CC1101TR3/4/8/9S-L

315/433/868/915MHz FSK/MSK/ASK/OOK

最小体积无线数传模块

Description

CC1101 is a FSK/ASK/OOK/MSK Transceiver module.It provides extensive hardware support for packet handling ,data buffering ,burst transmissions ,clear channel assessment, link quality indication and wake on radio . It can be used in 315/433/868 and 915MHz ISM/SRD band systems.eg. RKE-two way Remote Keyless Entry、wireless alarm and security systems、AMR-automatic Meter Reading、Consumer Electronics、Industrial monitoring and control。

We support the frequency have 433 ISM Band modules now,

一般描述

CC1101 是集 FSK/ASK/OOK/MSK.调制方式于一体的收发模块。它提供扩展硬件 支持实现信息包处理、数据缓冲、群发信息、空闲信道评估、链接质量指示和无线唤醒。它可以应用在 315/433/868/915MHz ISM/SRD 频段的系统中，比如 PKE- 无钥门禁系统、无线安防系统、AMR-远程抄表系统、消费类电子产品、工业监控 等等。
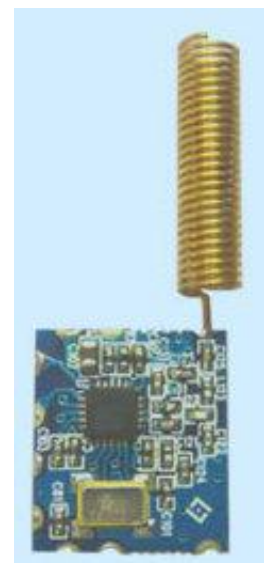
我们目前支持 433MHz 范围的 ISM 频段的模块.

Features 基本特征

1. Low current consumption.　●低电流损耗
2. Easy for application.　●方便投入应用
3. Efficient SPI interface　●高效的串行编程接口
4. Operating voltage 2.1~ 3.6 Volts　●工作电压：2.1~ 3.6 Volts.
5. Operating temperature range 　-40℃～＋85℃ ●工作温度范围：-40℃～＋85℃
6. Frequency range 300 – 1000 MHz ●频率范围：300 – 1000 MHz
7. Programmable output power and Hign sensitivity ●灵敏度高、输出功率可编程
8. Programmable data rate up to 500kbps ●可编程数据速率高达 500kbps
9. Suitable for frequency hopping protocols 　●支持跳频协议
10. RSSI and LQI ●接收信号强度指示和链接质量指示

Applications 应用领域

1. 315/433/868 and 915MHz ISM/SRD band systems
2. Consumer Electronics 　●消费类电子产品
3. Industrial monitoring and control ●工业监控、控制
4. Wireless alarm and security systems 　●无线报警安防系统
5. Home and building automation 　●家庭、建筑门禁系统
6. AMR – Automatic Meter Reading ●自动抄表
7. RKE – Two-way Remote Keyless Entry●RKE-无钥门禁系统

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	GND	GND	GND 地
3	SI	Digital Input	Serial configuration interface, data input 串行配置接口，数据输入
4	SCLK	Digital Input	Serial configuration interface, clock input 串行配置接口，时钟输入
5	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
6	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
7	GDO0	Digital I/O	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 input TX data 　　　串行输入发射数据
8	CSn	Digital Input	Serial configuration interface, chip select 串行配置接口，芯片选择

Absolute Maximum Ratings 极限参数

Parameter（参数）	MIN (最小值)	MAX（最大值）	Units（单位）
Supply Voltage（支持电压）	-0.3	3.6	V DC
Operating Temperature（工作温度）	-40	85	℃

