the STM8SVLDISCOVERY usable.
- By breaking the board and removing the ST-LINK: This way constitutes a good alternative to programming the STM8S devices in other applications. See [Figure 8](#).

Note: This ST-LINK only supports the STM8S family. Do not use it with other STM8 families.

Figure 7. ST-LINK without breaking the PCB

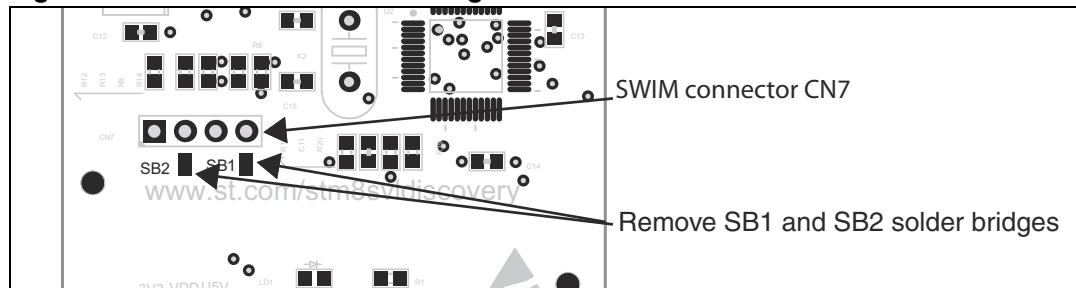
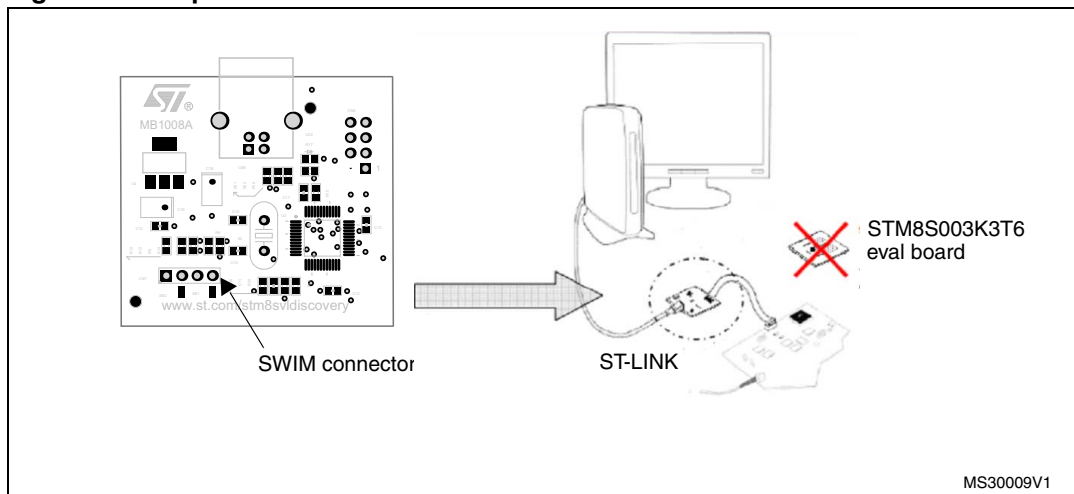


Figure 8. Separated ST-LINK module



Warning: By removing this module you will lose power supply on the STM8S003K3T6 evaluation board. Consequently, you will need a SWIM cable and an external power supply to program and use the STM8S003K3T6 board. To reconnect your STM8S003K3T6 use connector CN7 see [Table 1](#).

