

FSC-BT813

4.0 Dual Mode Bluetooth Module Data Sheet

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Release Record

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Revision 1.0	2013-11-10	First Release
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Revision 1.2	2014-5-7	
Revision 1.4	2014-10-8	

1. INTRODUCTION

FSC-BT813 is a fully integrated Bluetooth module that complies with Bluetooth 4.0 dual mode protocols(BR/EDR/BLE). It provides several interfaces such as UART, I2C, PCM, AIO, PIO, etc., which can customized different applications.

FSC-BT813 supports SPP, BLE profiles. It integrates MCU, Baseband controller, RF antenna etc. in a small package, so the designers can have better flexibilities for the product shapes.

FSC-BT813 can be controlled by UART port or other interfaces. Please refer to Feasycom software design guide for the interfacing protocol.

1.1 Block Diagram

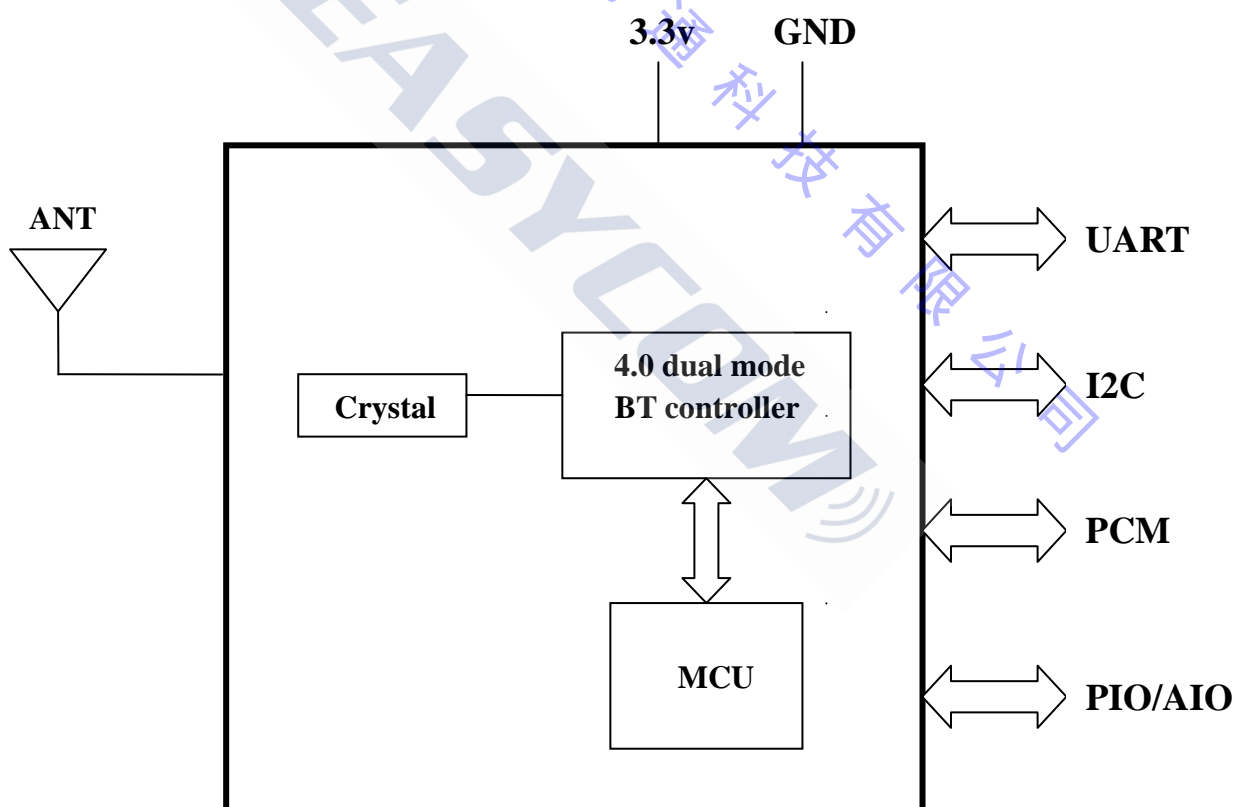


Figure 1

1.2 Feature

- ◆ Fully qualified Bluetooth 4.0/3.0/2.1/2.0/1.2/1.1
- ◆ Postage stamp sized form factor, 13mm x 13mm x 1.6mm
- ◆ Low power
- ◆ Class 1.5 support(high output power)
- ◆ The default UART Baud rate is 115.2Kbps and can support from 1200bps up to 921Kbps,.
- ◆ UART, I2C , PCM data connection interfaces.
- ◆ Embedded Bluetooth stack profiles support(requires no host stack): SPP, HFP/HSP, A2DP, AVRCP, MAP, and all BLE protocols.

