RAK815(RAK813 BreakBoard) Datasheet V1.1

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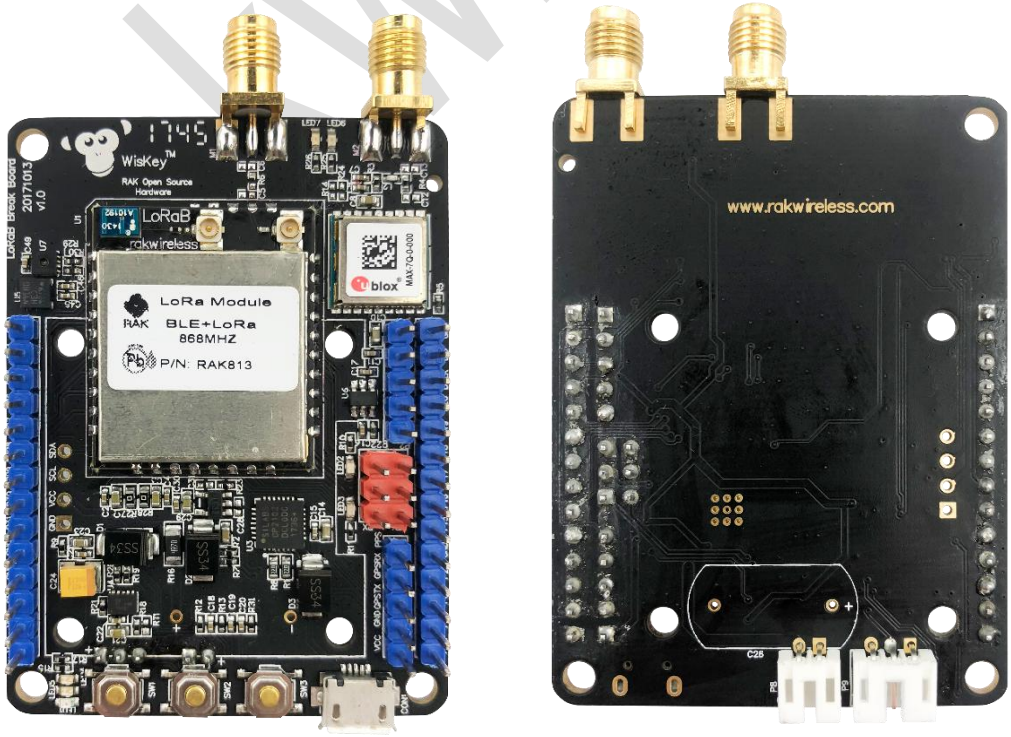
1. Introduction

RAK815(RAK813 BreakBoard) is a wireless remote solution based on the RAK813 + GPS + MEMS + HT+LCD design. It integrates the latest LoRaWAN 1.0.2 protocol and the latest Bluetooth 5.0 protocol, supports LoRaWAN working mode, supports Bluetooth transparent transmission, Bluetooth up to 300 meters.

RAK815(RAK813 BreakBoard) built-in GPS, acceleration, temperature and humidity sensors, expanded I2C LCD interface. We provide case applications that can configure LoRaWAN parameters using Bluetooth, display sensor data using LCD, and upload sensor data to the LoRaWAN network. And all the code open source. Users can find all the open source code in github. We also designed three customizable buttons and two customizable LED lights for our users, allowing users to implement they idea with open-source code.

RAK815(RAK813 BreakBoard) is also a support for battery-powered products. Greatly expanded product application scenarios. We also designed the function to enter the low power mode when the device is detected to be stationary to ensure battery life. The device also supports RAK831 + Ri3 gateway to use, you can graphically display the various data of the sensor in the Cayenne platform, but also support the real-time observation of sensor data on the phone.