## Package Description 外型说明
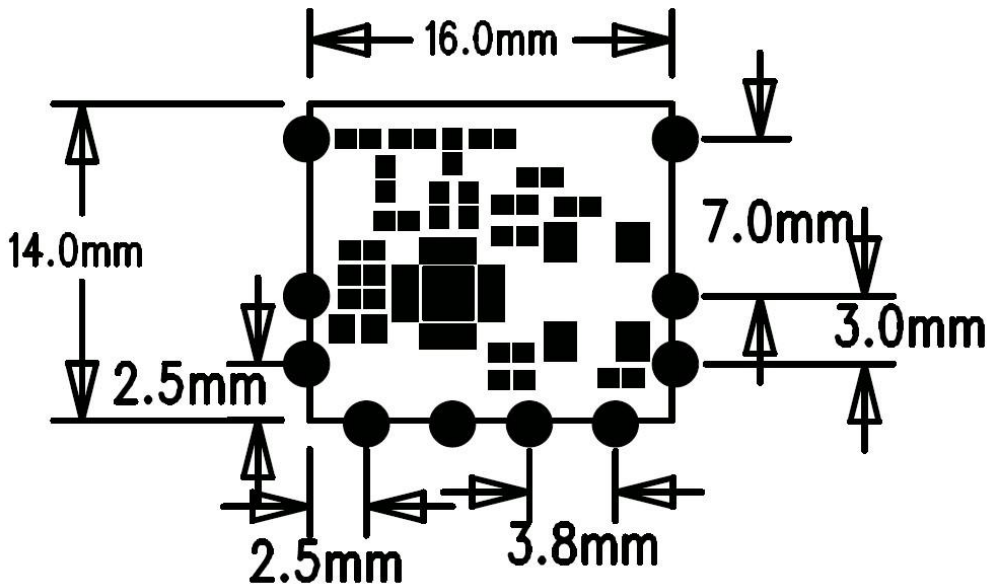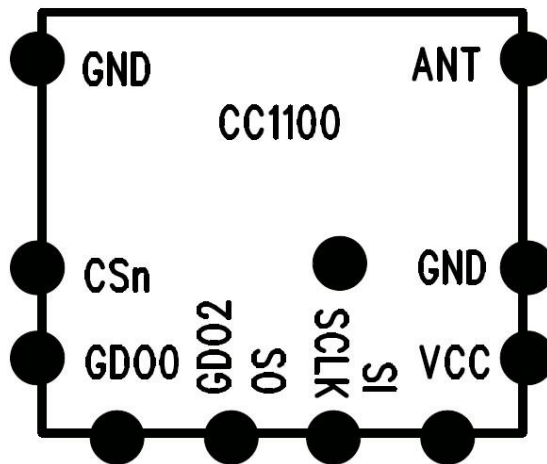
Application Circuit 典型应用电路
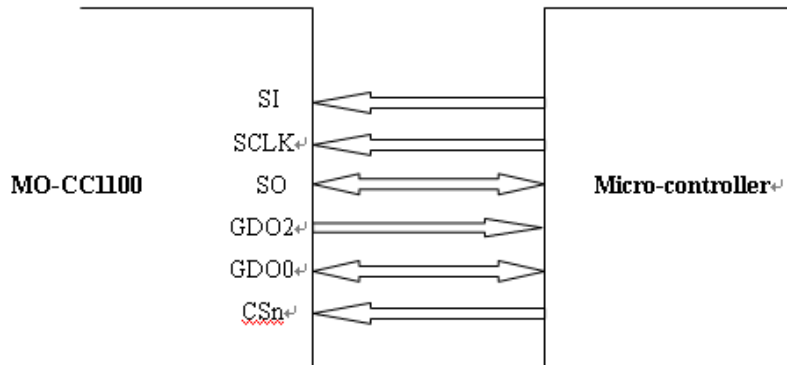
Module Program 模块编程

1. Configuration Software 配置软件

CC1101 can be configured using the SmartRF® Studio software, available for download from http://www.chipcon.com. The SmartRF® Studio software is highly recommended for obtaining optimum register settings, and for evaluating performance and functionality.

