FSC-BT986

5.2 Dual Mode Bluetooth Module Datasheet

Version 1.7.2

Revision History

Version	Data	Notes	
1.0	2021/04/21	Initial Version	Fish
1.1	2021/06/03	Update module picture	Fish
1.2	2021/06/08	Update transmit power	Fish
1.3	2021/08/25	Update transmit power	Devin Wan
1.3.1	2021/10/11	1,change the Supply Voltage 2, Storage: -20°C to +85°C	Devin Wan
1.4	2021/10/27	1,change the Supply Voltage 2, Bluetooth version changed to 5.2	Devin Wan
1.5	2022/2/23	Update Pin31,P32 definition(Application only for HC05)	Devin Wan
1.6	2022/05/21	Update Pin Name	Marsh
1.7	2022/11/28	Update Operating temperature：-10°C to +85°C	Marsh
1.7.1	2024/08/17	Updated the description of the RF interface	Li
1.7.2	2025/03/06	Add chapter:1.1 Selection of version	Li

Contact Us

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1. INTRODUCTION

Overview

FSC-BT986 is a high-performance, highly integrated Bluetooth 5.2 BR/EDR/BLE, designed to operate on the 2400MHz to 2480Mhz ISM frequency band.

Abundant peripherals, power-on reset (POR) and I2C/USB, arithmetic accelerators further reduce the cost and size of the entire system.

By default, Feasycom standard firmware is built-in, and customized firmware is also available.FSC-BT986 is a suitable product for designers who want to add wireless functions to their products.

Features

- Bluetooth 5.2 Classical/BLE Proprietary double-mode RF SOC
- UART programming and data interface (baudrate can up to 921600bps)
- I2C/USB interfaces
- Digital Peripherals
  - Two-wire Master (I2C compatible) , up to 400kbps
  - LED drive capability
  - AES256 HW encryption
  - USB2.0 fullspeed,4Eps, support host mode
- Dual Core Digital Architecture
  - ARM Cortex-M0 Core for application
  - CPU clock speed up to 192Mhz
- 2.4GHz Transceiver
  - Single-end RFIO
  - -95dBm in BLE mode
  - Support 250kbps, 1/2/3 Mbps data rates
  - Tx Power 0dBm
- Postage stamp sized form factor
- Working current is 5mA
- Support External Antenna
- RoHS compliant

Application

- Health Thermometer
- Heart Rate
- Blood Pressure
- Proximity

Module picture as below showing

Figure 1: FSC-BT986 Picture

2. General Specification

Table 1: General Specifications

Categories	Features	Implementation
Wireless Specification	Bluetooth Version	Bluetooth v5.2 Dual mode
	Frequency	2.400 - 2.480 GHz
	Transmit Power	5dBm (Maximum)
	Receive Sensitivity	-95 dBm@0.1%BER (BLE mode)
	Modulation	GFSK, π/4 DQPSK, 8DPSK
	Raw Data Rates (Air)	3 Mbps
Host Interface and Peripherals	UART Interface	TX, RX, Supports Automatic Flow Control (CTS and RTS lines).
		General Purpose I/O
		Default 115200,N,8,1
		Baudrate support from 1200 to 921600
		5, 6, 7, 8 data bit character
	GPIO	8 (maximum – configurable) lines
	I2C Interface	1 (configurable from GPIO total). Up to 400 kbps
Profiles	Classic Bluetooth	Support
	Bluetooth Low Energy	Support
Maximum Connections	Classic Bluetooth	1 Clients
	Bluetooth Low Energy	1 Clients
FW upgrade		Jlink
Supply Voltage	Supply	3.3V ~ 3.6V
Power Consumption		Working current 5mA
Physical	Dimensions	13mm X 26.9mm X 2.4mm; Pad Pitch 1.5mm
Environmental	Operating	-10°C to +85°C
	Storage	-20°C to +85°C
Miscellaneous	Lead Free	Lead-free and RoHS compliant
	Warranty	One Year
Humidity		10% ~ 90% non-condensing
MSL grade:		MSL 3
ESD grade:		Human Body Model: Class-2 Machine Model: Class-B

