

Evaluation Board Instructions

MS85MX5

The nRF52 series-EVAL kit from Minew allows for stand-alone use of the Minew module featuring the Nordic nRF52 Series RF System on Chip (SoC). The Evaluation Kit provides a great starting point for almost any Bluetooth 5 Low Energy, Thread, or Zigbee project(nRF52840).



V1.0

Revision history

Version	Date	Notes	Contributor(s)	Person of Approve
1.0	2019.06.10	Initial release	Lynn	Shuang Yan

Index

Revision history.....	2
1. Product introduction.....	4
1.1 Key features.....	4
1.2 Ordering information.....	4
2. Development tools.....	5
3. Hardware description.....	6
3.1 Power.....	7
3.1.1 USB.....	7
3.1.2 AA battery.....	7
3.2 Buttons.....	8
3.3 LEDS.....	9
3.4 32kHz crystal oscillator.....	10
3.5 Switch.....	10
4. Related documents.....	11
5. Notes & cautions.....	12
5.1 Design notes.....	12
5.2 Handling and storage.....	12
5.3 Life support applications.....	13
6. Disclaimer.....	13
7. Contact information.....	14

1. Product introduction

The nRF52 series-EVAL kit from Minew allows for stand-alone use of the Minew module featuring the Nordic nRF52 Series RF System on Chip (SoC).

The Evaluation Kit provides a great starting point for almost any Bluetooth 5 Low Energy, Thread, or Zigbee project(nRF52840). All features of the Minew modules are easily accessed from the evaluation board.

This guide provides setup instructions for starting development and describes the hardware functionality of the MS85MX5 boards.

1.1 Key features

- Virtual COM port over USB
- Full GPIO of the MS50SFA/MS50SFB/MS88SF2(nRF52 Series)
- Buttons and LEDs for user interaction
- NFC antenna pin
- 32.768kHz Crystal(In Module or adapter board)
- Relay
- Buzzer

1.2 Ordering information

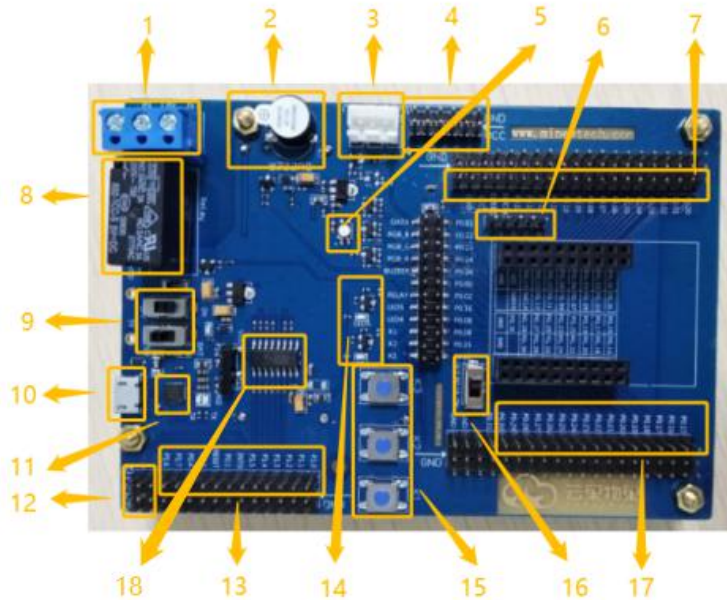
Ordering number	Description
MS85MX5	306030054, B3528RGB lighting, CP2104 Chipset, Anti-ESD package

2. Development tools

The below information is the development tools which help Minew's customer in development with the nRF52 series Bluetooth modules. Customers can choose the best-suited development tools to develop the software and Not all tools will be required.