可以利用 SmartRF® Studio 软件对 CC1101 进行配置，该软件可以从网站 http://www.chipcon.com 下载。SmartRF® Studio 是被高度推荐用来获得最合适的寄存 器配置，和用来评估模块性能和功能的软件。
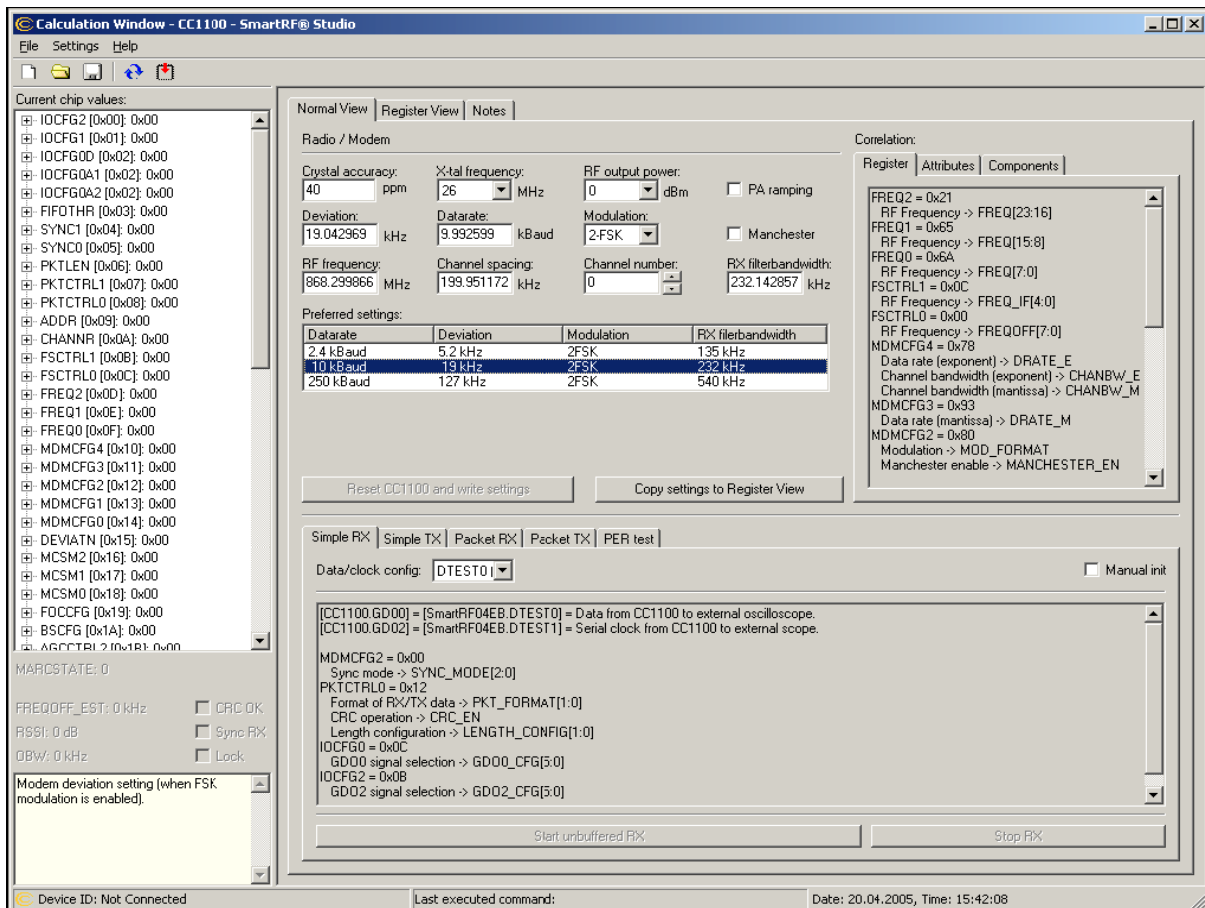
SmartRF® Studio user interface

