REYAX
TECHNOLOGY CORPORATION, LTD

18-Jan-2021 56312E39

RYS8830

Small form factor & Ultra Low Power 1.8V UART/I2C interface GNSS antenna module

Datasheet

11*11*2.2mm

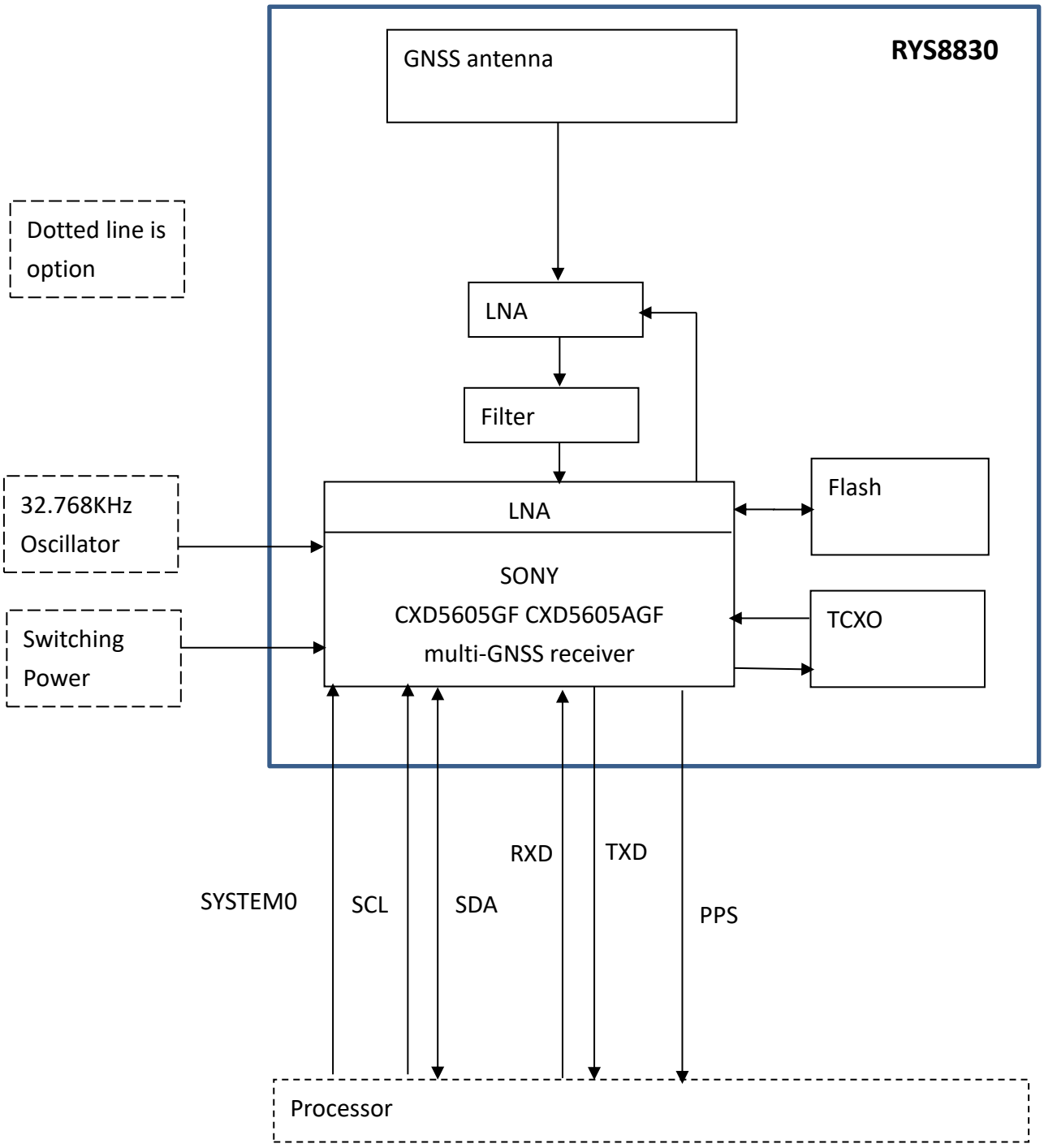
PRODUCT DESCRIPTION

The REYAX RYS8830 is built on the high performance of the SONY CXD5605GF CXD5605AGF GNSS engine. The RYS8830 modules utilize concurrent reception of GNSS systems offering high sensitivity in a small SMD form factor

