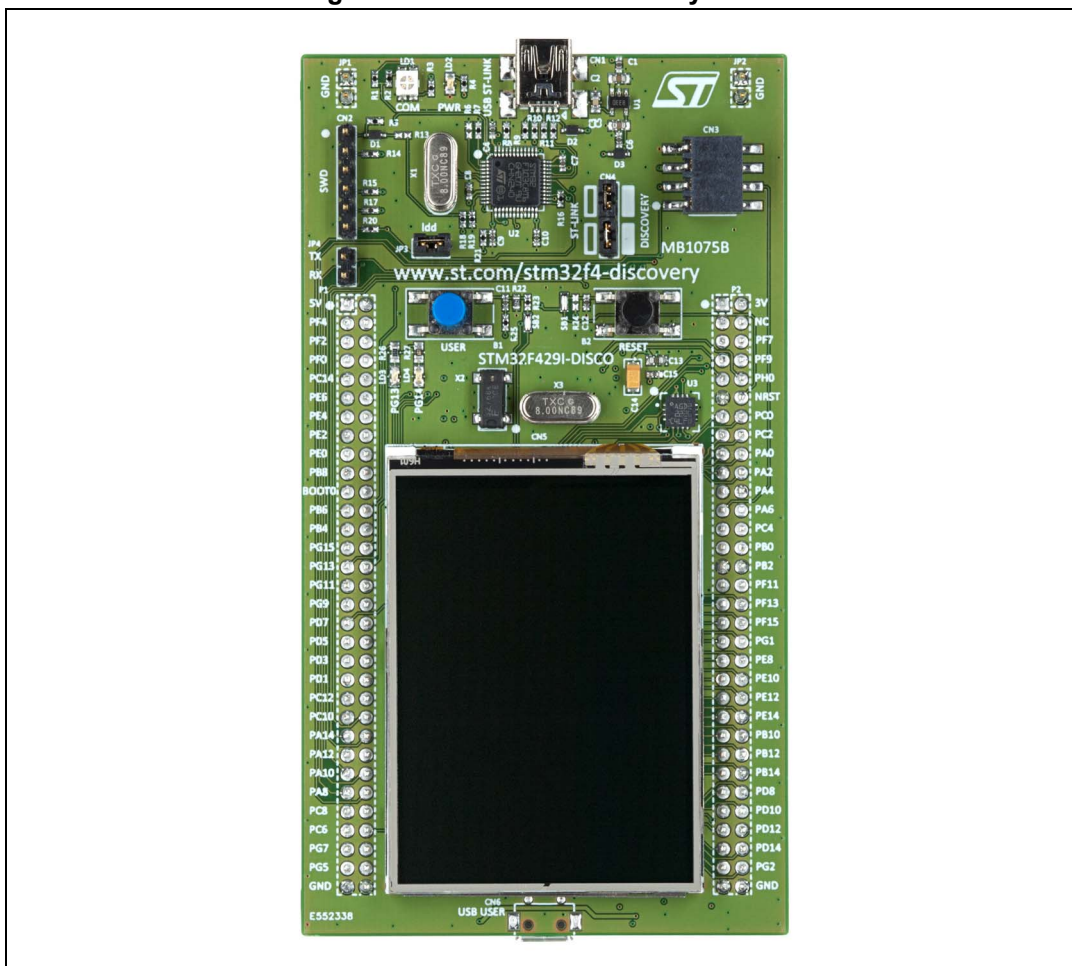


Discovery kit for STM32F429/439 lines

Introduction

The STM32F429 Discovery kit (32F429IDISCOVERY) helps you to discover the high performance of the STM32F4 series and to develop your applications. It is based on an STM32F429ZIT6 and includes an ST-LINK/V2 embedded debug tool interface, 2.4" TFT LCD, SDRAM 64 Mbits, Gyroscope ST MEMS, LEDs, pushbuttons and a USB OTG micro-B connector.

Figure 1. STM32F429 Discovery board



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1 Conventions

[Table 1](#) provides the definition of some conventions used in the present document.

Table 1. ON/OFF conventions

| Convention | Definition |
|-----------------------|----------------------------------|
| Jumper JPx ON | Jumper fitted |
| Jumper JPx OFF | Jumper not fitted |
| Solder bridge SBx ON | SBx connections closed by solder |
| Solder bridge SBx OFF | SBx connections left open |

2 Quick start

The STM32F429 Discovery is a low-cost and easy-to-use development kit to quickly evaluate and start a development with an STM32F4 series microcontroller.

Before installing and using the product, please accept the Evaluation Product License Agreement from www.st.com/stm32f4-discovery.

For more information on the STM32F429 Discovery board and for demonstration software, visit www.st.com/stm32f4-discovery.

2.1 Getting started

Follow the sequence below to configure the STM32F429 Discovery board and launch the DISCOVER application:

1. Ensure that the jumpers JP3 and CN4 are set to "on" (Discovery mode).
2. Connect the STM32F429 Discovery board to a PC using a USB cable type A/mini-B through the USB ST-LINK connector CN1, to power the board. The LEDs LD2 (PWR) and LD1 (COM).
3. The following applications are available on the screen:
 - Clock/Calendar and Game
 - Video Player and Image Browser (play videos and view images from the USB mass storage connected to CN6)
 - Performance monitor (watch the CPU load and run a graphical benchmark)
 - System Info
4. The demo software, as well as other software examples that allow you to discover the STM32 F4 series features, are available on www.st.com/stm32f4-discovery.
5. Develop your own applications starting from the examples.

2.2 System requirements

- Windows PC (XP, Vista, 7)
- USB type A to mini-B cable

2.3 Development toolchain supporting the STM32F429 Discovery kit

- Altium: TASKING™ VX-Toolset
- Atollic: TrueSTUDIO
- IAR: EWARM
- Keil™: MDK-ARM

2.4 Order code

To order the STM32F429 Discovery kit, use the STM32F429I-DISCO order code.

3 Features

The STM32F429 Discovery board offers the following features:

- STM32F429ZIT6 microcontroller featuring 2 MB of Flash memory, 256 KB of RAM in an LQFP144 package
- On-board ST-LINK/V2 with selection mode switch to use the kit as a standalone ST-LINK/V2 (with SWD connector for programming and debugging)
- Board power supply: through the USB bus or from an external 3 V or 5 V supply voltage
- L3GD20, ST MEMS motion sensor, 3-axis digital output gyroscope
- TFT LCD (Thin-film-transistor liquid-crystal display) 2.4", 262K colors RGB, 240 x 320 dots
- SDRAM 64 Mbits (1 Mbit x 16-bit x 4-bank) including an AUTO REFRESH MODE, and a power-saving
- Six LEDs:
 - LD1 (red/green) for USB communication
 - LD2 (red) for 3.3 V power-on
 - Two user LEDs:
LD3 (green), LD4 (red)
 - Two USB OTG LEDs:
LD5 (green) VBUS and LD6 (red) OC (over-current)
- Two pushbuttons (user and reset)
- USB OTG with micro-AB connector
- Extension header for LQFP144 I/Os for a quick connection to the prototyping board and an easy probing

4 Hardware layout

The STM32F429 Discovery board has been designed around the STM32F429ZIT6 microcontroller in a 144-pin LQFP package.

[Figure 1](#) illustrates the connections between the STM32F429ZIT6 and its peripherals (ST-LINK/V2, pushbutton, LED, USB OTG, Gyroscope ST MEMS, Accelerometer + Magnetometer ST MEMS, and connectors).

[Figure 2](#) and [Figure 3](#) help you to locate these features on the STM32F429 Discovery board.

