

Datasheet

产品名称 (Product): BT 5.2 module (nRF5340)

产品型号 (Model No.): HOLYIOT-20046 -nRF5340

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1. Description

HOLYIOT-20046 module is based on Nordic nRF5340 SoC, nRF5340 Soc is an ultra-low power wireless System on Chip (SoC) with two Arm® Cortex®-M33 processors and a multiprotocol 2.4 GHz transceiver. The two flexible processors, combined with advanced security features and an operating temperature of up to 105°C, make nRF5340 a great choice for LE Audio, professional lighting, advanced wearables and other complex IoT applications.

Hardware

SWD programmer (SWDIO, SWCLK, VDD, GND)

nRF5340 QKAA

Size: 27.2mm*16mm

Features

- 1.7 V to 5.5 V supply voltage range
- Single 32 MHz crystal operation
- Package variants
- 1.8 V to 3.3 V regulated supply for external components
- 48 general purpose I/O pins

- Distributed programmable peripheral interconnect (DPPI) Distributed programmable peripheral interconnect (DPPI)
- Inter-processor communication (IPC)
- Mutually exclusive peripheral (MUTEX)

Application core

- Arm® Cortex®-M33 with TrustZone® technology
- 1 MB flash and 512 kB low leakage RAM
- Arm TrustZone CryptoCell™-312 security subsystem
- Two-way set associative cache towards flash and QSPI XIP code regions
- QSPI peripheral for communicating with an external flash memory device
- Up to 5x SPI master/slave with EasyDMA
- Up to 4x I2C compatible two-wire master/slave with EasyDMA
- Up to 4x UART (CTS/RTS) with EasyDMA
- Audio peripherals: I2S, digital microphone interface (PDM)
- Up to 4x pulse width modulator (PWM) units with EasyDMA
- 12-bit, 200 ksps ADC with EasyDMA - eight configurable channels with programmable gain
- Up to 3x 32-bit timer with counter mode
- Up to 2x 24-bit real-time counter (RTC)
- Up to 2x Quadrature decoder (QDEC)

Network core

- Arm Cortex-M33
- 256 kB flash
- 64 kB low leakage RAM
- Bluetooth® 5.2, IEEE 802.15.4-2006, 2.4 GHz transceiver
- SPI master/slave with EasyDMA
- I2C compatible two-wire master/slave with EasyDMA
- UART (CTS/RTS) with EasyDMA

- Up to 3x 32-bit timer with counter mode
- Up to 2x real-time counter (RTC)
- Temperature sensor
- Distributed programmable peripheral interconnect (DPPI)
- Inter-processor communication (IPC)
- Mutually exclusive peripheral (MUTEX)

Applications

- Advanced computer peripherals and I/O devices
 - Multi-touch trackpad
- Advanced wearables
 - Health/fitness sensor and monitor devices
 - Wireless payment enabled devices
- Wireless audio devices
 - Bluetooth Low Energy Audio
 - True wireless earbuds
 - Headphones, microphones, and speakers
- Internet of things (IoT)
 - Smart home sensors and controllers
 - Industrial IoT sensors and controllers
- Interactive entertainment devices
 - Remote controls
 - Gaming controllers
- Professional lighting
 - Wireless connected luminaire
- Medical
- Asset tracking and RTLS

2. Introduction

HOLYIOT-20046 module is based on Nordic nRF5340 SoC, the nRF5340 SoC is a wireless, ultra-low power multicore System on Chip (SoC), integrating two fully programmable Arm Cortex-M33 processors, advanced security features, a range of peripherals, and a multiprotocol 2.4 GHz transceiver. The transceiver supports Bluetooth Low Energy

The two Arm Cortex-M33 processors share the power, clock, and peripheral architecture with Nordic Semiconductor nRF51, nRF52, and nRF91 Series of SoCs, ensuring minimal porting efforts. The application core is a full-featured Arm Cortex-M33 processor including DSP instructions and FPU and running at up to 128 MHz with 1 MB of flash and 512 kB of RAM. The option to run the application processor at 64 MHz allows the CPU to increase energy efficiency. The network core is an Arm Cortex-M33 processor with a reduced feature set, designed for ultra-low power operation. It runs at a fixed 64 MHz frequency and contains 256 kB of flash and 64 kB of RAM.