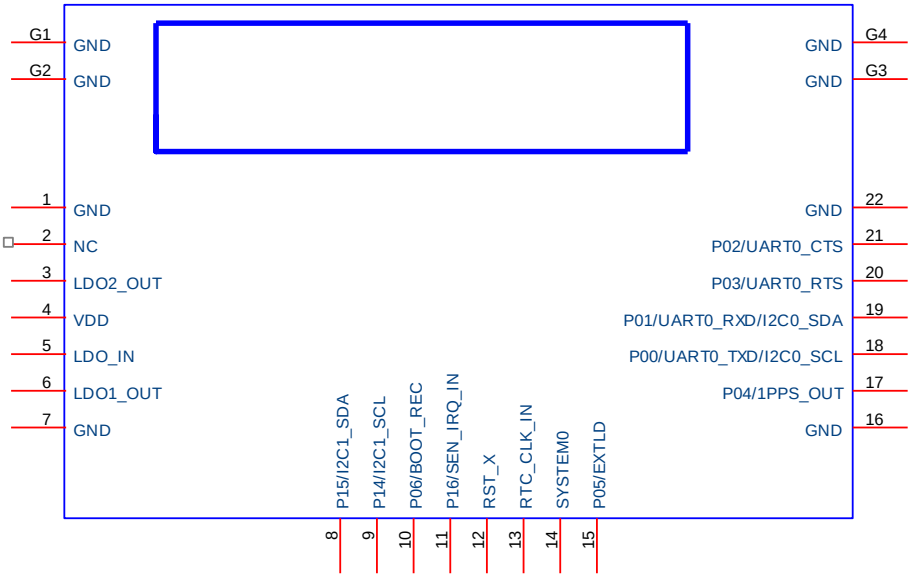
FEATURES

- SONY CXD5605GF CXD5605AGF multi-GNSS receiver for GPS, GLONASS, SBAS, QZSS, BeiDou and Galileo
- Small SMD form factor 121mm^2
- Enhanced GNSS Filter and Low Noise Amplifier
- Ultra-low power consumption
- Up to Position accuracy 1.0 m CEP
- Embedded Antenna
- Optional external antenna

