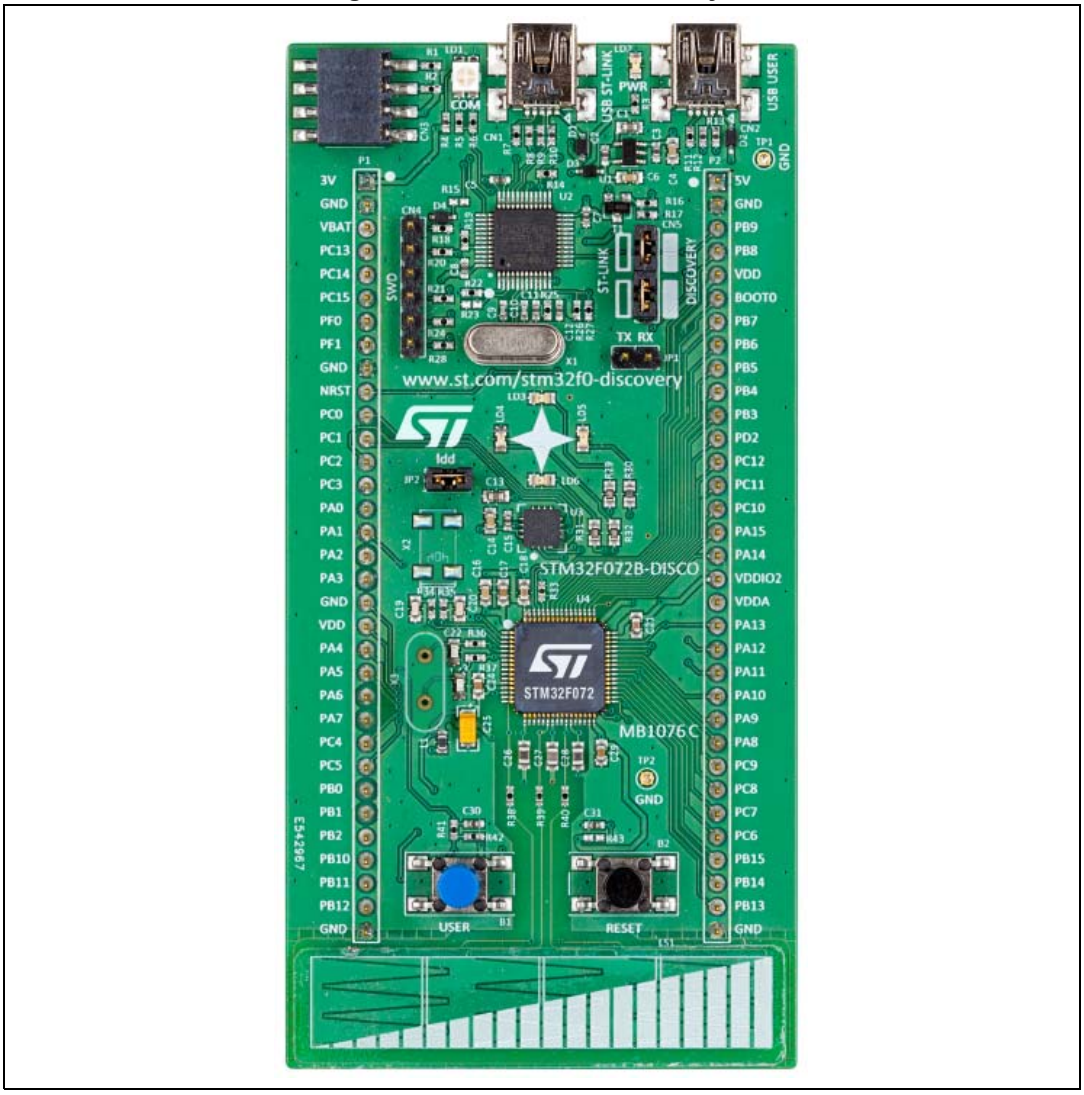
UM1690
User manual

Discovery kit for STM32F0 Series microcontrollers with STM32F072RB

Introduction

The STM32F072 Discovery kit (32F072BDISCOVERY) helps users to discover the full features of the STM32F0 Series and develop their applications. It is based on an STM32F072RBT6 microcontroller and includes an ST-LINK/V2 embedded debug tool interface, ST MEMS gyroscope, LEDs, push-buttons, linear touch sensor, touch keys, RF EEPROM connector and a USB Mini-B connector.

Figure 1. STM32F072 Discovery kit



Picture is not contractual.

Contents

1 **Features** 6

2 **Ordering information** 7

2.1 Product marking 7

2.2 Codification 7

3 **Development environment** 8

3.1 System requirements 8

3.2 Development toolchains 8

3.3 Demonstration software 8

4 **Conventions** 8

5 **Hardware layout** 9

5.1 Embedded ST-LINK/V2 12

5.1.1 Using ST-LINK/V2 to program/debug the STM32F072 on board 12

5.1.2 Using ST-LINK/V2 to program/debug an external STM32 application . . 13

5.2 Power supply and power selection 14

5.3 LEDs 14

5.4 Pushbuttons 14

5.5 Linear touch sensor / touch keys 15

5.6 USB device support 15

5.7 BOOT0 configuration 15

5.8 Embedded USB Bootloader 15

5.9 Gyroscope MEMS (ST MEMS I3G4250D) 16

5.10 JP2 (Idd) 16

5.11 Extension and RF EEPROM connector 16

5.12 OSC clock 18

5.12.1 OSC clock supply 18

5.12.2 OSC 32 KHz clock supply 18

5.13 Solder bridges 19

5.14 Extension connectors 20

6 Mechanical drawing 25

7 Revision history 26

List of tables

Table 1. Ordering information . . . 7
Table 2. Codification explanation . . . 7
Table 3. ON/OFF conventions . . . 8
Table 4. Jumper states . . . 12
Table 5. Debug connector CN4 (SWD) . . . 13
Table 6. Extension and RF EEPROM connector (CN3) . . . 17
Table 7. Solder bridges . . . 19
Table 8. MCU pin description versus board function . . . 20
Table 9. Document revision history . . . 26

List of figures

Figure 1. STM32F072 Discovery kit . . . 1
Figure 2. Hardware block diagram . . . 9
Figure 3. Top layout . . . 10
Figure 4. Bottom layout . . . 11
Figure 5. STM32F072 Discovery kit connections . . . 12
Figure 6. ST-LINK connections . . . 13
Figure 7. Extension and RF EEPROM connector . . . 16
Figure 8. STM32F072 Discovery kit mechanical drawing . . . 25