The peripheral set offers a variety of analog and digital functionality enabling single-chip implementation of a wide range of applications. Arm TrustZone technology, Arm CryptoCell-312, and supporting blocks for system protection and key management are embedded for the advanced security needed for IoT applications.

2.1 Programmer

HOLYIOT-20046 module 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 use 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 module support Bluetooth 5, Bluetooth Low Energy

Software Development Kit

nRF Connect SDK is a scalable and unified software development kit for building products based on all our nRF52, nRF53 and nRF91 Series wireless devices. It offers developers an extensible framework for building size-optimized software for memory-constrained devices as well as powerful and complex software for more advanced devices and applications. It integrates the the Zephyr RTOS and a wide range of samples, application protocols, protocol stacks, libraries and hardware drivers.

For developing Bluetooth Low Energy, Thread and Zigbee products, the nRF Connect SDK contains all needed software, including protocol stacks

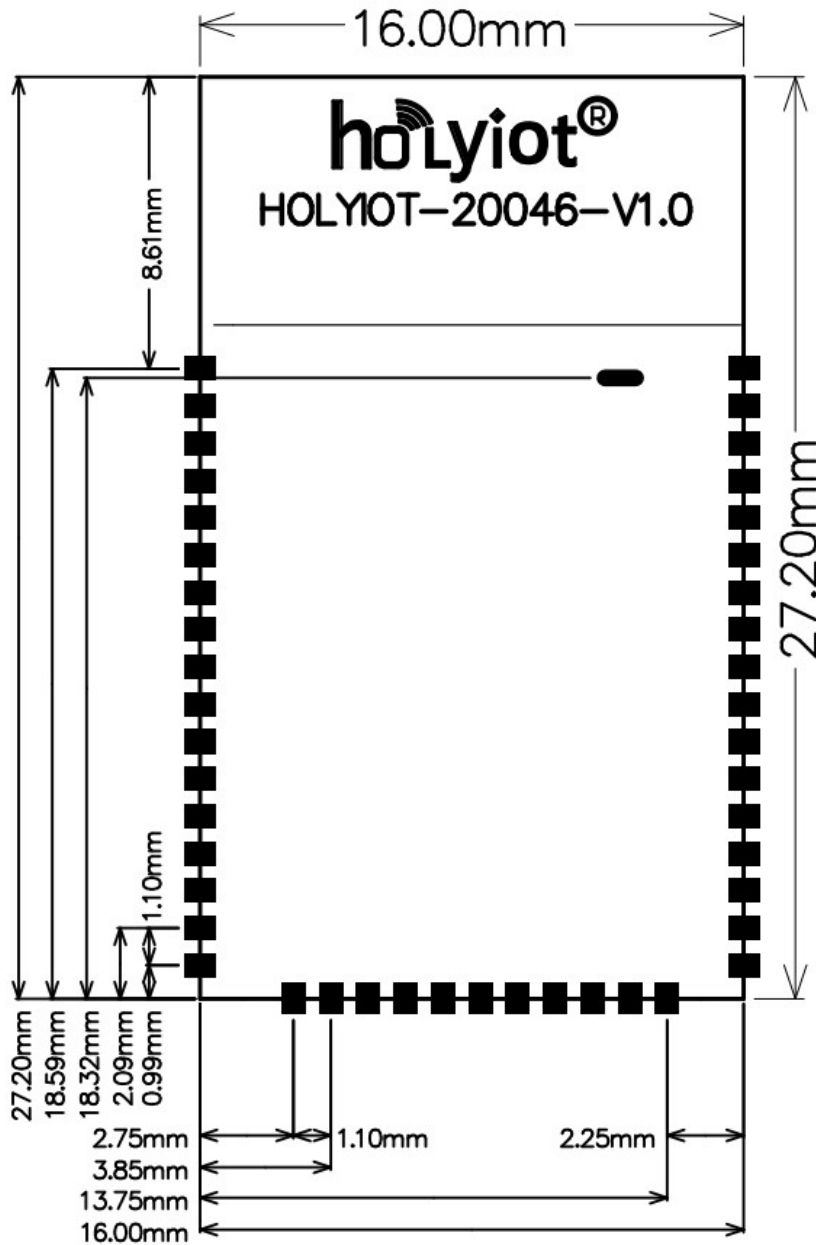
Get Started: <https://www.nordicsemi.com/Software-and-tools/Development-Kits/nRF5340-DK/GetStarted#infotabs>

