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Datasheet

产品名称 (Product):　　　　　BT Module

产品型号 (Model No.):　　　HOLYIOT-21043-52810

1. Description

HOLYIOT-21043is based on Nordic nRF52810 Soc, the nRF52810 SoC is an ultra-low power 2.4 GHz wireless system on chip (SoC) integrating the nRF52 Series 2.4 GHz transceiver and an Arm® Cortex®-M4 CPU with flash memory.

nRF52810 supports *Bluetooth®* Low Energy, the ANT™ protocol, and a range of proprietary 2.4 GHz protocols, such as Gazell from Nordic Semiconductor. Fully qualified Bluetooth Low Energy stacks for nRF52810 are implemented in the S100 series of SoftDevices. The S100 series of SoftDevices are available for free and can be downloaded and installed on nRF52810 independent of your own application code.

nRF52810 is part of the nRF52 product family that offers you code compatible devices across the nRF52 Series and simple software migration from the nRF51 family.

Hardware :

SWD programmer (SWDIO,SWCLK,VDD,GND)

nRF52810 QFAA

Size :22.6mm*15.0mm

BLE stack & RF 2.4Ghz

Features :

- 2.4 GHz transceiver

  - -96 dBm sensitivity in Bluetooth low energy mode

  - Supported data rates: 1 Mbps, Bluetooth low energy mode

  - -20 to +4 dBm TX power, configurable in 4 dB steps

  - On-chip balun (single-ended RF)

  - 4.6 mA peak current in TX (0 dBm)

  - 4.6 mA peak current in RX

  - RSSI (1 dB resolution)

- ARM® Cortex®-M4 32-bit processor, 64 MHz

  - 144 EEMBC CoreMark® score running from flash memory

  - 34.4 µA/MHz running CoreMark from flash memory

  - 32.8 µA/MHz running CoreMark from RAM memory

  - Serial wire debug (SWD)

- Flexible power management

  - 1.7 V to 3.6 V supply voltage range

  - Fully automatic LDO and DC/DC regulator system

  - Fast wake-up using 64 MHz internal oscillator

  - 0.3 µA at 3 V in System OFF mode, no RAM retention

  - 0.5 µA at 3 V in System OFF mode with full 24 kB RAM retention

  - 1.5 µA at 3 V in System ON mode, with full 24 kB RAM retention, wake on RTC

  - 1.4 µA at 3 V in System ON mode, no RAM retention, wake on RTC

- 192 kB flash and 24 kB RAM

- Nordic SoftDevice ready

- Support for concurrent multi-protocol

• 12-bit, 200 ksps ADC - 8 configurable channels with programmable gain

• 64 level comparator

• Temperature sensor

• Up to 32 general purpose I/O pins

• 4-channel pulse width modulator (PWM) unit with EasyDMA

• Digital microphone interface (PDM)

• 3x 32-bit timer with counter mode

• SPI master/slave with EasyDMA

• I2C compatible 2-wire master/slave

• UART (CTS/RTS) with EasyDMA

• Programmable peripheral interconnect (PPI)

• Quadrature decoder (QDEC)

• AES HW encryption with EasyDMA

• 2x real-time counter (RTC)

• Single crystal operation

• Package variants

    • QFN48 package, 6 x 6 mm

    • QFN32 package, 5 x 5 mm

    • WLCSP package, 2.482 x 2.464 mm

Application:

- Computer peripherals and I/O devices

    - Mouse

    - Keyboard

    - Mobile HID

- CE remote controls

- Network processor

    - Wearables

    - Virtual reality headsets

- Health and medical

- Enterprise lighting

    - Industrial

    - Commercial

    - Retail

- Beacons

- Connectivity device in multi-chip solutions

2. Introduction

2.1 Programmer

HOLYIOT-21043 use the Serial Wire Debug(SWD port), the module which layout the SWDIO, SWCLK, VDD, GND for debug and flash your own firmware, more info about the SWD, please visit https://www.silabs.com/community/mcu/32-bit/knowledge-base.entry.html/2014/10/21/serial_wire_debugs-qKCT

You can using the Jlink or Jtag for programmer.

