CC2500MPATR2.4

带 PA 和 LNA 的 2.4G 无线数传模块

1.Description

is a TI transceiver module based on CC2500IC design.It provides extensive hardware support for packet handling ,data buffering ,burst transmissions ,clear channel assessment, link quality indication and wake on radio . It 's data stream can be manchester coded by the modulator and decoded by the demodulator .It has a high performance and easily to design your product.It can be used in 2409.3-2457.3MHz ISM/SRD band systems,Consumer Electronics, Wireless game controllers,Wireless audio and others wireless systems. we support the frequency have 2409.3-2457.3MHz ISM Band modules now

Features	基本特征
Low current consumption.	●低电流损耗
Easy for application.	●方便投入应用
Efficient SPI interface	●高效的串行编程接口
Operating temperature range	●工作温度范围：﹣40℃～＋85℃
Operating voltage	●工作电压：1.8~ 3.6 Volts.
Available frequency at	●有效频率：2409.3MHz~2457.3MHz
Programmable output power and hi sensitivity	●灵敏度高、输出功率可编程

3. BOM list for the modules:

N/A

4. Schematic Diagram

N/A

5. Pin Descriptions 管脚描述

Pin No	Pin Name	Pin Type	Description 一般描述
1	VCC	Power	1.8V-3.6V power 1.8~3.6 电源
2	SI	Digital Input	Serial configuration interface, data input 串行配置接口，数据输入
3	SCLK	Digital Input	Serial configuration interface, clock input 串行配置接口，时钟输入
4	SO	Digital Output	Serial configuration interface, data output. 串行配置接口，数据输出 Optional general output pin when CSn is high CSn 高电平时，可选通用输出
5	GDO2	Digital Output	Digital output pin for general use: 通用数字信号输出： • Test signals • 测试信号 • FIFO status signals • 先进先出堆栈状态信号 • Clear Channel Indicator • 空闲信道指示 • Clock output, down-divided from XOSC • 时钟输出，从 XOSC 分频 • Serial output RX data • 串行输出接收数据
6	GND	Ground	GND 地

7	GDOo	Digital 0/I	Digital output pin for general use: 通用数字信号输出： • Test signals • 测试信号 • FIFO status signals • 先进先出堆栈状态信号 • Clear Channel Indicator • 空闲信道指示 • Clock output, down-divided from XOSC • 时钟输出，从 XOSC 分频 • Serial output RX data • 串行输出接收数据 Serial intput RX data • 串行输入接收数据
8	CSn	Digital Input	Serial configuration interface, chip select 串行配置接口，芯片选择
9	PA_EN	Digital Input	When TX status set "1", RX set"0" Tx 发射状态时设置为 "1" RX 接收设置为 "0"
10	LNA_EN	Digital Input	When RX status set "1", TX set"0" Rx 接收状态时设置为 "1" TX 发射设置为 "0"

Absolute Maximum Ratings 极限参数

Parameter（参数）	Rating（额定值）	Units（单位）
Supply Voltage（工作电压）	2-3.6	V DC
Operating Temperature（工作温度）	-40 to +85	℃

Package Description 外型说明
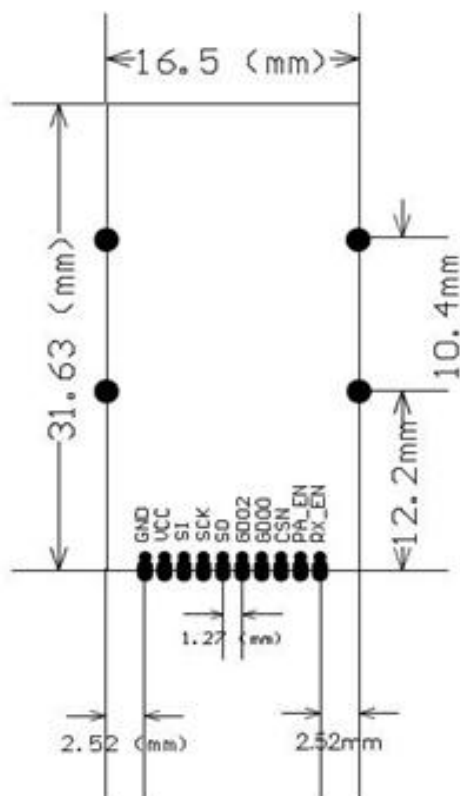
6. Electrical Specifications　电气特性

Tc = 25°C, VDD = 3.0V

Parameter	Min	Typ	Max	Unit	Condition
Current consumption, 消耗电流		150		mA	Transmit mode, +17dBm output power