More info please visit <https://www.nordicsemi.com/Software-and-tools/Software/nRF-Connect-SDK>

You can also download the SDK for coding development.

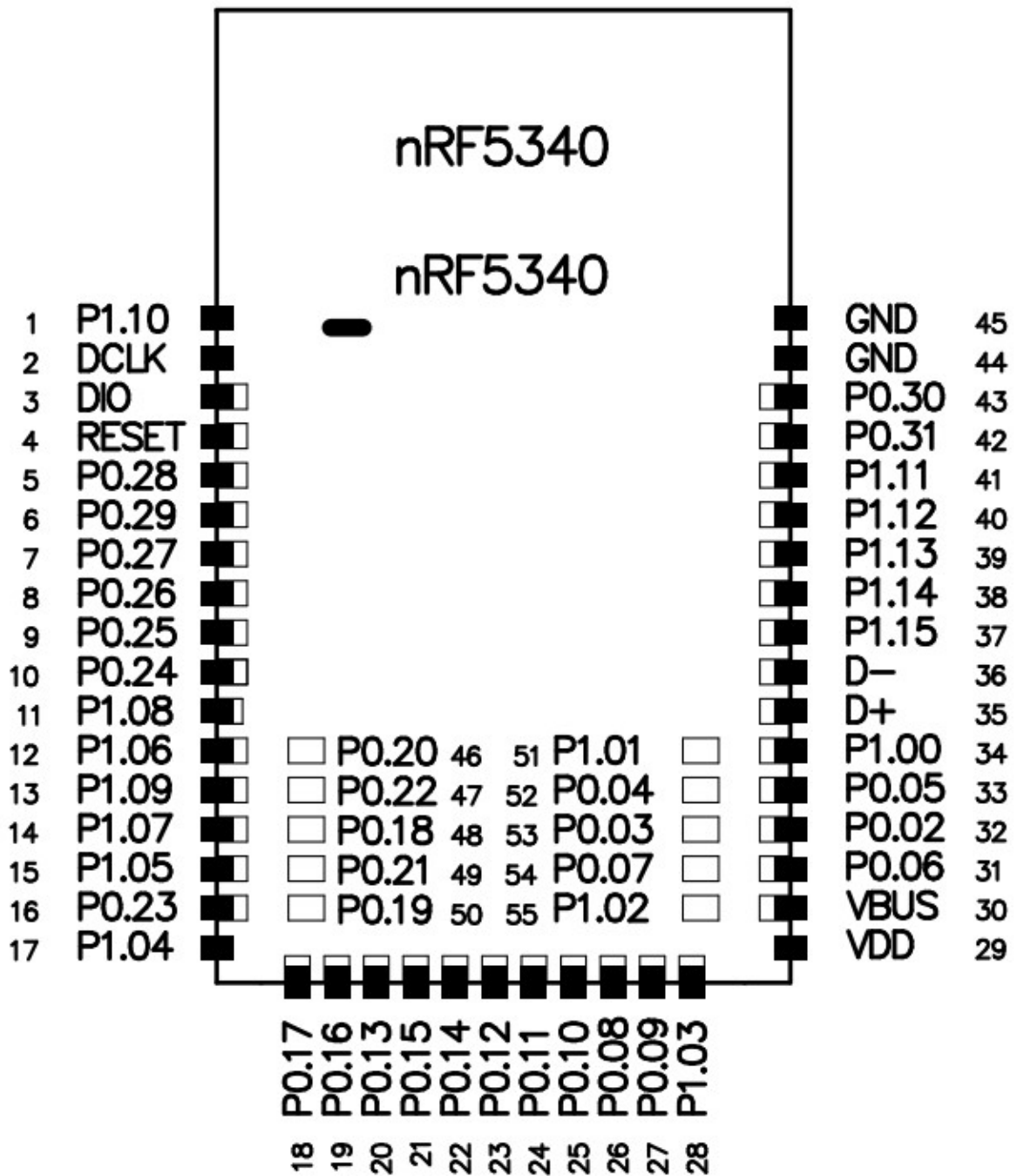
3. Product Descriptions

3.1 Mechanical drawings



TOP VIEW

3.2 Pin assignments



BOTTOM VIEW

PIN No.	PIN define	Functions
1	P1.10	General purpose I/O
2	DCLK	Serial wire debug clock input for debug and programming
3	DIO	Serial wire debug I/O for debug and programming
4	RESET	Pin RESET with internal pull-up resistor
5	P0.28 AIN7	General purpose I/O Analog input
6	P0.29	General purpose I/O
7	P0.27	General purpose I/O
8	P0.26 AIN5	General purpose I/O Analog input
9	P0.25 AIN4	General purpose I/O Analog input
10	P0.24	General purpose I/O
11	P1.08	General purpose I/O
12	P1.06	General purpose I/O
13	P1.09	General purpose I/O
14	P1.07	General purpose I/O
15	P1.05	General purpose I/O
16	P0.23	General purpose I/O
17	P1.04	General purpose I/O
18	P0.17 SCK	General purpose I/O Dedicated pin for Quad SPI
19	P0.16 IO3	General purpose I/O Dedicated pin for Quad SPI
20	P0.13 IO0	General purpose I/O Dedicated pin for Quad SPI
21	P0.15 IO2	General purpose I/O Dedicated pin for Quad SPI
22	P0.14 IO1	General purpose I/O Dedicated pin for Quad SPI