Figure 1. Hardware block diagram

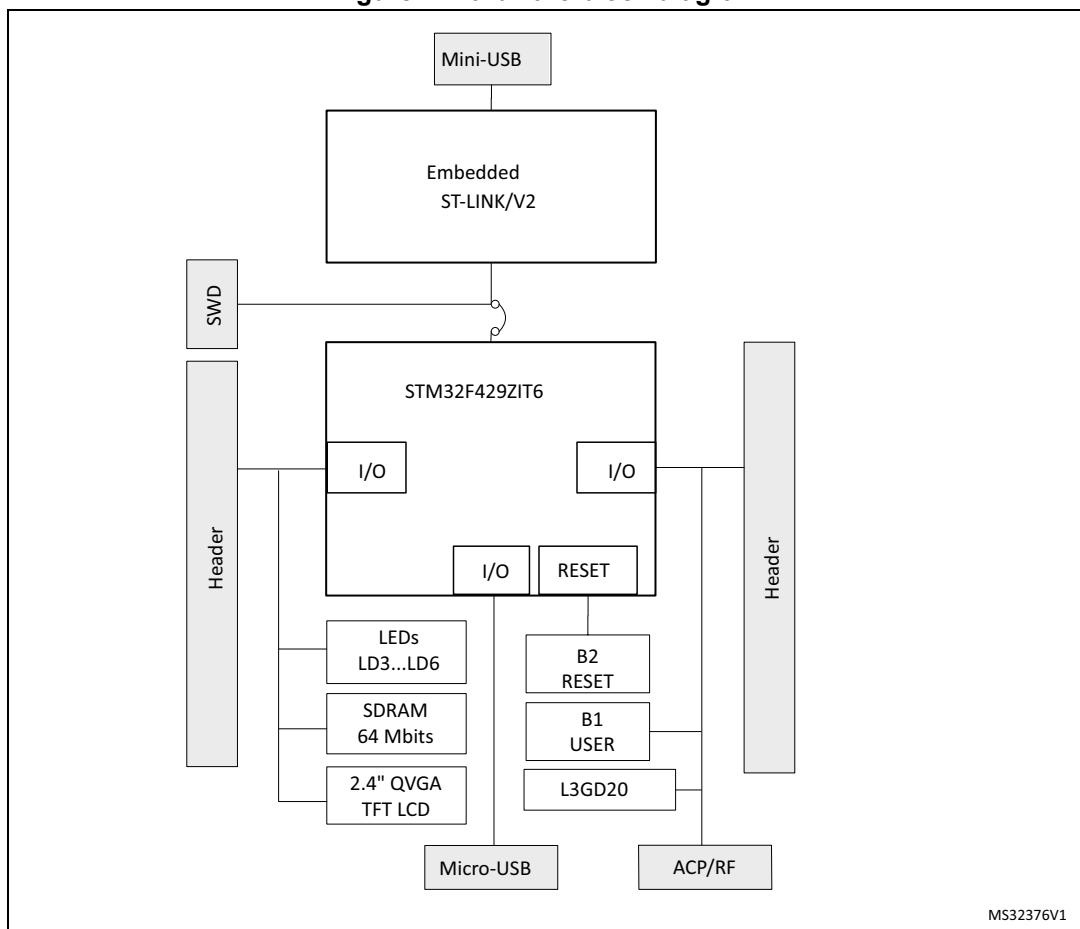


Figure 2. Top layout

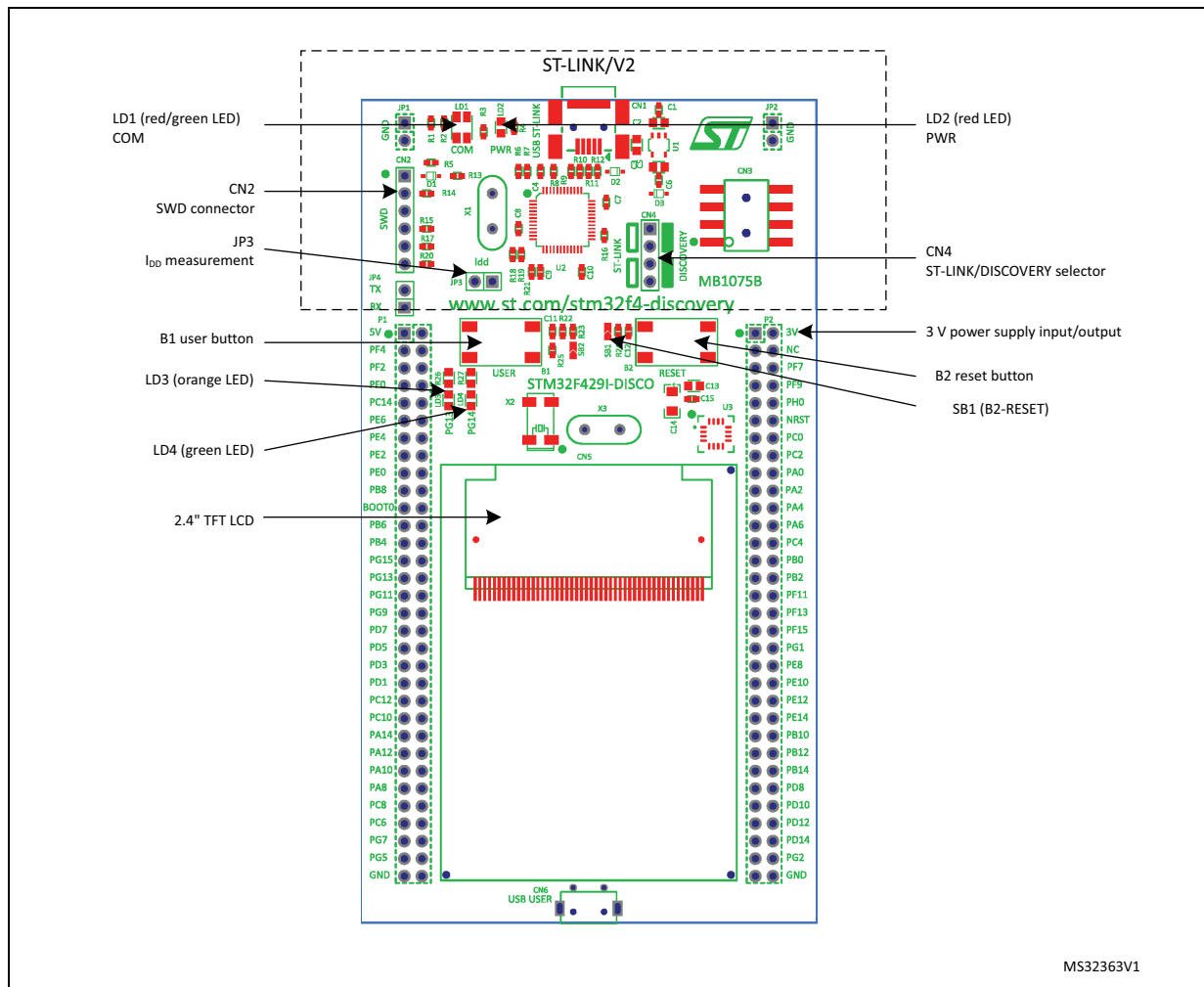
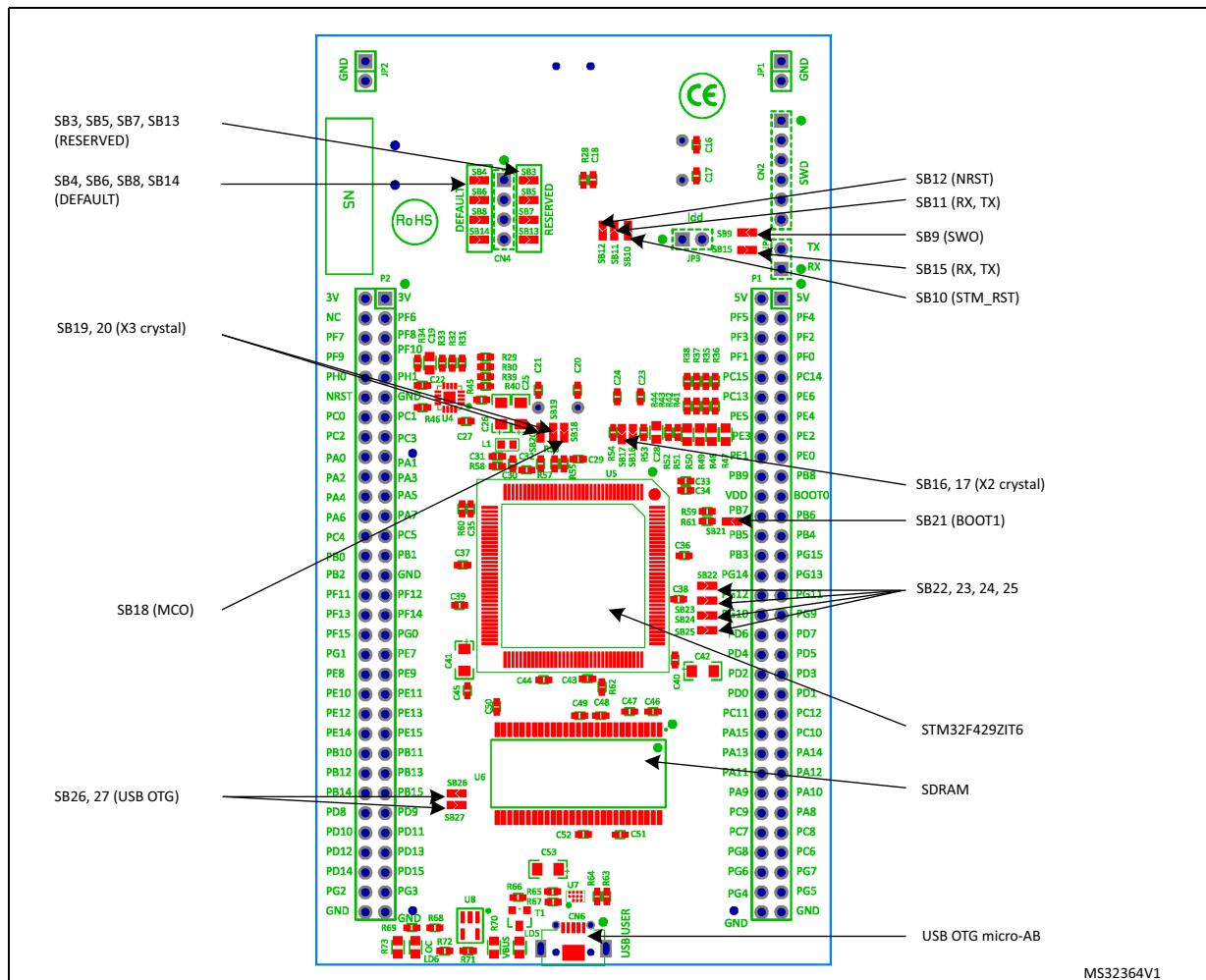


Figure 3. Bottom layout

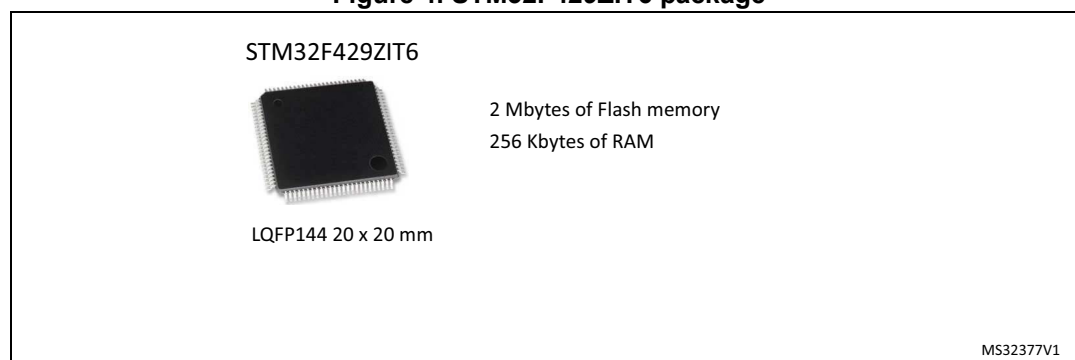


MS32364V1

4.1 STM32F429ZIT6 microcontroller

This ARM Cortex-M4 32-bit MCU with FPU has 225 DMIPS, up to 2 MB Flash/256 + 4 KB RAM, USB OTG HS/FS, Ethernet, 17 TIMs, 3 ADCs, 20 comm. interfaces, a camera and an LCD-TFT, 1.7-3.6 V operation.

Figure 4. STM32F429ZIT6 package



This device provides the following benefits (see [Table 2](#)).

