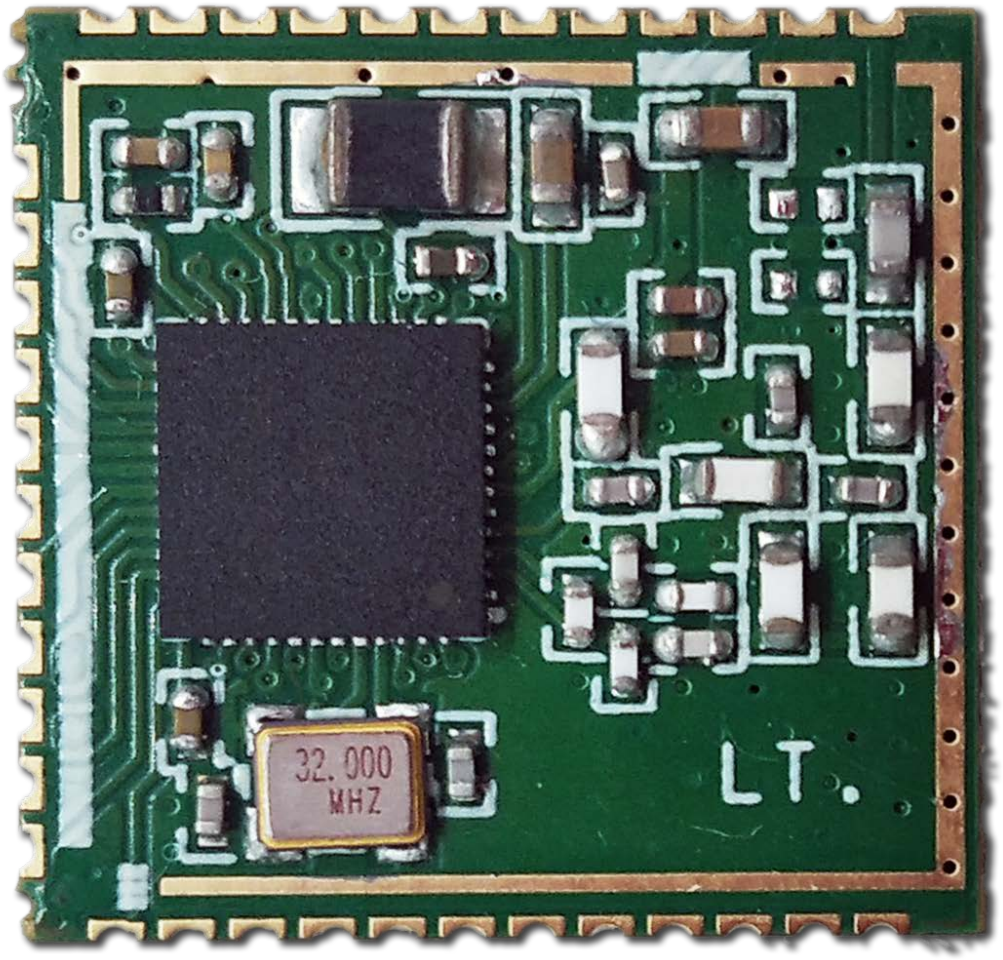
RFM390F64 SOC Transceiver Module



Contents

1. General Description

The RFM390F64 module integrates a 32-bit ARM Cortex-M0 core and an ultra-low-power RF transceiver. It is a low-power, high-performance, OOK, (G)FSK, 4(G)FSK RF transceiver module for wireless applications. The RFM390F64 module can support a variety of data packet formats and encoding and decoding methods, which can flexibly meet various application requirements. It has multiple GPIOs and interrupt configuration, and Duty-Cycle operation mode, channel listening, high-precision RSSI, low-voltage detection, power-on reset, low-frequency clock output, fast frequency hopping, squelch output and other functions, which make the application more flexible.