BLOCK DIAGRAM

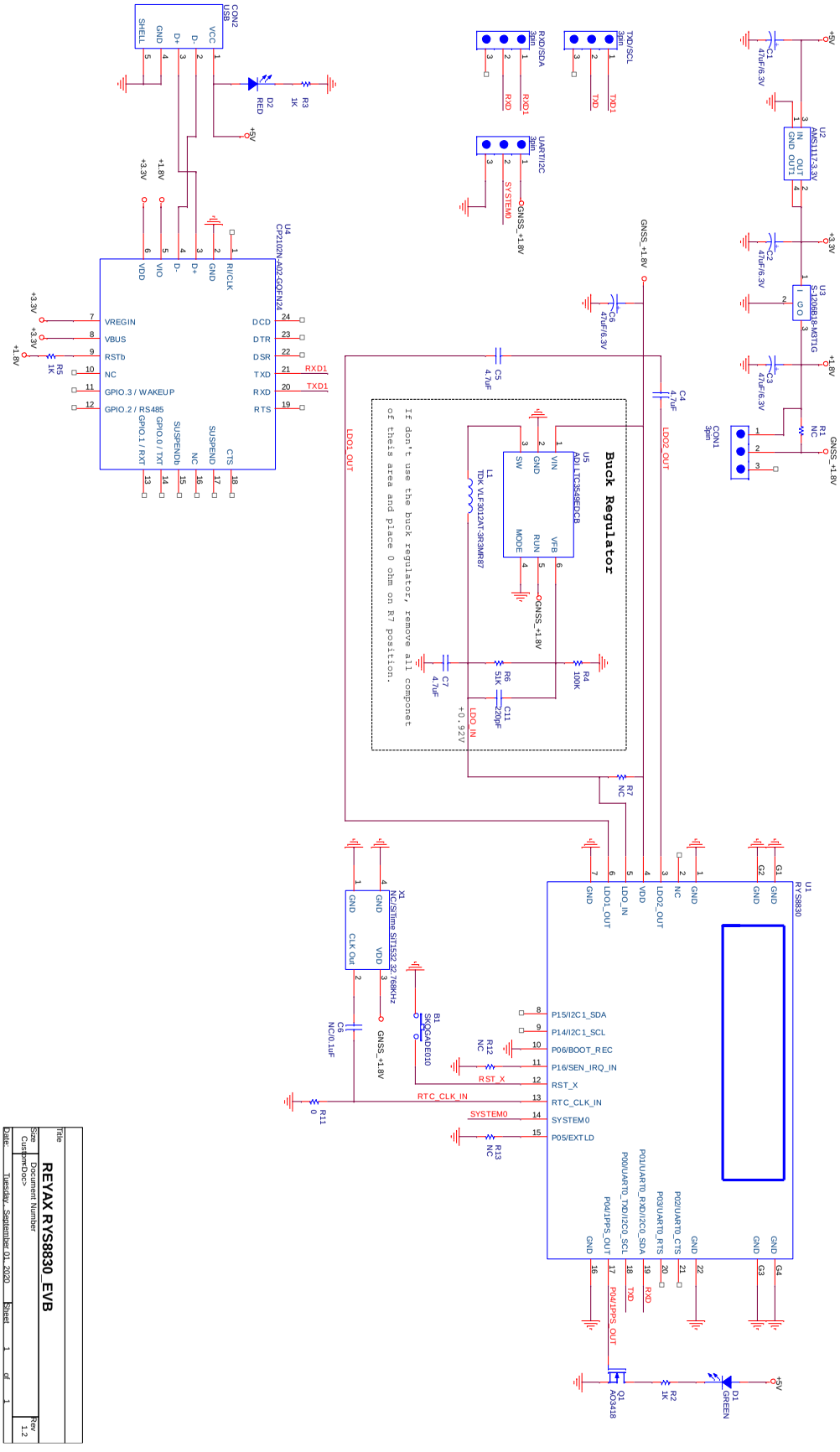


PIN DESCRIPTION



Pin	Name	I/O	Condition
1	GND	-	Ground
2	Reversed	-	Leave Unconnected.
3	LDO2_OUT	O	LDO output for memory core blocks.
4	VDD	I	Power supply
5	LDO_IN	I	LDO0 / LDO1 Input
6	LDO1_OUT	O	LDO output for digital block.
7	GND	-	Ground
8	I2C_SDA	I/O	I2C SDA *If not used, Please Leave Unconnected.
9	I2C_SCL	I/O	I2C SCL *If not used, Please Leave Unconnected.
10	BOOT_REC	I/O	BOOT Recovery. *If not used, Please connect to GND.
11	SEN_IRQ_IN	I	Interrupt input. *If not used, Please Leave Unconnected.
12	RST_X	I	Low Reset
13	RTC_CLK_IN	I	RTC 32.768KHz clock input, The pin must be connected to GND, If not used.
14	SYSTEM0	I	H : UART L : I2C
15	EXTLD_IN	I	Timing signal input, from LTE module. *If not used, Please Leave Unconnected.
16	GND	-	Ground
17	P04/1PPS_OUT	O	Time pulse output, 1PPS output
18	TXD/SCL	O	Serial interface Output / I2C interface
19	RXD/SDA	I/O	Serial interface Input / I2C interface
20	Reversed	-	Leave Unconnected.
21	Reversed	-	Leave Unconnected.
22	GND	-	Ground
G1	GND	-	Ground
G2	GND	-	Ground
G3	GND	-	Ground
G4	GND	-	Ground