- Segger Embedded Studio
- Segger J-Link Software and Documentation Pack
- Nordic Semiconductor SDK
- Nordic Semiconductor nRF Connect for Desktop
- Nordic Semiconductor nRF Connect for Mobile
- Nordic Semiconductor Mobile Apps

3. Hardware description



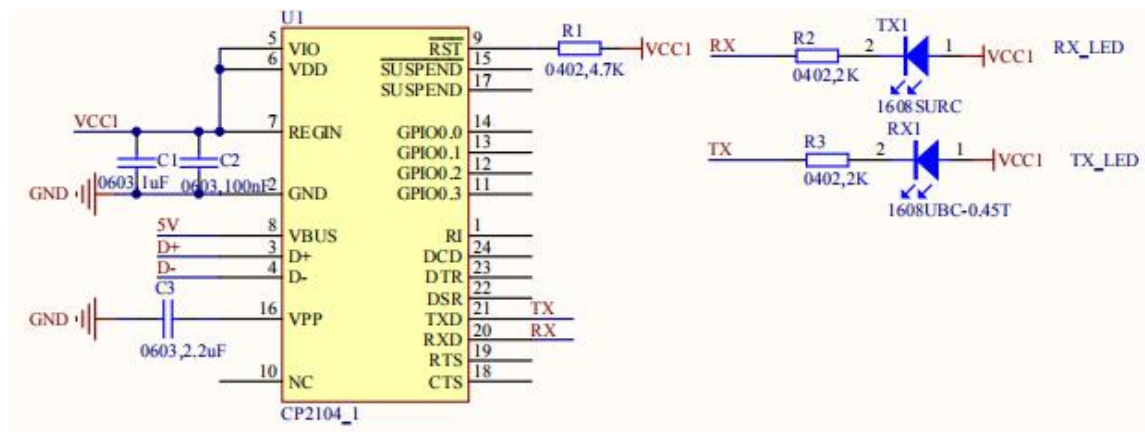
Number	Type
1	Relay output terminal
2	Buzzer
3	RGB control terminal
4	Power terminal
5	RGB Light
6	Pin for uploading software for Bluetooth module
7	jumpers for pin headers
8	Relay
9	Power switch
10	Micro-USB
11	Chipset for USB to UART
12	Jumpers for UART pin headers
13	Jumpers for MCU pin headers
14	LED indicator
15	Button
16	Switch
17	jumpers for pin headers
18	MCU

