Bluetooth Module

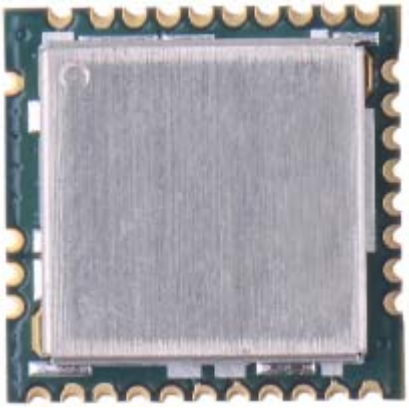
Product User Manual

Model# : BM-4088

Description:

Bluetooth v4.0 Dual Mode HCI Module

Version#: 1.6



Features:

- CSR8811 Chip
- Bluetooth v4.0+HS Class1.5 UART Module
- BT v4.0 Dual-mode / Bluetooth low energy
- Compliant with BT v2.1 EDR/ v3.0
- Transmission Rates: Up to 3Mbps
- Tx Power: +4dBm; Rx Sensitivity: -80dBm
- High speed UART interface
- Audio PCM/I2S support
- 802.11 co-existence support
- Piconet and Scatternet Support
- Dimension: 12mm x 12mm x 2.15mm

Applications:

- DSCs / PMPs / Gaming Devices / Audio
- Automation / Sports & fitness / Automotive
- Health care & Consumer wellness
- Security & Proximity / Data Transferring

Descriptions:

BM-4088 is designed for applications where a host processor is capable of running the Bluetooth software stack. It only implements Bluetooth HCI accessed by the Bluetooth software stack on a host. It supports Bluetooth v4.0 Dual-mode standard. A host can connect to BM-4088 with UART interface. The dual mode radio enables it to connect to the billions of Bluetooth products already in the market, as well as a new generation of Bluetooth low energy devices/sensors. It can be used in equipments like a handheld PND/terminal, automotive, medical/sports/fitness host devices or low cost phones.

VERSION HISTORY

Version	Date	Comment
0.1	2/23/2012	Initial Version
1.0	3/10/2012	Modify Dimension; Add Drawing
1.1	4/20/2012	Modify Power consumption
1.2	5/28/2012	PIO4,5 are reserved
1.3	6/22/2012	Add Reference Circuit
1.4	9/19/2012	Correct Reset pin definition
1.5	3/14/2013	Modify Supply Current
1.6	6/20/2013	Modify Electrical Characteristics

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Technical Support Contact Information

If you encounter any technical issues while using BM-4088, do not hesitate to contact us @AtechOEM. Our technical staff will help you resolve the technical issues. You can contact us by email or phone. The following is our technical contact:

- Hours: 9:30AM to 5:30PM (GMT+08:00)
- Email: wifi.support@atechtpe.com.tw
- Phone: +886.2.2377.0282

CONTENTS

1. Product Information

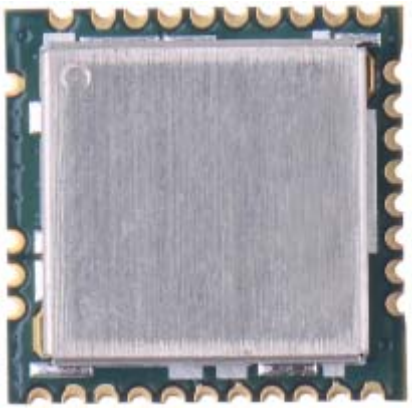
■ Product Number : **BM-4088**

■ Product Description: **Bluetooth v4.0 Dual Mode HCI Module**

■ Product Features:

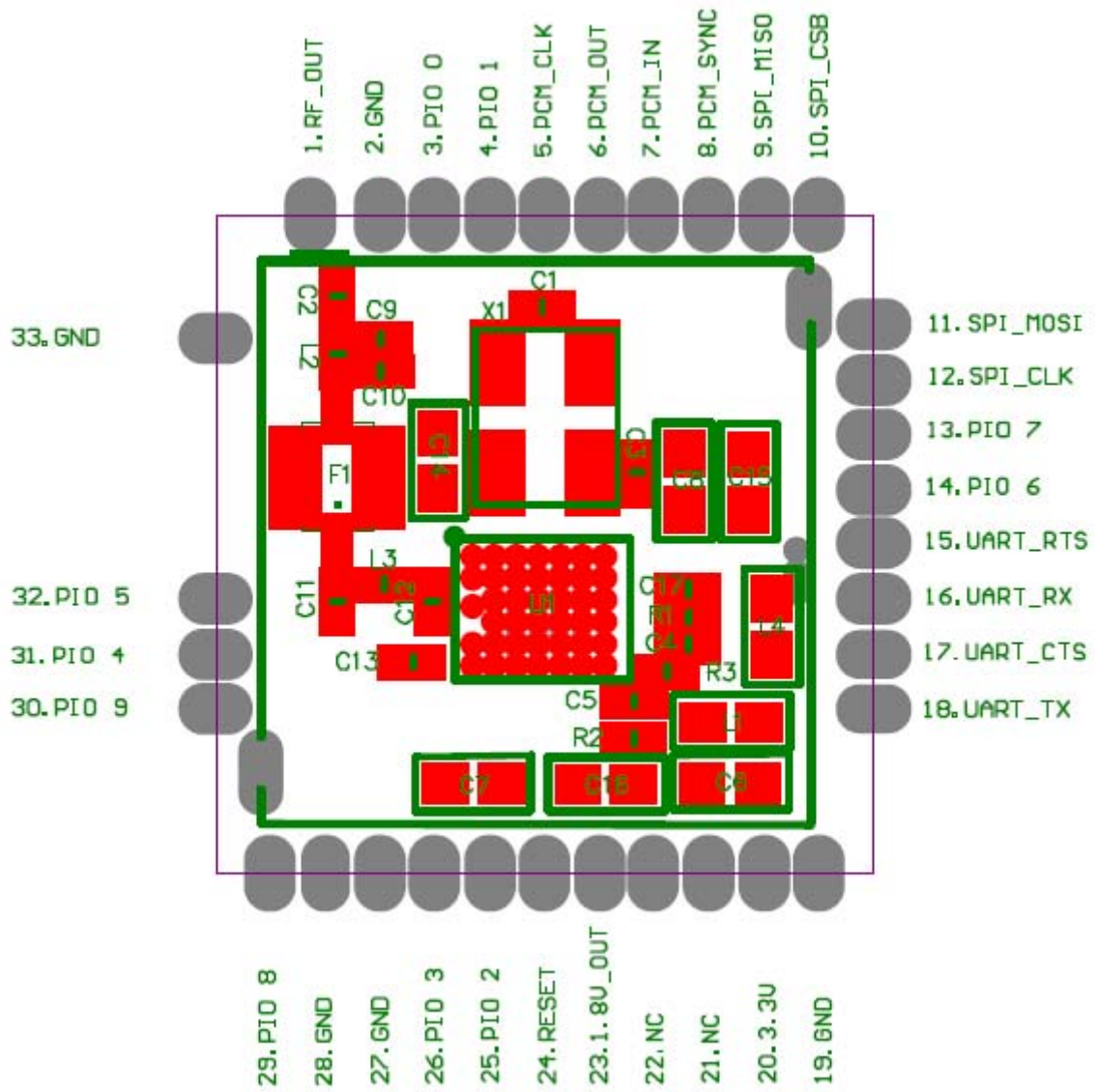
Chip	CSR8811
Standard	Bluetooth v4.0 / Bluetooth low energy (BLE) / BTv2.1 + EDR
RF band	2.4~2.4835GHz ISM band
RF Output Power	Up to +7dBm
Sensitivity	<-80dBm
Antenna	External antenna
Power voltage	3.3V
Dimension	12mm x 12mm x 2.15mm

■ Product photo :