2.2 Software development Tool

It supports the standard Nordic Software Development Tool-chain using Segger Embedded Studio, Keil, IAR and GCC. More info please visit https://www.nordicsemi.com/Software-and-Tools/Development-Tools

2.3 Protocols

This product support Bluetooth 5, Bluetooth Low Energy,Bluetooth mesh,Thread,802.15.4,ANT, 2.4GHz proprietary. So we can use different protocols for different situations.

Software Development Kit

Nordic Semiconductor's Software Development Kits (SDK) are your starting point for software development on the nRF51 and nRF52 Series. It contains source code libraries and example applications covering wireless functions, libraries for all peripherals, bootloaders, wired and OTA FW upgrades, RTOS examples, serialization libraries.

More info please visit https://www.nordicsemi.com/Software-and-Tools/Software/nRF5-SDK

You can also download the SDK for coding development .

2.4 SoftDevices

Nordic Semiconductor protocol stacks are known as SoftDevices. SoftDevices are pre-compiled, pre-linked binary files. SoftDevices can be programmed in nRF5 series devices, and are freely downloadable from the Nordic website. Please download that here:
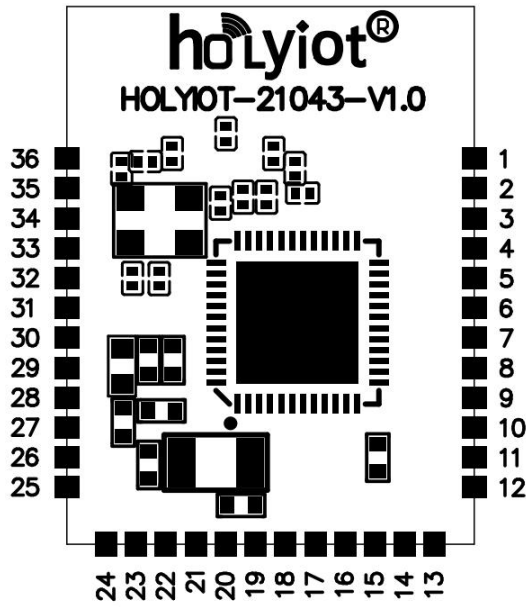
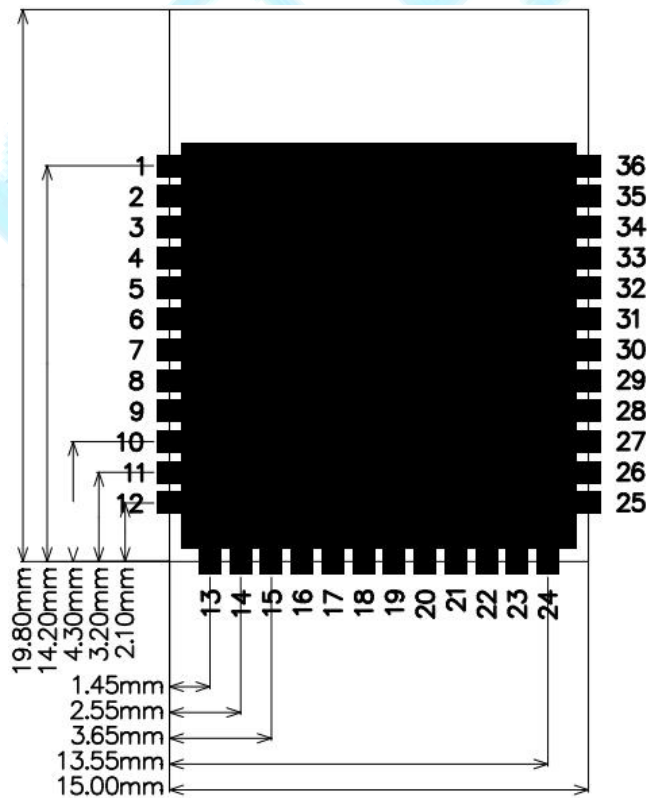https://www.nordicsemi.com/Software-and-Tools/Software/S112

Over-The-Air DFU

The SoC is supported by an Over-The-Air Device Firmware Upgrade (OTA DFU) feature. This allows for in the field updates of application software and SoftDevice.