General Characteristics　一般特性

N/A

Application Circuit　典型应用电路
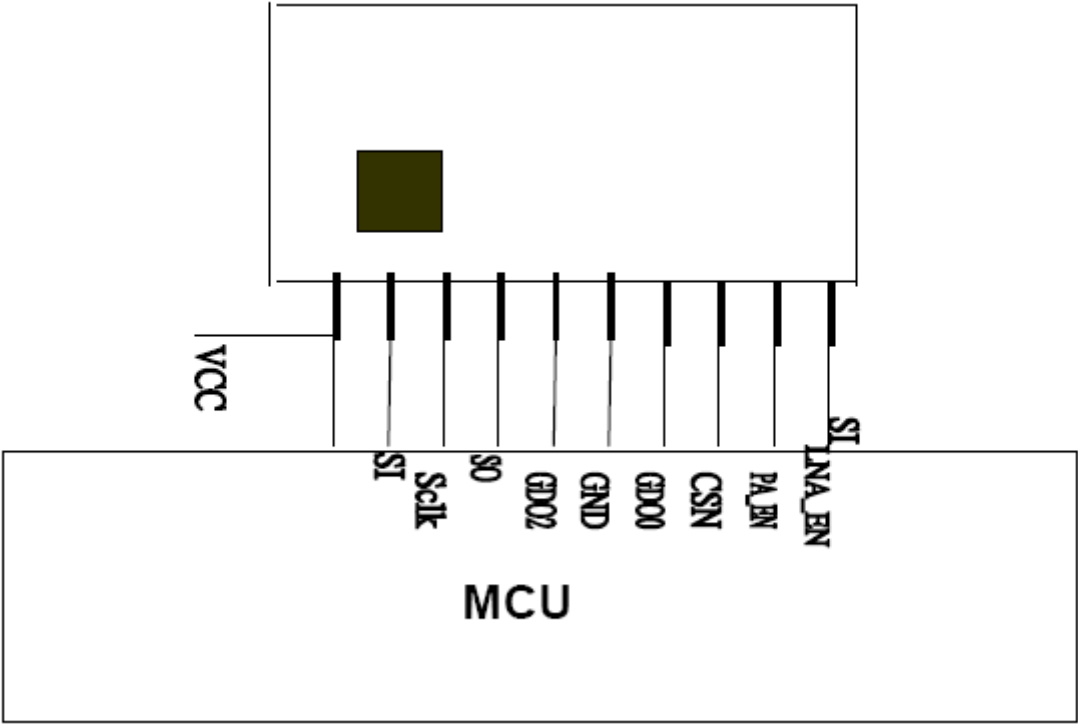
6.1 RF receiver section RF 接收部分

Tc = 25°C, VDD = 3.0V

Parameter	Min	Typ	Max	Unit	Condition/Note
Receiver sensitivity 接收灵敏度		−112		dBm	2-FSK, 2.4kbps, 38kHz deviation, , 1% packet error rate, 20 bytes packet length, 203 kHz digital channel filter bandwidth
		−105		dBm	10 kbps data rate, FSK, 1% packet error rate, 20 bytes packet length, 232 kHz digital channel filter bandwidth
		-95		dBm	250kbps, MSK, 1% packet error rate, 20 bytes packet length, 540 kHz digital channel filter bandwidth
		-89		dBm	500Kbps, MSK, 1% packet error rate, 20 bytes packet length, 812 kHz digital channel filter bandwidth
Saturation输入饱和度		−13		dBm	
Digital channel filter bandwidth数字通道滤波器带宽	58		650	kHz	User programmable. The bandwidth limits are proportional to crystal frequency (given values assume a 26.0MHz crystal).

6.2 RF Transmit Section   RF 发射部分

Tc = 25°C, VDD = 3.0V

Parameter	Min	Typ	Max	Unit	Condition/Note
Differential load impedance差分负载阻抗		80 + j74		Ω	Differential impedance as seen from the RF-port (RF_P and RF_N) towards the antenna. Follow the CC2500EM reference design available from the TI and Chipcon websites.
Output power, highest setting最大输出功率		0	2	dBm	Output power is programmable, and full range is available in all frequency bands. Delivered to a 50Ωsingle-ended load via Chipcon reference RF matching network.

