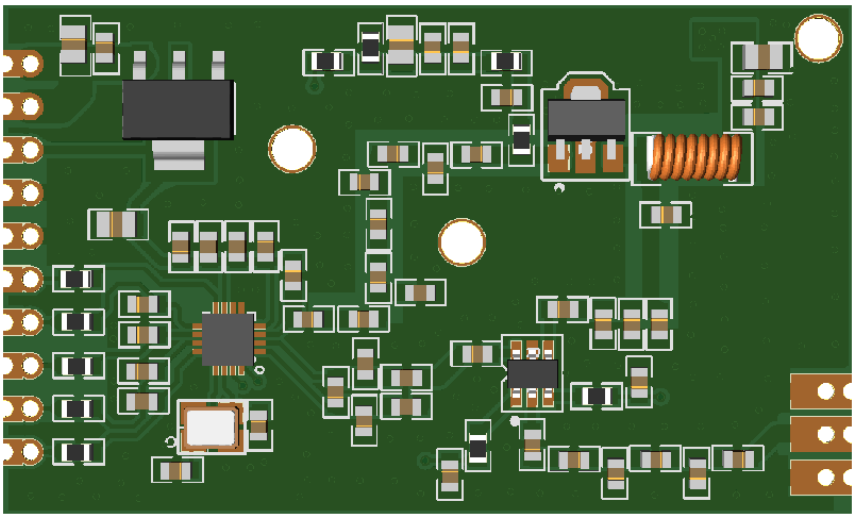
433.92/868MHz OOK/FSK 1W/4W High Power Transceiver Module



Overview

RFM300P is a 1W/4W high power, high performance, OOK, (G)FSK, RF transceiver module for 433.92/868MHz wireless applications. The high-level integration of RFM300P simplifies the external components required in the system design. Up to 4W transmitting power improves the RF link performance. RFM300P supports a variety of data packet formats and encoding/decoding methods, which can flexibly meet various application requirements. RFM300P also supports 64-Byte FIFO, Auto Tx mode, low-voltage detection, power-on reset, low-frequency clock output, fast frequency hopping, and other functions, making the application more flexible and more differentiated.

Features

- Strong anti-interference ability, suitable for use in complex interference environments
- Working frequency: 433.92MHz, 868MHz
- Modem: OOK, (G)FSK
- Data rate: 0.5 - 300Kbps
- Working voltage: 1.8 - 5.0V (1W), 1.8 - 7.5V (4W)
- Transmitting current: 800mA @1W, 433.92MHz, FSK
  1.4A @4W, 433.92MHz, FSK
- Support Auto Tx mode
- Support 3-wire SPI interface
- Support direct mode and packet mode
- Support 64-Byte FIFO
- Support FEC (Forward Error Correction)

Application

- Smart home security and building automation
- ISM band data communication
- Industrial monitoring and control
- Remote control and security system
- Remote key entry
- Wireless sensor nodes
- Wireless tag reader

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Pin Arrangement

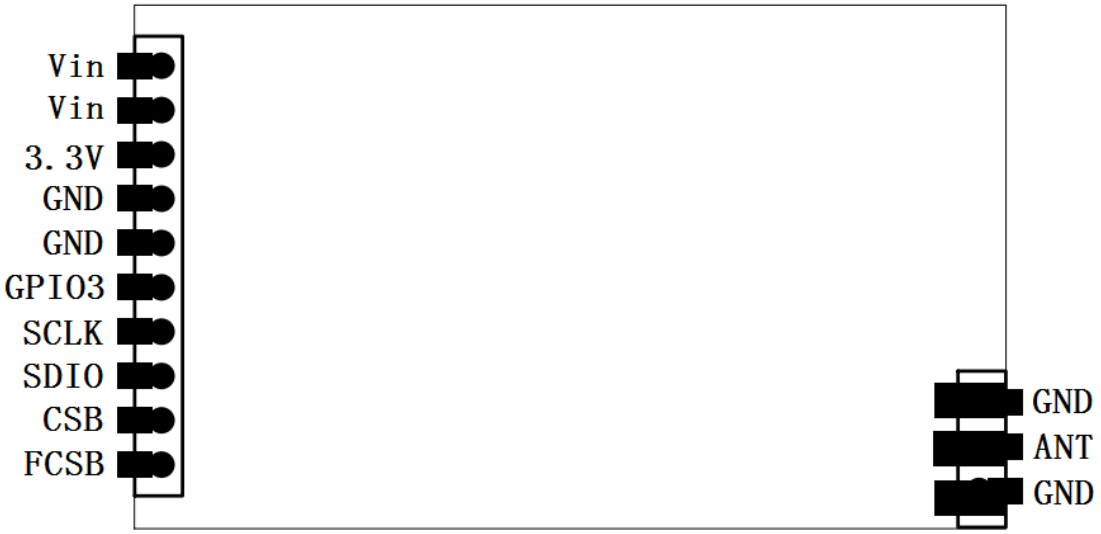


Figure 1. RFM300P Pin Arrangement (Top View)