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2. Feature

Model	RAK815(RAK813 BreakBoard)
Device size	74mm x 43mm x17mm(With antenna interface)
Battery	2200mAh (To be ordered individually)
Battery working time	2 year(Chargeable)
Power consumption	TBD
Operation temperature	-20℃ ~ 60℃
Working environment	Outdoor/Indoor
Equipped with module	RAK813+GPS+MEMS+HT+LCD
LoRaWAN Version	V1.0.2
Bluetooth Version	5.0
LoRa Network Activation	ABP and OTAA
Open source code	Yes
Charging interface	Micro USB

Note: the open source code link: https://github.com/RAKWireless/RAK813-BreakBoard

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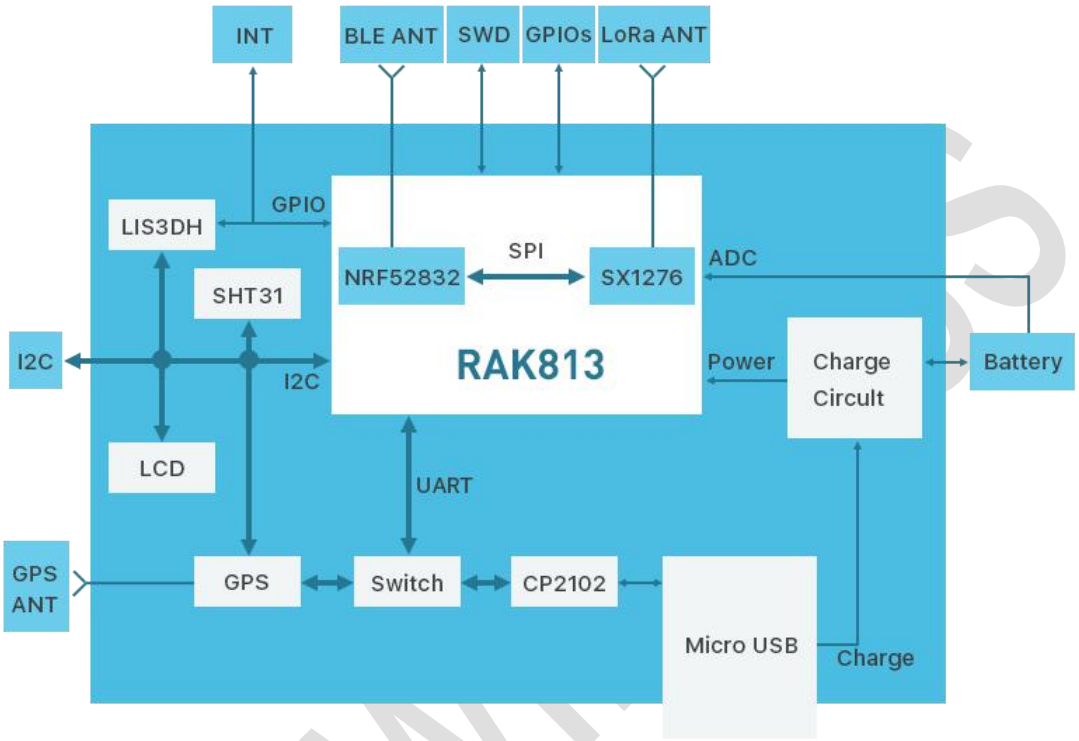
3. System Diagram