2, 4-wire Serial Configuration and Data Interface

CC1101 is configured via a simple 4-wire SPI compatible interface (SI, SO, SCLK and CSn) where CC1101 is the slave. This interface is also used to read and write buffered data. All address and data transfer on the SPI interface is done most significant bit first

CC1101 是通过一个简单的 4 线 SPI 兼容接口（SI，SO，SCLK，CSn）来配置，这时 CC1101 工作于 slave 模式。该接口也用于读写缓冲器的数据。所有的地址和数据在 SPI 口的传送 都是从最高位开始的。
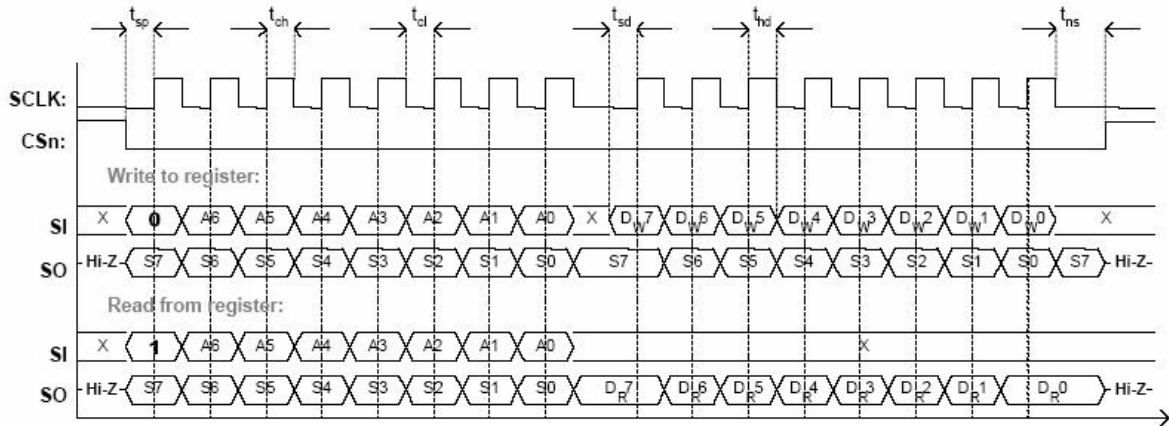

Figure 6: Configuration registers write and read operations

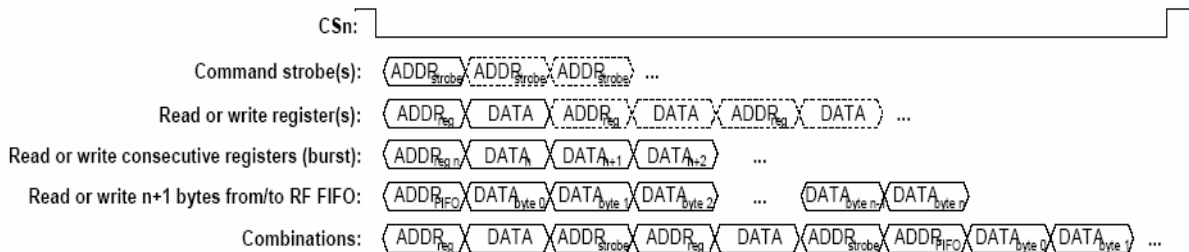**Register access types** 寄存器访问类型如下图：

Figure 7: Register access types
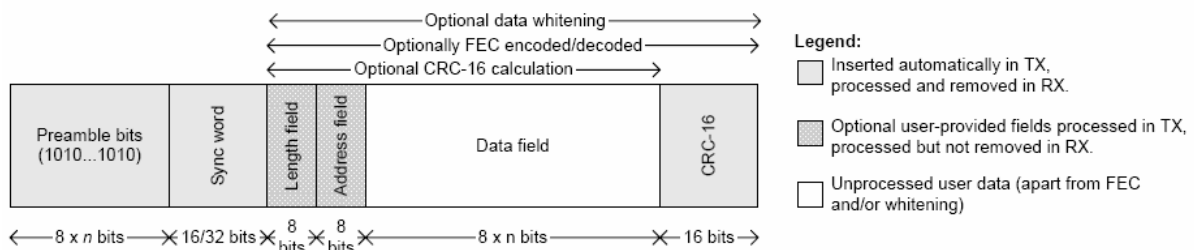
3, Packet Format 数据包格式