2. Technical Information Index

2.1 Pin Assignment:

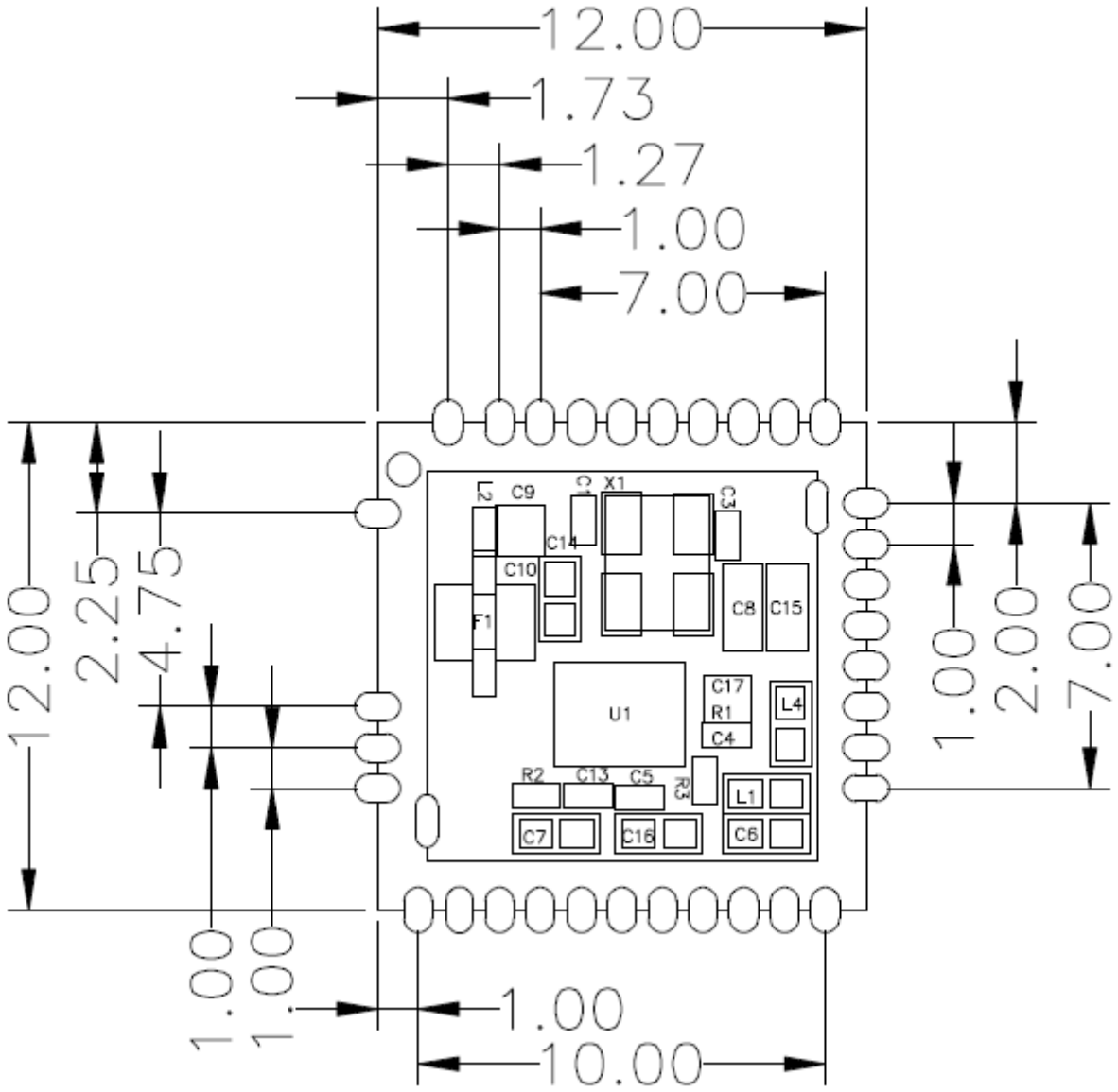


2.2 Pin Definition:

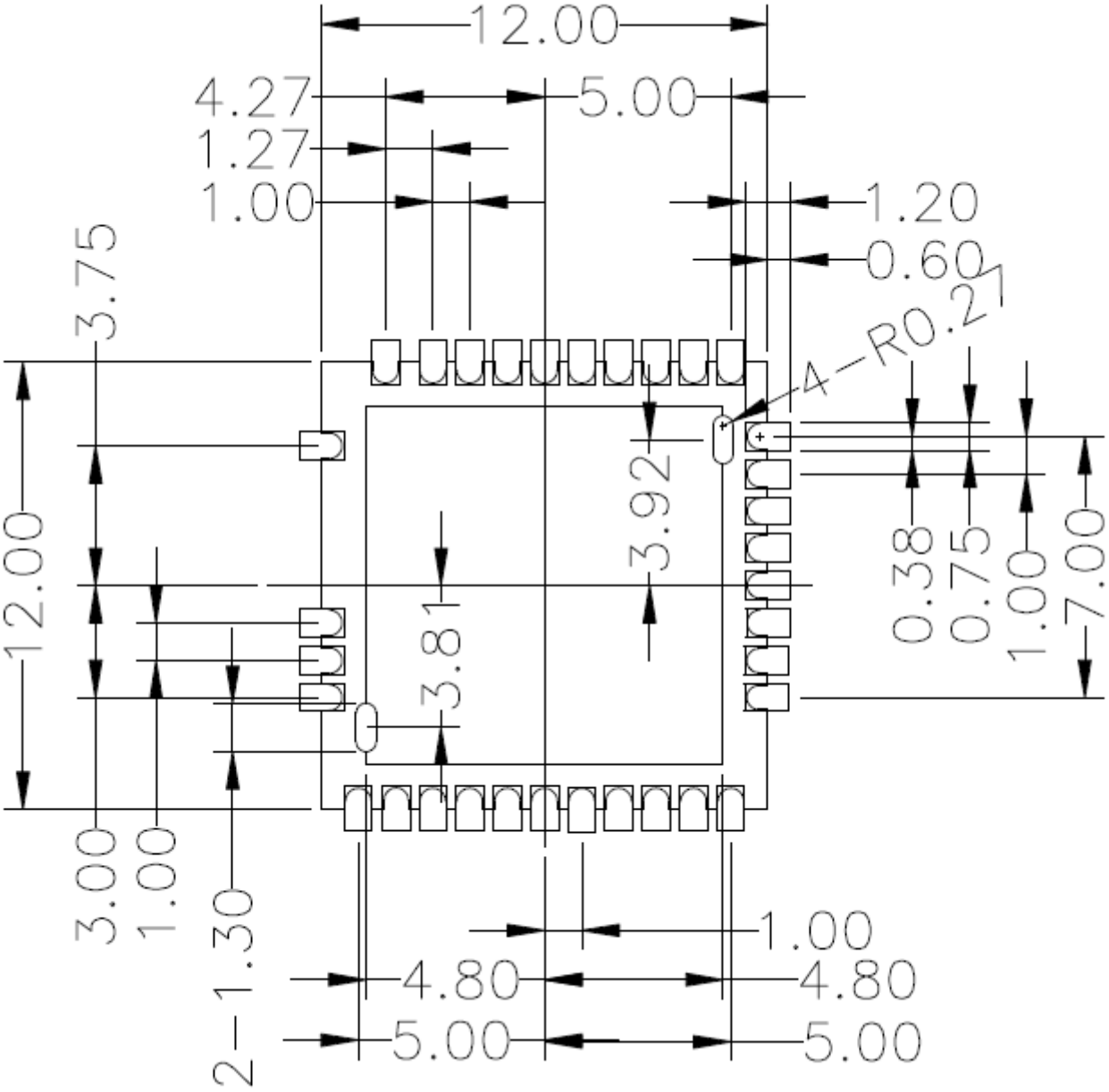
Pin No	Name	Description	Type/Remarks
1	RF_OUT	Bluetooth transmitter/receiver	RF
2	GND	-	-
3	PIO0	Programmable I/O	Bi-directional with internal pull-up/down
4	PIO1	Programmable I/O	Bi-directional with internal pull-up/down
5	PCM_CLK	Synchronous data clock	Bi-directional with weak internal pull-down
6	PCM_OUT	Synchronous data output	Output, tri-state, with weak internal pull-down
7	PCM_IN	Synchronous data input	Input, with weak internal pull-down
8	PCM_SYNC	Synchronous data sync	Bi-directional with weak internal pull-down
9	SPI_MISO	SPI data output	Reserved
10	SPI_CSB	Chip select for SPI, active low	Reserved
11	SPI_MOSI	SPI data input	Reserved
12	SPI_CLK	SPI clock	Reserved
13	PIO7	Programmable I/O	Bi-directional with internal pull-up/down
14	PIO6	Programmable I/O	Bi-directional with internal pull-up/down
15	UART_RTS	UART request to send, active low	Output
16	UART_RX	UART data input, active high	Input
17	UART_CTS	UART clear to send, active low	Input
18	UART_TX	UART data output, active high	Output
19	GND	-	-
20	3V3	-	Input
21	NC	-	Reserved-
22	NC	-	Reserved
23	1.8V_OUT	-	Output
24	RESET	Reset if low. Input debounced so must be low for >5ms to cause a reset.	Input with internal strong pull-high
25	PIO2	Programmable I/O	Bi-directional with internal pull-up/down
26	PIO3	Programmable I/O	Bi-directional with internal pull-up/down
27	GND	-	-
28	GND	-	-