Table 2. Features and benefits

| Features | Benefits |
|--|---|
| High performance <ul style="list-style-type: none"> – Up to 180 MHz/225 DMIPS Cortex-M4 with single cycle DSP MAC and floating point unit – CoreMark score: 608 at 180 MHz – CoreMark/MHz: 3.37 | <ul style="list-style-type: none"> – Boosted execution of control algorithms – More features for your applications – Ease of use – Better code efficiency – Faster time to market – Elimination of scaling and saturation – Easier support for meta-language tools |
| Maximum integration <ul style="list-style-type: none"> – Up to 2 Mbytes of on-chip dual bank Flash memory, up to 256 Kbytes of SRAM, reset circuit, internal RCs, PLLs, ultra-small packages (WLCSP) | <ul style="list-style-type: none"> – Read while write operations support – More features in space-constrained applications – Use of high-level languages: Java, .Net |
| Designed for high performance and ultra-fast data transfers <ul style="list-style-type: none"> – ART Accelerator™: memory accelerator – Chrom-ART Accelerator™: graphic accelerator (rectangle filling, rectangle copy with pixel format conversion and blending) | <ul style="list-style-type: none"> – Performance equivalent to zero-wait execution from Flash – Graphic content is created twice as fast and independently from the CPU |
| <ul style="list-style-type: none"> – 32-bit, 7-layer AHB bus matrix with up to 10 masters and 8 slaves including 3 blocks of SRAM – Multi DMA controllers: 2 general-purpose, 1 for USB HS, one for Ethernet | Concurrent execution and data transfer |
| <ul style="list-style-type: none"> – One 4th SRAM block dedicated to the core | Simplified resource allocation |
| <ul style="list-style-type: none"> – Flexible memory interface with SDRAM support: up to 90 MHz, 32-bit parallel | <ul style="list-style-type: none"> – High bandwidth for external memories – Cost-effective external RAM |

Table 2. Features and benefits (continued)

| Features | Benefits |
|---|--|
| Outstanding power efficiency <ul style="list-style-type: none"> – Ultra-low dynamic power in Run mode: 260 μA/MHz at 180 MHz running CoreMark benchmark from Flash memory (peripherals off) – RTC <1 μA typ in V_{BAT} mode – Down to 100 μA typ in Stop mode – 3.6 V down to 1.7 V V_{DD} – 1.2 V voltage regulator with power scaling capability | Extra flexibility to reduce power consumption for applications requiring both high-processing and low-power performance when running at low voltage or on a rechargeable battery |
| Superior and innovative peripherals and connectivity <ul style="list-style-type: none"> – Connectivity: camera interface, crypto/hash HW processor with AES GCM and CCM support, and SHA-256 – Ethernet MAC10/100 with IEEE 1588 v2 support, 2 USB OTG (one with HS support) – Up to 20 communication interfaces (including 4x USART + 4x UART, 6x SPI, 3x I²C with digital filter, 2x CAN, SDIO) – USART at 11.25 Mbit/s; SPI at 45 Mbit/s | New possibilities to connect and communicate high-speed data |
| Audio: <ul style="list-style-type: none"> – dedicated audio PLL, 2x I²S and 1x SAI with TDM⁽¹⁾ support | High-quality multi-channel audio support |
| <ul style="list-style-type: none"> – LCD TFT controller – Up to SVGA format (800 x 600) – Up to 24-bit RGB parallel pixel output – 2-layer support with blending | Support for cost-effective standard displays |
| Analog: <ul style="list-style-type: none"> – 2x 12-bit DACs, 3x 12-bit ADCs reaching 7.2 MSPS in interleaved mode – Up to 17 timers: 16 and 32 bits running up to 180 MHz | More precision thanks to high resolution |
| High integration <ul style="list-style-type: none"> – WLCSP143 4.5 x 5.5 mm, 2-Mbyte Flash/256-Kbyte SRAM) | Smaller board space allowing for smaller applications |
| Extensive tools and software solutions <ul style="list-style-type: none"> – Hardware sector protection with execute only access – Various IDE, starter kits, libraries, RTOS and stacks, either open source or provided by ST or 3rd parties, including the ARM CMSIS DSP library optimized for Cortex-M4 instructions | <ul style="list-style-type: none"> – Software IP protection – A wide choice within the STM32 ecosystem to develop your applications |

1. TDM: time division multiplex

[illegible]

4.2 Embedded ST-LINK/V2

The ST-LINK/V2 programming and debugging tool is integrated on the STM32F429 Discovery board. The embedded ST-LINK/V2 can be used in 2 different ways according to the jumper states (see [Table 3](#)):

- Program/debug the MCU on board,
- Program/debug an MCU in an external application board using a cable connected to SWD connector CN3.

The embedded ST-LINK/V2 supports only SWD for STM32 devices. For information about debugging and programming features, refer to user manual UM1075 (ST-LINK/V2 in-circuit debugger/programmer for STM8 and STM32) which describes in detail all the ST-LINK/V2 features.

Figure 6. Typical configuration

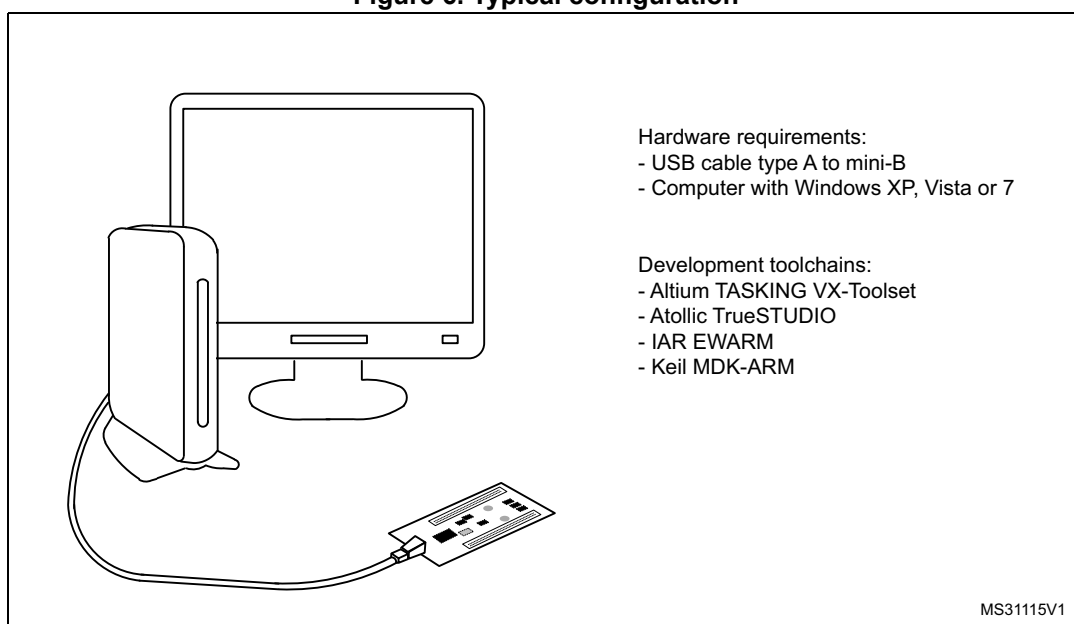


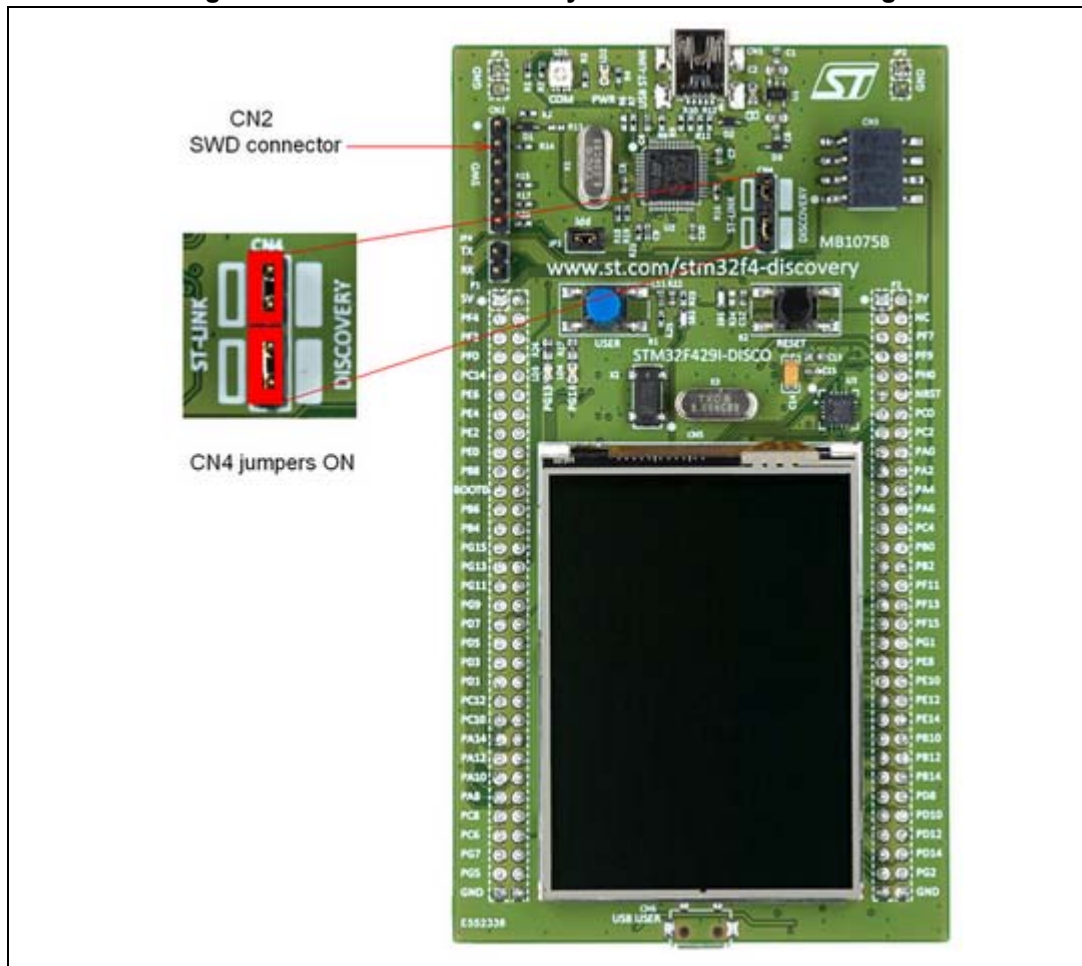
Table 3. Jumper states

| Jumper state | Description |
|----------------------|---|
| Both CN4 jumpers ON | ST-LINK/V2 functions enabled for on-board programming (default) |
| Both CN4 jumpers OFF | ST-LINK/V2 functions enabled for application through external CN3 connector (SWD supported) |

4.2.1 Using ST-LINK/V2 to program/debug the STM32F429ZIT6 on board

To program the STM32F429ZIT6 on board, simply plug in the two jumpers on CN4, as shown in [Figure 7](#) in red, but do not use the CN3 connector as that could disturb the communication with the STM32F429ZIT6 of the STM32F429 Discovery board.