Table 1. RFM300P Pin Description

Pin #	Name	I/O	Description
1	Vin	--	5V/7.5V
2	Vin	--	5V/7.5V
3	3.3V	--	3.3V
4	GND	--	GND
5	GND	--	GND
6 [1]	GPIO3		Configurable: CLKO, INT2, DCLK (TX)
7	SCLK		SPI Clock
8	SDIO		SPI Data In/Out
9	CSB		SPI Chip Select for Register
10	FCSB		SPI Chip Select for FIFO
11	GND	--	GND
12	ANT	--	Antenna Port
13	GND	--	GND

Note:

[1] INT2 is an RF interrupt. DCLK (TX) is a synchronization clock for modulated data, which automatically switches when TX mode is switched.

Electrical Specifications

Test conditions: working voltage 5.0V/7.5V [1], working temperature 25℃.

Recommended Operating Conditions

Table 2. Recommended Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Voltage [1]	V_{DD}	P_{OUT}=1W	1.8		5	V
		P_{OUT}=4W	1.8		7.5	V
Operating Temperature	T_{OP}		-40		85	℃
Operating Voltage Slope			1			mV/us

Note:

[1] The 1W transmitting power is tested with a 5V voltage, and the 4W transmitting power is tested with a 7.5V voltage.

Absolute Maximum Ratings

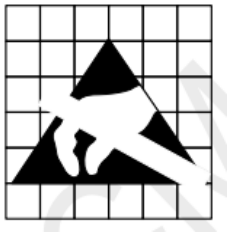
Table 3. Absolute Maximum Ratings [1]

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply voltage	V_{DD}	P_{OUT}=1W	-0.3		5	V
		P_{OUT}=4W	-0.3		7.5	V
Interface voltage	V_{IN}		-0.3		3.6	V
Junction temperature	T_J		-40		125	℃
Storage temperature	T_{STG}		-50		150	℃
Soldering temperature	T_{SDR}	Last for at least 30 seconds			255	℃
ESD rating [2]		Human Body Model (HBM)	-2		2	kV
Latch-up current		@85℃	-100		100	mA

Note:

[1]. Exceeding the Absolute Maximum Ratings may cause permanent damage to the equipment. This value is a pressure rating and does not imply that the function of the equipment is affected under this pressure condition, but if it is exposed to absolute maximum ratings for extended periods of time, it may affect equipment reliability.

[2]. The RFM300P is a high-performance RF module and the operation and assembly of this module should only be performed on a workbench with good ESD protection.



Caution! ESD sensitive device.

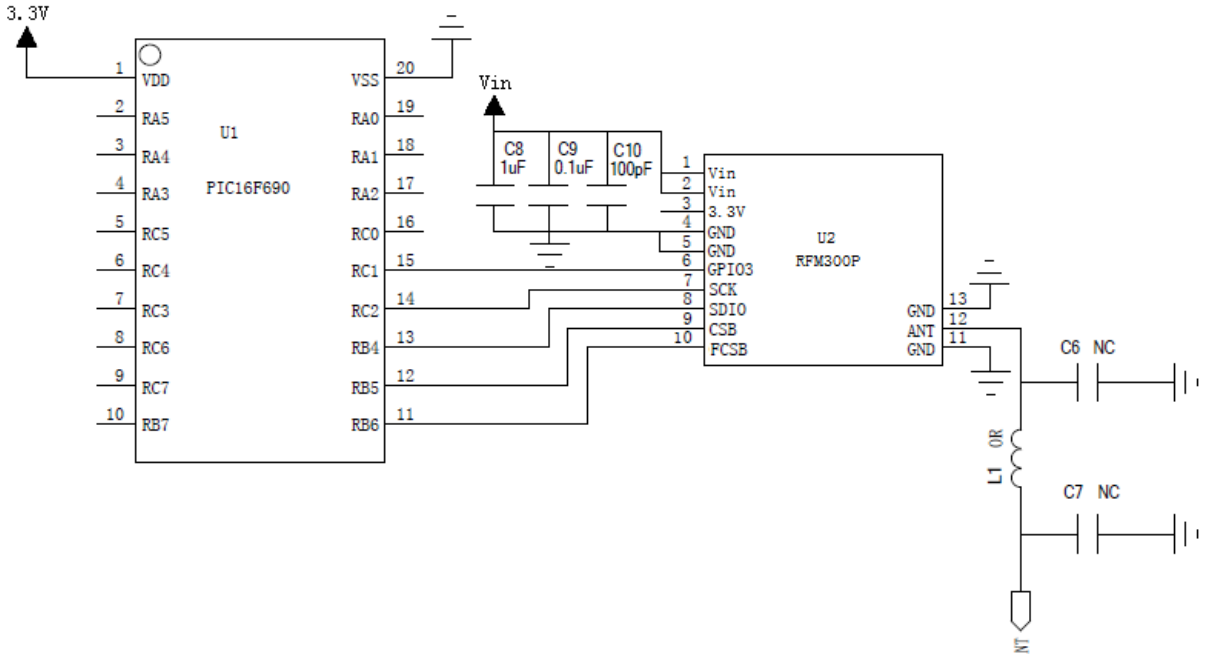
Precaution should be used when handling the device in order to prevent performance degradation or loss of functionality.