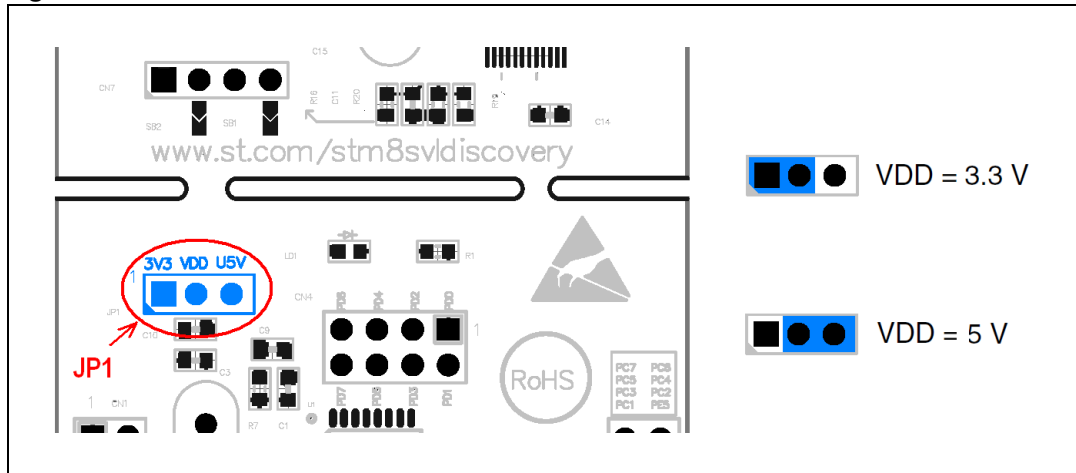
Table 1. SWIM connector CN7

| Pin | CN2 | Designation |
|-----|------------|------------------------|
| 1 | VDD_TARGET | VDD from application |
| 2 | SWIM | SWIM data input/output |
| 3 | GND | Ground |
| 4 | SWIM_RST | SWIM reset |

2.3 Power supply and power selection

The power supply is provided by a USB connector. Jumper JP1 selects the VDD value (5 V or regulated 3.3 V) see [Figure 9](#).

Figure 9. Power selection



2.4 LEDs

The ST-LINK provides two LEDs:

- LD1: Green LED LD1 is connected to the I/O PD0 of STM8S003K3.
- LD2: Red LED LD2 indicates communication between PC and ST-LINK.

2.5 Push button

Push button B1 is connected to the I/O PB7 of STM8S003K3.

3 Daughterboard connection

Four 12-pin male headers CN1, CN2, CN3 and CN4 are connected to the STM8S003K3T6 microcontroller.

See the following tables for pin assignments.

Table 2. CN1 pinout

| CN1 pin | Pin (chip) | Pin name | Type | Main function | Alternate function |
|---------|------------|-----------|------|---------------------------|--|
| 1 | 1 | NRST | I/O | Reset | |
| 2 | 2 | OSCIN/PA1 | I/O | Port A1 | |
| 3 | 3 | OSCOU/PA2 | I/O | Port A2 | |
| 4 | 4 | GND | S | Digital ground | |
| 5 | 4 | GND | S | Digital ground | |
| 6 | 5 | VCAP | S | 1.8 V regulator capacitor | |
| NC | 6 | VDD | S | Digital power supply | |
| 7 | 7 | PA3 | I/O | Port A3 | Timer 2 - channel 3 / SPI master slave |
| 8 | 8 | PF4 | I/O | Port F4 | |

Table 3. CN2 pinout

| CN2 pin | Pin (chip) | Pin name | Type | Main function | Alternate function |
|---------|------------|----------|------|---------------|--|
| 1 | 17 | PE5 | I/O | Port E5 | SPI master slave |
| 2 | 18 | PC1 | I/O | Port C1 | Timer 1 - channel 1 / UART2 synchronous clock |
| 3 | 19 | PC2 | I/O | Port C2 | Timer 1 - channel 2 |
| 4 | 20 | PC3 | I/O | Port C3 | Timer 1 - channel 3 |
| 5 | 21 | PC4 | I/O | Port C4 | Timer 1 - channel 4 |
| 6 | 22 | PC5 | I/O | Port C5 | SPI clock |
| 7 | 23 | PC6 | I/O | Port C6 | SPI master out / slave in |
| 8 | 24 | PC7 | I/O | Port C7 | SPI master in / slave out |