3.1 Power

- USB from the debug interface
- AA battery

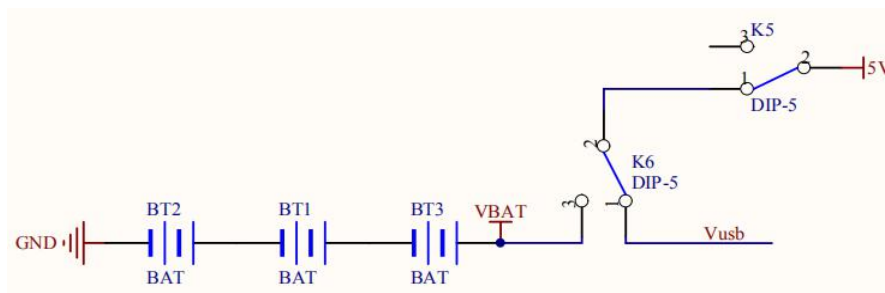
3.1.1 USB

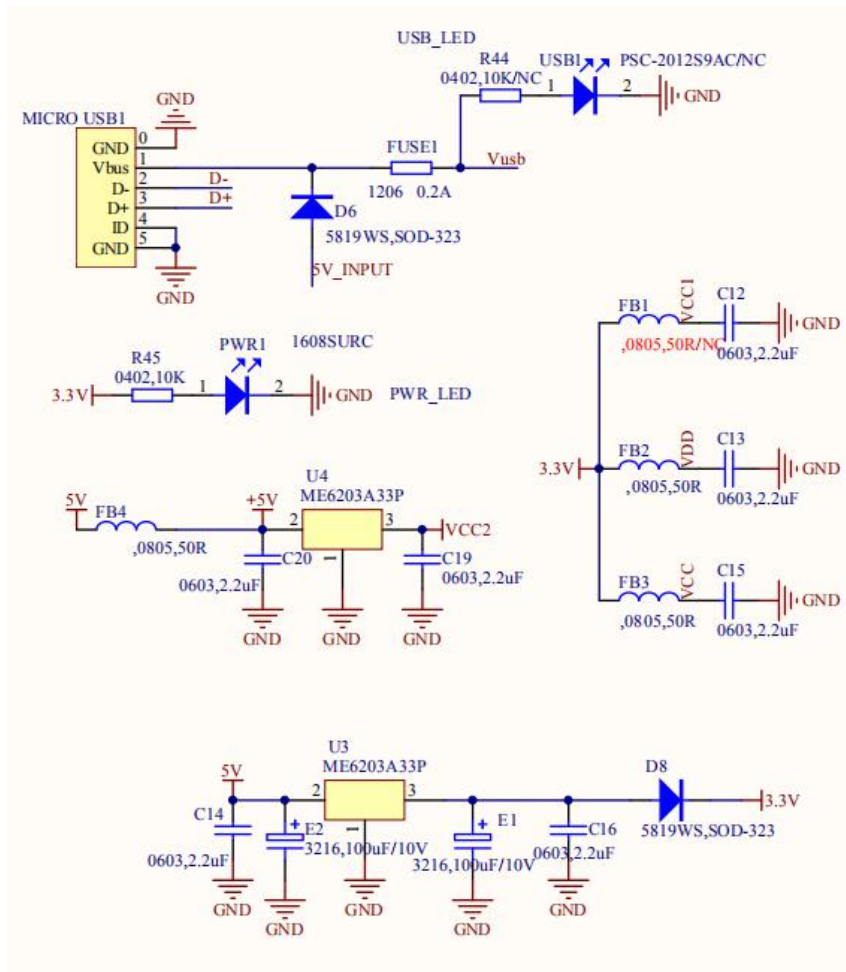
The CP2104 is a highly-integrated USB-to-UART Bridge Controller providing a simple solution for updating RS-232/RS-485 designs to USB using a minimum of components and PCB space. The CP2104 includes a USB 2.0 full-speed function controller, USB transceiver, oscillator, one-time programmable ROM, and asynchronous serial data bus (UART) with full modem control signals.



3.1.2 AA battery

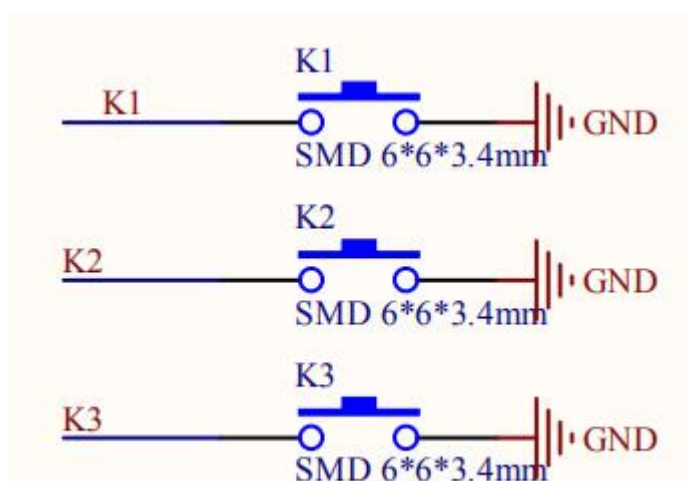
During typical debugging, power will be provided by VUSB on the USB debug interface to supply +5V to the 3.3V LDO regulator. When powering the board from the AA Battery, please use Switch-K6 to change the method of power supply.