1.3 Application

- ◆ Smart Watch and Bluetooth Bracelet
- ◆ Health & Medical devices
- ◆ Measurement and monitoring systems
- ◆ Industrial sensors and controls
- ◆ Asset tacking

2. GENERAL SPECIFICATION

General Specification	
Chip Set	
Product ID	FSC-BT813
Dimension	13mm x 13mm x 1.6mm
Bluetooth Specification	Bluetooth V4.0 (Dual Mode)
Power Supply	3.3 Volt DC
Output Power	10.5 dBm (Class 1.5)
Sensitivity	-82dBm@0.1%BER
Frequency Band	2.402GHz -2.480GHz ISM band
Modulation	FHSS,GFSK,DPSK,DQPSK
Baseband Crystal OSC	26MHz
Hopping & channels	1600hops/sec, 1MHz channel space,79 Channels
RF Input Impedance	50 ohms
Antenna	Internal (Default) External (Option)
Interface	Data: UART (Standard), I2C Audio: PCM Others: PIO, AIO, Touch sensor, PWM.
Profile	SPP, BLE (Standard) HFP, A2DP, AVRCP, MAP
Temperature	-40°C to +85°C
Humidity	10%~95% Non-Condensing
Environmental	RoHS Compliant

Table 1

3. PHYSICAL CHARACTERISTIC

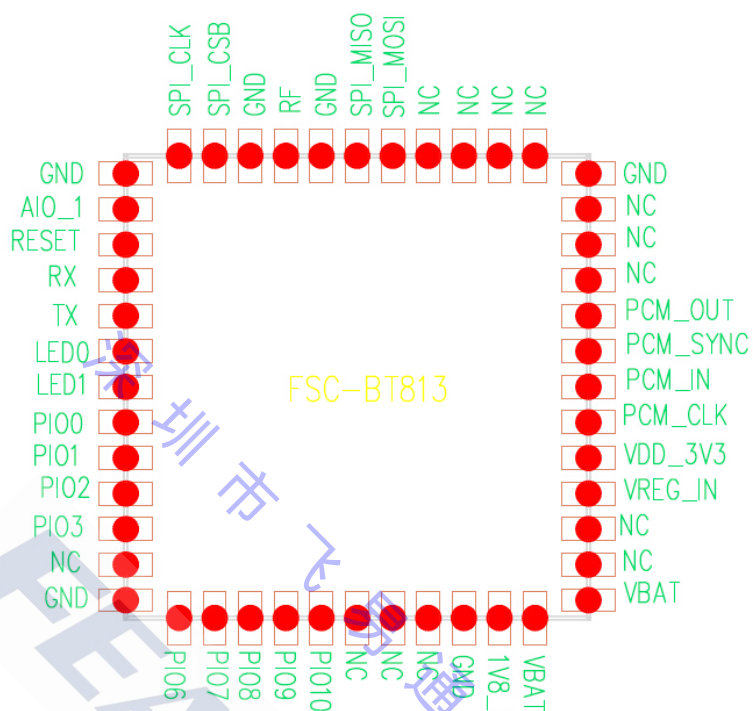


Figure 2

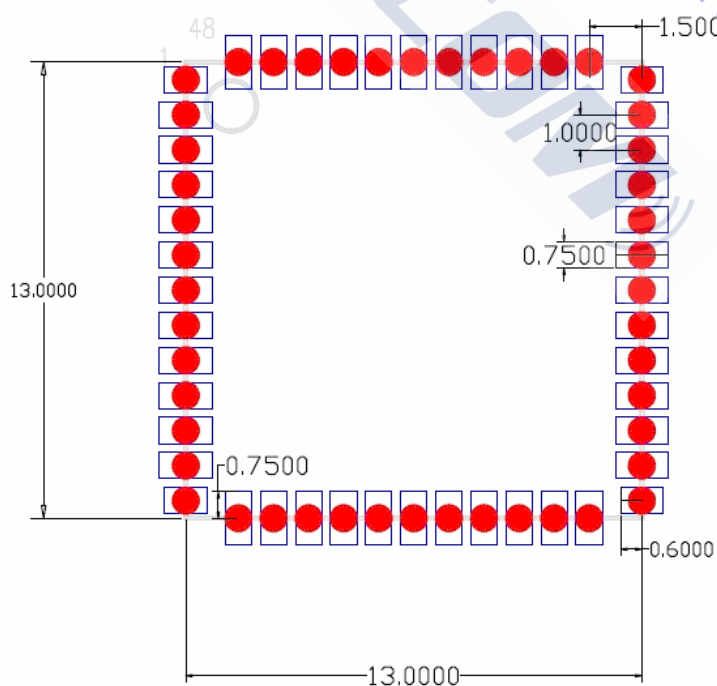


Figure 3

4. PIN DEFINITION DESCRIPTIONS

Pin	Pin Name	Pad Type	Description
1	GND	Ground	Digital Ground
2	AIO_1	Bi-directional	Analogue programmable input / output line
3	RESET	Input with strong pull-up	Reset if low. Input debounced so must be low for >5ms to cause a reset
4	RX	Bi-directional with strong pull_up	UART data input
5	TX	Bi-directional with weak pull_up	UART data output
6	LED0	Open drain	LED driver
7	LED1	Open drain	LED driver
8	PIO0	Bi-directional with weak pull_down	Programmable input/output line
9	PIO1	Bi-directional with weak pull_down	Programmable input/output line
10	PIO2	Bi-directional with weak pull_down	Programmable input/output line
11	PIO3	Bi-directional with weak pull_down	Programmable input/output line
12	NC	NC	NC
13	GND	Ground	Digital Ground
14	PIO6	Bi-directional with weak pull_down	Programmable input/output line
15	PIO7	Bi-directional with weak pull_down	Programmable input/output line
16	PIO8	Bi-directional with weak pull_down	Programmable input/output line
17	PIO9	Bi-directional with weak pull_down	Programmable input/output line
18	PIO10	Bi-directional with weak pull_down	Programmable input/output line
19	NC	NC	NC