Table 4. CN3 pinout

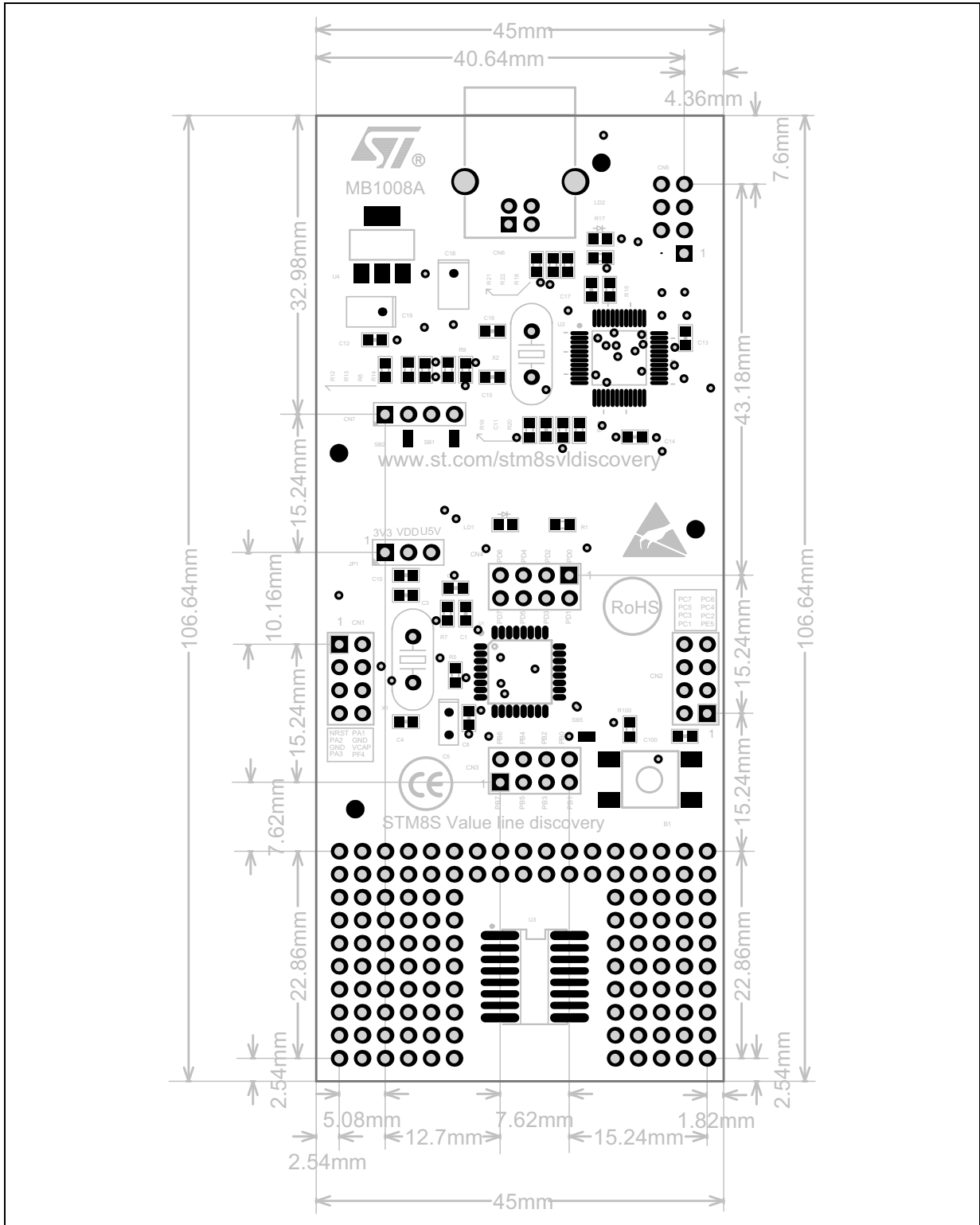
| CN3 in | Pin (chip) | Pin name | Type | Main function | Alternate function |
|--------|------------|----------|------|---------------|--|
| 1 | 9 | PB7/B1 | IO | Port B7 | |
| 2 | 10 | PB6 | IO | Port B6 | |
| 3 | 11 | PB5 | I/O | Port B5 | I2C data |
| 4 | 12 | PB4 | I/O | Port B4 | I2C clock |
| 5 | 13 | PB3 | I/O | Port B3 | Analog input 3 / Timer 1 external trigger |
| 6 | 14 | PB2 | I/O | Port B2 | Analog input 2 / Timer 1 inverted channel 3 |
| 7 | 15 | PB1 | I/O | Port B1 | Analog input 1 / Timer 1 inverted channel 2 |
| 8 | 16 | PB0 | I/O | Port B0 | Analog input 0 / Timer 1 inverted channel 1 |

Table 5. CN4 pinout

| CN4 pin | Pin (chip) | Pin name | Type | Main function | Alternate function |
|---------|------------|----------|------|---------------|--|
| 1 | 25 | PD0/LD1 | I/O | Port D0 | Timer 1 - break input / configurable clock output |
| 2 | 26 | PD1/SWIM | I/O | Port D1 | SWIM data interface |
| 3 | 27 | PD2 | I/O | Port D2 | Timer 2 - channel 3 |
| 4 | 28 | PD3 | I/O | Port D3 | Timer 2 - channel 2 / ADC external trigger |
| 5 | 29 | PD4 | I/O | Port D4 | Timer 2 - channel 1 / BEEP output |
| 6 | 30 | PD5 | I/O | Port D5 | UART1 data transmit |
| 7 | 31 | PD6 | I/O | Port D6 | UART1 data receive |
| 8 | 32 | PD7 | I/O | Port D7 | Top level interrupt / Timer 1 - channel 4 |