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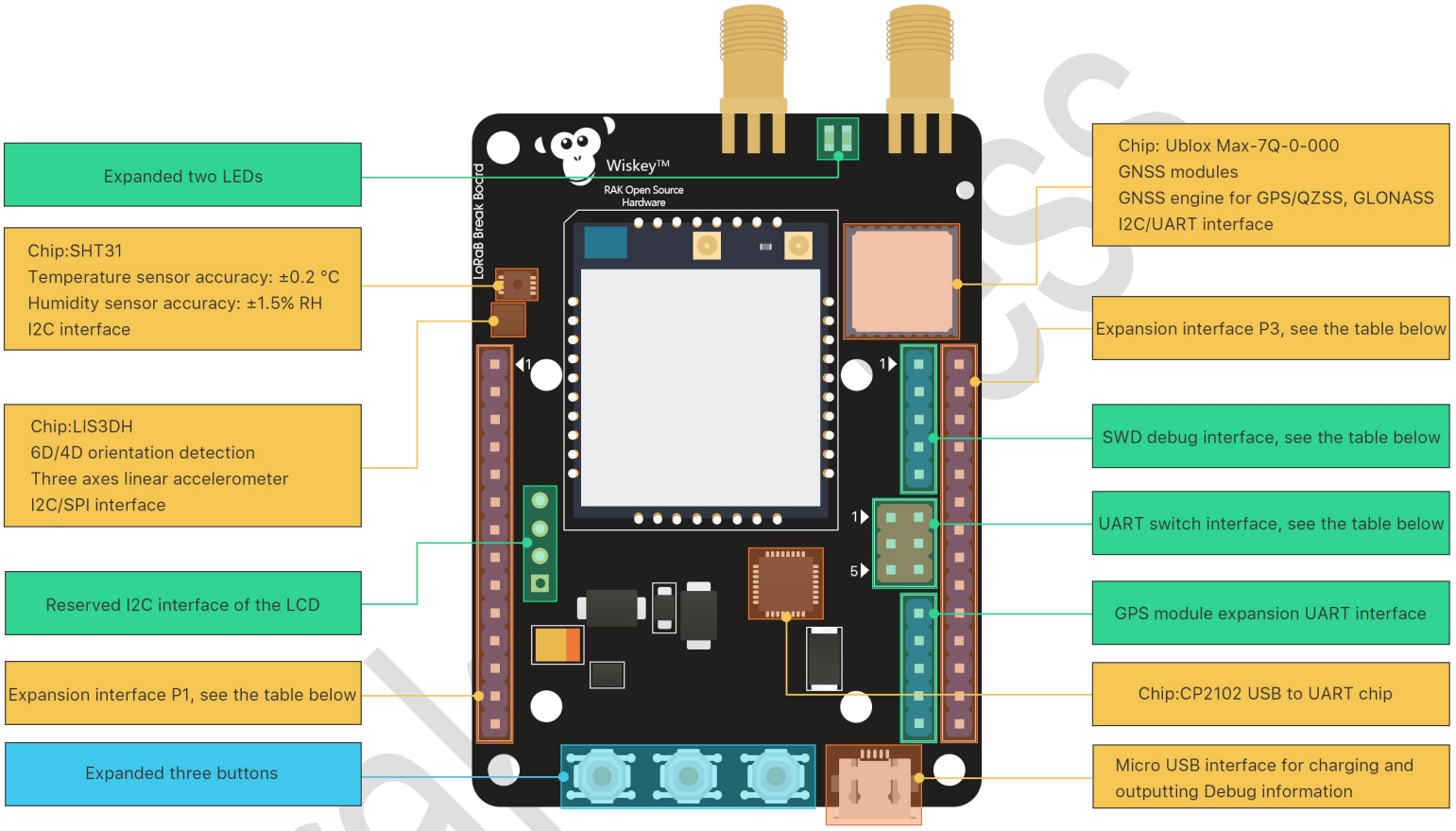
4. Pin definition



SWD debug interface(The numbers are sorted from top to bottom)		
Pin	Name	Description
1	VCC3.3	3.3V power supply
2	SWDIO	SWD interface data pin for NRF52832
3	SWDCLK	SWD interface clock pin for NRF52832
4	P0.21_NRST	P0.21 for NRF52832, Can be used as Reset pin(Button3)
5	GND	Ground
UART switch interface(The numbers are sorted from top to bottom)		
Pin	Name	Description