APPLICATION SCHEMATIC

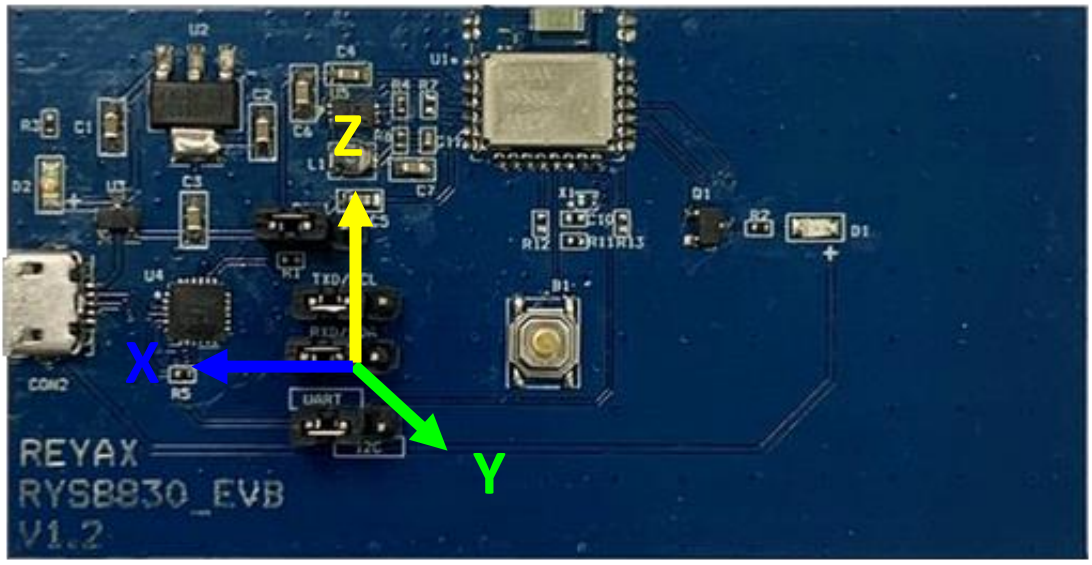


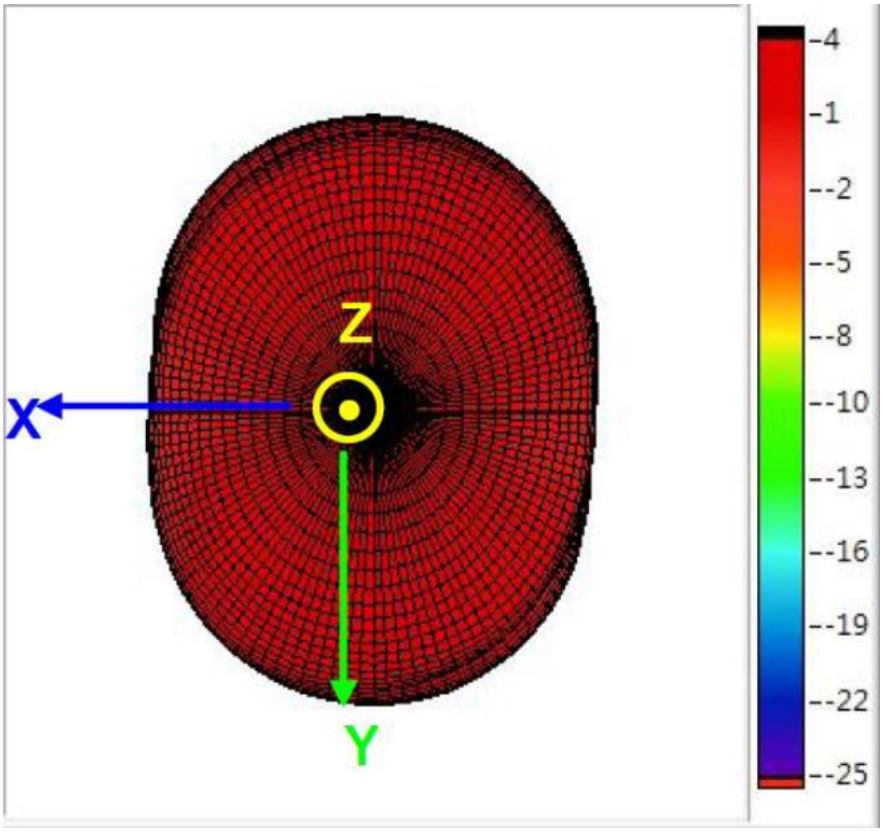
SPECIFICATION

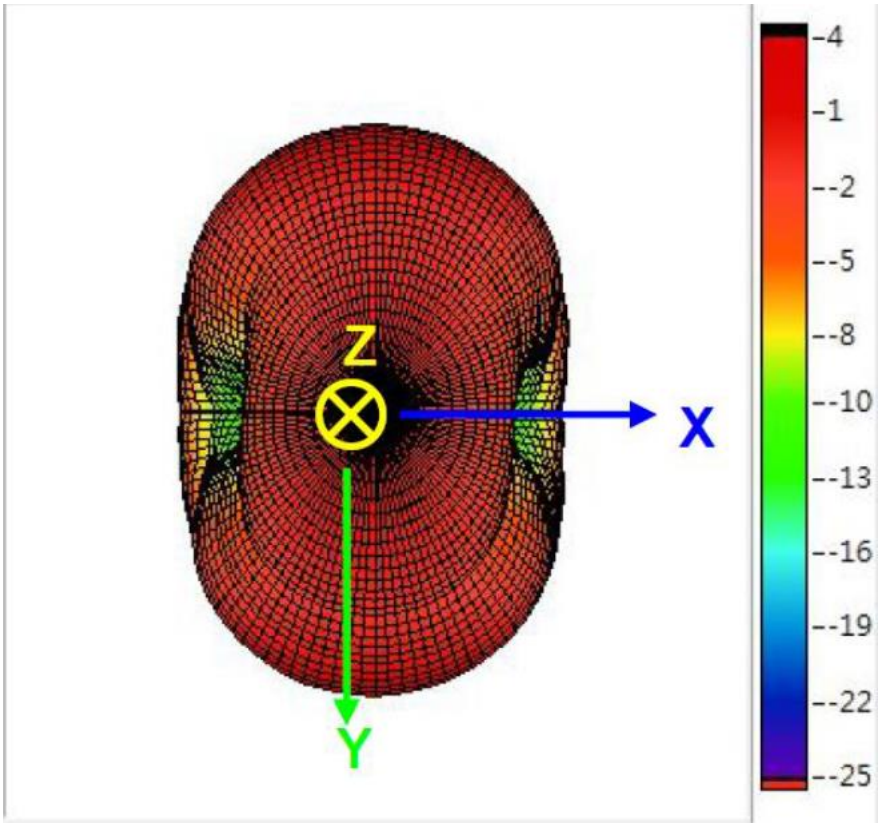
Item	Min.	Typical	Max.	Unit	Condition
Power Supply Voltage	1.71	1.8	1.89	V	VDD
	0.9	1.8	1.95	V	VDD_LDO_IN
GNSS continuous mode					
Satellite acquisition Current		19		mA	
Satellite tracking Current		13		mA	
Idle Current		3		mA	Waiting for command
Sleep2 mode current		200		uA	
Satellite acquisition Current		11.5		mA	Use buck regulator
Satellite tracking Current		8.2		mA	Use buck regulator
Idle Current		2.6		mA	Use buck regulator
Sleep0 mode current		500		uA	Use buck regulator
Sleep1 mode current		170		uA	Use buck regulator
Sleep2 mode current		170		uA	Use buck regulator
GNSS low power mode					
Satellite tracking average current	2.6		8.2	mA	Use buck regulator @GSOP command Sleep1 and normal mode cycle