Remark:

Host model 2402E can provide the buffered data to module.
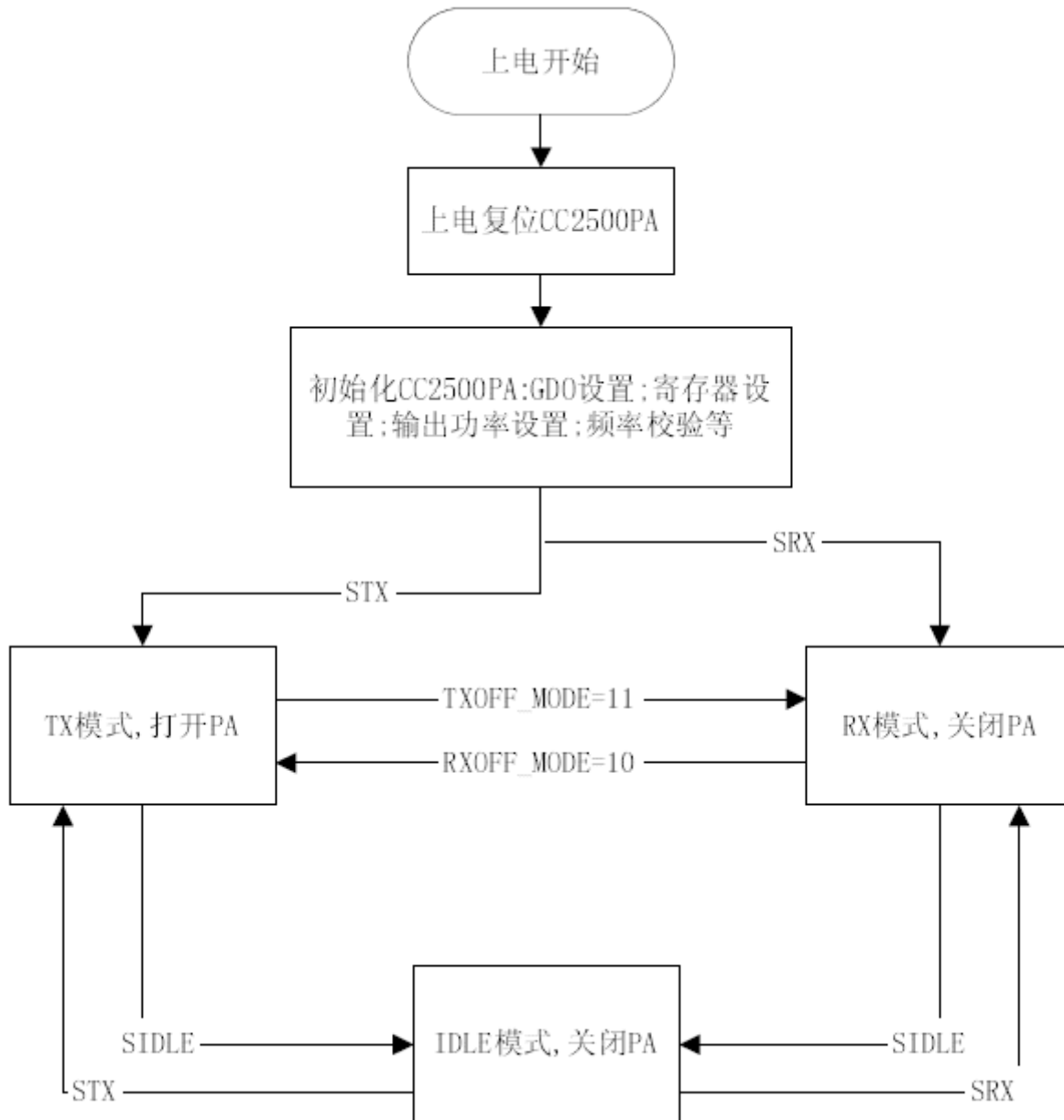And also it can supports stable 3.3 Voltage Power to the module.

9．OUTPUT POWER 输出功率表：

Output power [dBm]	Setting	Current consumption, typ. [mA]
(−55 or less)	0x00	8.9
−30	0x44	10.1
−28	0x41	10.0
−26	0x4C	11.7
−24	0x53	11.1
−22	0x83	10.9
−20	0x46	10.5
−18	0x4A	11.7
−16	0x86	11.0
−14	0x66	12.9
−12	0xC6	11.5
−10	0x69	14.1
−8	0x99	13.6
−6	0x7F	15.4
−4	0xAA	16.7
−2	0xBF	18.5
0	0xFB	21.6
1	0xFF	21.9

Table 22: Optimum PATABLE settings for various output power levels (subject to changes)