29	PIO8	Programmable I/O	Bi-directional with internal pull-up/down
30	PIO9	Programmable I/O	Bi-directional with internal pull-up/down
31	PIO4	Reserved	-
32	PIO5	Reserved	-
33	GND	-	-

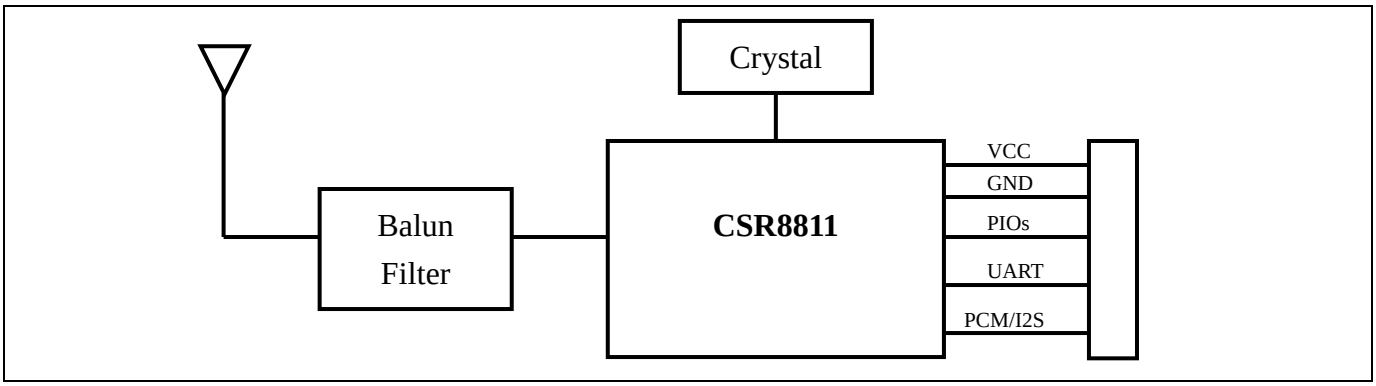
2.3 Mechanical Specification



2.4 PCB Layout Footprint



2.5 Block Diagram



2.6 Electrical Characteristics

Items	Min	Typ.	Max.	Unit
Supply Voltage	2.7	3.3	3.6	V
RX Supply Current	-	50	-	mA
TX Supply Current	-	-	70	mA
Standby Current		3.5		mA
Sleep Current	-	300	-	uA

■ Operating Conditions

Voltage Range	2.5~4.5V (TYP. 3.3V)
Operating Temperature Range	-30 °C ~ 85 °C
Storage Temperature Range	-40 °C ~ 105 °C
Relative Humidity (Operating)	≤90%
Relative Humidity (Storage)	≤90%