20	NC	NC	NC
21	NC	NC	NC

22	GND	Ground	Digital Ground
23	1V8_OUT	Open drain output	+1V8
24	VBAT	Power supply	Battery positive terminal(3.3V-4.2V)
25	VBAT	Power supply	Battery positive terminal
26	NC	NC	NC
27	NC	NC	NC
28	VREG_IN	NC	NC
29	VDD_3.3V	Connect to 3.3V	3.3V positive supply input for digital input/output ports
30	PCM_CLK	Bi-directional	Synchronous data clock (Operating votage level: 1.8V)
31	PCM_IN	CMOS output	Synchronous data input (Operating votage level: 1.8V)
32	PCM_SYNC	CMOS input	Synchronous data sync (Operating votage level: 1.8V)
33	PCM_OUT	Bi-directional	Synchronous data input (Operating votage level: 1.8V)
34	NC	NC	NC
35	NC	NC	NC
36	NC	NC	NC
37	GND	Ground	Digital Ground
38	NC	NC	NC
39	NC	NC	NC
40	NC	NC	NC
41	NC	NC	NC
42	SPI_MOSI	Input with weak pull-down	SPI data input
43	SPI_MISO	Output with weak pull-down	SPI data output
44	GND	Ground	Analogue Ground
45	RF	RF_IN	Bluetooth 50ohm transmitter output/

			receiver input
46	GND	Ground	Analogue Ground
47	SPI_CSB	Input with strong pull-up	Chip select for SPI,active low
48	SPI_CLK	Input with weak pull-down	SPI Clock

Table 2

5. Interface Characteristics

5.1 UART Interface

Four signals are used to implement the UART function. When FSC-BT813 is connected to another digital device, UART_RX and UART_TX transfer data between the two devices. The remaining two signals, UART_CTS and UART_RTS, can be used to implement RS232 hardware flow control where both are active low indicators.

The interface consists of four-line connection as described in below:

Signal name	Driving source	Description
UART-TX	FSC-BT813 module	Data from FSC-BT813 module
UART-RX	Host	Data from Host
UART-RTS	FSC-BT813 module	Request to send output of FSC-BT813 module
UART-CTS	Host	Clear to send input of MDC748 module

Table 3

Possible UART Settings

Property	Possible Values
BCSP-Specific Hardware	Enable or Disable
Baudrate	1200bps to 921Kbps
Flow Control	RTS/CTS or None
Data bit length	8bits
Parity	None, Odd or Even
Number of Stop Bits	1 or 2

Table 4

Default Data Format

Property	Possible Values
BCSP-Specific Hardware	Enable
Baudrate	115.2Kbps
Flow Control	None
Data bit length	8bit
Parity	Even
Number of Stop Bits	1