4 Mechanical drawing

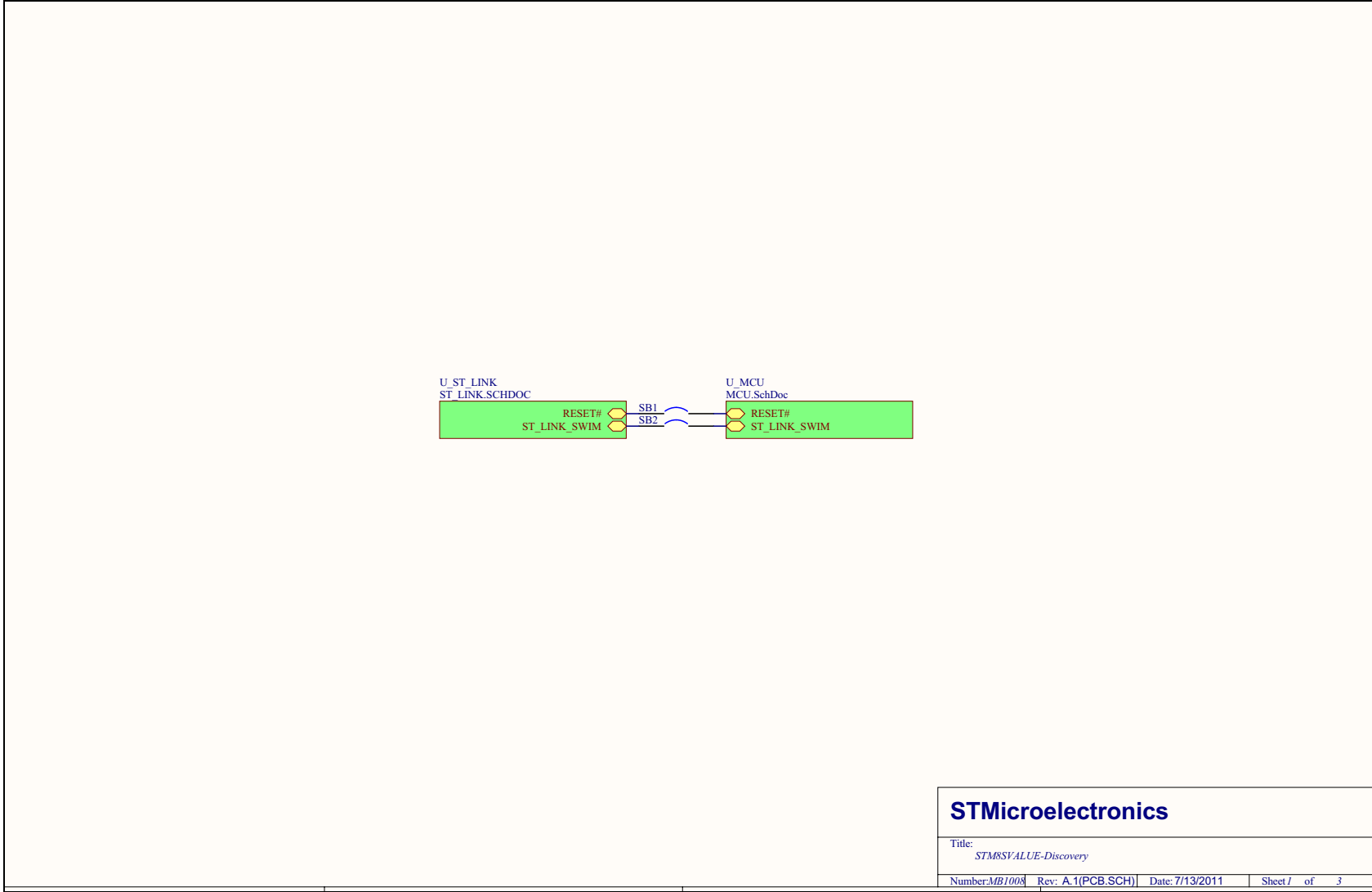
Figure 10. STM8SVLDiscovery mechanical drawing