1 Features

The STM32F072 Discovery kit offers the following features:

- STM32F072RBT6 microcontroller based on the Arm®(a) Cortex®-M0 processor, featuring 128 Kbytes of Flash memory, 16 Kbytes of SRAM in an LQFP64 package
- USB FS with Mini-B connector
- I3G4250D ST MEMS motion sensor 3-axis digital output gyroscope
- One linear touch sensor or four touch keys
- Six LEDs:
  - LD1 (red/green) for USB communication
  - LD2 (red) for 3.3 V power on
  - Four user LEDs: LD3 (red), LD4 (orange), LD5 (green) and LD6 (blue)
- Two push-buttons (user and reset)
- RF EEPROM daughterboard connector
- Extension header for LQFP64 I/Os for quick connection to a prototyping board and easy probing
- On-board ST-LINK/V2 with switch to use the kit as a standalone ST-LINK/V2 (with SWD connector for programming and debugging)
- Flexible power supply options:
  - USB bus or external 5 V supply voltage
- Power supply output for external applications: 3 V and 5 V
- Comprehensive free software including a variety of examples, part of STM32CubeF0 or STM32SnippetsL0 packages or STSW-STM32139 for legacy Standard Libraries usage

arm

a. Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and or elsewhere.

2 Ordering information

To order the 32F072BDISCOVERY Discovery kit, refer to *Table 1*. Additional information is available from the datasheet and reference manual of the target STM32.

Table 1. Ordering information

Order code	Board reference	Target STM32
STM32F072B-DISCO	MB1076	STM32F072RBT6

2.1 Product marking

Evaluation tools marked as “ES” or “E” are not yet qualified and are therefore not ready to be used as reference designs or in production. Any consequences arising from such usage will not be at ST’s charge. In no event will ST be liable for any customer usage of these engineering sample tools as reference designs or in production.

‘E’ or ‘ES’ marking examples of location:

- on the targeted STM32 that is soldered on the board (For an illustration of STM32 marking, refer to the section ‘Package information’ of the STM32 datasheet at *www.st.com*).
- next to the evaluation tool ordering part number, that is stuck or silkscreen printed on the board

2.2 Codification

The meaning of the codification is explained in *Table 2*.

Table 2. Codification explanation

32XXYYZDISCOVERY	Description	Example: 32F072BDISCOVERY
32XX	MCU series in STM32 32-bit Arm Cortex MCUs	STM32F0 Series
YY	MCU product line in the series	STM32F072
Z	STM32 Flash memory size: – B for 128 Kbytes	128 Kbytes
DISCOVERY	Discovery kit	Discovery kit

3 Development environment

3.1 System requirements

- Windows® OS (7, 8 and 10), Linux® 64-bit or macOS®(a) (b)
- USB Type-A to Mini-B cable

3.2 Development toolchains

- IAR™ - EWARM(c)
- Keil® - MDK-ARM(c) (d)
- STMicroelectronics - STM32CubeIDE

3.3 Demonstration software

The demonstration software, included in the STM32Cube MCU Package, is preloaded in the STM32 Flash memory for easy demonstration of the device peripherals in standalone mode. The latest versions of the demonstration source code and associated documentation can be downloaded from the www.st.com/stm32f0-discovery webpage.

4 Conventions

Table 3 provides the definition of some conventions used in the present document.

Table 3. 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

a. macOS® is a trademark of Apple Inc. registered in the U.S. and other countries.

b. All other trademarks are the property of their respective owners.

c. On Windows® only.

d. Free MDK-ARM for Arm® Cortex®-M0/M0+ cores.

5 Hardware layout

The STM32F072 Discovery kit is designed around the STM32F072RBT6 microcontroller in a 64-pin LQFP package.

Figure 2 illustrates the connections between the STM32F072RBT6 and its peripherals (ST-LINK/V2, ST MEMS gyroscope I3G4250D, LEDs, push buttons, linear touch sensor, touch keys, RF EEPROM connector and a USB Mini-B connector).

Figure 3 and *Figure 4* help to locate these features on the STM32F072 Discovery board.

