

Datasheet

产品名称 (Product): BT5.0 USB Dongle

产品型号 (Model No.): HOLYIOT-21017-nRF52840

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1. Description

HOLYIOT-21017 USB dongle is based on Nordic nRF52840 Soc, the nRF52840 SoC is an advanced, highly flexible single chip solution for today's increasingly demanding ULP wireless applications for connected devices on our person, connected living environments and the IoT at large. It is designed ready for the major feature advancements of Bluetooth® 5 and takes advantage of Bluetooth 5's increased performance capabilities which include long range and high throughput modes. The nRF52840 employs the same hardware and software architecture as existing nRF52 Series SoCs. At its core is an ARM Cortex-M4F processor allowing quicker and more efficient computation of complex functions for DSP and those requiring floating point math. There is extensive memory availability in both flash and RAM, 1MB/256kB respectively. A full-speed (12Mbps) USB 2.0 controller is included on-chip. An extensive range of peripherals are available with a number of high performance digital interfaces such as high speed SPI (32MHz) and quad SPI (32MHz) to allow direct interfacing to displays and external memory sources. The nRF52840 can operate from +5.5v down to 1.7v supply voltages allowing direct supply from rechargeable batteries and USB supplies. Of greatest importance is the support for longer range (up to x4 compared to Bluetooth 4.x) and doubling of on-air data-rate, up to 2Mbps from 1Mbps in Bluetooth 4.x. This adds to the already existing radio support for Bluetooth low energy, ANT/ANT+ and 2.4GHz for proprietary.

Hardware:

SWD programmer (SWDIO, SWCLK, VDD, GND)

nRF52840 QIAA

Size :21mm*11mm

BLE stack & RF 2.4Ghz

Power Amplifier (PA): RFX2401C

Hall Switch: It can be triggered by a magnet to turn on the USB programmable switch on nRF connect.

Features:

- Bluetooth 5, 2.4GHz transceiver
 - -95 dBm sensitivity in 1 Mbps Bluetooth® low energy (BLE) mode
 - -103 dBm sensitivity in 125 kbps BLE mode (long range)
 - +4 dBm TX power (down to -20 dBm in 4 dB steps)
 - On-air compatible with nRF52, nRF51, nRF24L and nRF24AP Series
 - Supported data rates:
 - Bluetooth 5: 2 Mbps, 1 Mbps, 500 kbps, 125 kbps
 - Proprietary 2.4 GHz: 2 Mbps, 1 Mbps
 - Single-ended antenna output (on-chip balun)
 - 4.9 mA peak current in TX (0 dBm)
 - 4.8 mA peak current in RX
 - RSSI (1 dB resolution)
- ARM® Cortex®-M4 32-bit processor with FPU, 64 MHz
 - 212 EEMBC CoreMark如 score running from flash memory
 - 56 µA/MHz running from flash memory
 - Watchpoint and trace debug modules (DWT, ETM and ITM)
 - Serial wire debug (SWD)
- Flexible power management
 - Supply voltage range 1.7 V to 5.5 V
 - On-chip DC/DC and LDO regulators with automated low current modes
 - Regulated supply for external components from 1.8 V to 3.3 V
 - Automated peripheral power management
- Memory
 - 1 MB flash/256 kB RAM
- HW accelerated security
 - ARM® TrustZone® Cryptocell 310 cryptographic accelerator
 - 128 bit AES/ECB/CCM/AAR co-processor (on-the-fly packet encryption)
 - Advanced on-chip interfaces

- USB 2.0 full speed (12 Mbps) controller
- QSPI 32 MHz interface
- High speed 32 MHz SPI
- Programmable peripheral interconnect (PPI)
- 48 general purpose I/O pins

- Nordic SoftDevice ready and with support for concurrent multi-protocol
- 12-bit, 200 ksps ADC - 8 configurable channels with programmable gain
- 5x 32-bit timers with counter mode
- Up to 4x SPI masters/3x SPI slaves with EasyDMA
- Up to 2x I2C compatible 2-wire masters/slaves
- 2x UART(CTS/RTS) with EasyDMA
- 3x real-time counters (RTC)
- Package variants
 - AQFN73 package, 7x7 mm

Application:

- Advanced computer peripherals and I/O devices
 - Mouse
 - Keyboard
- Advanced wearables
 - Health/fitness sensor and monitor devices
 - Wireless payment enabled devices
- Internet of things (IoT)
 - Smart home sensors and controllers
 - Industrial IoT sensors and controllers
- Interactive entertainment devices
 - Remote controls
 - Gaming controllers

2. Introduction

2.1 Programmer

HOLYIOT-21017 USB dongle 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 USB dongle 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:

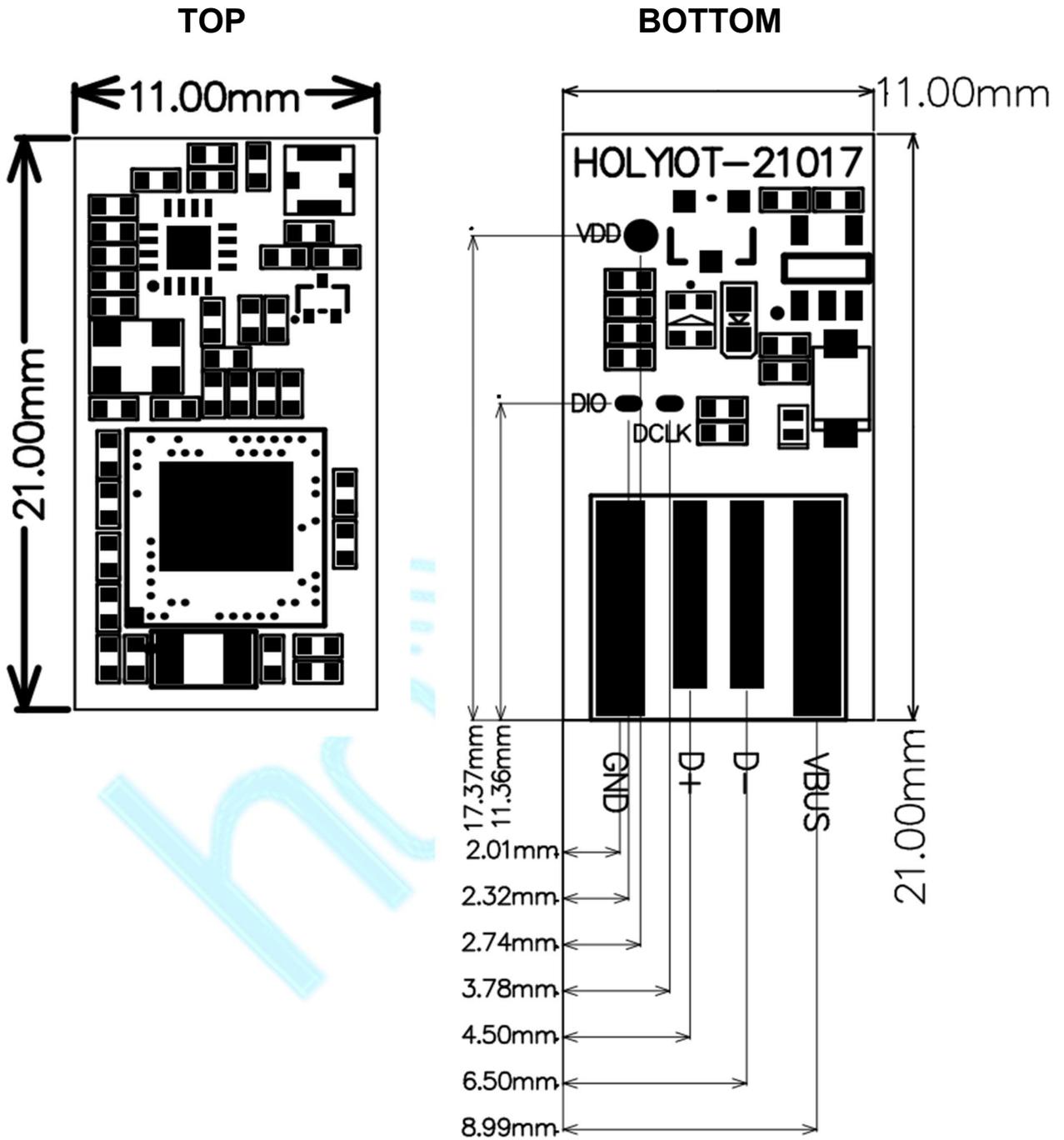
<https://www.nordicsemi.com/Software-and-Tools/Software/S140>