2. Product Features

- Strong anti-interference ability, suitable for use in complex interference environments
- Sensitivity: -113dBm, DR=10kbps, DEV=5KHz @434MHz
- Working frequency: 434MHz, 868MHz, 915MHz
- Working voltage: 1.8V-3.6V
- Output power: +20dbm
- Transmitting current: 73mA @20dbm @434MHz
- Receive current: 10.8mA (enable DCDC) @434MHz
- Automatic Frequency Correction (AFC)
- Fast and accurate effective signal monitoring (PDJ, RSSI)
- Automatic ACK and re-transmission
- 4-wire SPI interface
- Support direct mode and packet mode

3. Application range

- Smart meter reading
- Smart home security and building automation
- Industrial monitoring and control
- Wireless sensor nodes

- Tag reader
- ISM band data communication
- Remote key entry

4. Pin Diagram

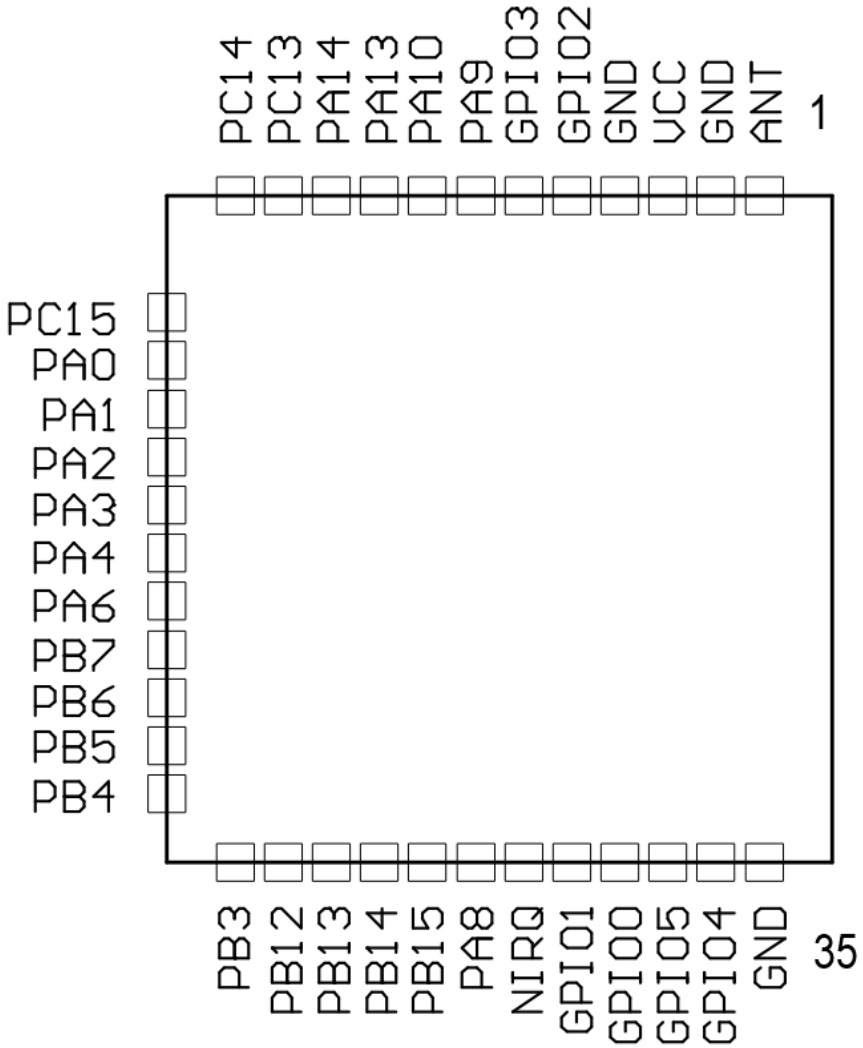


Figure 1. RFM390F64 Pin Diagram

5. Pin definition

Table 1. RFM390F64 Pin Definition

Pin no.	Definition	Function description
1	ANT	Antenna port
2,4,35	GND	Earth line
3	VCC	Power
5	GPIO2	IO, configurable
6	GPIO3	IO, configurable
7	PA9	MCU port PA9
8	PA10	MCU port PA10
9	PA13	MCU port PA13 **(SWDIO)**
10	PA14	MCU port PA14 **(SWCLK)**
11	PC13	MCU port PC13
12	PC14	MCU port PC14
13	PC15	MCU port PC15
14	PA0	MCU port PA0
15	PA1	MCU port PA1
16	PA2	MCU port PA2
17	PA3	MCU port PA3
18	PA4	MCU port PA4
19	PA6	MCU port PA6
20	PB7	MCU port PB7
21	PB6	MCU port PB7
22	PB5	MCU port PB5
23	PB4	MCU port PB4
24	PB3	MCU port PB3
25	PB12	MCU port PB12
26	PB13/RF_SCK	MCU port PB13/RF SPI clock
27	PB14/RF_SDO	MCU port PB14/RF SPI data output
28	PB15/RF_SDI	MCU port PB15/RF SPI data input
29	PA8/RF_CSB	SPI chip selection for register access
30	NIRQ	I, configurable
31	GPIO1	IO, configurable
32	GPIO0	IO, configurable
33	GPIO5_RST	IO, configurable
34	GPIO4	IO, configurable