Figure 7. STM32F429 Discovery board connections image



4.2.2 Using ST-LINK/V2 to program/debug an external STM32 application

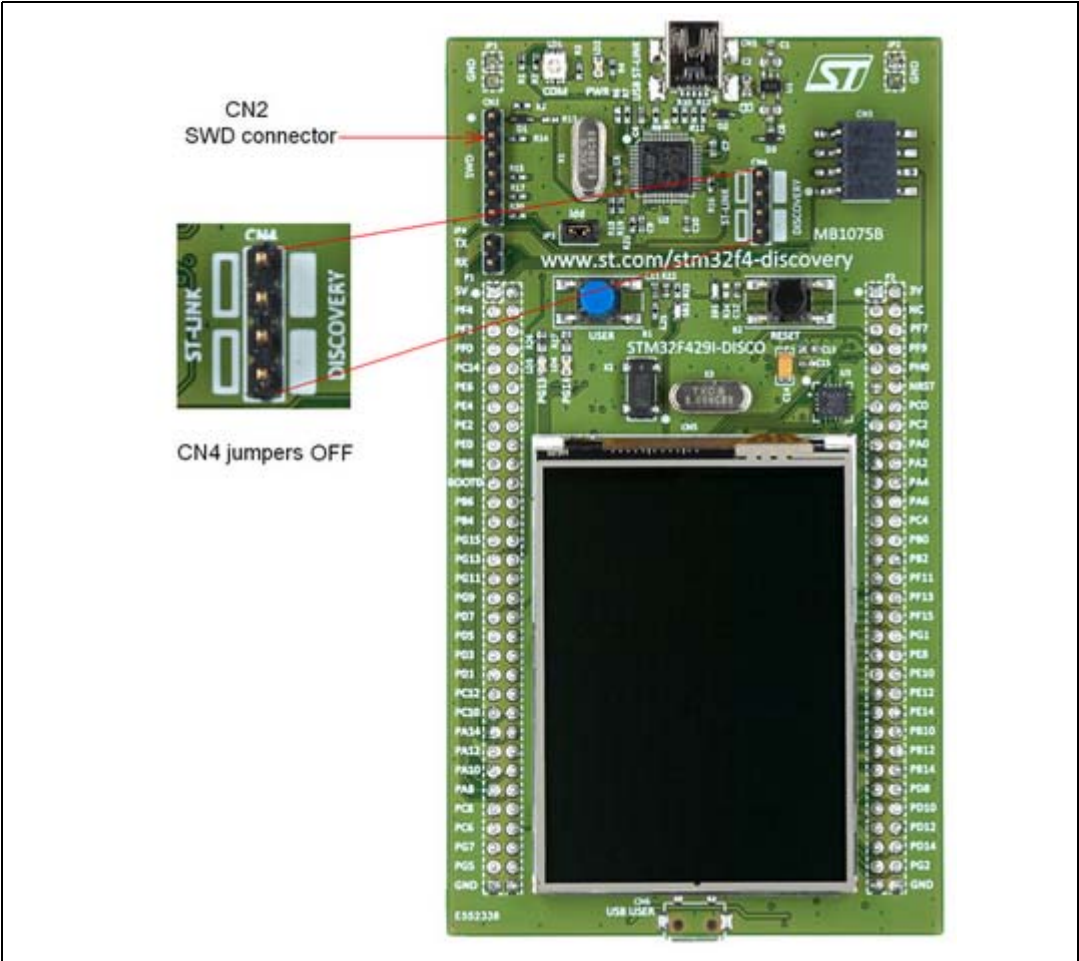
It is very easy to use the ST-LINK/V2 to program the STM32 on an external application. Simply remove the two jumpers from CN4 as shown in [Figure 8](#), and connect your application to the CN3 debug connector according to [Table 4](#).

Note: SB7 must be OFF if you use CN2 pin 5 in your external application.

Table 4. Debug connector CN2 (SWD)

| Pin | CN2 | Designation |
|-----|------------|-----------------------|
| 1 | VDD_TARGET | VDD from application |
| 2 | SWCLK | SWD clock |
| 3 | GND | Ground |
| 4 | SWDIO | SWD data input/output |
| 5 | NRST | RESET of target MCU |
| 6 | SWO | Reserved |

Figure 8. ST-LINK/V2 connections image



4.3 Power supply and power selection

The power supply is provided either by the host PC through the USB cable, or by an external 5 V power supply.

The D1 and D2 diodes protect the 5 V and 3 V pins from external power supplies:

- 5 V and 3 V can be used as output power supplies when another application board is connected to pins P1 and P2.
In this case, the 5 V and 3 V pins deliver a 5 V or 3 V power supply and the power consumption must be lower than 100 mA.
- 5 V and 3 V can also be used as input power supplies, e.g. when the USB connectors are not connected to the PC.
In this case, the STM32F429 Discovery board must be powered by a power supply unit or by an auxiliary equipment complying with standard EN-60950-1: 2006+A11/2009, and must be Safety Extra Low Voltage (SELV) with limited power capability.

Note: The board can also be powered through the USB USER connector and is protected by D4 and D5 diodes when both USBs are connected (in which case, the 5 V power is around 4.4 volts).

4.4 LEDs

- LD1 COM:
LD1 default status is red. LD1 turns to green to indicate that communications are in progress between the PC and the ST-LINK/V2.
- LD2 PWR:
The red LED indicates that the board is powered.
- User LD3:
The green LED is a user LED connected to the I/O PG13 of the STM32F429ZIT6.
- User LD4:
The red LED is a user LED connected to the I/O PG14 of the STM32F429ZIT6.
- User LD5:
The green LED indicates when VBUS is present on CN6 and is connected to PB13 of the STM32F429ZIT6.
- User LD6:
The red LED indicates an overcurrent from VBUS of CN6 and is connected to the I/O PC5 of the STM32F429ZIT6.

4.5 Pushbuttons

- B1 USER:
User and Wake-Up button connected to the I/O PA0 of the STM32F429ZIT6.
- B2 RESET:
The pushbutton connected to NRST is used to RESET the STM32F429ZIT6.

4.6 USB OTG supported

The STM32F429ZIT6 is used to drive only USB OTG full speed on this board. The USB micro-AB connector (CN6) allows the user to connect a host or device component, such as a USB key, mouse, and so on.

Two LEDs are dedicated to this module:

- LD5 (green LED) indicates when VBUS is active
- LD6 (red LED) indicates an overcurrent from a connected device.

4.7 Gyroscope MEMS (ST MEMS L3GD20)

The L3GD20 is an ultra-compact, low-power, three-axis angular rate sensor. It includes a sensing element and an IC interface able to provide the measured angular rate to the external world through the I2C/SPI serial interface.

The L3GD20 has dynamically user-selectable full scales of ± 250 dps/500 dps/ ± 2000 dps and is capable of measuring rates.

The STM32F429ZIT6 MCU controls this motion sensor through the SPI interface.

4.8 TFT LCD (Thin-film-transistor liquid-crystal display)

The TFT LCD is a 2.41" display of 262 K colors. Its definition is QVGA (240 x 320 dots) and is directly driven by the STM32F429ZIT6 using the RGB protocol. It includes the ILI9341 LCD controller and can operate with a 2.8 ± 0.3 V voltage.

The STM32F429ZIT6 MCU controls this motion sensor through the SPI interface.

4.9 64-Mbit SDRAM (1Mbit x 16-bit x 4-bank)

The 64-Mbit SDRAM is a high speed CMOS, dynamic random-access memory designed to operate in 3.3 V memory systems containing 67,108,864 bits. It is internally configured as a quad-bank DRAM with a synchronous interface. Each 16,777,216-bit bank is organized as 4,096 rows by 256 columns by 16 bits. The 64-Mbit SDRAM includes an AUTO REFRESH MODE, and a power-saving, power-down mode. All signals are registered on the positive edge of the clock signal, CLK.

The STM32F429ZIT6 MCU reads and writes data at 80 MHz.

4.10 JP3 (Idd)

Jumper JP3, labeled Idd, allows the consumption of STM32F429ZIT6 to be measured by removing the jumper and connecting an ammeter.

- Jumper on: STM32F429ZIT6 is powered (default).
- Jumper off: an ammeter must be connected to measure the STM32F429ZIT6 current, (if there is no ammeter, the STM32F429ZIT6 is not powered).

4.11 OSC clock

4.11.1 OSC clock supply

The following information indicates all configurations for clock supply selection.

- **MCO from ST-LINK** (from MCO of the STM32F429ZIT6)
This frequency cannot be changed, it is fixed at 8 MHz and connected to PH0-OSC_IN of the STM32F429ZIT6. The configuration needed is:
 - SB18 closed, SB19 open, R56 removed
 - SB20, R57, C20, C21, X3 = don't care
- **Oscillator onboard** (from X3 crystal)
For typical frequencies and its capacitors and resistors, please refer to the STM32F429ZIT6 Datasheet. The configuration needed is:
 - SB18, SB19, SB20 open
 - -R56, R57, C20, C21, X3 soldered
- **Oscillator from external PH0** (from external oscillator through pin 10 of the P2 connector)
The configuration needed is:
 - SB19 closed, SB18 open, R56 removed
 - SB20, R57, C20, C21, X3 = don't care
- **No external oscillator** (from Internal oscillator HSI only).
PH0 and PH1 can be used as GPIO. The configuration needed is:
 - SB18 open, SB19 closed, SB20 closed, R56 removed, R57 removed
 - C20, C21, X3 = don't care

4.11.2 OSC 32 KHz clock supply

The following information indicates all configurations for the 32 kHz clock supply selection.

- **Oscillator on board** (from X2 Crystal, not provided).
The configuration needed is:
 - SB16 open, SB17 open.
 - R53, R54, C23, C24, X2 soldered.
- **Oscillator from external PC14** (from external oscillator through pin 9 of P1 connector)
The configuration needed is:
 - SB16 closed, R53 removed
 - SB17, R54, C23, C24, X2 = don't care
- **No external oscillator** (PC14 and PC15 can be used as GPI).
The configuration needed is:
 - SB16 closed, SB17 closed, R53 removed, R54 removed.
 - C23, C24, X2 = don't care.