I2C slave					I2C clock : 400kHz Address length : 7 bits Slave address : 0x24
Default Baud Rate		115200		bps	8,N,1
Digital input level high	0.7*VDD		VDD+0.3	V	VIH
Digital input level low	-0.3		0.3*VDD	V	VIL
Digital output level high	0.8*VDD		VDD	V	VOH 2mA
Digital output level low	0		0.2*VDD	V	VOL 2mA
Flash size		16		M-bit	
GNSS Center Frequency		1561.098 1575.42 1602.5625		MHz	BeiDou GPS Glonass
Navigation update rate		1		Hz	
Accuracy		1		M	Signal strength is -130dBm
Cold starts		35		Sec.	Signal strength is -130dBm
Hot starts		1		Sec.	

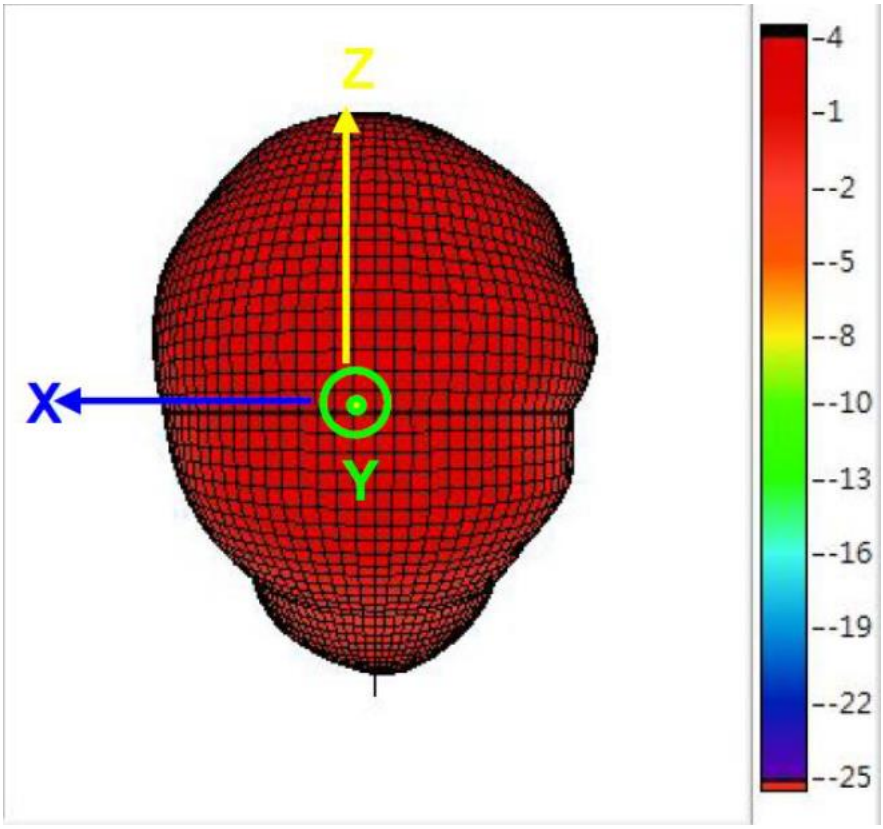
Tracking Sensitivity		-161		dBm	
Hot starts Sensitivity		-160		dBm	
Cold starts Sensitivity		-147		dBm	
Operating Temperature	-40	25	+85	˚C	
Dimensions					11mm*11mm*2.2mm
Weight		0.43		g	