6. Electrical Parameters

Test conditions: Power supply 3.3V, working temperature 25°C

Table 2. Electrical Parameters

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Working frequency	Fc	RFM390F64-433S2		434MHz		MHz
		RFM390F64-868S2		868MHz		
		RFM390F64-915S2		915MHz		
Receiving sensitivity	S	FSK: DR=10kbps, DEV=5KHz, 434MHz		-113		dBm
		FSK: DR=10kbps, DEV=5KHz, 868MHz		-109		
		FSK: DR=10kbps, DEV=5KHz, 915MHz		-109		
Working voltage	V_{DD}		1.8	3.3	3.6	V
Receiving current	IRx	434MHz enable DCDC		10.8		mA
		868MHz enable DCDC		11.8		
		915MHz enable DCDC		11.8		
Transmitting current	I_{Tx}	434MHz enable DCDC 20dbm		73		mA
		868MHz enable DCDC 20dbm		92		
		915MHz enable DCDC 20dbm		92		
Sleep current	I_{Sleep}	Duty Cycle=OFF		1.3		uA
Working temperature	T_{OP}		-40		+85	℃

7. Dimension

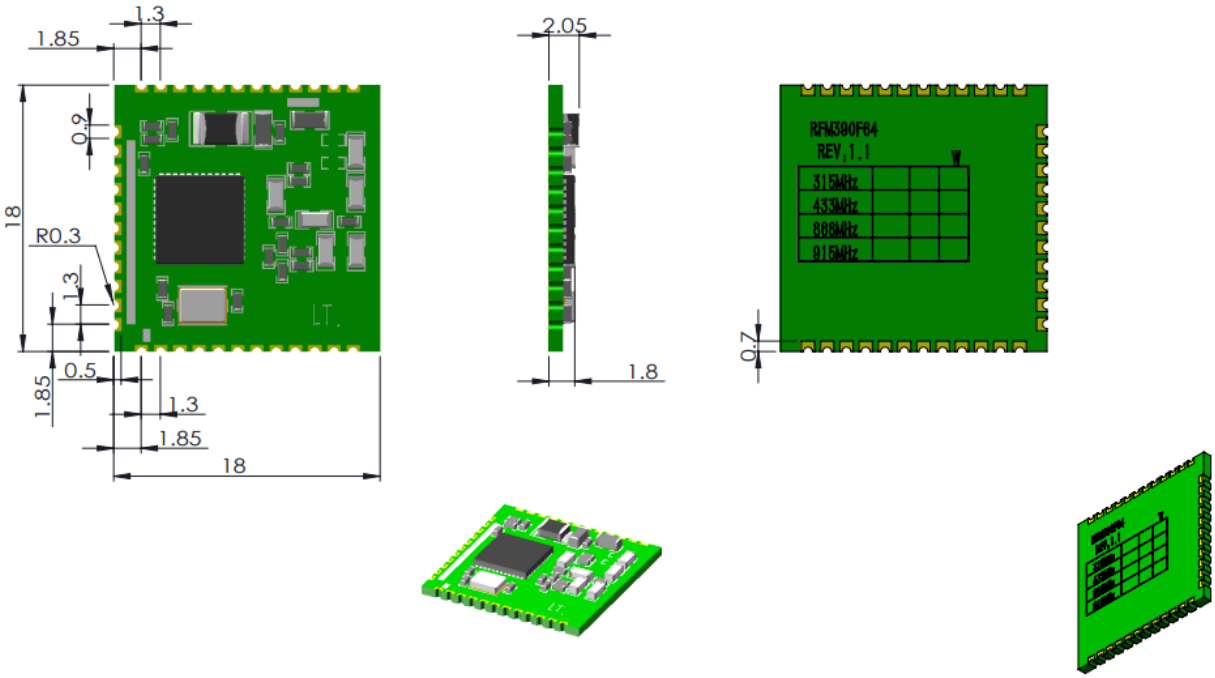


Figure 2. Module dimensions (Unit: mm)

8. Ordering information

Model	Frequency
RFM390F64-433S2	434MHz
RFM390F64-868S2	868MHz
RFM390F64-915S2	915MHz

9. Revision history

Table 3. Revision record

Version no	Update description	Update date
V1.0	First released	2023.7.14