Figure 2. Hardware block diagram

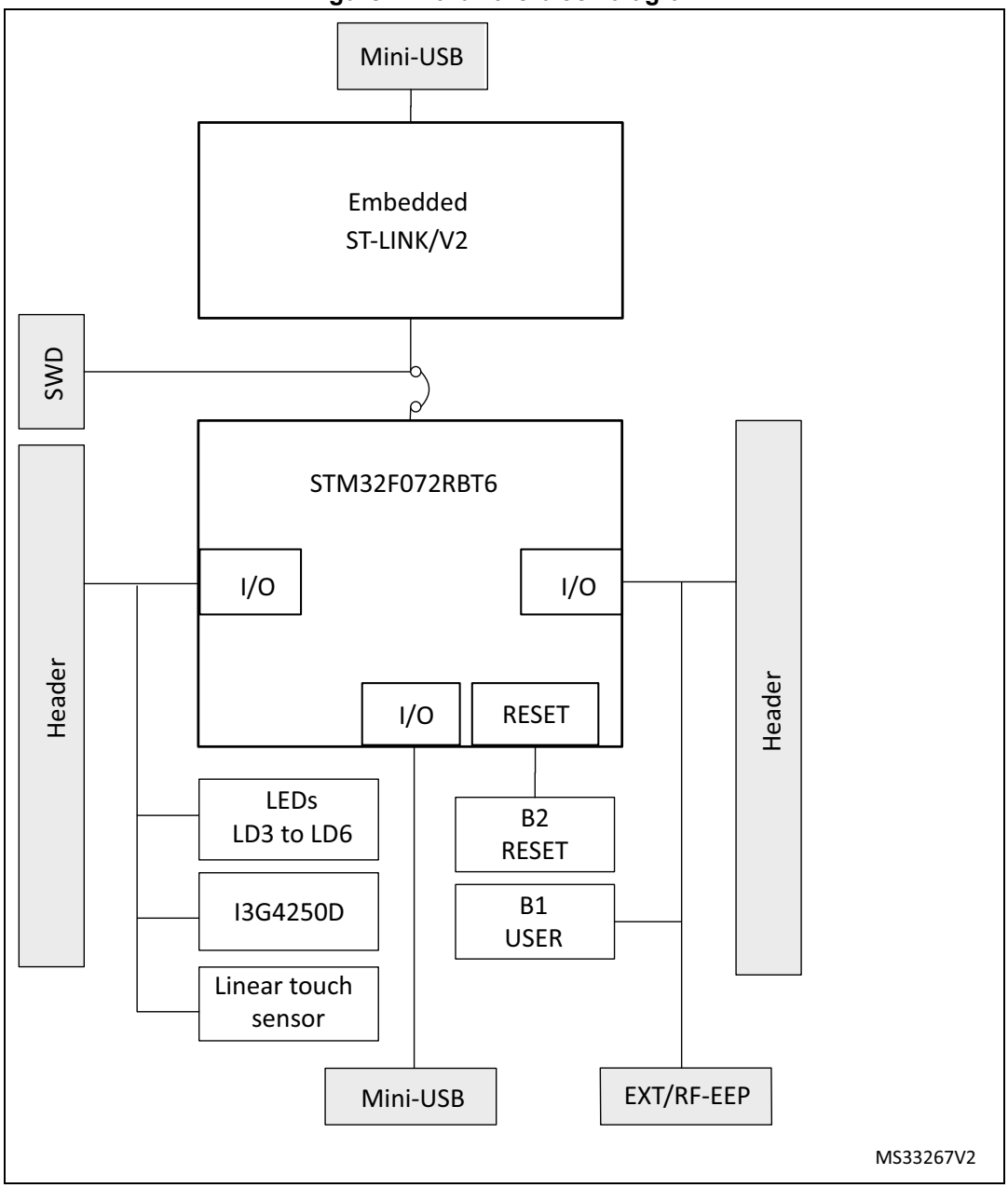


Figure 3. Top layout

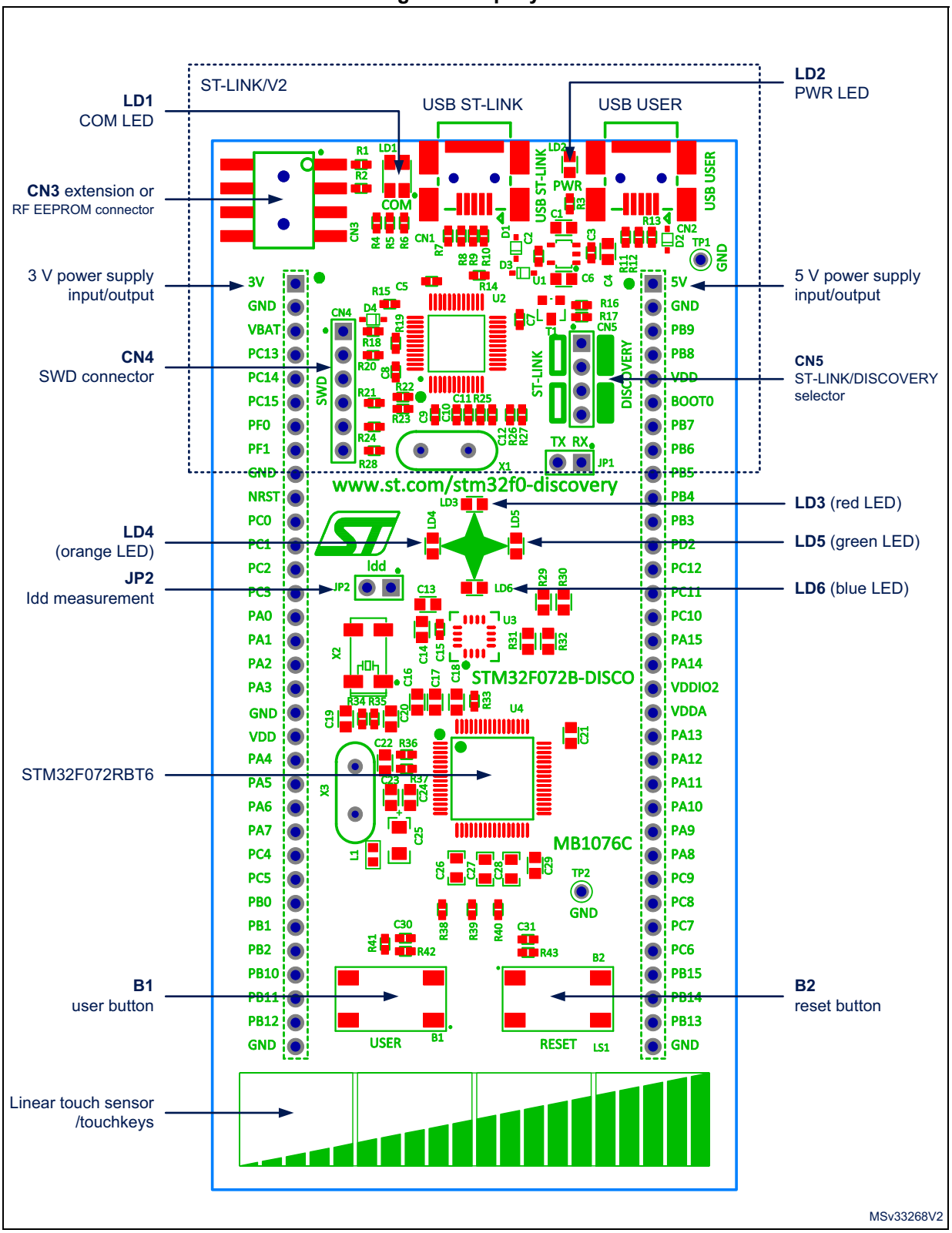
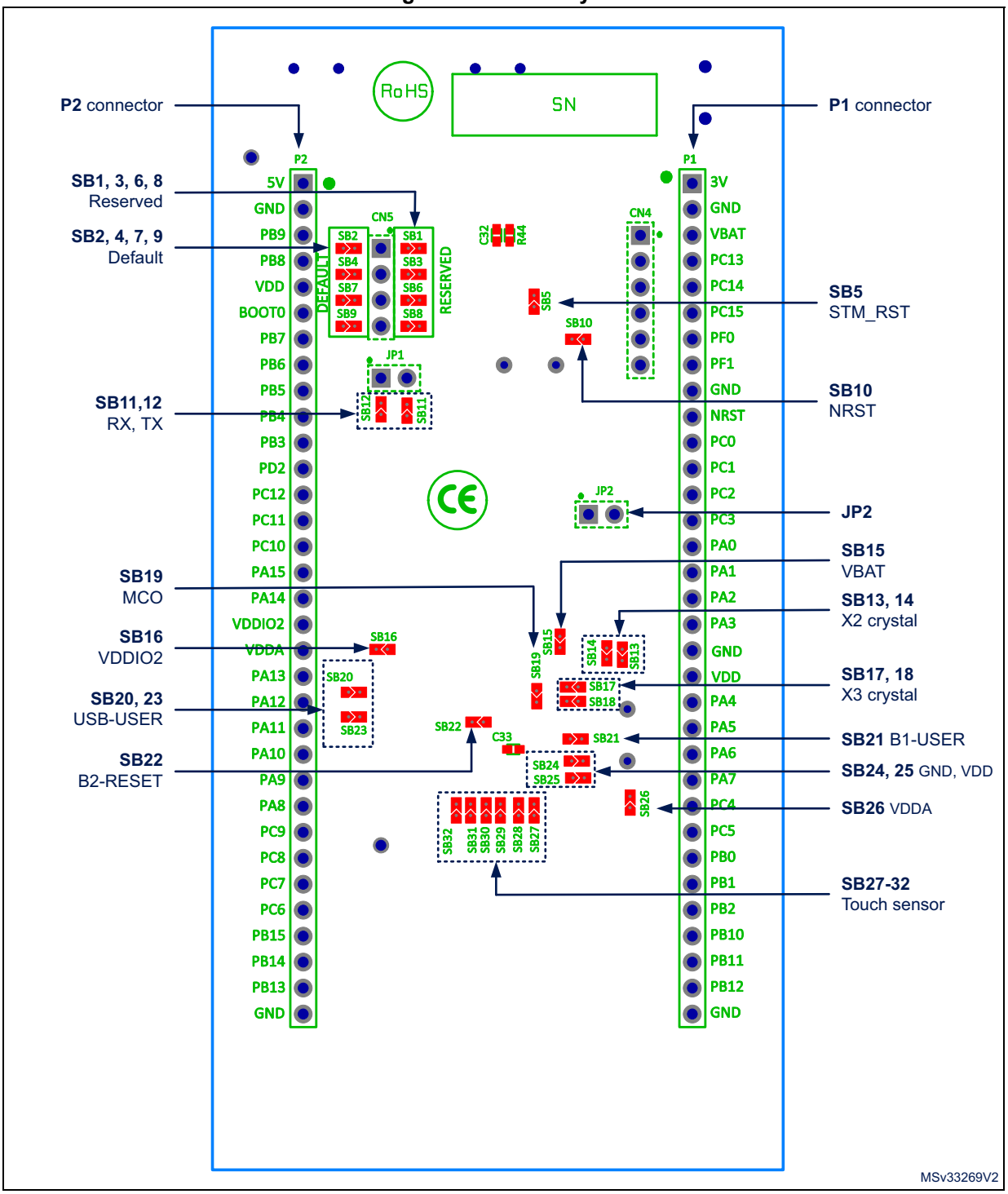