4.12 Solder bridges

Table 5. Solder bridges

| Bridge | State ⁽¹⁾ | Description |
|-----------------------|----------------------|--|
| SB19,20 (X3 crystal) | OFF | X3, C20, C21, R56 and R57 provide a clock. PH0, PH1 are disconnected from P2 |
| | ON | PH0, PH1 are connected to P2. Remove only R56 and R57 |
| SB4,6,8,14 (default) | ON | Reserved, do not modify |
| SB3,5,7,13 (reserved) | OFF | Reserved, do not modify |
| SB22,23,24,25 | OFF | Reserved, do not modify |
| SB16,17 (X2 crystal) | OFF | X2, C23, C24, R53 and R54 deliver a 32 KHz clock. PC14, PC15 are not connected to P2 |
| | ON | PC14, PC15 are only connected to P2 Remove only R53 and R54 |
| SB1 (B2-RESET) | ON | B2 Push Button is connected to NRST of STM32F429ZIT6 |
| | OFF | B2 Push Button is not connected to NRST of STM32F429ZIT6 |
| SB2 (B1-USER) | ON | B1 Push Button is connected to PA0 |
| | OFF | B1 Push Button is not connected to PA0 |
| SB11,15 (RX,TX) | OFF | Reserved, do not modify |
| | ON | Reserved, do not modify |
| SB12 (NRST) | ON | NRST signal of connector CN2 is connected to NRST of STM32F429ZIT6 |
| | OFF | NRST signal is not connected |
| SB9 (SWO) | OFF | SWO signal is not connected |
| | ON | SWO signal of connector CN3 is connected to PB3 |
| SB10 (STM_RST) | OFF | No incidence on NRST signal of STM32F429ZIT6 |
| | ON | NRST signal of STM32F429ZIT6 is connected to GND |
| SB21 (BOOT0) | ON | BOOT0 signal of STM32F429ZIT6 is at level "0" through 510 Ω pull-down |
| | OFF | BOOT0 signal of STM32F429ZIT6 is at level "1" through 10 K Ω pull-up (not provided) |
| SB26,27 (USB OTG) | OFF | PB14 and PB15 are only used for USB OTG and not connected to P2 to avoid noise |
| | ON | PB14 and PB15 are connected to P2. |
| SB18 (MCO) | OFF | MCO signal of STM32F429ZIT6 is not used |
| | ON | MCO clock signal from STM32F429ZIT6 is connected to OSC_IN of STM32F429ZIT6 |

1. Default SBx state is shown in bold.

4.13 Extension connectors

The male headers P1 and P2 can connect the STM32F429 Discovery board to a standard prototyping/wrapping board. STM32F429ZIT6 GPI/Os are available on these connectors. P1 and P2 can also be probed by an oscilloscope, a logical analyzer or a voltmeter.

Table 6. MCU pin description versus board function (page 1 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|-------|---------|---------|---------|--------|-----|-----|------------|---------|-------------|----------|--------------|-----|-----|-----|----|----|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| BOOT0 | 138 | BOOT0 | | | | | | | | | | | | | | | | 21 | |
| NRST | 25 | NRST | | RESET | RESET | RESET | | | | B2 | | | | | 5 | | | | 12 |
| PA0 | 34 | | | | | | | | | B1 | | | | | | | | | 18 |
| PA1 | 35 | | | | | | INT1 | | | | | | | | | | | | 17 |
| PA2 | 36 | | | | | | INT2 | | | | | | | | | | | | 20 |
| PA3 | 37 | | | DB3 | B5 | | | | | | | | | | | | | | 19 |
| PA4 | 40 | | | VSYNC | VSYNC | | | | | | | | | | | | | | 22 |
| PA5 | 41 | | | | | | | | | | | | | | | | | | 21 |
| PA6 | 42 | | | DB6 | G2 | | | | | | | | | | | | | | 24 |
| PA7 | 43 | | | | | | | | | | ACP_RST | | | | | 4 | | | 23 |
| PA8 | 100 | | | | | | | | | | SCL | SCL | | | | 3 | | 53 | |
| PA9 | 101 | | | | | | | | | | | | | | | | | 52 | |
| PA10 | 102 | | | | | | | | | | | | | | | | | 51 | |
| PA11 | 103 | | | DB14 | R4 | | | | | | | | | | | | | 50 | |
| PA12 | 104 | | | DB15 | R5 | | | | | | | | | | | | | 49 | |
| PA13 | 105 | SWDIO | | | | | | | | | | | | | 4 | | | 48 | |

Table 6. MCU pin description versus board function (page 2 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|--------|---------|---------|---------|--------|------|-------|------------|--------|-------------|----------|--------------|-----|-----|-----|----|-------------------|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| PA14 | 109 | SWCLK | | | | | | | | | | | | | 2 | | | 47 | |
| PA15 | 110 | | | | | | | | | | | INT | | | | | | 46 | |
| PB0 | 46 | | | DB13 | R3 | | | | | | | | | | | | | | 28 |
| PB1 | 47 | | | DB16 | R6 | | | | | | | | | | | | | | 27 |
| PB2 | 48 | BOOT1 | | | | | | | | | | | | | | | | | 30 |
| PB3 | 133 | SWO | | | | | | | | | | | | | 6 | | | 28 | |
| PB4 | 134 | | | | | | | | | | | | | | | | | 25 | |
| PB5 | 135 | | SDCKE1 | | | | | | | | | | | | | | | 26 | |
| PB6 | 136 | | SDNE1 | | | | | | | | | | | | | | | 23 | |
| PB7 | 137 | | | | | | | | | | | | | | | | | 24 | |
| PB8 | 139 | | | DB4 | B6 | | | | | | | | | | | | | 19 | |
| PB9 | 140 | | | DB5 | B7 | | | | | | | | | | | | | 20 | |
| PB10 | 69 | | | DB8 | G4 | | | | | | | | | | | | | | 48 |
| PB11 | 70 | | | DB9 | G5 | | | | | | | | | | | | | | 47 |
| PB12 | 73 | | | | | | | ID | | | | | | | | | 4 | | 50 |
| PB13 | 74 | | | | | | | VBUS | Green | | | | | | | | 1 | | 49 |
| PB14 | 75 | | | | | | | DM | | | | | | | | | 2 | | 52 ⁽¹⁾ |
| PB15 | 76 | | | | | | | DP | | | | | | | | | 3 | | 51 ⁽²⁾ |
| PC0 | 26 | | SDNWE | | | | | | | | | | | | | | | | 14 |

Table 6. MCU pin description versus board function (page 3 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|-------|---------|---------|---------|--------|-----|-----|------------|--------|-------------|----------|--------------|-----|-----|-----|----|----|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| PC1 | 27 | | | | | | CS | | | | | | | | | | | | 13 |
| PC2 | 28 | | | CSX | CSX | CSX | | | | | | | | | | | | | 16 |
| PC3 | 29 | | | | | | | | | | | | | | | | | | 15 |
| PC4 | 44 | | | | | | | PSO | | | | | | | | | | | 26 |
| PC5 | 45 | | | | | | | QC | Red | | | | | | | | | | 25 |
| PC6 | 96 | | | HSYNC | HSYNC | | | | | | | | | | | | | 57 | |
| PC7 | 97 | | | DB10 | G6 | | | | | | | | | | | | | 56 | |
| PC8 | 98 | | | | | | | | | | | | | | | | | 55 | |
| PC9 | 99 | | | | | | | | | | SDA | SDA | | | | 1 | | 54 | |
| PC10 | 111 | | | DB12 | R2 | | | | | | | | | | | | | 45 | |
| PC11 | 112 | | | | | | | | | | | | | | | | | 44 | |
| PC12 | 113 | | | | | | | | | | | | | | | | | 43 | |
| PC13 | 7 | | | | | | | | | | | | | | | | | 12 | |
| PC14 | 8 | OSC32_IN | | | | | | | | | | | | | | | | 9 | |
| PC15 | 9 | OSC32_OUT | | | | | | | | | | | | | | | | 10 | |
| PD0 | 114 | | D2 | | | | | | | | | | | | | | | 42 | |
| PD1 | 115 | | D3 | | | | | | | | | | | | | | | 41 | |
| PD2 | 116 | | | | | | | | | | | | | | | | | 40 | |
| PD3 | 117 | | | DB11 | G7 | | | | | | | | | | | | | 39 | |
| PD4 | 118 | | | | | | | | | | | | | | | | | 38 | |
| PD5 | 119 | | | | | | | | | | | | | | | | | 37 | |

Table 6. MCU pin description versus board function (page 4 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|-------|---------|---------|---------|--------|-----|-----|------------|--------|-------------|----------|--------------|-----|-----|-----|----|----|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| PD6 | 122 | | | DB0 | B2 | | | | | | | | | | | | | 36 | |
| PD7 | 123 | | | | | | | | | | | | | | | | | 35 | |
| PD8 | 77 | | D13 | | | | | | | | | | | | | | | | 54 |
| PD9 | 78 | | D14 | | | | | | | | | | | | | | | | 53 |
| PD10 | 79 | | D15 | | | | | | | | | | | | | | | | 56 |
| PD11 | 80 | | | TE | | | | | | | | | | | | | | | 55 |
| PD12 | 81 | | | RDX | | | | | | | | | | | | | | | 58 |
| PD13 | 82 | | | WRX | | DCX | | | | | | | | | | | | | 57 |
| PD14 | 85 | | D0 | | | | | | | | | | | | | | | | 60 |
| PD15 | 86 | | D1 | | | | | | | | | | | | | | | | 59 |
| PE0 | 141 | | NBL0 | | | | | | | | | | | | | | | 17 | |
| PE1 | 142 | | NBL1 | | | | | | | | | | | | | | | 18 | |
| PE2 | 1 | | | | | | | | | | | | | | | | | 15 | |
| PE3 | 2 | | | | | | | | | | | | | | | | | 16 | |
| PE4 | 3 | | | | | | | | | | | | | | | | | 13 | |
| PE5 | 4 | | | | | | | | | | | | | | | | | 14 | |
| PE6 | 5 | | | | | | | | | | | | | | | | | 11 | |
| PE7 | 58 | | D4 | | | | | | | | | | | | | | | | 37 |
| PE8 | 59 | | D5 | | | | | | | | | | | | | | | | 40 |
| PE9 | 60 | | D6 | | | | | | | | | | | | | | | | 39 |
| PE10 | 63 | | D7 | | | | | | | | | | | | | | | | 42 |
| PE11 | 64 | | D8 | | | | | | | | | | | | | | | | 41 |
| PE12 | 65 | | D9 | | | | | | | | | | | | | | | | 44 |
| PE13 | 66 | | D10 | | | | | | | | | | | | | | | | 43 |
| PE14 | 67 | | D11 | | | | | | | | | | | | | | | | 46 |