3D Antenna Radiation Pattern

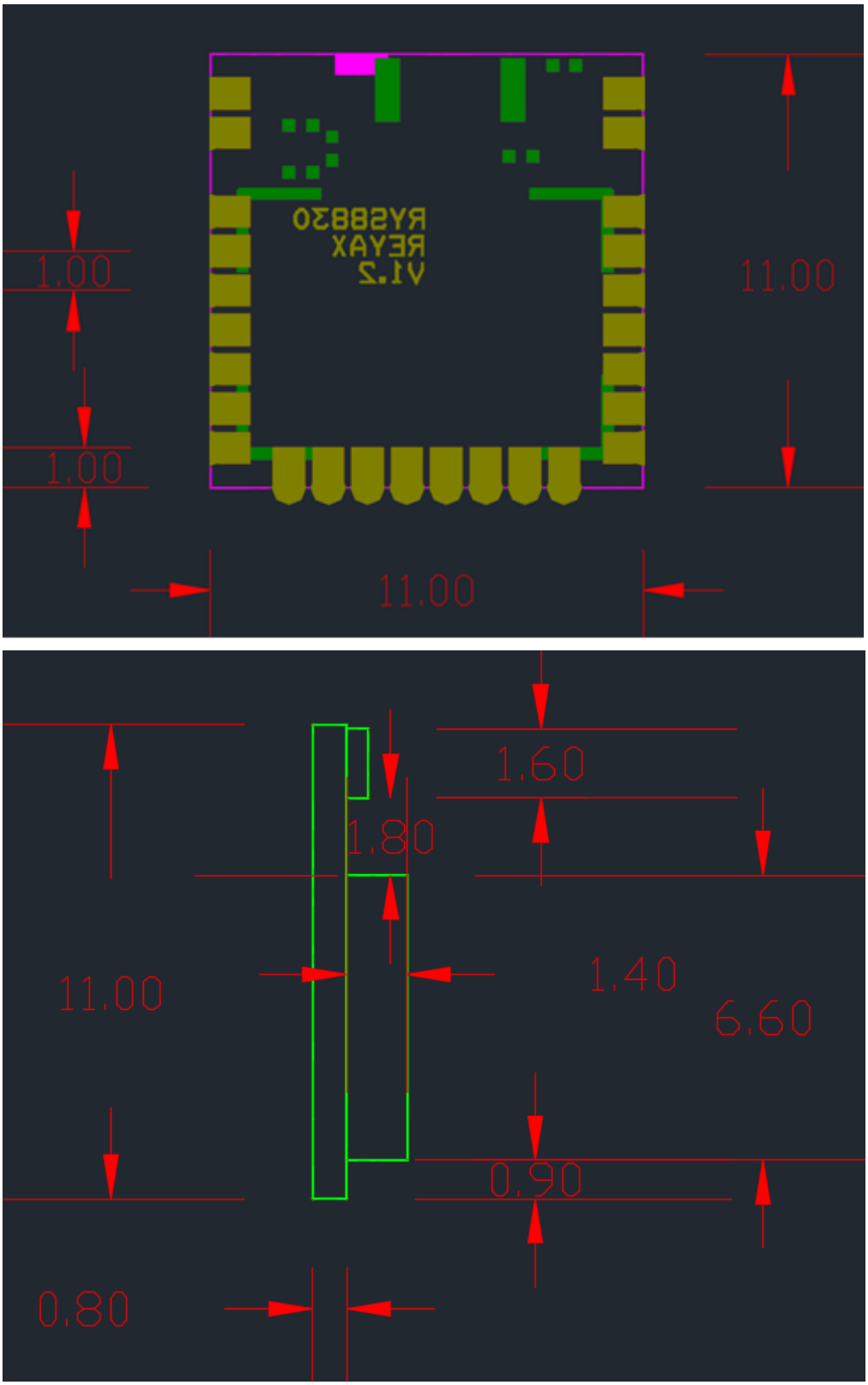






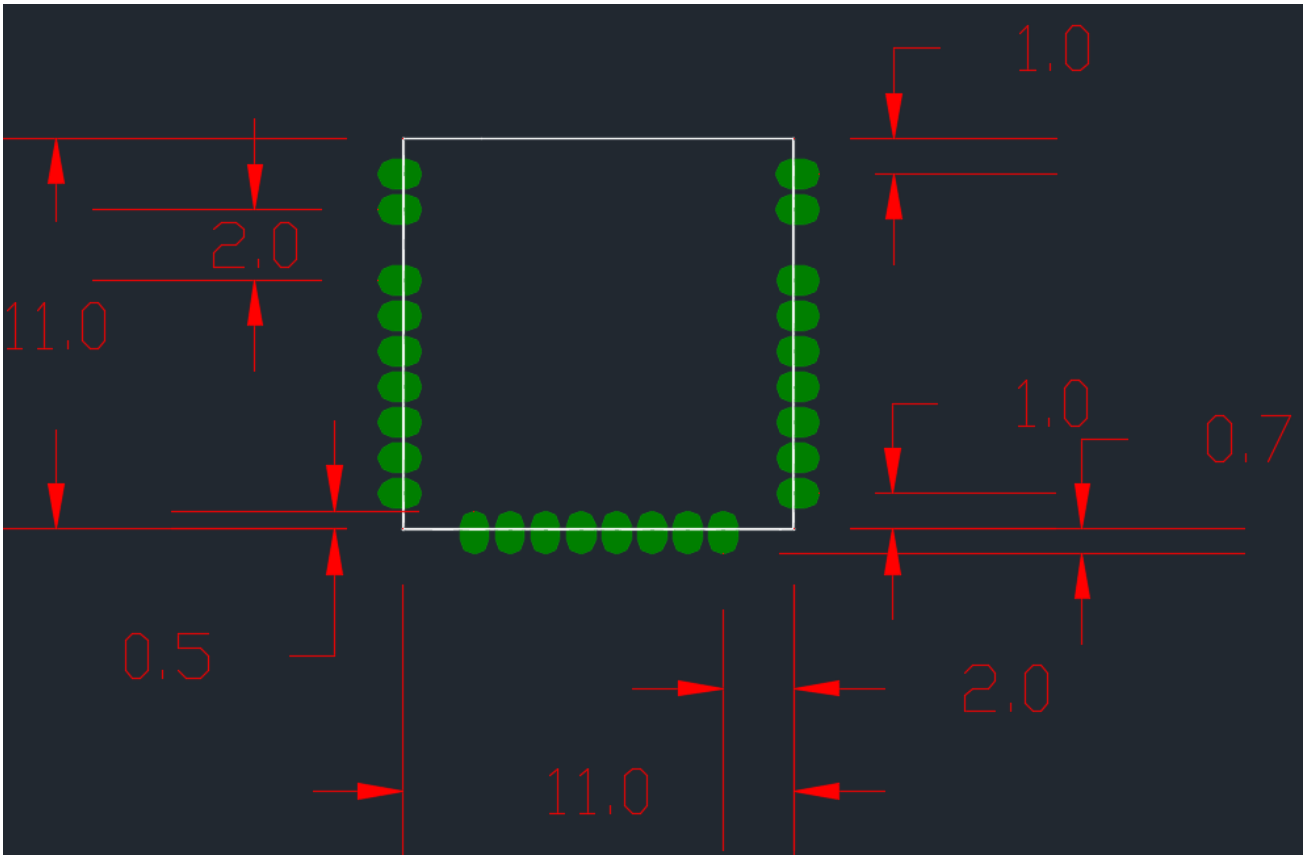


DIMENSIONS



Unit : mm

PCB FOOTPRINT



Unit : mm

PCB LAYOUT GUIDE

[1] Avoid placing any metal material between the RYS8830 and the sky.