Figure 4. Bottom layout



5.1 Embedded ST-LINK/V2

The ST-LINK/V2 programming and debugging tool is integrated on the STM32F072 Discovery kit. The embedded ST-LINK/V2 can be used in 2 different ways according to the jumper states (see *Table 4*):

- Program/debug the MCU on board
- Program/debug an MCU in an external application board using a cable connected to SWD connector CN4

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.

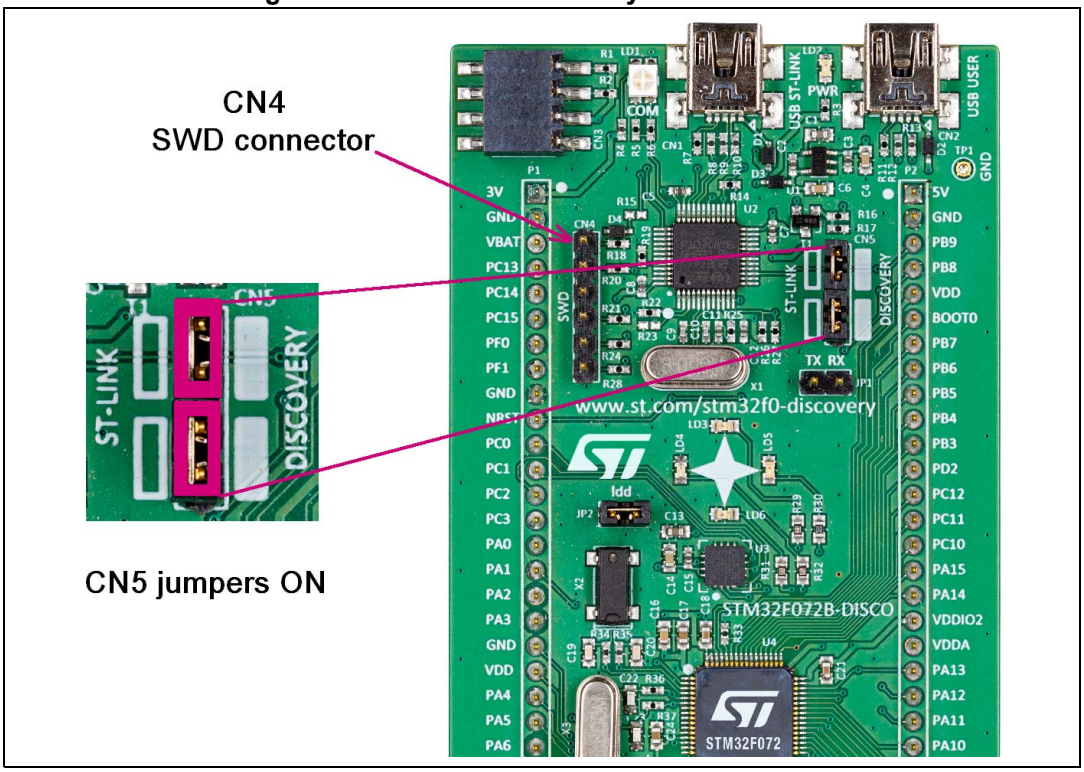
Table 4. Jumper states

Jumper state	Description
Both CN5 jumpers ON	ST-LINK/V2 functions enabled for on board programming (default)
Both CN5 jumpers OFF	ST-LINK/V2 functions enabled for application through external CN4 connector (SWD supported)

5.1.1 Using ST-LINK/V2 to program/debug the STM32F072 on board

To program the STM32F072 on board, simply plug in the two jumpers on CN5, as shown in *Figure 5* in pink, but do not use the CN4 connector as that could disturb communication with the STM32F072RBT6 of the STM32F072 Discovery kit.