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1	GPS_TXD	UART TXD pin for GPS module
2	GPS_RXD	UART RXD pin for GPS module
3	P0.28	P0.28 for NRF52832, Used as UART RXD
4	P0.29	P0.29 for NRF52832, Used as UART TXD
5	TXD	The CP2102 converts the USB to the TXD pin of the UART
6	RXD	The CP2102 converts the USB to the RXD pin of the UART

Extension interface P1(The numbers are sorted from top to bottom)		
Pin	Name	Description
1	GND	Ground
2	P0.24	P0.24 for NRF52832, Used to control the expansion Button2
3	P0.25	P0.25 for NRF52832, Used to control the expansion LED6
4	P0.26	P0.26 for NRF52832, Used to control the expansion LED7
5	P0.27	P0.27 for NRF52832, Used to control the expansion Button1
6	P0.28	P0.28 for NRF52832, Used as UART RXD
7	P0.29	P0.29 for NRF52832, Used as UART TXD
8	P0.30	P0.30 for NRF52832, Used to control GPS module PPS
9	P0.31	P0.31 for NRF52832, Used to control GPS module power
10	GND	Ground
11	GND	Ground
12	GND	Ground
13	VCC3.3	3.3V power supply
14	VCC3.3	3.3V power supply

Extension interface P3(The numbers are sorted from top to bottom)		
Pin	Name	Description
1	GND	Ground
2	SWDIO	SWD interface data pin for NRF52832
3	SWDCLK	SWD interface clock pin for NRF52832
4	P0.20	P0.20 for NRF52832
5	P0.19	P0.19 for NRF52832
6	P0.18	P0.18 for NRF52832
7	P0.17	P0.17 for NRF52832
8	P0.16	P0.16 for NRF52832, Used as I2C SCL
9	P0.15	P0.15 for NRF52832, Used as I2C SDA
10	GND	Ground
11	P0.21_NRST	P0.21 for NRF52832, Can be used as Reset pin(Button3)
12	P0.04	P0.04 for NRF52832, Used to control LIS3DH module INT1
13	P0.03	P0.03 for NRF52832, Used to control LIS3DH module INT2
14	P0.02	P0.02 for NRF52832, Used as ADC to detect battery charge