Figure 8: Packet Format

4．Power on start-up sequence 上电启动顺序

The power-up sequence is as follows (see Figure 11):

Set SCLK=1 and SI=0, to avoid potential problems with pin control mode .

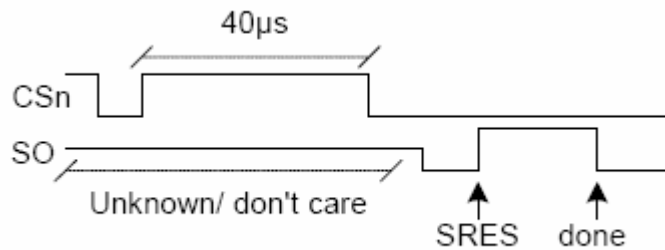Strobe CSn low / high.

Hold CSn high for at least 40μs.

Pull CSn low and wait for SO to go low (CHIP_RDYn).

Issue the SRES strobe.

When SO goes low again, reset is complete and the chip is in the IDLE state.

power-up 的操作顺序如下：

.设置 SCLK=1 和 SI=0，以避免 PIN 脚控制模式造成的潜在问题。

.设置 CSn 为低然后再拉高。

.保持 CSn 为高至少 40us。

.将 CSn 拉低等待 SO 变低（CHIP_RDYn）.

.发送 SRES 命令.

.当 SO 再次变低后,复位工作就完成了,IC 处于 IDLE 状态.

Power-up with SRES

5．Output power levels 输出功率表：

Output power [dBm]	315MHz		433MHz		868MHz		915MHz	
	Setting	Current consumption, typ. [mA]	Setting	Current consumption, typ. [mA]	Setting	Current consumption, typ. [mA]	Setting	Current consumption, typ. [mA]
-30	0x04	10.9	0x68	11.7	0x03	12.0	0x11	11.9
-20	0x17	11.5	0x6C	12.2	0x0D	12.6	0x0B	12.4
-15	0x1D	12.2	0x1C	12.8	0x1C	13.2	0x1B	13.1
-10	0x26	13.4	0x06	14.3	0x34	14.6	0x6D	13.7
-5	0x69	13.0	0x3A	13.8	0x67	14.4	0x67	14.2
0	0x51	15.1	0x51	16.1	0x60	16.8	0x50	16.5
5	0x86	18.3	0x85	19.3	0x85	19.9	0x85	19.3
7	0xCC	22.2	0xC8	24.0	0xCC	25.6	0xC9	25.6
10	0xC3	26.9	0xC0	28.8	0xC3	30.3	0xC1	30.2

PATABLE settings for various output power levels and frequency bands

灵活的适合不同输出功率的 PATABLE 设定

Default power setting	315MHz		433MHz		868MHz		915MHz	
	Output power [dBm]	Current consumption, typ. [mA]	Output power [dBm]	Current consumption, typ. [mA]	Output power [dBm]	Current consumption, typ. [mA]	Output power [dBm]	Current consumption, typ. [mA]
0xC6	8.9	25.1	7.8	25.0	8.9	28.3	8.1	26.8