Figure 5. STM32F072 Discovery kit connections



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

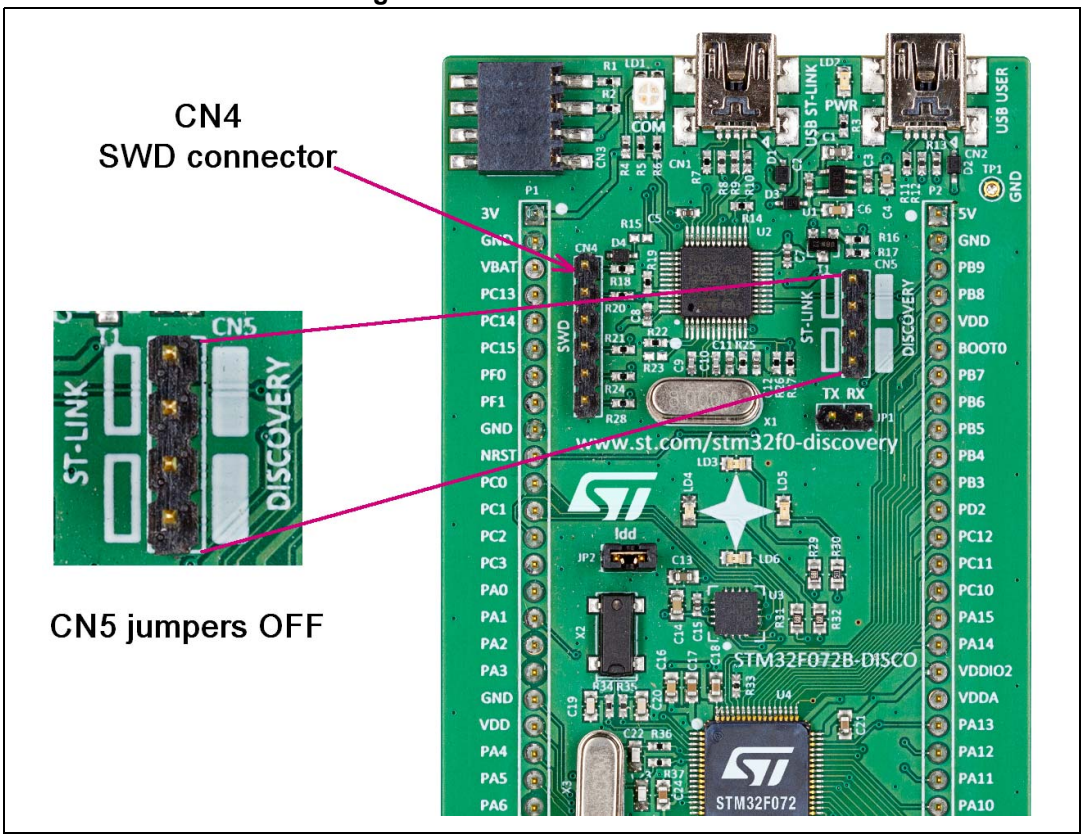
It is very easy to use the ST-LINK/V2 to program the STM32 on an external application. Simply remove the 2 jumpers from CN5 as shown in *Figure 6*, and connect the application to the CN4 debug connector according to *Table 5*.

Note: SB10 must be OFF if CN4 pin 5 is used by the external application.

Table 5. Debug connector CN4 (SWD)

Pin	CN4	Designation
1	VDD_TARGET	VDD from application
2	SWCLK	SWD clock
3	GND	Ground
4	SWDIO	SWD data input/output
5	NRST	Reset of the target MCU
6	SWO	Reserved

Figure 6. ST-LINK connections



5.2 Power supply and power selection

The power supply is provided either by the host PC through the USB ST-LINK or USB USER connector, 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 can also be used as input power supplies, for instance when the USB connector is not connected to the PC.
  In this case, the STM32F072 Discovery kit 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.

5.3 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: This red LED indicates that the board is powered.
- User LD3: This red user LED is connected to the I/O PC6 of the STM32F072RBT6.
- User LD4: This orange user LED is connected to the I/O PC8 of the STM32F072RBT6.
- User LD5: This green user LED is connected to the I/O PC9 of the STM32F072RBT6.
- User LD6: This blue user LED is connected to the I/O PC7 of the STM32F072RBT6.

5.4 Pushbuttons

B1 USER: User and Wake-Up button connected to the I/O PA0 of the STM32F072RBT6.

B2 RESET: The push button connected to NRST is used to reset the STM32F072RBT6.

5.5 Linear touch sensor / touch keys

To demonstrate touch sensing capabilities, the STM32F072 Discovery kit includes a linear touch sensor, which can be used either as a 3-position linear touch sensor or as 4 touch keys. Both functions are illustrated in the demonstration software.

3 pairs of I/O ports are assigned to the linear touch sensor / touch keys. Each pair must belong to the same analog switch group:

- PA2, PA3 (group 1)
- PA6, PA7 (group 2)
- PB0, PB1 (group 3)

To minimize the noise, these pairs are dedicated to the linear touch sensor and the touch keys and are not connected to external headers. To design a touch sensing application, refer to the following documentation and firmware:

- For details concerning I/O ports, refer to the STM32F072RBT6 datasheet.
- For information on software development, see DISCOVER application software on www.st.com/stm32f0-discovery.
- STM32 touch sensing library available from www.st.com/stm32f0-discovery.

5.6 USB device support

The STM32F072RBT6 MCU is also used to drive the second USB Mini-B connector (USB USER) which allows the board to be used as a USB Device. The STM32F072 Discovery kit can then act as a USB joystick, mouse, or other similar device. If both USBs are connected, diodes D1 and D2 protect the board and use the power from the USB ST-LINK.

The board can be powered through this USB USER connector, in which case LED2 PWR lights up, LED1 COM blinks and it can run an application in standalone mode.

The STM32F072RBT6 MCU controls the USB USER through PA11 and PA12.

5.7 BOOT0 configuration

BOOT0 is at level “0” through pull-down resistor R33. If the user wants to set BOOT0 at level “1”, it can be configured by setting a jumper between P2.6 (BOOT0) and P2.5 (VDD).

This facility is offered for fast and instantaneous configuration.

Note: If it is needed to set BOOT0 at level "1" continuously, then unsolder resistor R33 to avoid a consumption of 6 mA while connecting pin P2.6 (BOOT0) and P2.5 (VDD) with a jumper or with a wire.

5.8 Embedded USB Bootloader

The STM32F072 line microcontrollers embed a bootloader allowing the programming of blanked device or the upgrade device firmware over the USB without the need of a specific programmer. When using this Discovery kit, the STM32F072RBT6 MCU firmware can be thus programmed through the second USB Mini-B connector (USER USB).

To program the microcontroller Flash memory using this approach, a jumper must be set between BOOT0 (P2.6) and VDD (P2.5), and a cable connected between the USER USB

connector of the board and a PC. On the PC side, it is required to use the Device Firmware Upgrade Utility named "DfuSe". This software (STSW-STM32080) and its associated user manual (UM0412) are available from *www.st.com*.