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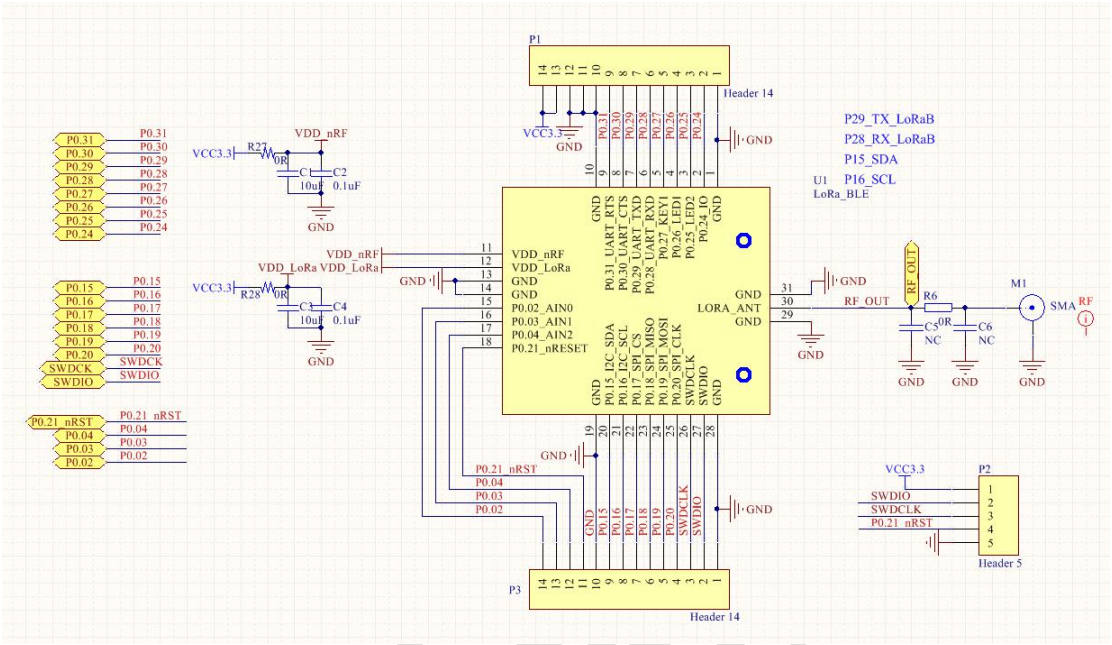
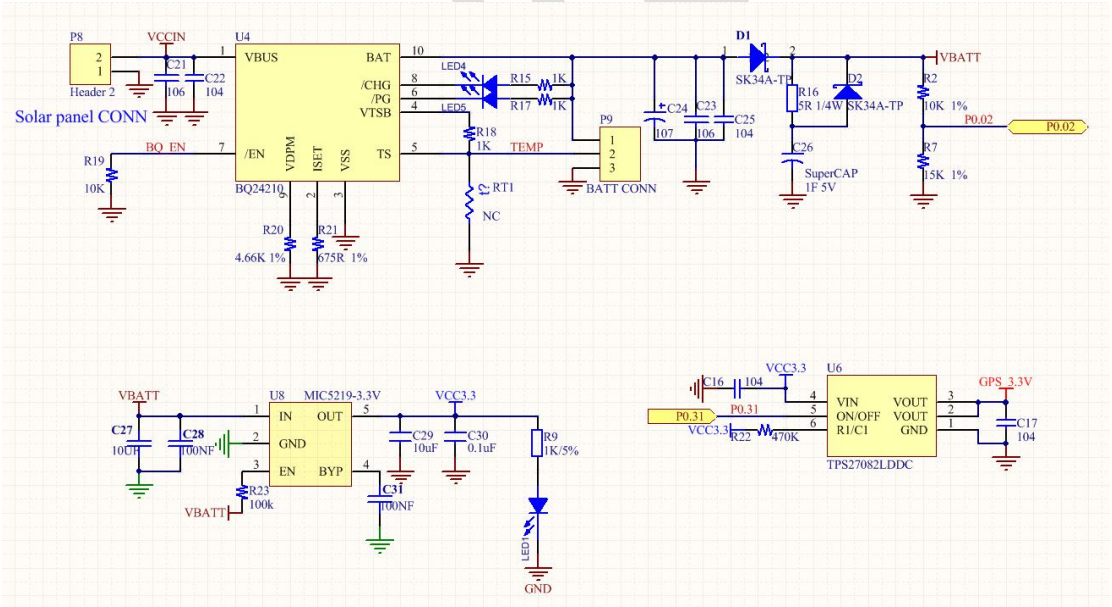
5. Hardware Schematics





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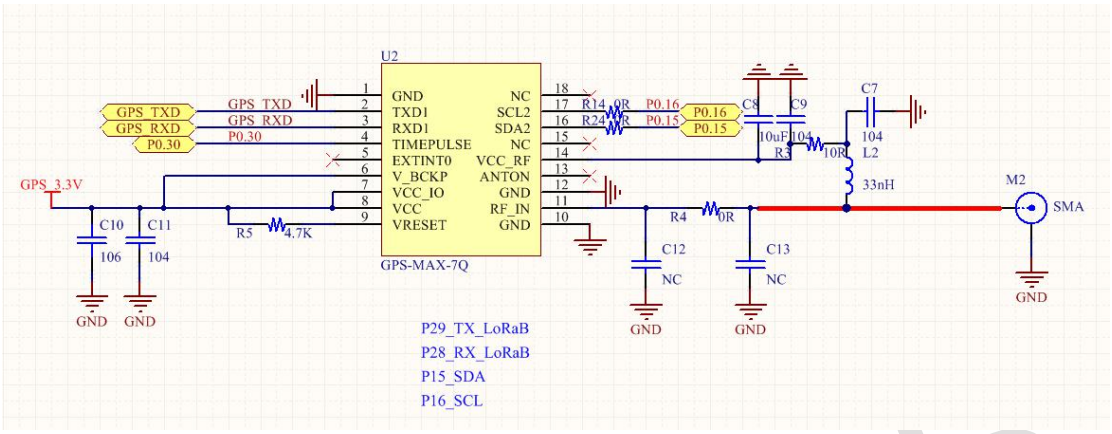