Table 6. MCU pin description versus board function (page 5 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|--------|---------|---------|---------|--------|-----|-----|------------|--------|-------------|----------|--------------|-----|-----|-----|----|----|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| PE15 | 68 | | D12 | | | | | | | | | | | | | | | | 45 |
| PF0 | 10 | | A0 | | | | | | | | | | | | | | | 7 | |
| PF1 | 11 | | A1 | | | | | | | | | | | | | | | 8 | |
| PF2 | 12 | | A2 | | | | | | | | | | | | | | | 5 | |
| PF3 | 13 | | A3 | | | | | | | | | | | | | | | 6 | |
| PF4 | 14 | | A4 | | | | | | | | | | | | | | | 3 | |
| PF5 | 15 | | A5 | | | | | | | | | | | | | | | 4 | |
| PF6 | 18 | | | | | | | | | | | | | | | | | | 3 |
| PF7 | 19 | | | DCX | | SCL | SCK | | | | | | | | | | | | 6 |
| PF8 | 20 | | | | | | MISO | | | | | | | | | | | | 5 |
| PF9 | 21 | | | SDA | | SDI/SDO | MOSI | | | | | | | | | | | | 8 |
| PF10 | 22 | | | ENABLE | DE | | | | | | | | | | | | | | 7 |
| PF11 | 49 | | SDNRAS | | | | | | | | | | | | | | | | 32 |
| PF12 | 50 | | A6 | | | | | | | | | | | | | | | | 31 |
| PF13 | 53 | | A7 | | | | | | | | | | | | | | | | 34 |
| PF14 | 54 | | A8 | | | | | | | | | | | | | | | | 33 |
| PF15 | 55 | | A9 | | | | | | | | | | | | | | | | 36 |
| PG0 | 56 | | A10 | | | | | | | | | | | | | | | | 35 |
| PG1 | 57 | | A11 | | | | | | | | | | | | | | | | 38 |
| PG2 | 87 | | | | | | | | | | | | | | | | | | 62 |
| PG3 | 88 | | | | | | | | | | | | | | | | | | 61 |
| PG4 | 89 | | BA0 | | | | | | | | | | | | | | | 62 | |
| PG5 | 90 | | BA1 | | | | | | | | | | | | | | | 61 | |

Table 6. MCU pin description versus board function (page 6 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|--------|---------|---------|---------|--------|-----|-------|------------|--------|-------------|----------|--------------|-----|-----|-----|----|----|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| PG6 | 91 | | | DB17 | R7 | | | | | | | | | | | | | 60 | |
| PG7 | 92 | | | DOTCLK | CLK | | | | | | | | | | | | | 59 | |
| PG8 | 93 | | SDCLK | | | | | | | | | | | | | | | 58 | |
| PG9 | 124 | | | | | | | | | | | | | | | | | 33 | |
| PG10 | 125 | | | DB7 | G3 | | | | | | | | | | | | | 34 | |
| PG11 | 126 | | | DB1 | B3 | | | | | | | | | | | | | 31 | |
| PG12 | 127 | | | DB2 | B4 | | | | | | | | | | | | | 32 | |
| PG13 | 128 | | | | | | | | Green | | | | | | | | | 29 | |
| PG14 | 129 | | | | | | | | Red | | | | | | | | | 30 | |
| PG15 | 132 | | SDNCAS | | | | | | | | | | | | | | | 27 | |
| PH0 | 23 | OSC_IN | | | | | | | | | | | | | | | | | 10 |
| PH1 | 24 | OSC_OUT | | | | | | | | | | | | | | | | | 9 |
| | | | | | | | | | | | | | | VDD | | | | 22 | |
| | | | | | | | | | | | | | | 3 V | | 5 | | | 1 |
| | | | | | | | | | | | | | | 3 V | | | | | 2 |
| | | | | | | | | | | | | | | 5 V | | 8 | | 1 | |
| | | | | | | | | | | | | | | 5 V | | | | 2 | |
| | | | | | | | | | | | | | | GND | 3 | 7 | 5 | 63 | 11 |

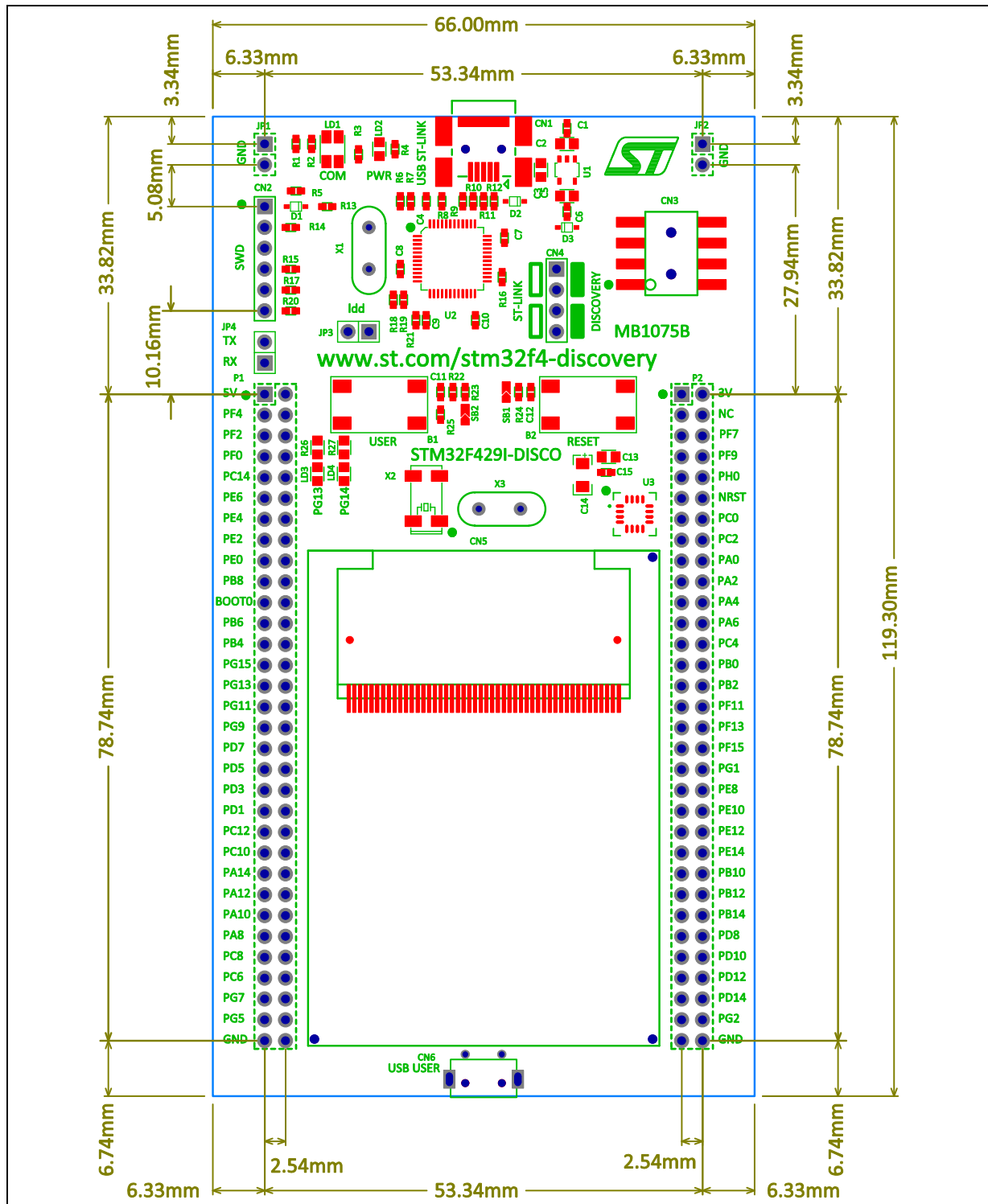
Table 6. MCU pin description versus board function (page 7 of 7)

| MCU pin | | Board function | | | | | | | | | | | | | | | | | |
|---------------|---------|----------------|-------|---------|---------|---------|--------|-----|-----|------------|--------|-------------|----------|--------------|-----|-----|-----|----|----|
| Main function | LQFP144 | System | SDRAM | LCD-TFT | LCD-RGB | LCD-SPI | L3GD20 | USB | LED | Puchbutton | ACP/RF | Touch panel | Free I/O | Power supply | CN2 | CN3 | CN6 | P1 | P2 |
| | | | | | | | | | | | | | | GND | | | | 64 | 29 |
| | | | | | | | | | | | | | | GND | | | | | 63 |
| | | | | | | | | | | | | | | GND | | | | | 64 |

- 1. If SB27 is On.
- 2. If SB26 is On.