5 Electrical schematics

Figure 11. STM8SVLDISCOVERY



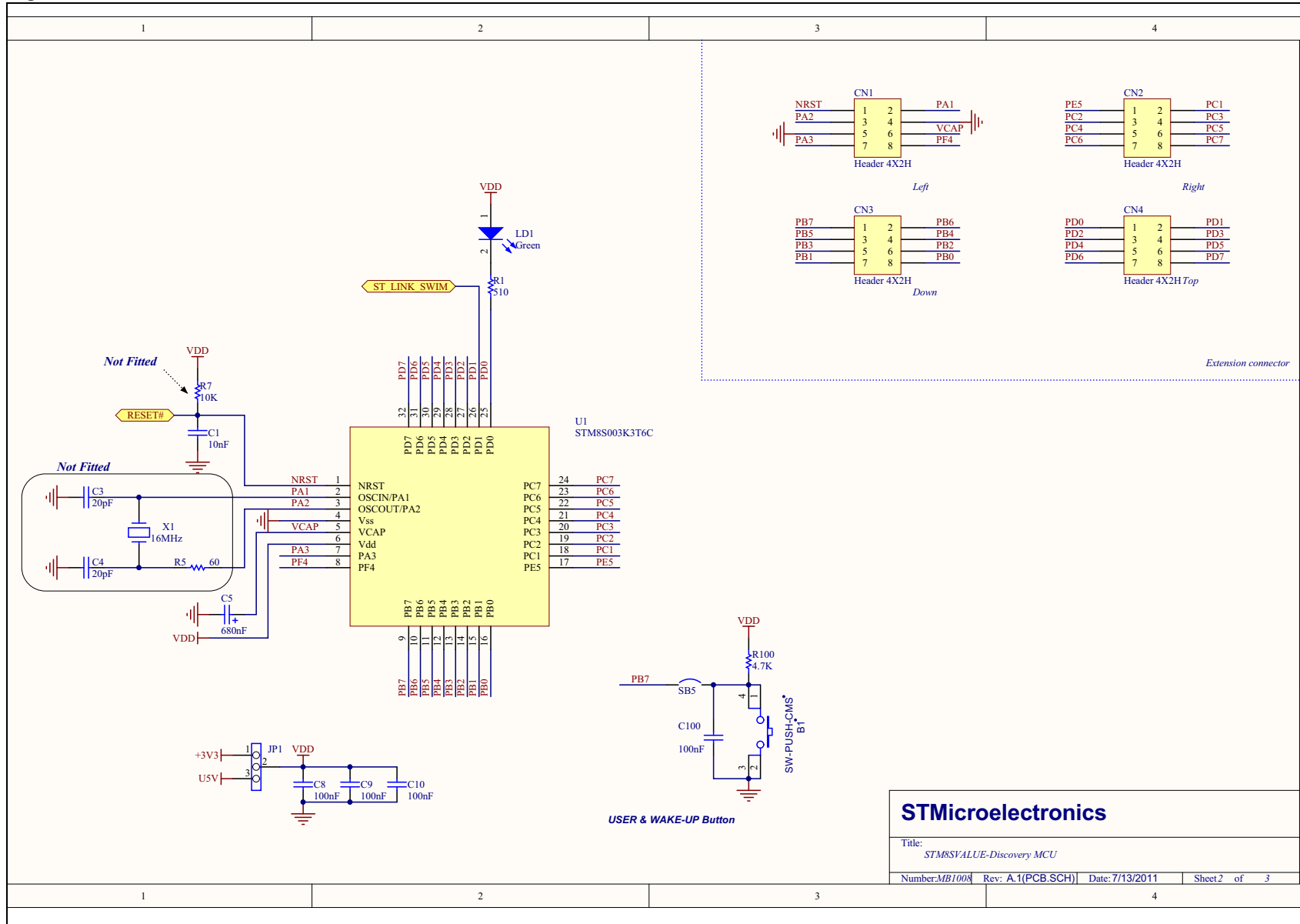
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| Title: STM8SVALUE-Discovery | | | |
| Number: MB1008 | Rev: A.1(PCB.SCH) | Date: 7/13/2011 | Sheet 1 of 3 |