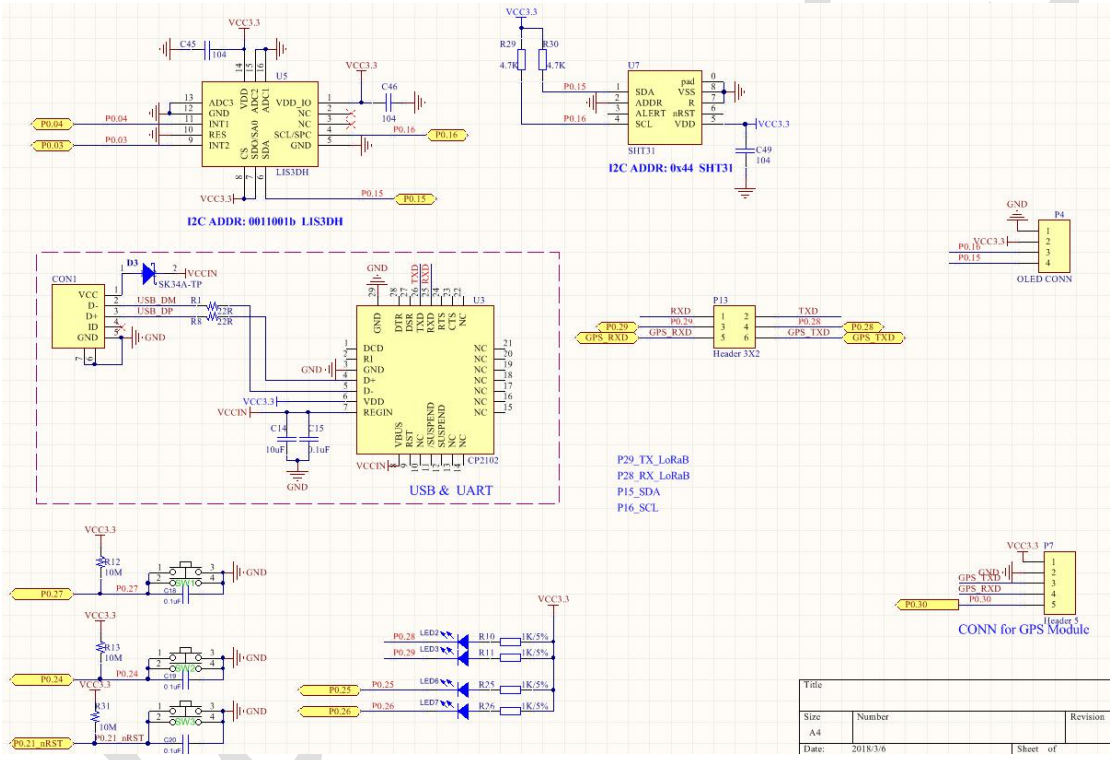

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6. Ordering Information

Product	Describe	Activation
RAK815(RAK813 BreakBoard)	LoRaWAN Region Support EU868,US915,AS923,AU915, KR920,IN865	OTAA/ABP

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7. Contact information

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8. Revision History

Version	Date	Change	Author
V1.0	2017-12-7	First release	Chace
V1.1	2018-3-6	Update schematics and product names	Chace

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