DXYBT021 OEM/INTEGRATORS INSTALLATIONS MANUAL

Version	Comment
V1.0	First draft
V1.1	Add new pin out and modify some description

1 Description

The DXYBT021 is a compact, surface mount Bluetooth 4.0 Low Energy (BLE) compliant wireless module. It integrates an advanced single-chip BLE SoC chip-QN9021 with RF circuit and antenna in a compact module.

Due to its small size, outstanding performance at very low power consumption and easy modular handling, the DXYBT021 is leading the way for the new generation of Bluetooth low energy modules.

2 Key Features

◆ Bluetooth® 4.0 Low Energy wireless module
  - Frequency bands:2400MHz to 2483.5MHz
  - 1Mbps on air data rate
  - Slave and Master mode operation
  - Support to 8 simultaneous links in master mode

◆ Integrated 32-bit Cortex-M0 MCU with
  - 64K system memory
  - 64/128KB falsh

◆ Ultra Low Power Consumption
  - 2uA deep sleep mode
  - 3uA sleep mode(32kHz RC OSC on)
  - DC-DC mode
    - 8.9mA RX current at 3V
    - 8.8mA TX current @0dBm Tx power at 3V
  - Non DC-DC mode
    - 13.6mA RX current at 3V
    - 13.3mA TX current @0dBm Tx power at 3v
  - Integrated DC-DC converter and LDO
  - Single 2.4V-3.6V power supply

◆ High Performance
  - -95dBm RX sensitivity (Non DC‐DC mode)
  - -93dBm RX sensitivity (DC‐DC mode)
  - Tx power from ‐20dBm to 4dBm
  - Excellent link budget up to 99dB

◆ Complete Protocol Stack and Profile
  - Bluetooth® v4.0 host stack including L2CAP , SMP,   ATT, GATT, GAP
  - Qualified application profiles and services

◆ Ease of Design
  - Small form factor: 12x18x2mm

● Easy to use command set over UART/SPI to communicate with App MCU

◆ Application
   ● Sports & Fitness
   ● Healthcare & Wellness
   ● Remote Control
   ● PC Peripherals (mouse, keyboard)
   ● Mobile Phone Accessories
   ● Home/building Automation
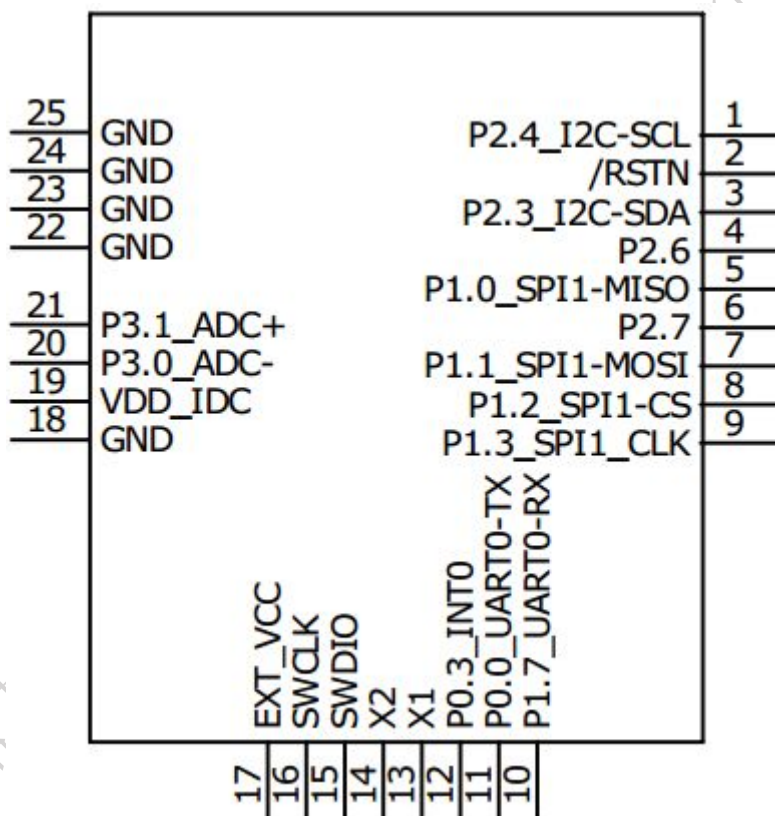   ● Industrial automation
   ● Wireless Sensor Networks

3 Pin out

Table 1 Pin out description

Pin	Name	Function	Description
1	P2.4/I2C_SCL	Digital in/out	GPIO / I2C clock
2	/RSTN	Digital in/out	Hardware reset, active low.
3	P2.3/I2C_SDA	Digital in/out	GPIO / I2C data with pull-up
4	P2.6	Digital in/out	GPIO
5	P1.0/SPI_MISO	Digital in/out	GPIO / SPI data master in/slave out
6	P2.7	Digital in/out	GPIO
7	P1.1/SPI_MOSI	Digital in/out	GPIO / SPI data master out/slave in