Several application notes are also available on that topic.

- AN2606: STM32 microcontroller system memory boot mode
- AN3156: USB DFU protocol used in the STM32 bootloader

Note: ST-LINK utilities must not be used when the DFU utility is running.

5.9 Gyroscope MEMS (ST MEMS I3G4250D)

The I3G4250D 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 I^2C/SPI serial interface.

The I3G4250D has dynamically-user-selectable full scales:

- ±245 dps
- ±500 dps
- ±2000 dps

The I3G4250D is capable of measuring rates.

The STM32F072RBT6 MCU controls this motion sensor through the SPI interface.

5.10 JP2 (Idd)

Jumper JP2, labeled Idd, allows the consumption of STM32F072RBT6 to be measured by removing the jumper and connecting an ammeter.

- Jumper ON: STM32F072RBT6 is powered (default).
- Jumper OFF: an ammeter must be connected to measure the STM32F072RBT6 current, (if there is no ammeter, the STM32F072RBT6 is not powered).

5.11 Extension and RF EEPROM connector

This connector is able to accept an extension board or the RF EEPROM board ANT7-M24LR-A (see application note *How to design an antenna for dynamic NFC tags* (AN2972) for more details).

Figure 7. Extension and RF EEPROM connector

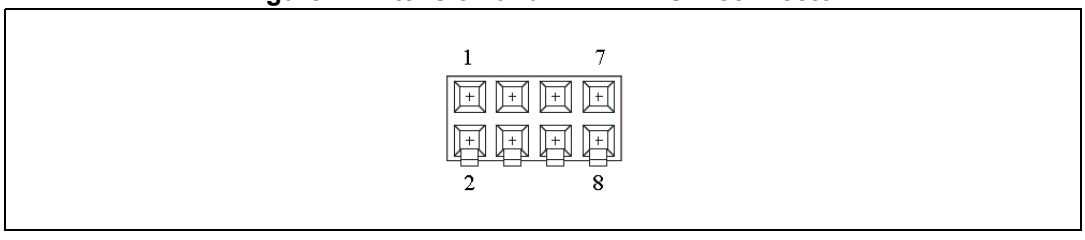


Table 6. Extension and RF EEPROM connector (CN3)

Pin	CN3	Designation
1	I2C SDA	Data signal for I^2C
2	NC	Not connected
3	I2C SCL	Clock signal for I^2C
4	EXT_RESET	Reset signal for extension board
5	3V	3 volt power supply
6	NC	Not connected
7	GND	Ground
8	5V	5 volt power supply

5.12 OSC clock

By default, the STM32F072RBT6 clock source is the high-speed internal (HSI) RC oscillator. Other clock sources are described hereunder.

5.12.1 OSC clock supply

If PF0 and PF1 are only used as GPIOs instead of clock, then SB17 and SB18 are ON and R36 and R37 are removed (SB19 must be OFF).

- MCO from ST-LINK (from MCO of the STM32F103). This frequency cannot be changed, it is fixed at 8 MHz and connected to PF0-OSC_IN of the STM32F072RBT6.
  The required configuration is:
  - SB19 ON and SB17 OFF
  - R36 removed
- Oscillator on board (from X3 crystal, not provided). For typical frequencies and its capacitors and resistors, refer to the STM32F072RBT6 datasheet.
  The required configuration is:
  - SB17, SB18, SB19 OFF
  - X3, R36, R37, C22, C23 soldered
- Oscillator from external PF0 (from external oscillator through pin 7 of the P1 connector).
  The required configuration is:
  - SB17 ON
  - SB19 OFF
  - R36 removed

5.12.2 OSC 32 KHz clock supply

If PC14 and PC15 are only used as GPIOs instead of clock, then SB13 and SB14 are ON, and R34 and R35 are removed.

- Oscillator on board (from X2 crystal, not provided).
  The required configuration is:
  - SB13, SB14 OFF
  - X2, C19, C20, R34, R35 soldered
- Oscillator from external PC14 (from external oscillator trough the pin 5 of P1 connector).
  The required configuration is:
  - SB14 ON
  - R35 removed

5.13 Solder bridges

Table 7. Solder bridges

Bridge	State[1]	Description
SB17,18 (X3 crystal)	**ON**	PF0, PF1 are connected to P1 (R36, R37 must not be fitted and SB19 must be OFF).
	OFF	X3, C22, C23, R36 and R37 provide a clock. PF0, PF1 are disconnected from P1.
SB13,14 (X2 crystal)	**ON**	PC14, PC15 are only connected to P1. Remove only R34, R35
	OFF	X2, C19, C20, R34 and R35 deliver a 32 KHz clock. PC14, PC15 are not connected to P1.
SB19 (MCO)	**OFF**	MCO signal of STM32F103C8T6 is not used.
	ON	MCO clock signal from STM32F103C8T6 is connected to OSC_IN of STM32F072RBT6. (SB17 must be OFF).
SB2,4,7,9 (Default)	**ON**	Reserved, do not modify.
SB1,3,6,8 (Reserved)	**OFF**	Reserved, do not modify.
SB24,25 (GND,VDD)	**ON**	Reserved, do not modify.
SB11,12 (RX,TX)	**OFF**	Reserved, do not modify
SB27,28,29,30,31,32 (touch sensor)	**OFF**	Reserved to the linear touch sensor. PA2,3,6,7 and PB0,1 are not available.
	ON	PA2,3,6,7 and PB0,1 are available then remove R38,39,40 and C26,27,28. (the linear touch sensor is not available)
SB20,23 (USB-USER)	**OFF**	Reserved to the USB USER CN2. PA11,12 are not available.
	ON	PA11,12 are available then remove R12,13. (the USB USER CN2)
SB21 (B1-USER)	**ON**	B1 pushbutton is connected to PA0.
	OFF	B1 pushbutton is not connected to PA0.
SB22 (B2-RESET)	**ON**	B2 pushbutton is connected to the NRST pin of the STM32F072RBT6 MCU.
	OFF	B2 pushbutton is not connected the NRST pin of the STM32F072RBT6 MCU.
SB10 (NRST)	**ON**	T_NRST pin of the STM32F103C8T6 (ST-LINK/V2) and CN4.5 are connected to the NRST pin of the STM32F072RBT6 MCU.
	OFF	T_NRST pin of the STM32F103C8T6 (ST-LINK/V2) and CN4.5 are not connected to the NRST pin of the STM32F072RBT6 MCU.
SB5 (STM_RST)	**OFF**	No incidence on STM32F103C8T6 (ST-LINK/V2) NRST signal.
	ON	STM32F103C8T6 (ST-LINK/V2) NRST signal is connected to GND.
SB15 (VBAT)	**ON**	VBAT Power is supplied by VDD
	OFF	VBAT Power is supplied by P1.3 connector
SB16 (VDDIO2)	**ON**	VDDIO2 Power is supplied by VDD
	OFF	VDDIO2 Power is supplied by P2.18 connector
SB26 (VDDA)	**ON**	VDDA Power is supplied by VDD through L1 inductance.
	OFF	VDDA Power is supplied by P2.19 connector

1. The default state is in bold.

5.14 Extension connectors

The male headers P1 and P2 can connect the STM32F072 Discovery kit to a standard prototyping/wrapping board. STM32F072RBT6 GPIOs are available on these connectors. P1 and P2 can also be probed by an oscilloscope, logical analyzer or voltmeter.