3. Product Descriptions

3.1 Mechanical drawings

TOP VIEW

BOTTOM VIEW

3.2 Pin diagram

Left pins	Right pins
P0.24	GND
P0.23	P0.25
P0.22	P0.26
P0.21/RESET	P0.27
SWDCLK	P0.28/AIN4
SWDIO	P0.29/AIN5
P0.20	P0.30/AIN6
P0.19	N.C
P0.18	P0.31/AIN7
P0.17	P0.02/AIN0
P0.16	GND
P0.15	VCC

Bottom pins: P0.14, P0.13, P0.12, P0.11, P0.10, P0.09, P0.08, P0.07, P0.06, P0.05/AIN3, P0.04/AIN2, P0.03/AIN1
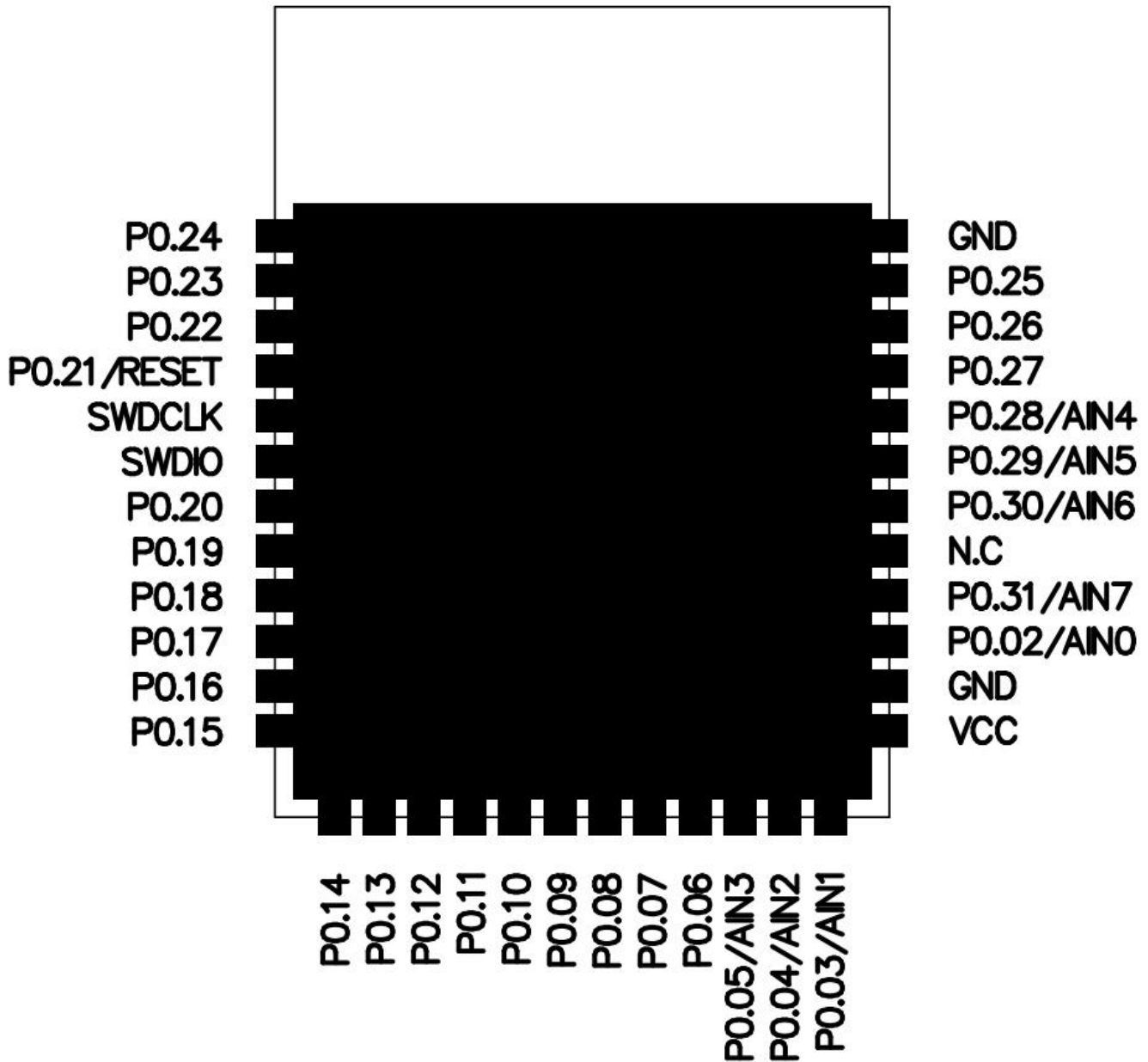
BOTTOM VIEW