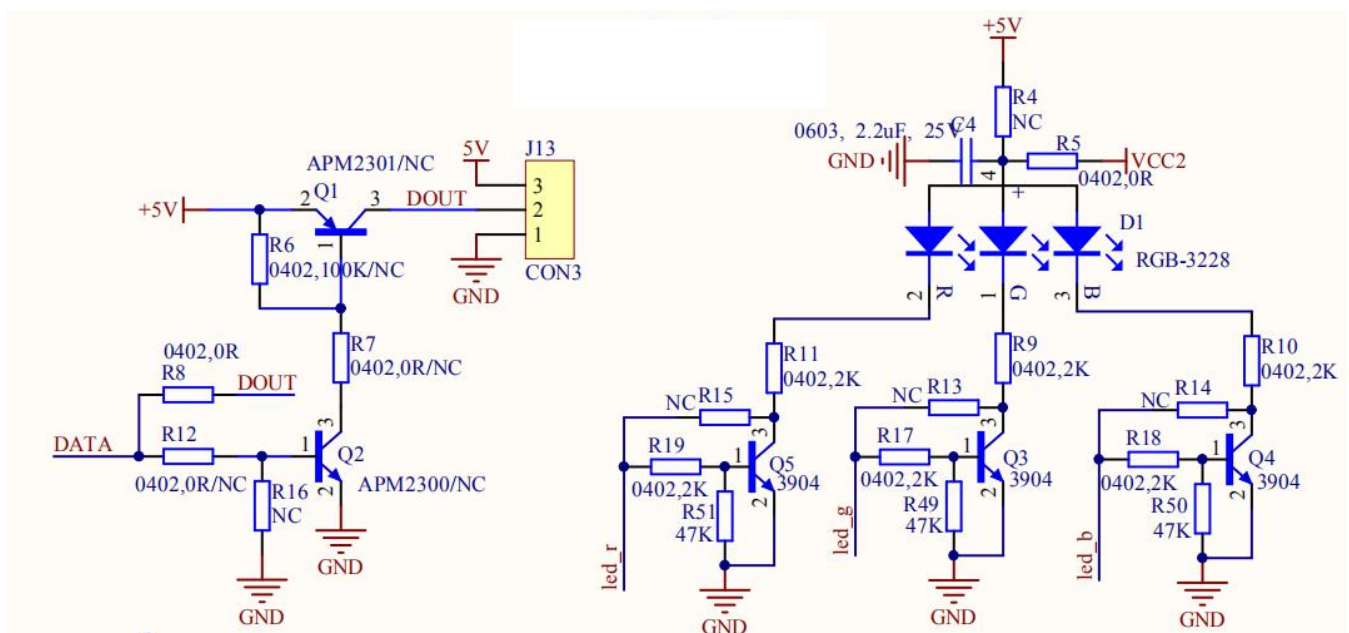
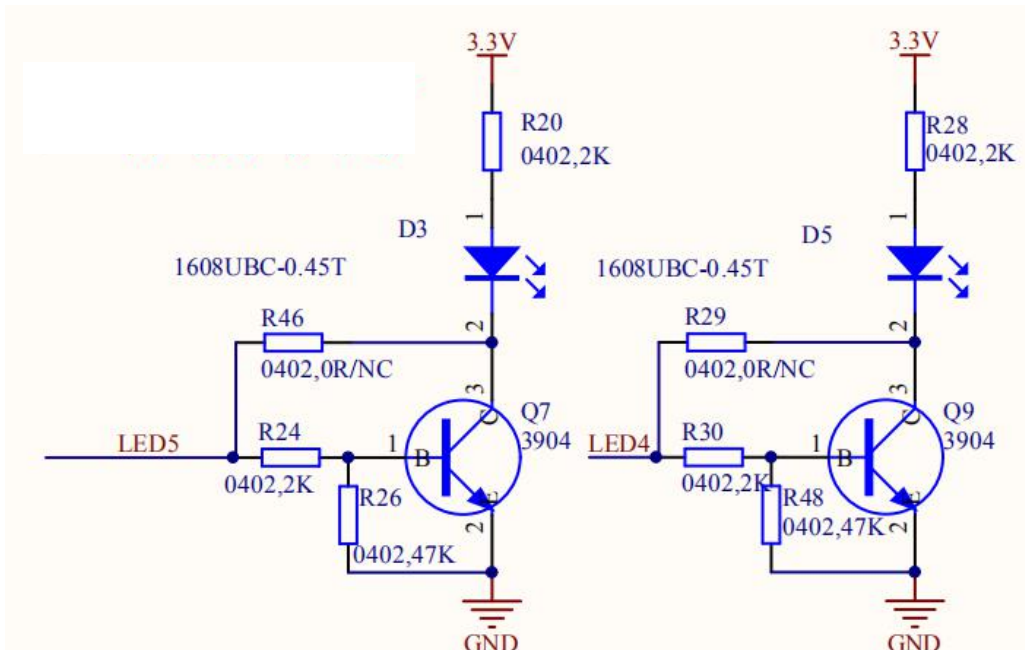
3.2 Buttons