Table 8. MCU pin description versus board function

MCU pin		Board function													
Main function	LQFP64 pin num.	System	Linear touch sensor	I3G4250D	EXT/ RF-E2P	Pushbutton	LED	USB USER	Free I/O	Power supply	CN3	CN4	P1	P2	SBx(1)
BOOT0	60	BOOT0	-	-	-	-	-	-	-	-	-	-	-	6	-
NRST	7	NRST	-	-	-	RESET	-	-	-	-	-	5	10	-	-
PA0	14	-	-	-	-	USER	-	-	-	-	-	-	15	-	-
PA1	15	-	-	-	-	-	-	-	PA1	-	-	-	16	-	-
PA2	16	-	TS_G1_IO3	-	-	-	-	-	-	-	-	-	17	-	SB27
PA3	17	-	TS_G1_IO4	-	-	-	-	-	-	-	-	-	18	-	SB28
PA4	20	-	-	-	-	-	-	-	PA4	-	-	-	21	-	-
PA5	21	-	-	-	-	-	-	-	PA5	-	-	-	22	-	-
PA6	22	-	TS_G2_IO3	-	-	-	-	-	-	-	-	-	23	-	SB29
PA7	23	-	TS_G2_IO4	-	-	-	-	-	-	-	-	-	24	-	SB30

Table 8. MCU pin description versus board function (continued)

MCU pin		Board function													
Main function	LQFP64 pin num.	System	Linear touch sensor	I3G4250D	EXT/ RF-E2P	Pushbutton	LED	USB USER	Free I/O	Power supply	CN3	CN4	P1	P2	SBx(1)
PA8	41	-	-	-	-	-	-	-	PA8	-	-	-	-	25	-
PA9	42	-	-	-	-	-	-	-	PA9	-	-	-	-	24	-
PA10	43	-	-	-	-	-	-	-	PA10	-	-	-	-	23	-
PA11	44	-	-	-	-	-	-	DM	-	-	-	-	-	22	SB23
PA12	45	-	-	-	-	-	-	DP	-	-	-	-	-	21	SB20
PA13	46	SWDIO	-	-	-	-	-	-	-	-	-	4	-	20	-
PA14	49	SWCLK	-	-	-	-	-	-	-	-	-	2	-	17	-
PA15	50	-	-	-	-	-	-	-	PA15	-	-	-	-	16	-
PB0	26	-	TS_G3_IO2	-	-	-	-	-	-	-	-	-	27	-	SB31
PB1	27	-	TS_G3_IO3	-	-	-	-	-	-	-	-	-	28	-	SB32
PB2	28	-	-	-	-	-	-	-	PB2	-	-	-	29	-	-
PB3	55	-	-	-	-	-	-	-	PB3	-	-	-	-	11	-
PB4	56	-	-	-	-	-	-	-	PB4	-	-	-	-	10	-
PB5	57	-	-	-	-	-	-	-	PB5	-	-	-	-	9	-
PB6	58	-	-	-	-	-	-	-	PB6	-	-	-	-	8	-
PB7	59	-	-	-	-	-	-	-	PB7	-	-	-	-	7	-
PB8	61	-	-	-	-	-	-	-	PB8	-	-	-	-	4	-

Table 8. MCU pin description versus board function (continued)

MCU pin		Board function													
Main function	LQFP64 pin num.	System	Linear touch sensor	I3G4250D	EXT/ RF-E2P	Pushbutton	LED	USB USER	Free I/O	Power supply	CN3	CN4	P1	P2	SBx(1)
PB9	62	-	-	-	-	-	-	-	PB9	-	-	-	-	3	-
PB10	29	-	-	-	SCL	-	-	-	-	-	3	-	30	-	-
PB11	30	-	-	-	SDA	-	-	-	-	-	1	-	31	-	-
PB12	33	-	-	-	-	-	-	-	PB12	-	-	-	32	-	-
PB13	34	-	-	SCL/ SPC	-	-	-	-	-	-	-	-	-	32	-
PB14	35	-	-	SDO	-	-	-	-	-	-	-	-	-	31	-
PB15	36	-	-	SDA/ SDI/	-	-	-	-	-	-	-	-	-	30	-
PC0	8	-	-	CS_I2C/ SPI	-	-	-	-	-	-	-	-	11	-	-
PC1	9	-	-	INT1	-	-	-	-	-	-	-	-	12	-	-
PC2	10	-	-	INT2	-	-	-	-	-	-	-	-	13	-	-
PC3	11	-	-	-	-	-	-	-	PC3	-	-	-	14	-	-
PC4	24	-	-	-	-	-	-	-	PC4	-	-	-	25	-	-
PC5	25	-	-	-	EXT_RESET	-	-	-	-	-	4	-	26	-	-
PC6	37	-	-	-	-	-	RED	-	-	-	-	-	-	29	-
PC7	38	-	-	-	-	-	BLUE	-	-	-	-	-	-	28	-
PC8	39	-	-	-	-	-	ORANGE	-	-	-	-	-	-	27	-

Table 8. MCU pin description versus board function (continued)