23	P0.12 TRACECLK DCX	General purpose I/O Trace buffer clock Dedicated pin for high-speed SPI

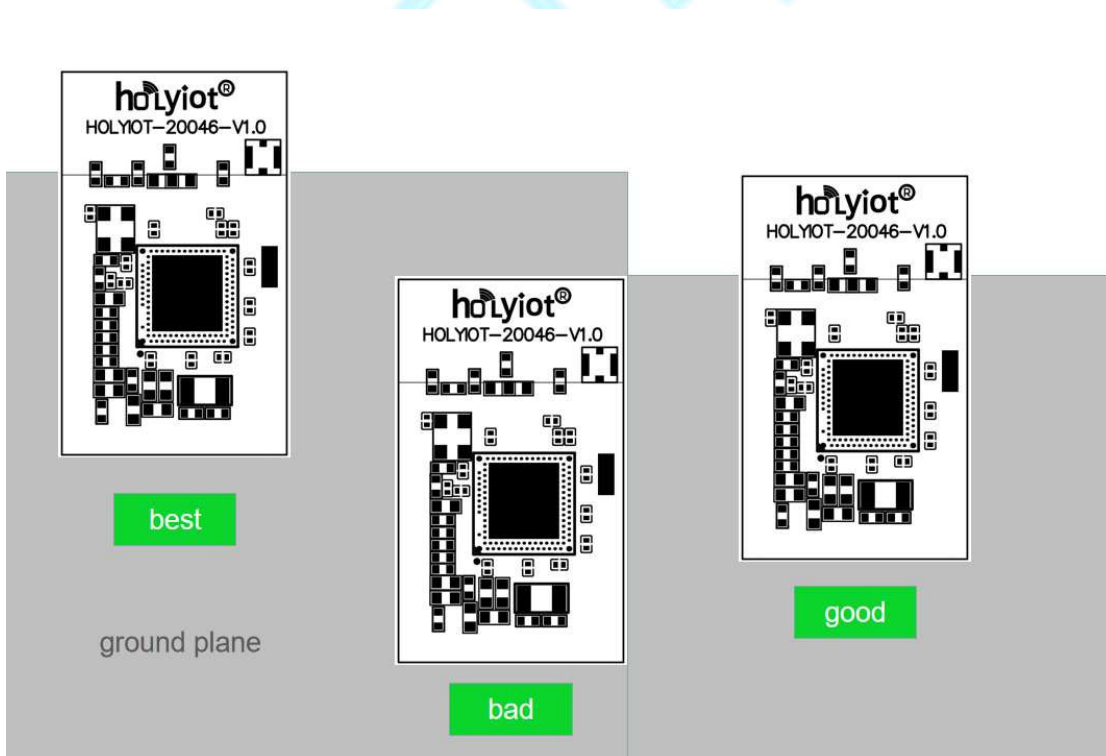
24	P0.11 TRACECLK CSN	General purpose I/O Trace buffer TRACEDATA[0] Dedicated pin for high-speed SPI
25	P0.10 TRACEDATA1 MISO	General purpose I/O Trace buffer TRACEDATA[1] Dedicated pin for high-speed SPI
26	P0.08 TRACEDATA3 SCK	General purpose I/O Trace buffer TRACEDATA[3] Dedicated pin for high-sp
27	P0.09 TRACEDATA2 MOSI	General purpose I/O Trace buffer TRACEDATA[2] Dedicated pin for high-speed SPI
28	P1.03 TWI	General purpose I/O High-speed pin for 1 Mbps TWI
29	VDD	Power supply
30	VBUS	5 V input for USB 3.3 V regulator
31	P0.06 AIN2	General purpose I/O Analog input
32	P0.02 NFC1	General purpose I/O NFC antenna connection
33	P0.05 AIN1	General purpose I/O Analog input
34	P1.00	General purpose I/O
35	D+	USB D+
36	D-	USB D-
37	P1.15	General purpose I/O
38	P1.14	General purpose I/O
39	P1.13	General purpose I/O
40	P1.12	General purpose I/O
41	P1.11	General purpose I/O
42	P0.31	General purpose I/O
43	P0.30	General purpose I/O
44	GND	Ground pad
45	GND	Ground pad
46	P0.20	General purpose I/O
47	P0.22	General purpose I/O
48	P0.18	General purpose I/O