8	P1.2/SPI_CS	Digital in/out	GPIO / SPI chip select
9	P1.3/SPI_CLK	Digital in/out	GPIO / SPI clock
10	P1.7/UART_RX	Digital input	GPIO / UART RX data input
11	P0.0/UART_TX	Digital output	GPIO / UART TX data output
12	P0.3/INT0	Digital in	GPIO / Interrupt
13	X1	Analog in	Not connected
14	X2	Analog in	Not connected
15	SWDIO	Digital in/out	SWD data with pull-up
16	SWCLK	Digital in	SWD clock input with pull-up
17	VCC	Power	Power supply (2.4~3.6V)
18	GND	Ground	Should be connected to ground
19	VDD_IDC	Power	Not connected
20	P3.0/ADC-	Analog in	GPIO / ADC-
21	P3.1/ADC+	Analog in	GPIO / ADC+
22	GND	Ground	Should be connected to ground
23	GND	Ground	Should be connected to ground
24	GND	Ground	Should be connected to ground
25	GND	Ground	Should be connected to ground

4 Electrical Characteristics

Table 2 Recommended Operating Conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VCC	Power	To GND	2.4	3.0	3.6	V
TA	Operating temperature		-40	+25	+85	℃

Table 3 DC Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Icc	Current consumption	Deep sleep		2		uA
		Sleep		3		uA
		Idle(w/o DC-DC)		0.84		mA
		MCU@8MHz(w/o DC-DC)		1.35		mA
		Rx(w/o DC-DC)		13.6		mA
		Rx(w/t DC-DC)		8.9		mA

(Typical values are Ta=25℃ and VCC=3V)

Notes:

1. Current include current for both analog and digital;

2. Depend on IO conditions.

3. Deep sleep mode: digital regulator off, no clocks, POR, RAM/register content retained

4. Sleep mode: digital regulator off, 32k RC OSC on, POR, sleep timer on, and RAM/register content retained

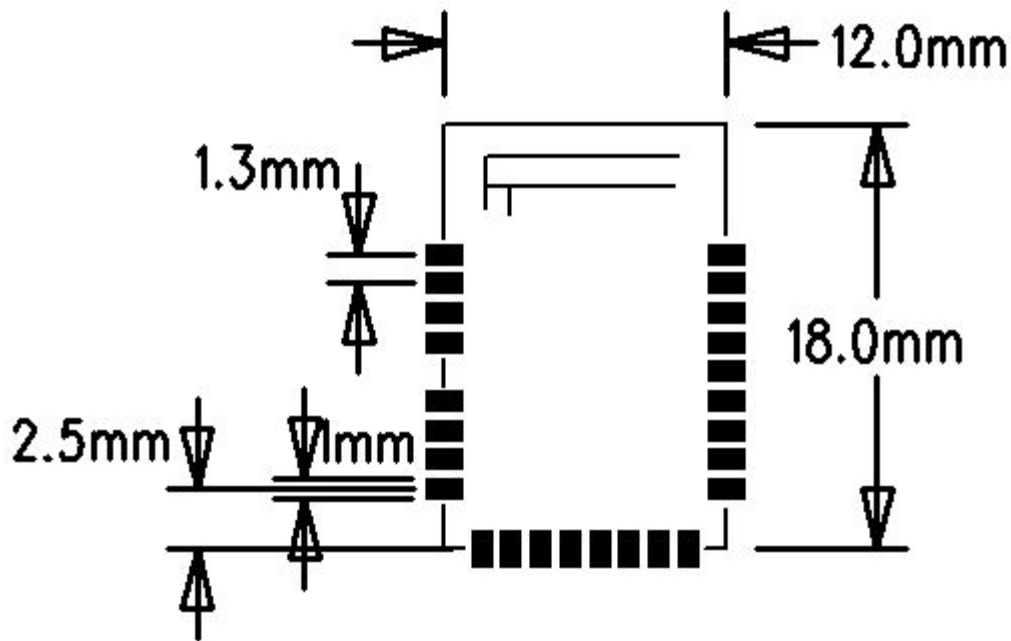5. Idle: 16MHz OSC on, no radio or peripherals, 8 MHz system clock and MCU idle (no code

execution)

6. MCU@8 MHz: MCU running at 8 MkHz RC OSC clock, no radio or peripherals

7. RX sensitivity is -95dBm sensitivity when DC-DC is disabled.

8. RX sensitivity is -93dBm sensitivity when DC-DC is enabled.

5 Layout and physical dimemsions

Full Modular Approval

This RF Module is full modular approval, it is limited to OEM installation ONLY.

Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure compliance of the entire end product incl. the integrated RF Module. Additional measurements (15B) and/or equipment authorizations (e.g Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to the end user of the final host device.

With the documented max output power this RF Module meets the FCC SAR Exemption, so it comply with any applicable RF exposure requirements in its final configuration. The RF Module is powered by battery, the antenna is PCB antenna and the antenna gain is 2.21dBi. The final host device, into which this RF Module is integrated" has to be labeled with an auxiliary label stating

the FCC ID of the RF Module, such as "Contain FCC ID: **2AEZC021**"."

The module is limited to installation in mobile or fixed applications. The separate approval is required for all other operating configurations, including portable configuration with respect to Part 2.1093 and different antenna configurations.

FCC RF 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: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications 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
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Hereby, DXY Technology Co.,Ltd. declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
For the declaration of conformity, visit the Web site http://www.dxytech.com

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Notice: Observe the national local regulations in the location where the device is to be used. This device may be restricted for use in some or all member states of the European Union (EU)