Output power and current consumption for default PATABLE serring

默认 PATABLE 设定下的输出功率和电流消耗

6．Simplified state diagram,with typical usage and current consumption

简单的状态示意，典型用法和电流消耗示意图
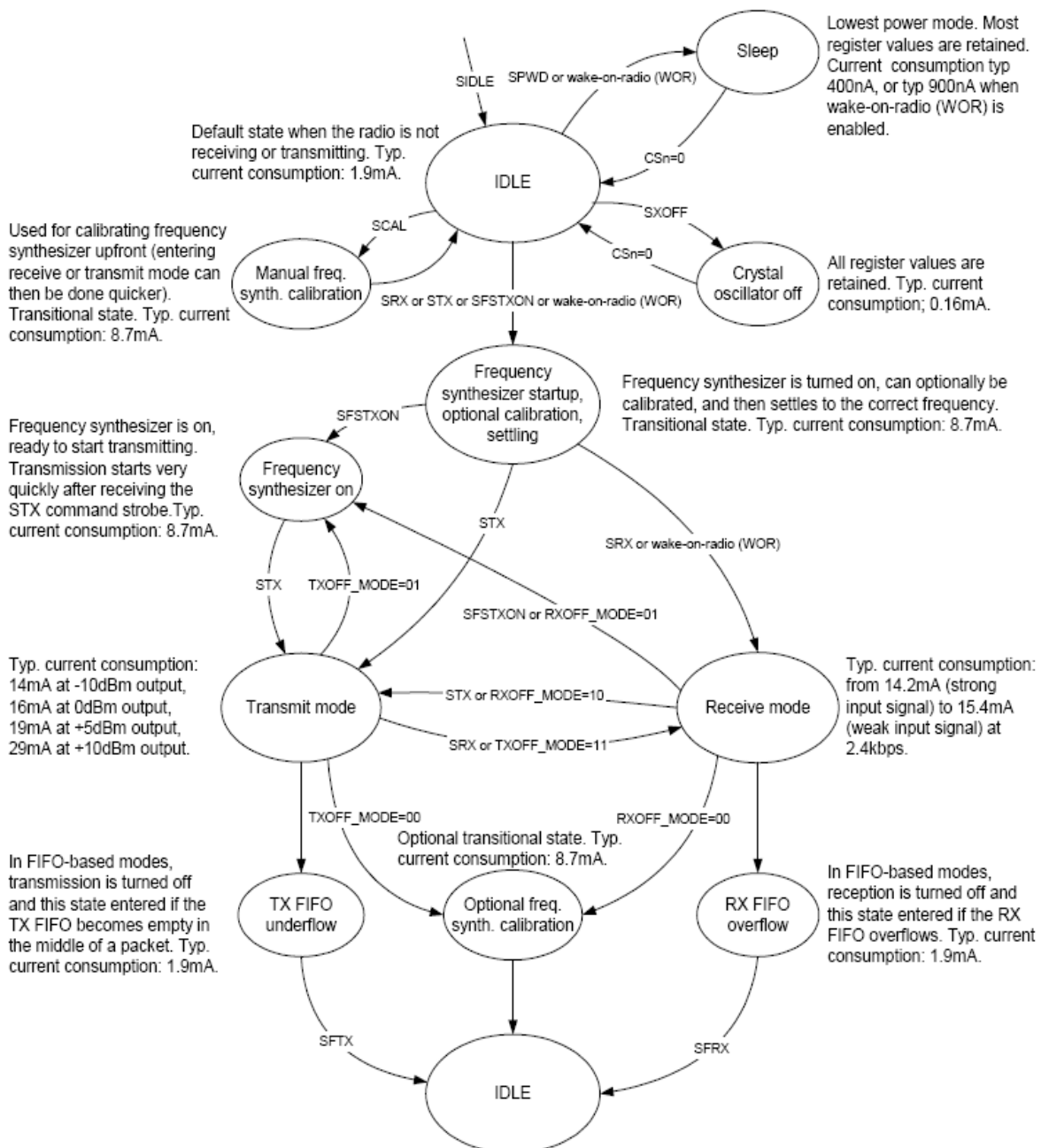
7．Radio Control State Diagram
无线控制状态示意图