10．FLOW CHART 参考流程图：

```
                    ┌─────────────────┐
                    │    上电开始      │
                    └────────┬────────┘
                             │
                    ┌────────▼────────┐
                    │  上电复位CC2500PA │
                    └────────┬────────┘
                             │
          ┌──────────────────▼──────────────────┐
          │ 初始化CC2500PA:GD0设置:寄存器设       │
          │ 置:输出功率设置:频率校验等            │
          └──────────────────┬──────────────────┘
                    STX      │      SRX
         ┌───────────────────┴───────────────────┐
         ▼                                        ▼
┌──────────────────┐  TXOFF_MODE=11  ┌──────────────────┐
│  TX模式,打开PA    │ ──────────────► │  RX模式,关闭PA    │
│                  │ ◄────────────── │                  │
└──────────────────┘  RXOFF_MODE=10  └──────────────────┘

         │SIDLE    ┌──────────────────┐   SIDLE
         │────────►│  IDLE模式,关闭PA  │◄────────
         │STX      └──────────────────┘   SRX
```

Mark:

1. About Detail Specifications , Pls see CC2500 Data sheet .
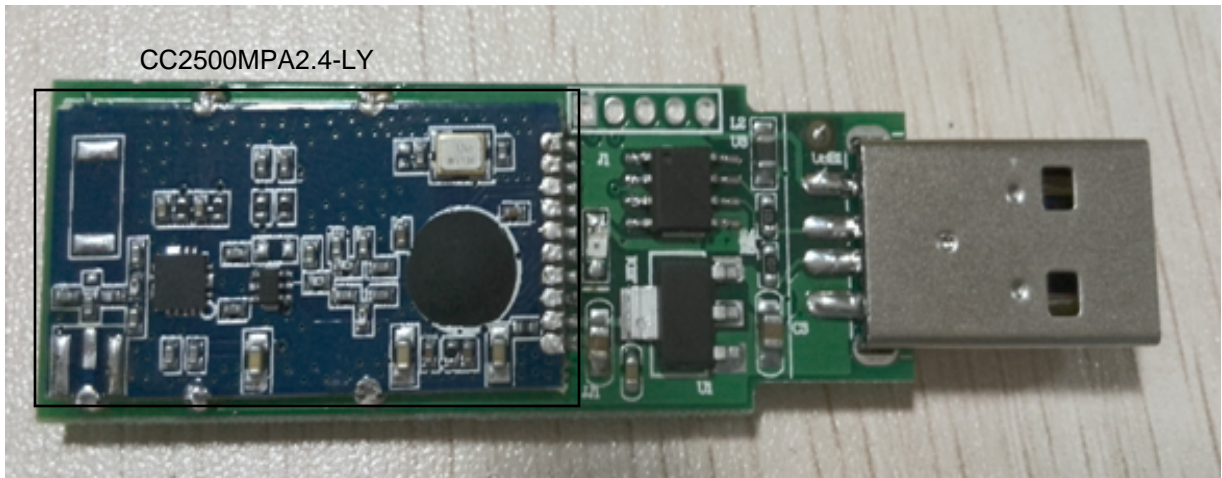
   www.ti.com

Installation Instructions

1, Prepare the main PCB of host, model, 2402E which has installed the spring antenna shown in below picture.

Antenna

2,the CC2500MPA2.4-LY and antenna in the Main board as shown in the below picture.

CC2500MPA2.4-LY

3,Use the transmitter device by connecting with module to control its function

FCC Notice on the End product User Manual

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.

2. This device must accept any interference that may be received, including interference that may cause undesired operation.
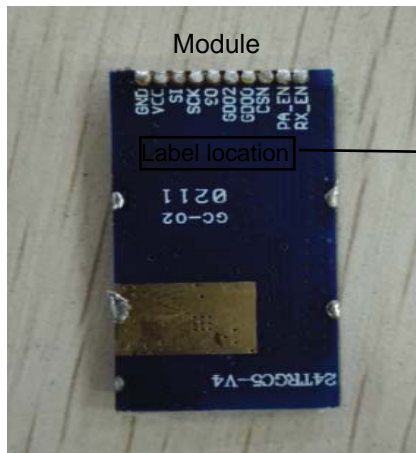
Warning: Changes or modifications not expressly approved by the Resolution Products, Inc. could void the user's authority to operate this equipment.

Label location:

Host model:2402E

Contains transmitter module FCCID:XAO-CC2500MPATR

Module

FCCID: XAO-CC2500MPATR

Remark:

Since it is a limited module. Fot the OEM, it have been inserted in host model:2402E.

So it can not be inserted in other kind of host, except similar host, like host 2402E.