Over-The-Air DFU

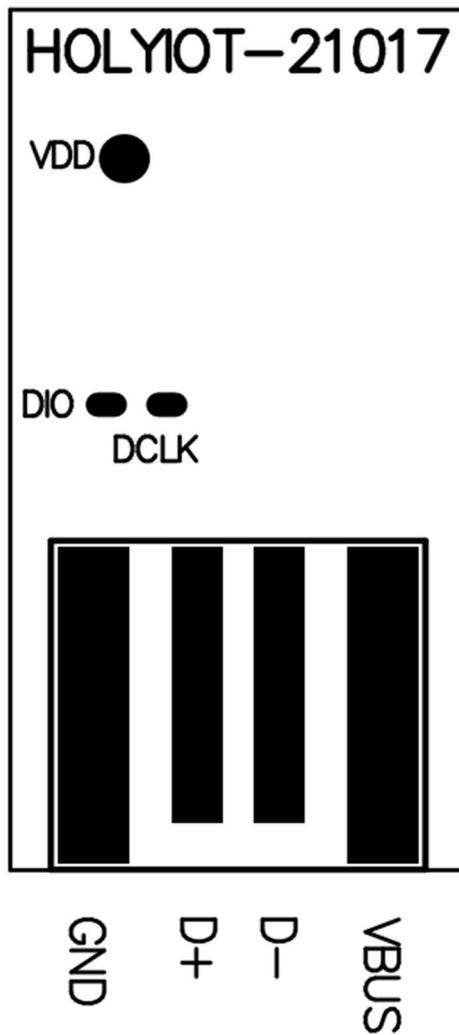
The SoC is supported by an Over-The-Air Device Firmware Upgrade (OTA DFU) feature. This allows for in the field updates of application software and SoftDevice.

3. Product Descriptions

3.1 Mechanical drawings



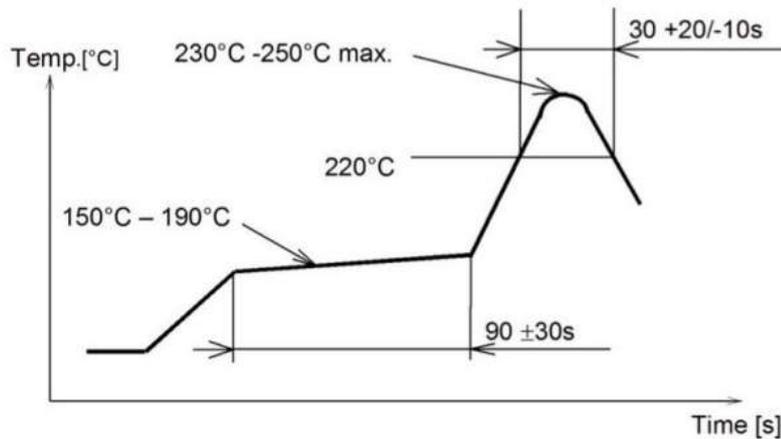
3.2 Pin assignments



PIN No.	PIN define	Functions
1	VDD	power
2	GND	Ground
3	SWCLK	Digital I/O ² (serial wire debug)
4	SWDIO	Digital input(serial wire debug)

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.



5. Absolute maximum ratings

Maximum ratings are the extreme limits to which the chip can be exposed for a limited amount of time without permanently damaging it. Exposure to absolute maximum ratings for prolonged periods of time may affect the reliability of the device.

	Note	Min.	Max.	Unit
Supply voltages				
VDD		-0.3	+3.9	V
VDDH		-0.3	+5.8	V
VBUS		-0.3	+5.8	V
VSS			0	V
I/O pin voltage				
$V_{I/O}, VDD \leq 3.6\text{ V}$		-0.3	$VDD + 0.3\text{ V}$	V
$V_{I/O}, VDD > 3.6\text{ V}$		-0.3	3.9 V	V
NFC antenna pin current				
$I_{NFC1/2}$			80	mA
Radio				
RF input level			10	dBm
Environmental (AQFN package)				
Storage temperature		-40	+125	°C
MSL	Moisture Sensitivity Level		2	
ESD HBM	Human Body Model		4	kV
ESD CDM _{QF}	Charged Device Model		750	V
	(AQFN73, 7×7 mm package)			
Flash memory				
Endurance		10 000		Write/erase cycles
Retention		10 years at 40°C		