MCU pin		Board function													
Main function	LQFP64 pin num.	System	Linear touch sensor	I3G4250D	EXT/ RF-E2P	Pushbutton	LED	USB USER	Free I/O	Power supply	CN3	CN4	P1	P2	SBx(1)
PC9	40	-	-	-	-	-	GREEN	-	-	-	-	-	-	26	-
PC10	51	-	-	-	-	-	-	-	PC10	-	-	-	-	15	-
PC11	52	-	-	-	-	-	-	-	PC11	-	-	-		14	-
PC12	53	-	-	-	-	-	-	-	PC12	-	-	-		13	-
PC13	2	-	-	-	-	-	-	-	PC13	-	-	-	4	-	-
PC14	3	OSC32_IN	-	-	-	-	-	-	-	-	-	-	5	-	SB14
PC15	4	OSC32_OUT	-	-	-	-	-	-	-	-	-	-	6	-	SB13
PD2	54	-	-	-	-	-	-	-	PD2	-	-	-	-	12	-
PF0	5	OSC_IN	-	-	-	-	-	-	-	-	-	-	7	-	SB17
PF1	6	OSC_OUT	-	-	-	-	-	-	-	-	-	-	8	-	SB18
VBAT	1	-	-	-	-	-	-	-	-	VDD	-	-	3	-	SB15
VDDA	13	-	-	-	-	-	-	-	-	VDD	-	-	-	19	SB26
VDDIO2	48	-	-	-	-	-	-	-	-	VDD	-	-	-	18	SB16
-	-	-	-	-	-	-	-	-	-	VDD	-	-	20	5	-
-	-	-	-	-	-	-	-	-	-	5V	8	-	-	1	-

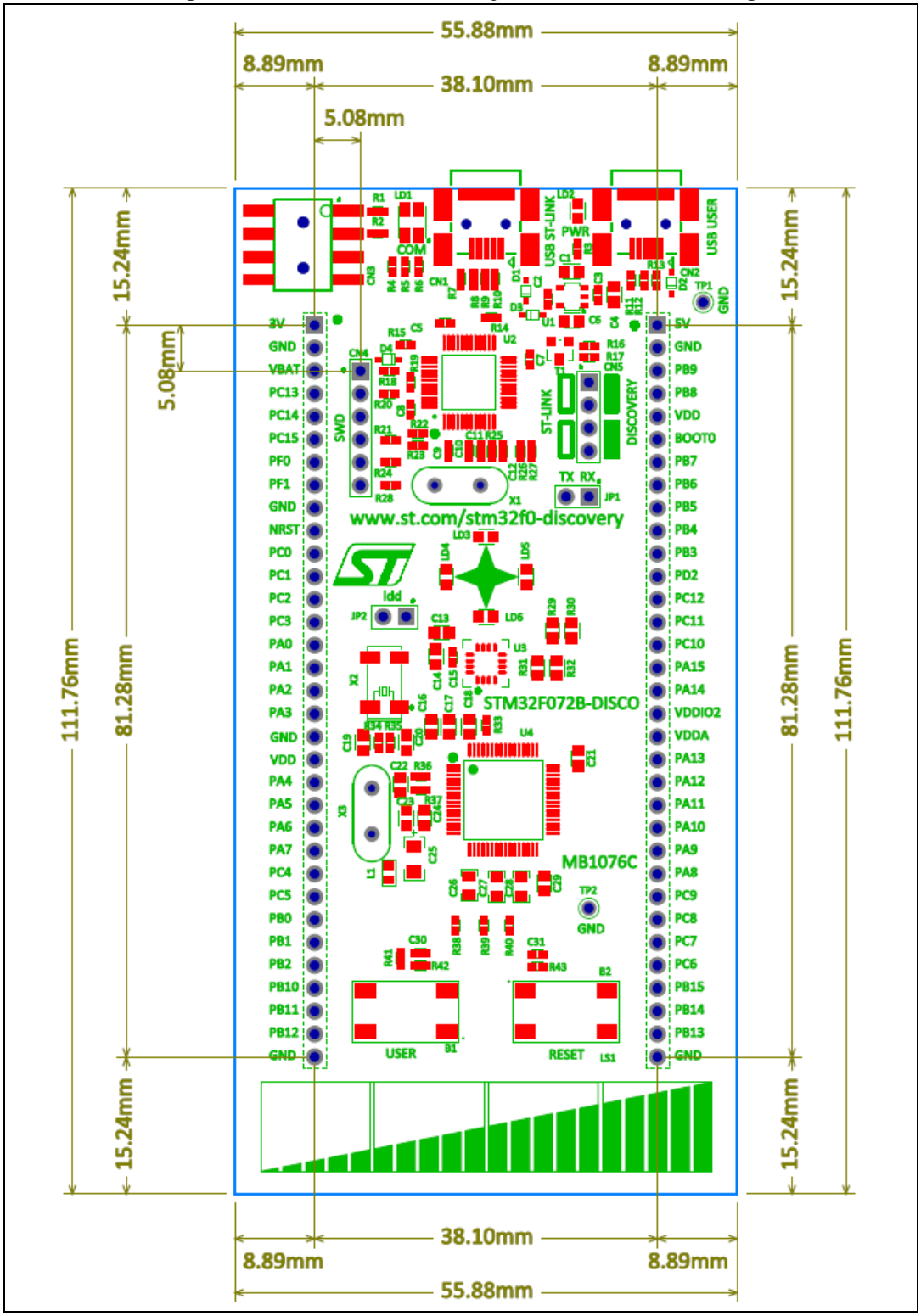
Table 8. MCU pin description versus board function (continued)

MCU pin		Board function													
Main function	LQFP64 pin num.	System	Linear touch sensor	I3G4250D	EXT/ RF-E2P	Pushbutton	LED	USB USER	Free I/O	Power supply	CN3	CN4	P1	P2	SBx(1)
-	-	-	-	-	-	-	-	-	-	3V	5	-	1	-	-
-	-	-	-	-	-	-	-	-	-	GND	7	3	2	2	-
-	-	-	-	-	-	-	-	-	-	GND	-	-	9	-	-
-	-	-	-	-	-	-	-	-	-	GND	-	-	19	-	-
-	-	-	-	-	-	-	-	-	-	GND	-	-	33	33	-

1. Depending on SBx, connected to STM32F072RBT6 MCU pin or board function. (Refer to the schematics on *www.st.com* for more detail)

6 Mechanical drawing

Figure 8. STM32F072 Discovery kit mechanical drawing



7 Revision history

Table 9. Document revision history

Date	Revision	Changes
18-Dec-2013	1	Initial release.
23-June-2014	2	Updated *Figure 1: STM32F072 discovery board*. Added *Section 4.7* and *Section 4.8*. Added *Figure 12: MEMS and USB* and *Figure 13: Linear sensor and pushbutton*.
19-Mar-2020	3	Updated ST MEMS gyroscope and user LEDs descriptions in *Features*, *Gyroscope MEMS (ST MEMS I3G4250D)*, *LEDs*, and across the document. Removed *Electrical schematics*. Reorganized the entire document: – Updated *Features* and *Ordering information* – Added *Product marking*, *Codification* and *Development environment*