	CSN	Dedicated pin for Quad SPI
49	P0.21	General purpose I/O
50	P0.19	General purpose I/O
51	P1.01	General purpose I/O
52	P0.04 AIN0	General purpose I/O Analog input
53	P0.03 NFC2	General purpose I/O NFC antenna connection
54	P0.07 AIN3	General purpose I/O Analog input
55	P1.02 TWI	P1.02 TWI

4. Mounting our board on the host PCBA

We suggest that you mount our RF board (HOLYIOT-20046) on the board like that:

1. For the best Bluetooth performance, the antenna of the area needs to extend about several mm without ground under the antenna of the edge of the host PCB.
2. The second choice is that place our board at the corner of host PCB, the antenna of board needs to extend several mm outside of the Ground plane of the host PCB.

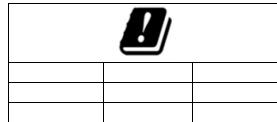


EU Declaration Conformity

Hereby, Shenzhen holyiot technology Co.,LTD declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. In accordance with Article 10(2) and Artical10(10), This product is allowed to used in all EU member states.

A complete declaration of conformity can be obtained at: www.XXXXXXX.com

The device can operate in EU Member State without restricted.



Warnings

1. Do not store the device in temperatures lower -20°C and higher than 60°C
2. The operating temperature of this device is 0°C - 40°C

Technical description:

Frequency Range: Bluetooth: 2402 - 2480 MHz

Transmit Power: -3.71m EIRP

RF Exposure Statement

This device complies with RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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.

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 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.

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

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

This module is Limited single modular without shielding, host manufacturer have to consult with module manufacturer for the module limiting conditions when integrate the module in the host. module manufacturer should reviews detailed test data or host designs prior to giving the host manufacturer approval.

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 FCC ID:2ALGY-20046 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.

Antenna No.	Operate frequency band	Antenna Type	Maximum antenna gain
Bluetooth	2400-2500MHz	PCB Antenna	0dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: 2ALGY-20046".

2.9 Information on test modes and additional testing requirements

Host 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.