3. HARDWARE SPECIFICATION

3.1 Block Diagram and PIN Diagram

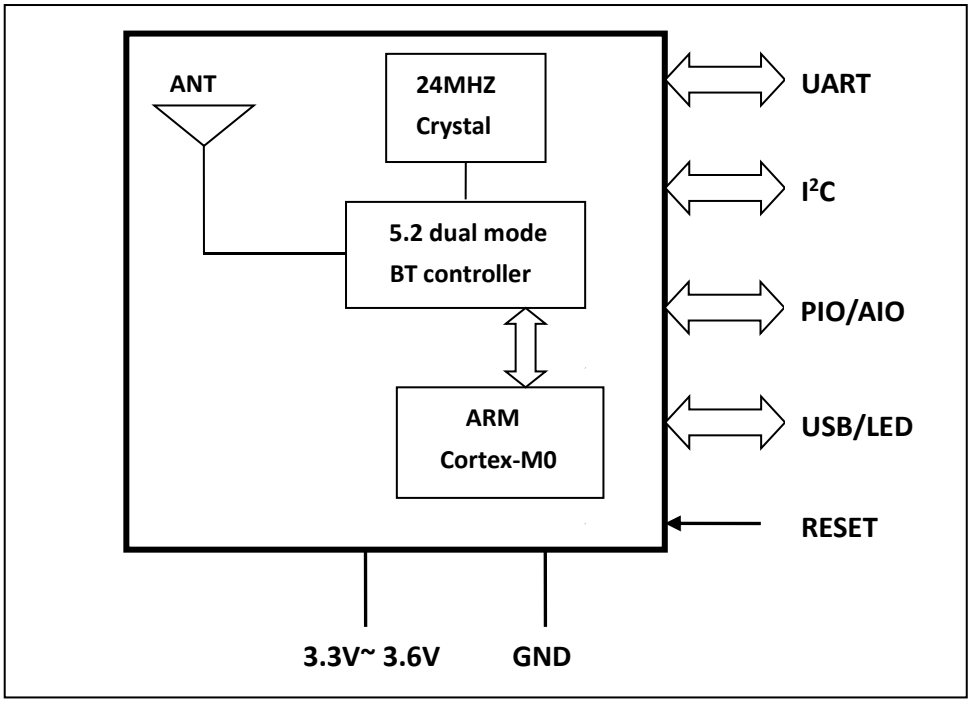

Figure 2: Block Diagram

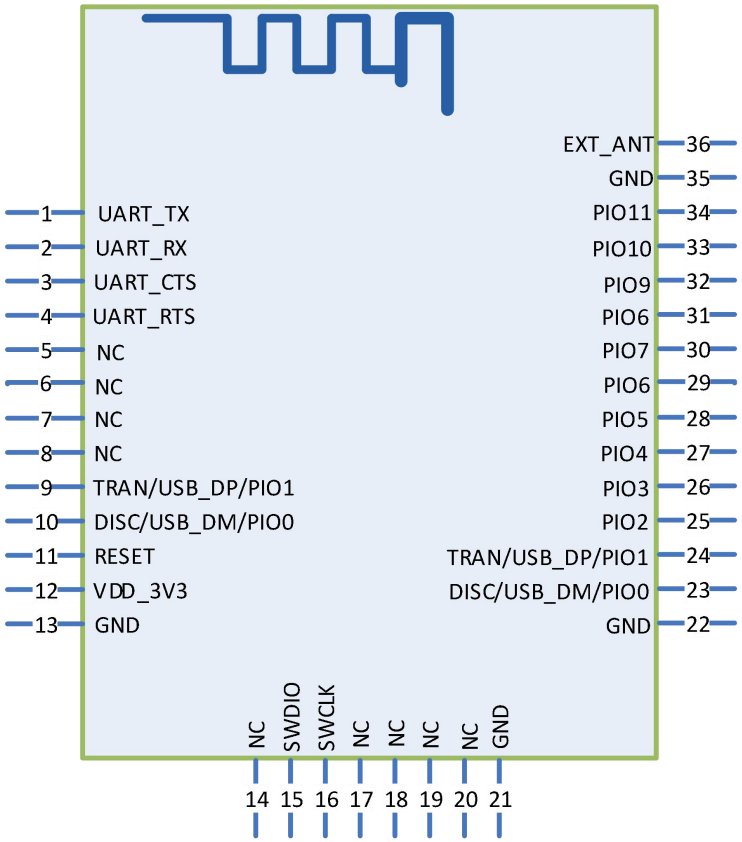

Figure 3: FSC-BT986 PIN Diagram(Top View)

3.2 PIN Definition Descriptions

Table 2: Pin definition

Pin	Pin Name	Type	Pin Descriptions
1	UART_TX	I/O	UART Data output
2	UART_RX	I/O	UART Data input
3	UART_CTS	I/O	UART Clear to Send (active low)
4	UART_RTS	I/O	UART Request to Send (active low)
5	NC		
6	NC		
7	NC		
8	NC		
9,24	Tran/USB_DP/PIO1	I/O	Host MCU change UART transmission mode. (Default) ***H = instruction mode*** ***L = throughput mode*** Alternative Function: Programmable input/output line Alternative Function: USB_DP
10,23	Disc/USB_DM/PIO0	I/O	Host MCU disconnect bluetooth. (Default) Alternative Function: Programmable input/output line Alternative Function: USB_DM
11	RESET	I	External reset input: Active LOW. Set this pin low reset to initial state
12	VDD_3V3	Vdd	Power supply voltage 3.3V~ 3.6V
13	GND	Vss	Power Ground
14	NC		
15	SWDIO	I/O	Debugging through the data line
16	SWCLK	I/O	Debugging through the clk line
17	NC		
18	NC		
19	NC		
20	NC		
21	GND	Vss	Power Ground
22	GND	Vss	Power Ground
25	PIO2	I/O	Programmable input/output line
26	PIO3	I/O	Programmable input/output line
27	PIO4	I/O	Programmable input/output line
28	PIO5	I/O	Programmable input/output line
29,31	PIO6		Programmable input/output line Alternative Function 1: I2C_SCL **Alternative Function 2: LED** ***Power On: Light Slow Shinning; Connected: Steady Lighting.***
30	PIO7	I/O	BT Status(Default)

			Connected: High ; Not connected: low Alternative Function: Programmable input/output line Alternative Function: I2C_DAT