5 Mechanical drawing

Figure 9. STM32F429 Discovery board mechanical drawing



6 Electrical schematics

Figure 10. STM32F429 Discovery board

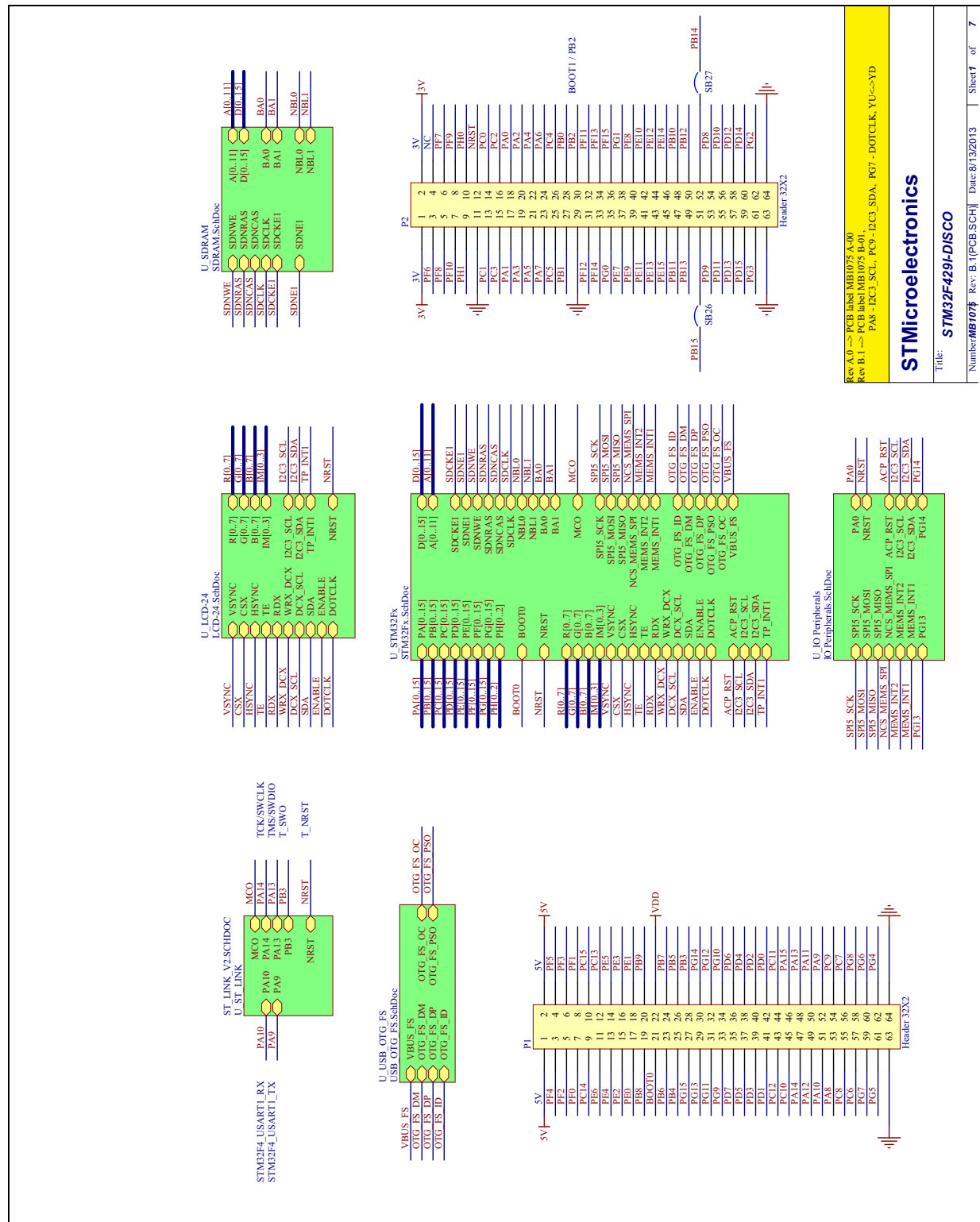
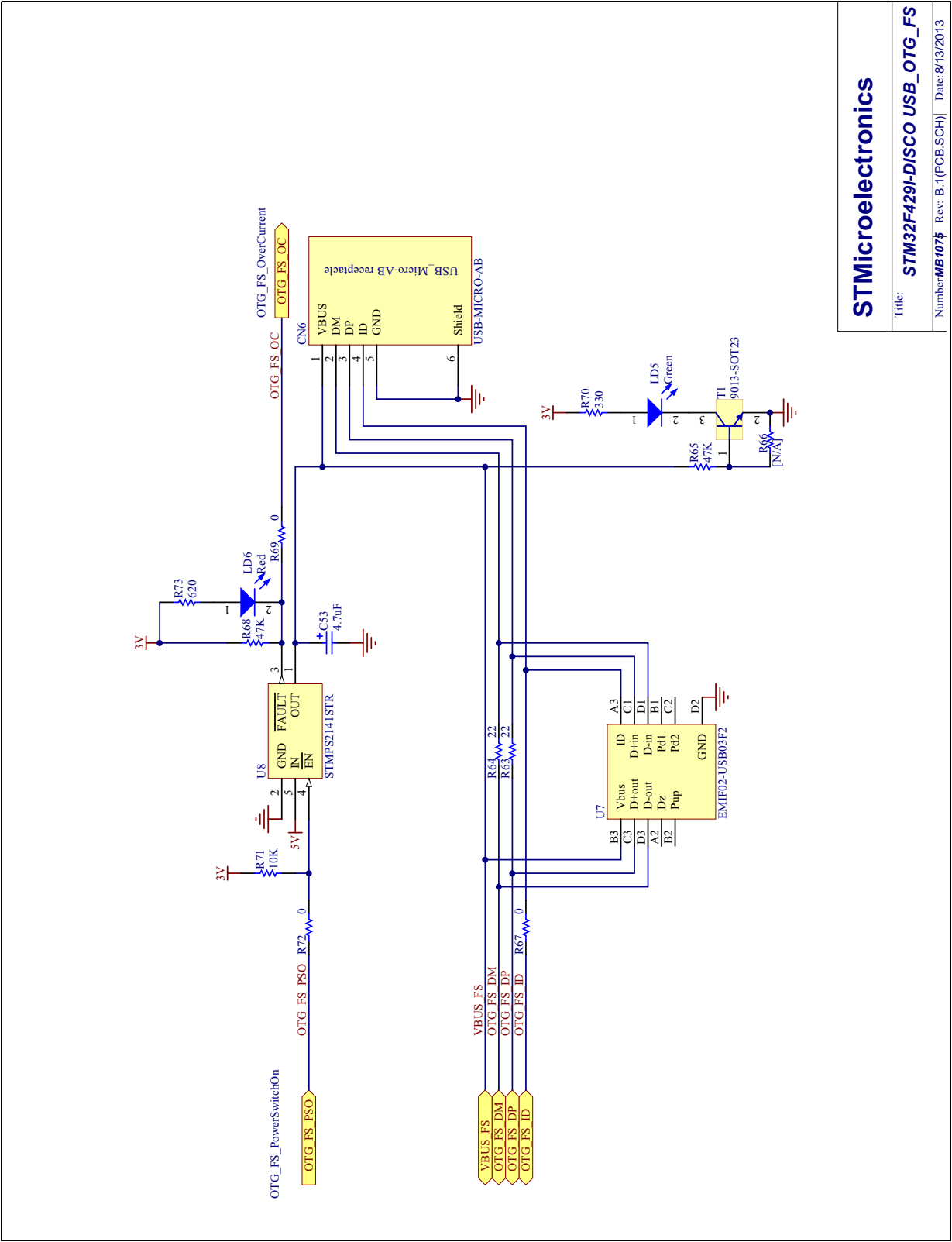


Figure 12. USB OTG_FS



STMicroelectronics

Title: **STM32F429I-DISCO USB_OTG_FS**
Number: **MB1075** Rev: B.1 (PCB.SCH) Date: 8/13/2013

Figure 13. SDRAM 64 Mbits

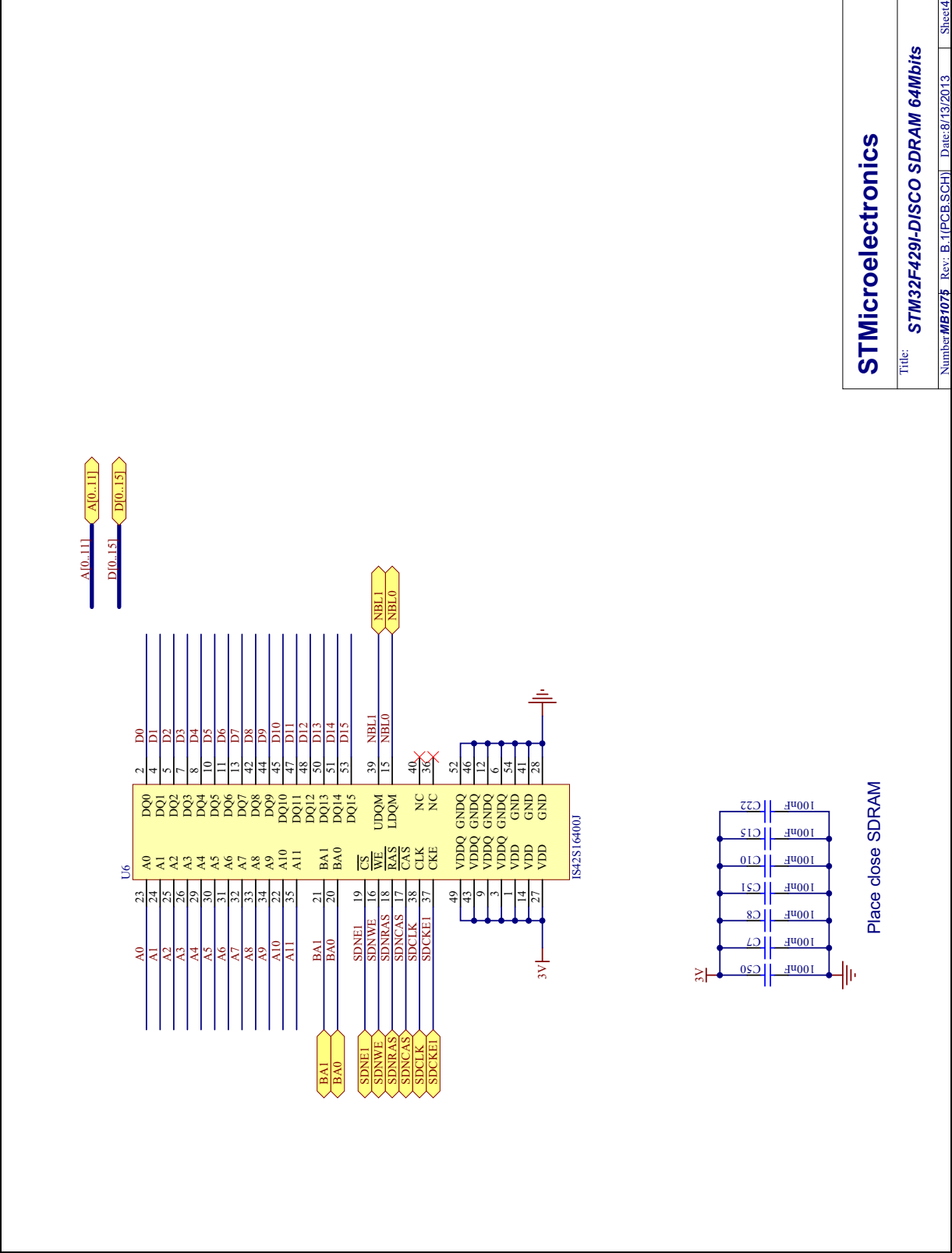
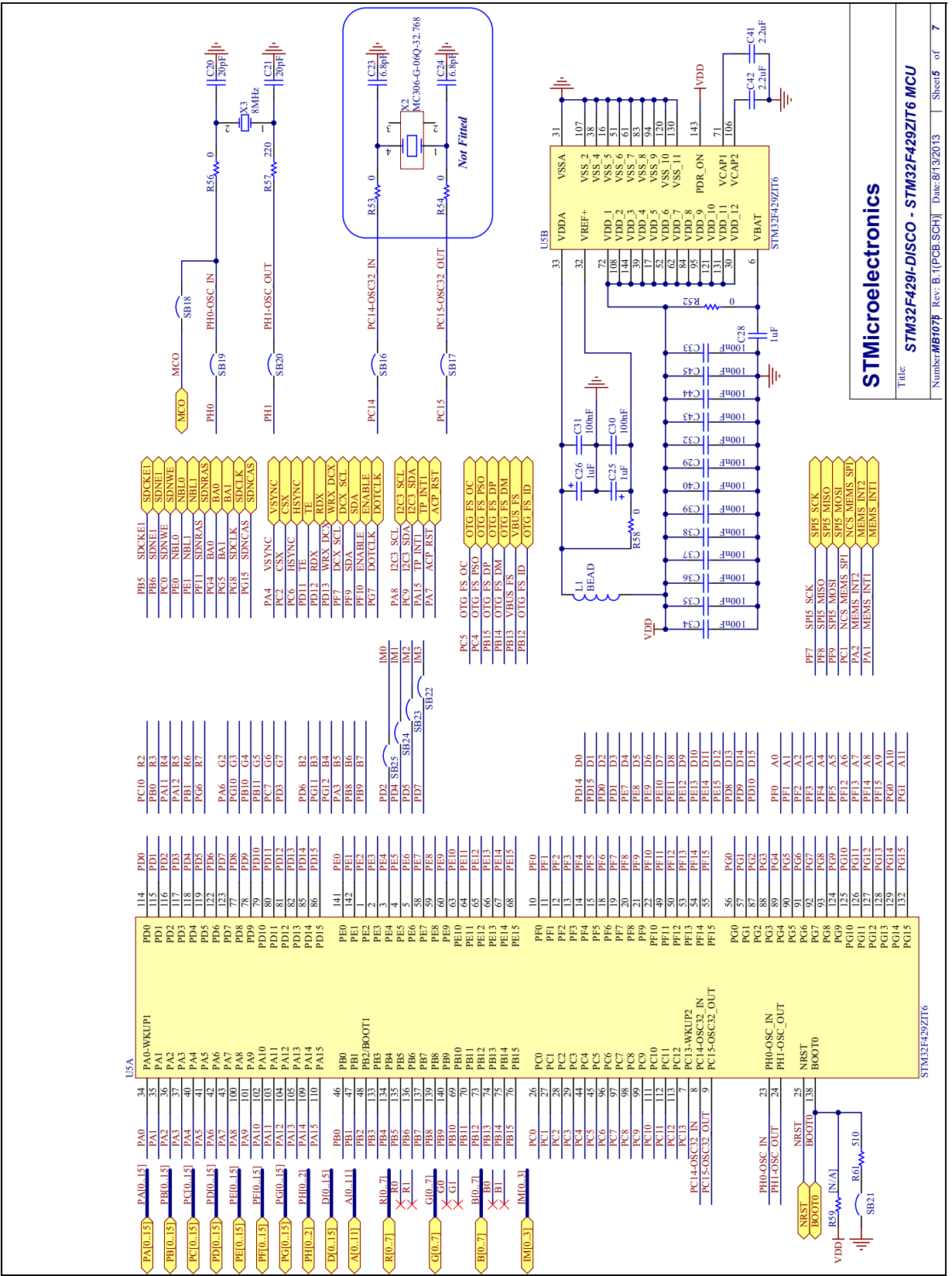