3.3 Pin assignment

PIN No.	PIN define	Functions
1	P0.24	General purpose I/O
2	P0.23	General purpose I/O
3	P0.22	General purpose I/O
4	P0.21	General purpose I/O
	nRESET	Configurable as pin reset
5	SWDCLK	Serial wire debug clock input for debug and programming
6	SWDIO	Serial wire debug I/O for debug and programming
7	P0.20	General purpose I/O
8	P0.19	General purpose I/O
9	P0.18	General purpose I/O
10	P0.17	General purpose I/O
11	P0.16	General purpose I/O
12	P0.15	General purpose I/O
13	P0.14	General purpose I/O
14	P0.13	General purpose I/O
15	P0.12	General purpose I/O
16	P0.11	General purpose I/O
17	P0.10	General purpose I/O
18	P0.09	General purpose I/O
19	P0.08	General purpose I/O
20	P0.07	General purpose I/O
21	P0.06	General purpose I/O
22	P0.05	General purpose I/O
	AIN3	COMP input
		SAADC input
23	P0.04	General purpose I/O
	AIN2	COMP input
		SAADC input
24	P0.03	General purpose I/O
	AIN1	COMP input
		SAADC input
25	VCC	Power supply
26	GND	Ground

PIN No.	PIN define	Functions
27	P0.02 AIN0	General purpose I/O COMP input SAADC input
28	P0.31 AIN7	General purpose I/O COMP input SAADC input
29	N.C	NO connect Leave unconnected
30	P0.30 AIN6	General purpose I/O COMP input SAADC input
31	P0.29 AIN5	General purpose I/O COMP input SAADC input
32	P0.28 AIN4	General purpose I/O COMP input SAADC input
33	P0.27	General purpose I/O
34	P0.26	General purpose I/O
35	P0.25	General purpose I/O
36	GND	Ground

4. Miscellaneous

Soldering Temperature-Time Profile for Re-Flow Soldering. Maximum number of cycles for re-flow is 2. No opposite side re-flow is allowed due to module weight.
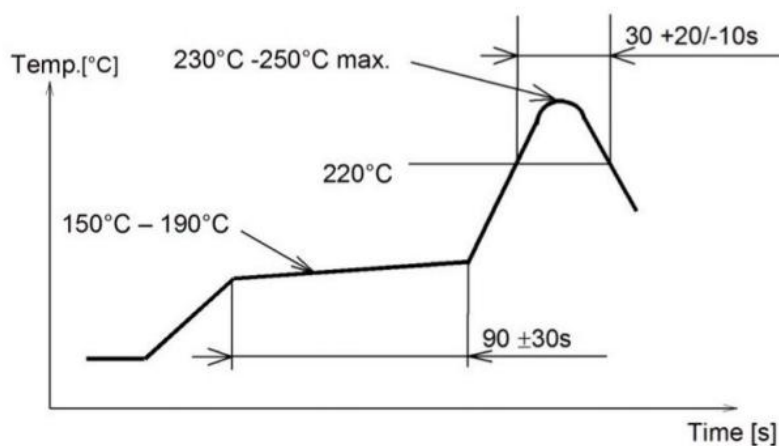
FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help important announcement

Radiation Exposure Statement

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2ALGY-21043".

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter.

2.3 Specific operational use conditions

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures

Not applicable

2.5 Trace antenna designs

Not applicable

2.6 RF exposure considerations

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

2.7 Antennas

This radio transmitter **2ALGY-21043** has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Model	Type	Peak Gain(dBi)
2400-2500MHz	PCB antenna	0 dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following "Contains FCC ID: 2ALGY-21043".

2.9 Information on test modes and additional testing requirements

Host manufacturer which install this modular with limit modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C:15.247 and 15.209 requirement, only if the test result comply with FCC part 15.247 and 15.209 requirement, then the host can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.