32	PIO9/LED	I/O	Programmable input/output line Alternative Function 1: LED(Default) Power On: Light Slow Shinning; Connected: Steady Lighting. **Alternative Function 2: BT status (Application only for HC05)** ***Connected: High; Not connected: low***
33	PIO10	I/O	Programmable input/output line
34	PIO11	I/O	Programmable input/output line
35	GND	Vss	Power Ground
36	EXT_ANT	O	RF signal output . If you need to use an external antenna, you can shield the onboard antenna by modifying the module on the 0R resistor. Or contact Feasycom to modify.

4. FCC 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.

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

FCC ID:2AMWO-FSCBT986

FCC Statement
FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
Device is equipped with Integral antenna
Antenna 1:
Model:WIFI740x8L50CM1
Antenna Type:FPC antenna
Antenna2:
Model:FYT-01-7
Antenna Type:FPCantenna
Antenna Gain:
Antenna 1:2.80dBi
Antenna 2:2.63dBi

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

FCC Radiation Exposure Statement
This modular complies with FCC 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.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2AMWO-FSCBT986 Or Contains FCC ID: 2AMWO-FSCBT986”
When the module is installed inside another device, the user manual of the host must contain above a, b, c warning statements .
The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.
Any company of the host device which install the modular with modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15B Class B requirement, Only if the test result comply with FCC part 15B Class B requirement, then the host can be sold legally.