[2] Avoid placing the module at the corner of the PCB. This will reduce the efficiency of the signal.

[3] The best placement of the module is at the center of the PCB but close to the edge; keep at least 10 mm distance to the nearest ground plane corner.

[4] The height >2mm components should be placed at least 5 mm away from the RYS8830.

[5] The minimum distance between the plastic cover and the RYS8830 should be 1mm.

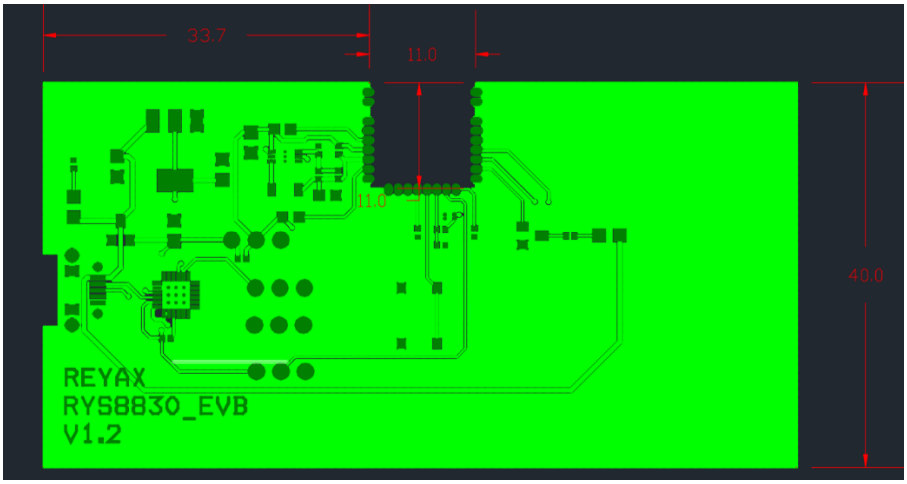
[6] The Placement of the module should keep a minimum distance of 5 mm from the human body or the animal.

[7] The optimum PCB size is 78x 40 mm, but a larger or smaller ground plane can be used. The suggested minimum ground plane size is 40 x 20 mm.

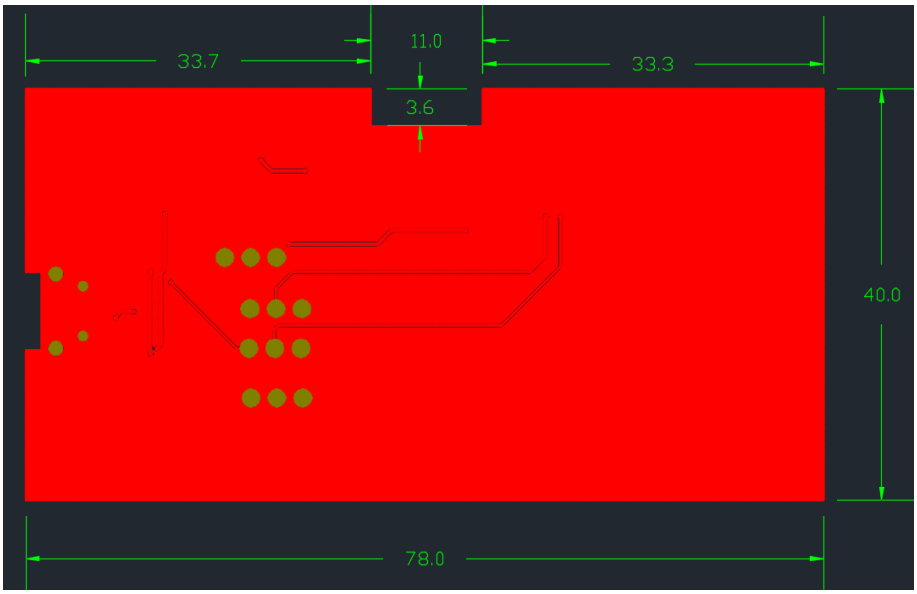
[8] Place more GND via hole as close as possible to the RYS8830.

[9] Keep the VDD voltage ripple under 30mVpp.

PCB TOP LAYER



BOTTOM LAYER



Unit : mm

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