2.7 Radio Characteristics

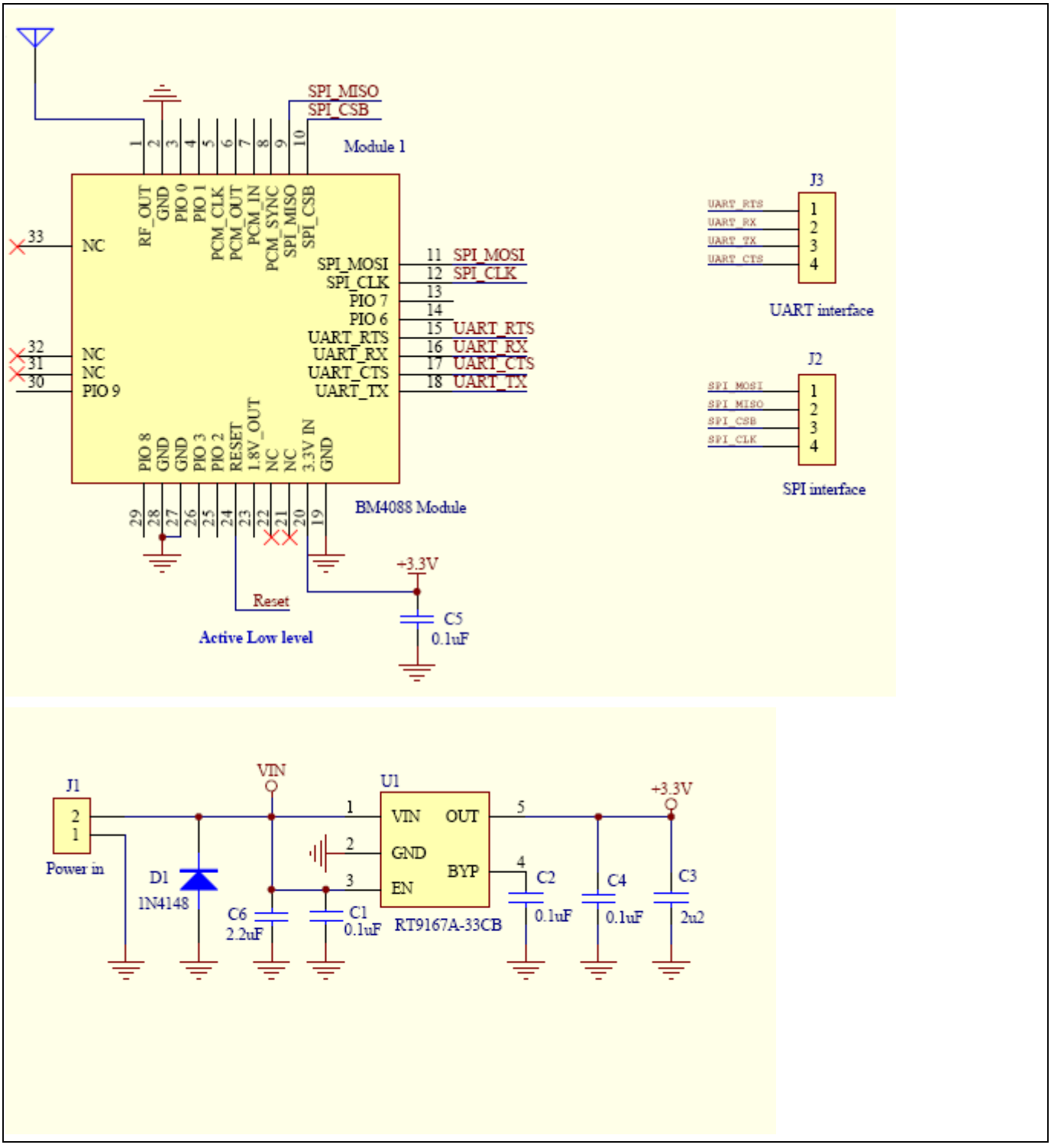
The part of BT v2.1

	Frequency (GHz)	Min	Typ	Max	BT Spec.	Unit
Sensitivity at 0.1%BER	2.402	-	-80	-	≤ −70	dBm
	2.441	-	-80	-		dBm
	2.480	-	-80	-		dBm
RF Transmit Power	2.402		5		≤4	dBm
	2.441		5			dBm
	2.480		5			dBm
Initial Carrier Frequency Tolerance	2.402	-	30	75	75	kHz
	2.441	-	30	75		kHz
	2.480	-	30	75		kHz
Drift Rate		-	8	-	±20	kHz
$\Delta f1_{avg}$ "Maximum Modulation"	2.402GHz	140	165	175	$140 < \Delta f1_{avg} < 175$	kHz
	2.441GHz	140	165	175		kHz
	2.480GHz	140	165	175		kHz
$\Delta f2_{max}$ "Minimum Modulation"	2.402GHz	115	150	-	>=115	kHz
	2.441GHz	115	150	-		kHz
	2.480GHz	115	150	-		kHz

The part of BT BLE

	Frequency (GHz)	Min	Typ	Max	BT Spec.	Unit
Sensitivity at 0.1%BER	2.402	-	5	-	≤ 30.8	dBm
	2.441	-	5	-		dBm
	2.480	-	5	-		dBm
RF Transmit Power	2.402		5		≤10	dBm
	2.441		5			dBm
	2.480		5			dBm
Initial Carrier Frequency Tolerance	2.402	-	75	-	<150	kHz
	2.441	-	75	-		kHz
	2.480	-	75	-		kHz
Drift Rate		-	10	-	±20	kHz
$\Delta f1_{avg}$ "Maximum Modulation"	2.402GHz	-	260	-	$225 < \Delta f1_{avg} < 275$	kHz
	2.441GHz	-	260	-		kHz
	2.480GHz	-	260	-		kHz
$\Delta f2_{max}$ "Minimum Modulation"	2.402GHz	-	210	-	>=185	kHz
	2.441GHz	-	210	-		kHz
	2.480GHz	-	210	-		kHz

2.8 Reference Schematics



TBD for Others.