DC Characteristics

Table 4. DC Characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Working Frequency	F_C	Different frequency bands require specific peripheral materials		433.92		MHz
				868		MHz
Modem	MOD			OOK，FSK		
Tx Power	P_{out}	RFM300P1-433S2		1		W
		RFM300P4-433S2		4		W
		RFM300P1-868S2		1		W
Tx Current	I_{TX}	433.92MHz band, Pout =1W		800	825	mA
		433.92MHz band, Pout =4W		1400	1450	mA
		868MHz band, Pout =1W		1050	1070	mA
Rx Sensitivity	SENS	433.92MHz, DR=0.6Kbps, F_{DEV}=10KHz		-118		dBm
		868MHz, DR=0.6Kbps, F_{DEV}=10KHz		-115		dBm
Rx Current	I_{RX}	433.92MHz		13	15	mA
		868MHz		13	15	mA
Sleep Current	I_{sleep}	Full band			1.7	mA
FSK Data Rate	D_R		0.5		300	Kbps
OOK Data Rate	D_R		0.5		40	Kbps
FSK Frequency Deviation Range			2		200	KHz
Deviation Resolution				25		Hz

Typical Application



Note:

For software information, refer to the chip datasheet and demo program of the HopeDuino development kit.

Dimensions

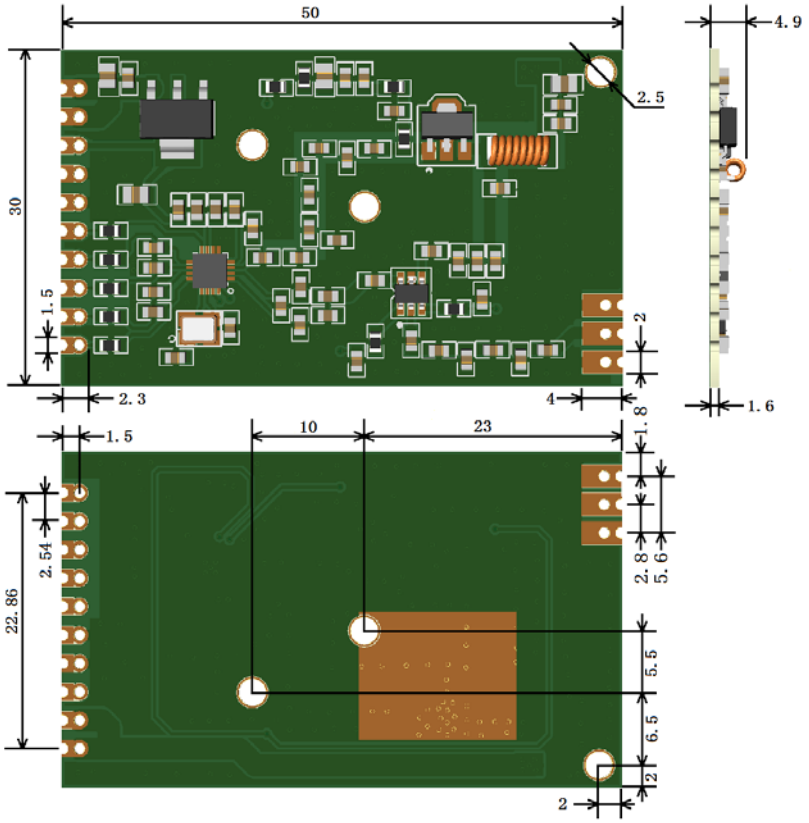


Figure 2. Dimensions (Unit: mm)

Ordering Information

Part Number	Working Frequency	Tx Power
RFM300P1-433S2	433.92MHz	1W
RFM300P4-433S2	433.92MHz	4W
RFM300P1-868S2	868MHz	1W

Revise History

Version No.	Date	Description
V1.0	2023.4.14	Initial version
V1.1	2024.2.18	Update the dimensions