Table 5

5.2 PCM CODEC Interface

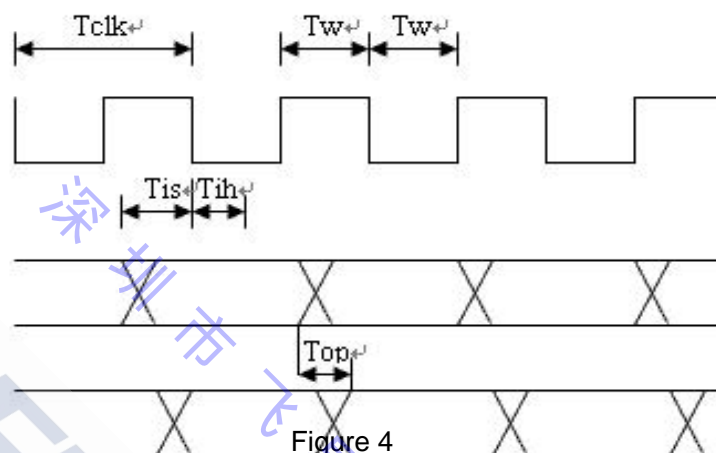


Figure 4

5.2.1 PCM Master

Symbol	Parameter	Condition	Min	Max	Unit
Tclk	Cycle time		166.67(6MHZ)	15625(64kHz)	ns
Tw	High or low pulse width		50% of Tclk time		
Tis	PCM-IN setup time		25		
Tih	PCM-IN hold time		0		
Top	PCM-OUT propagation time	40pF load	0	10	
Top	PCM-SYNC propagation time	40pF load	0	10	

Table 6

5.2.2 PCM Slave

Symbol	Parameter	Condition	Min	Max	Unit
Tclk	Cycle time		62.5(16MHZ)		ns
Tw	High or low pulse width		40% of Tclk time		
Tis	PCM-IN setup time		8		
Tih	PCM-IN hold time		0		
tis	PCM-SYNC setup time		8		
tih	PCM-SYNC hold time		0		
Top	PCM-OUT propagation time	40pF load	0	21	

Table 7

5.3 AIO and PIO lines

11 programmable bi-directional input/output (I/O) can be used.

Two general purpose analogue interface pin can be used.

LED0 and LED1 can be used as PWM channels to control LED or motor

PIO6 and PIO7 can be used as I2C interface.

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6. RECOMMENDED TEMPERATURE REFLOW PROFILE

The soldering profile depends on various parameters necessitating a set up for each Application.

The data here is given only for guidance on solder reflow.

Peak Temperature : <250°C

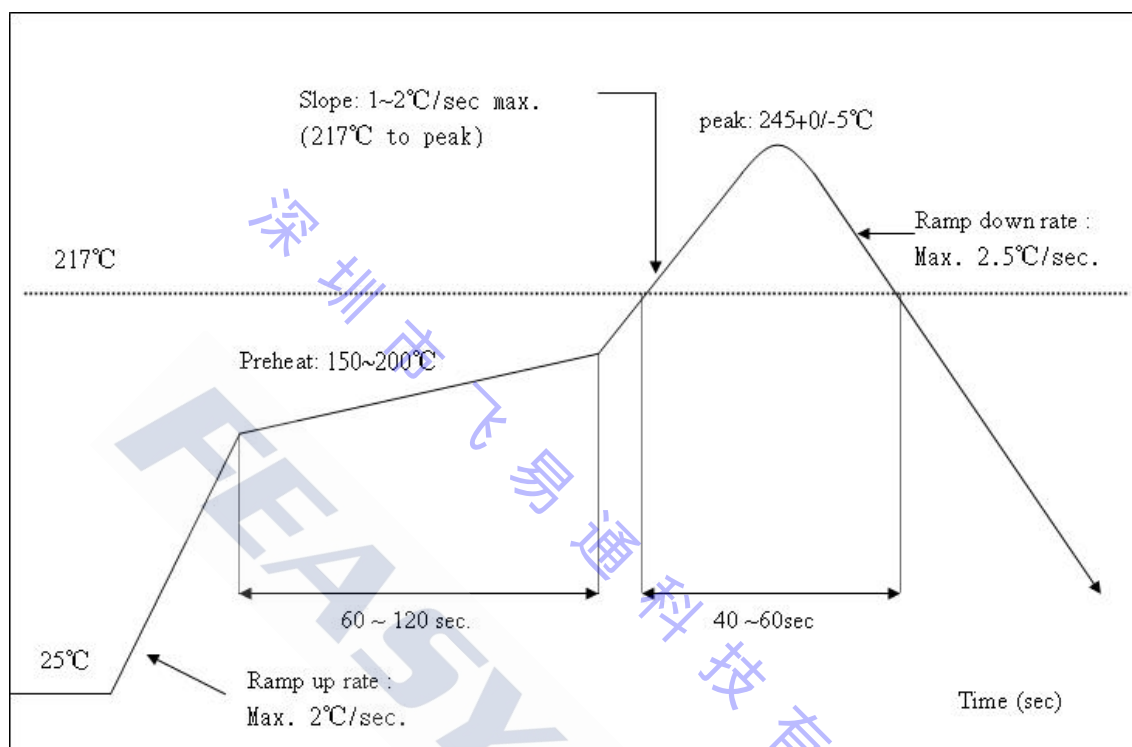


Figure 5

SPI, USB升级脚预留焊盘位置, 便于以后升级