Figure 12. STM8SVLDiscovery MCU

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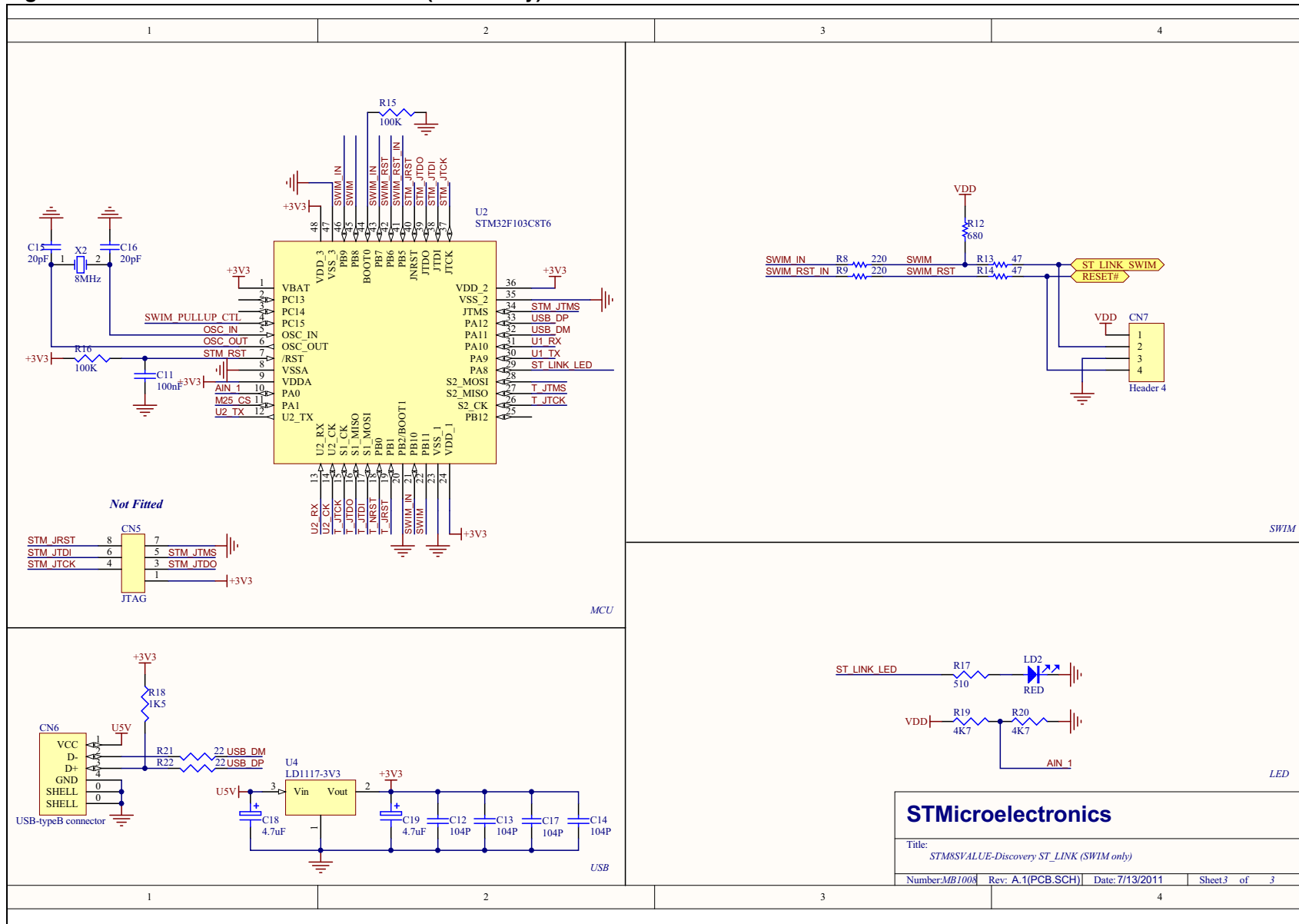
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| STMicroelectronics | | | |
| Title: STM8SVALUE-Discovery MCU | | | |
| Number: MB1008 | Rev: A.1(PCB.SCH) | Date: 7/13/2011 | Sheet 2 of 3 |

UM1482

Electrical schematics



Figure 13. STM8SVLDiscovery ST-LINK (SWIM only)



STMicroelectronics

Title: STM8SVALUE-Discovery ST_LINK (SWIM only)

Number: MB1008 Rev: A.1(PCB.SCH) Date: 7/13/2011 Sheet 3 of 3

6 Revision history

Table 6. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 18-Nov-2011 | 1 | Initial release. |

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