Figure 14. STM32F429ZIT6 MCU

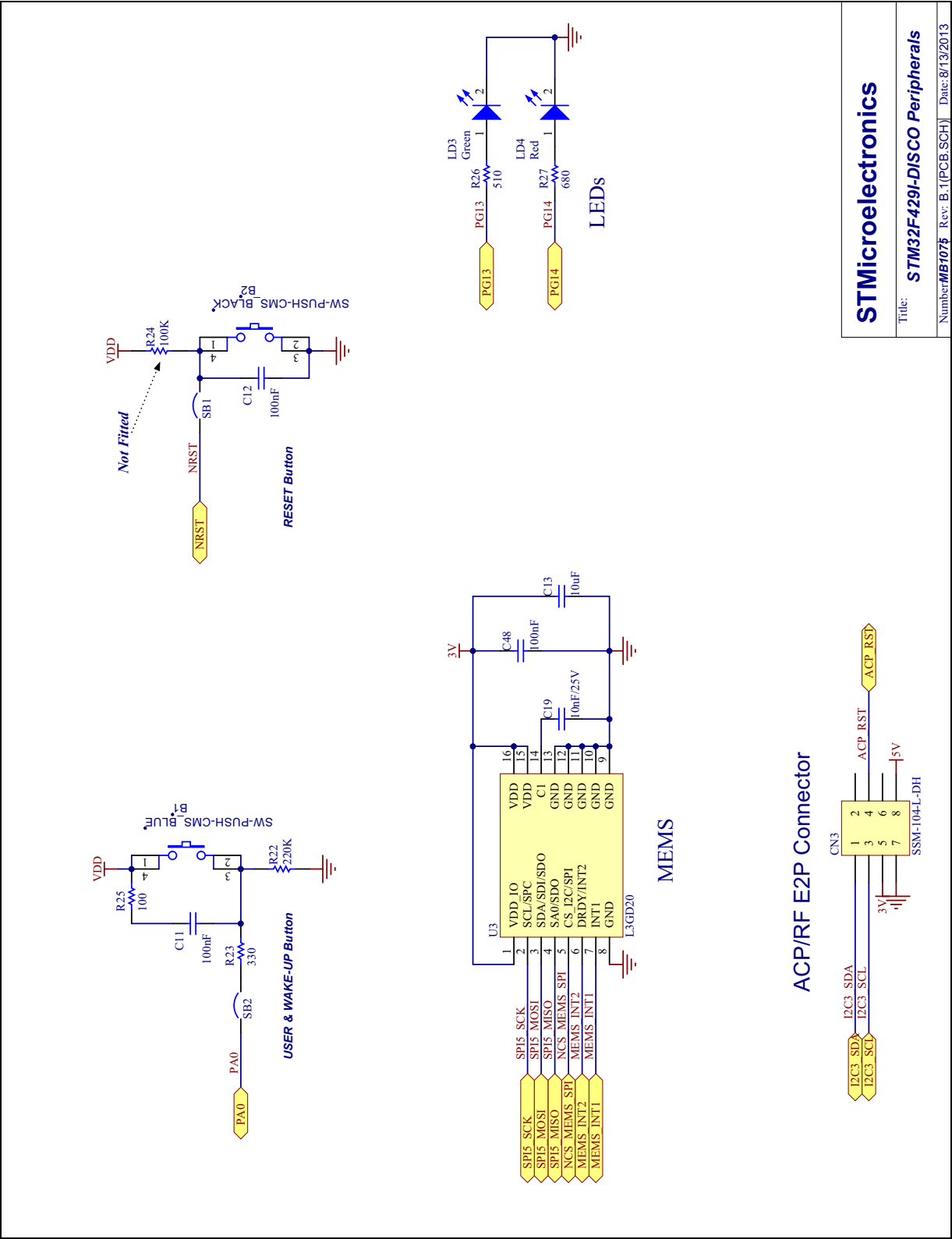


STMicroelectronics

Title: STM32F429I-DISCO - STM32F429ZIT6 MCU

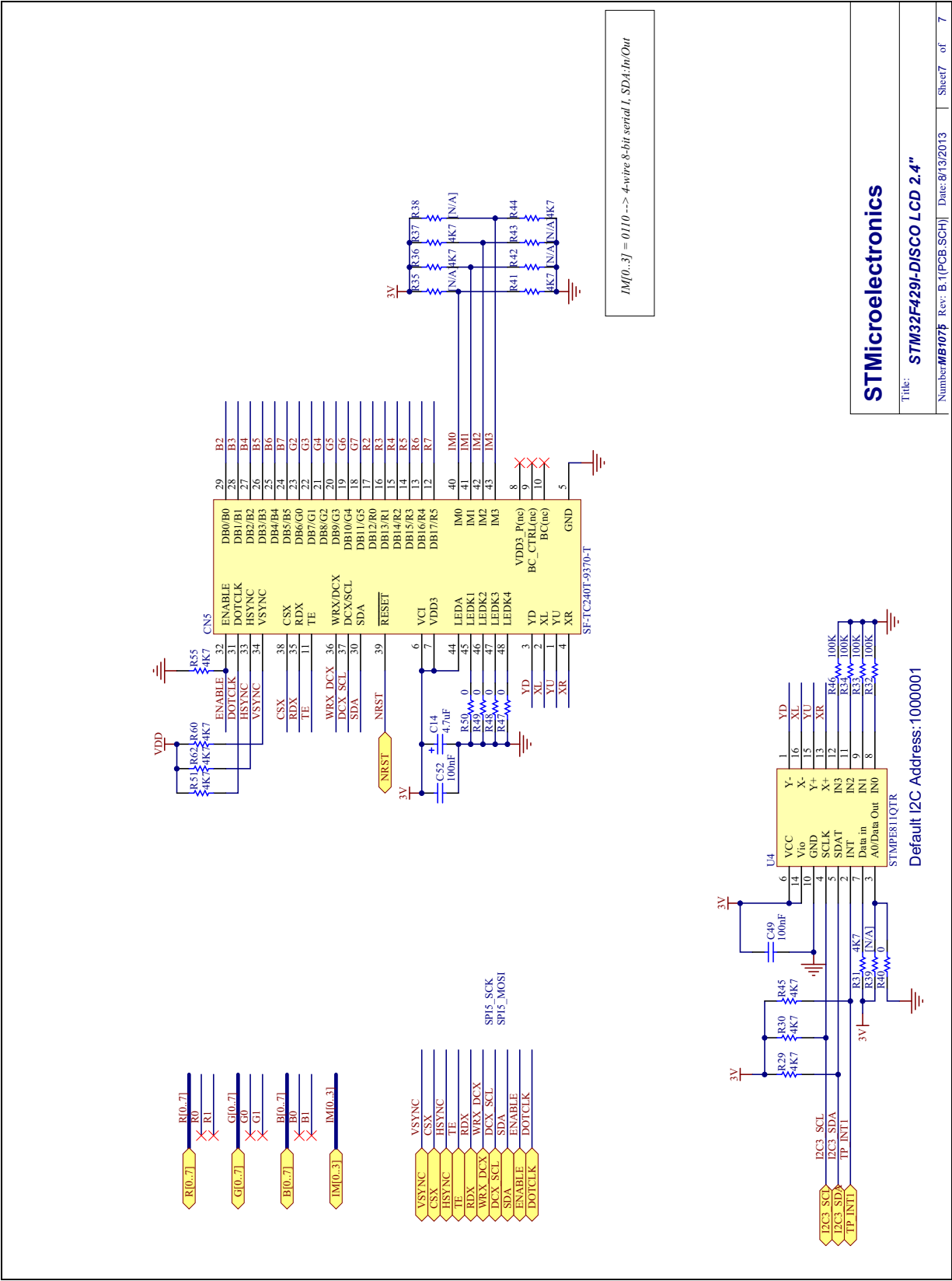
Number: MB1079 Rev: B.1(PCB SCH) Date: 8/13/2013 Sheet 5 of 7

Figure 15. Peripherals



| | |
|--------------------|---|
| STMicroelectronics | |
| Title: | STM32F429I-DISCO Peripherals |
| Number | MB1075 Rev: B.1 (PCB.SCH) Date: 8/13/2013 |

Figure 16. LCD 2.4"



7 Revision history

Table 7. Document revision history

| Date | Revision | Changes |
|-------------|----------|------------------|
| 10-Sep-2013 | 1 | Initial release. |

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