The Evaluation Board has Three user buttons: K1, K2, K3. All buttons are active low; they will connect to ground when pressed. The button GPIO pins must be configured with internal pull-up resistors for proper operation when using the user buttons. The buttons and ESD protection can be completely removed from the circuit by breaking the associated jumper.



3.3 LEDES

User LEDs are provided on the Evaluation Board: Two blue. An RGB LED is included as well and can be enabled by changing the position of JLED. LEDs are powered by GPIO and are active high. The GPIO should be enabled for high drive when sinking current for the LEDs. The LEDs can be completely removed from the circuit by breaking the associated jumper.



3.4 32kHz crystal oscillator

The Modules have a 32.768kHz Crystal Oscillator by default.

This allows the module to use any of the Three available low frequency (LF) clock sources:

--Chipset:

an internal 64 MHz on-chip oscillator;

64 MHz crystal oscillator, using external 32 MHz crystal

32.768 kHz +/-250 ppm RC oscillator

32.768 kHz crystal oscillator, using external 32.768 kHz crystal

32.768 kHz oscillator synthesized from 64 MHz oscillator

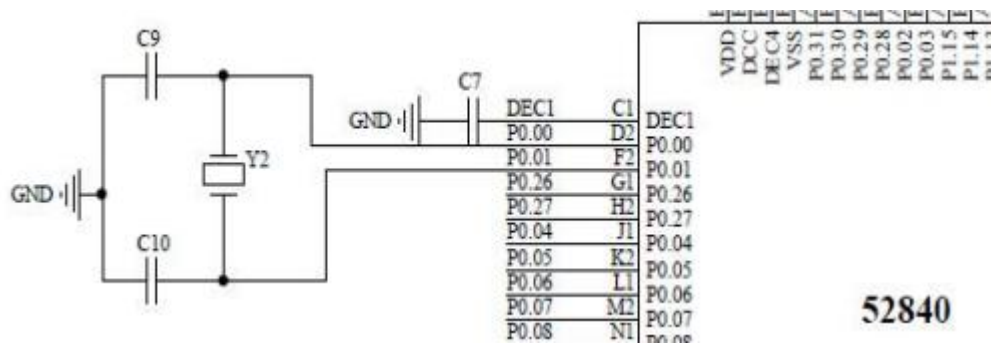
-- MS50SFB Module:

32.768 kHz crystal oscillator on the adapter board.

-- MS50SFA/MS88SF2

Modules have 32.768 kHz crystal oscillator by default.

The external crystal oscillator is the most accurate and lowest power LF clock option. For applications without strict time keeping requirements, the internal calibrated RC oscillator is often suitable. For the module which do not contains Crystal Oscillator in default, will add them into the adapter board.

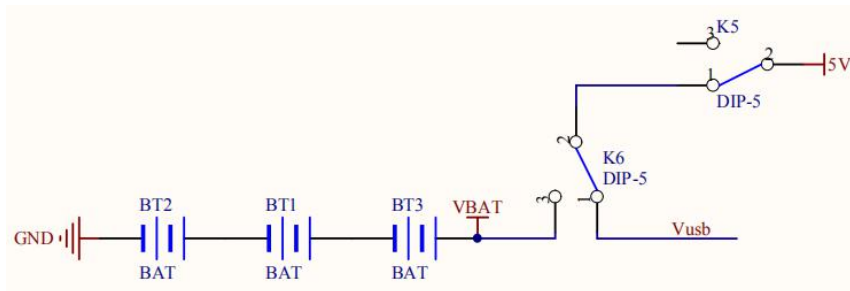


3.5 Switch

The nRF52 Series module has a configurable hardware switch. However, P0.18 is assumed to be used as the reset pin for nRF52840 based module and Nordic example projects, and thus the evaluation board hardware is configured to use P0.18 as a switch. The switch button can be configured to connect to an input on the interface IC or to directly connect to P0.18. For the nRF52832/nRF52810 based module, the reset pin is P0.21.

When the Reset button is directly connected to P0.18, it can be used as a K4 Switch or as a Switch button directly connected to the nRF52840 module.

When the Reset button is directly connected to P0.21, it can be used as a K4 Switch or as a Switch button directly connected to the nRF52832/nRF52810 module.



4. Related documents

Minew Specification:

- [MS50SFA Specification](#)
- [MS50SFB Specification](#)
- [MS88SF2 Specification](#)

Feel free to send your specification inquiry to Minew.

5. Notes & cautions

We cannot assure that the specification has no errors and omission even though this specification is under collate and check strictly.

This specification is under the protection of laws and regulations of copyright, please do not copy and duplicate at any form, or do not transmit part or full of this specification in any wire and wireless network in any form, or do not edit or translate to any other format, word, code, etc.

5.1 Design notes

(1) It is critical to following the recommendations of this document to ensure the module meets the specifications.

(2) The module should be placed at the edge of the circuit board as far as possible to keep away from other circuits.

(3) Antenna should be kept away from other circuits. It can prevent low radiation efficiency and the normal use of other circuits from being affected.

(4) The landing of components should be appropriate and that is better for reducing the parasitic inductance.

(5) Please refuse to supply voltage that is not within the range of specification.

(6) Please make sure the module or its surface may not suffer from the physical shock or extreme stress.

5.2 Handling and storage

(1) Due to the fact that CMOS components are included in the module, it is better to eliminate static electricity at any methods when transporting or working with the module. Moreover, it is strongly recommended adding anti-ESD components to circuit design to hinder damage from real-life ESD events.



(2) Please store the board within -40°C to $+125^{\circ}\text{C}$ before and after installation and make sure the board is away from the direct sunlight exposure for a long duration. The board should be far away from humid and salty air conditions, and any corrosive gasses or substances.

(3) Please not to wash the board. No-Clean Paste is used in production. The metal shield may be oxidized by the washing process and may lead to chemistry reaction with No-Clean Paste. If modules goes through the washing process, functions of the module may not guaranteed.

5.3 Life support applications

(1) The module & the board is not design for life support device or system and not allowed to be used in destructive devices or system in any direct, or indirect ways. Minew is not responsible for compensation of any losses when applying modules under such application as described above.

(2) Minew shall not responsible for the customer's products or application.

6. Disclaimer

The factory has passed the ISO9001 quality management system, ISO14001 environmental management system and OAHS18001 occupational health and safety assessment . Each product has been rigorously tested (transmission power test, sensitivity test, power consumption test, stability test, aging test, etc.).

* NOTICES:

(1) The Bluetooth trade mark is owned by the Bluetooth SIG Inc. USA.

(2) All other trademarks listed herein are owned by their respective owners.

(3) All specifications are subject to change without notice.

(4) Please do not use this specification for produce, sell or illegal purpose without Minew's authorization.

(5) Minew have right to interpret all the items above.

7. Contact information

Manufacturer: Shenzhen Minew Technologies Co., Ltd.

Tel: 0086-755-2103 8160

Email: info@Minew.com

URL: <https://www.minew.com/>

Address:

3rd Floor, Building I,
Gangzhilong Science Park,
Qinglong Road, Longhua District,
Shenzhen 518109,
China