RFM119B

Sub-1GHz OOK / FSK High Performance RF Transmitter Module

Product Overview

RFM119B is a RF module with which +20dBm high power and high performance thus to support 127 to 1020 MHz frequency, OOK, (G) FSK modulation. The module is high integration so it simplifies the peripheral materials needed in the system design, so users can secondary development easily. The transmission power is up to +20 dBm, which can improves the link performance of the application, even can support a variety of packet formats and codec so as to flexibly meet the requirements of various applications for different data packet formats and coding.

RFM119B

Also, the RFM119B module can support 64-byte Tx FIFO, the GPIO and interrupt configuration, auto Tx running mode, low voltage detection, low frequency timing interrupt wake-up MCU, manual fast frequency hopping and so on, which making the application designs.more flexible thus to achieve product differentiation design. The working voltage of RFM119B is from 1.8 V to 3.6 V. The output power of +13dBm only consumes 23 mA emission current. It only consumes 80mA transmit current in the case of +20dBm output power. It is the best choice for low power and high efficiency.

Ordering Information

Module No.	Working Frequency
RFM119B-315S2	315MHz
RFM119B-433S2	433.92MHz
RFM119B-868S2	868.35MHz
RFM119B-915S2	915MHz

Features

- Comply with FCC and ETSI safety rules
- Strong anti-interference ability, suitable for complex interference environment scenarios
- Frequency range: 127~1020MHz
- Modulation and demodulation mode: OOK, (G) FSK &(G)MSK
- Data rate: 0.5~300 kbps
- Voltage Range: 1.8~3.6 V
- Transmit current
  - 23 mA @ 13 dBm，433.92 MHz, FSK
  - 80 mA @ 20 dBm，433.92 MHz, FSK
- Suppor tAuto Tx Mode
- Deep sleeping：300 nA
- Low power wake-up：800 nA
- 3-wire SPI interface
- Support direct and package mode
- Configurable packet processor& 64-Byte FIFO
- Support forward error correction

Applications

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

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Pin Information

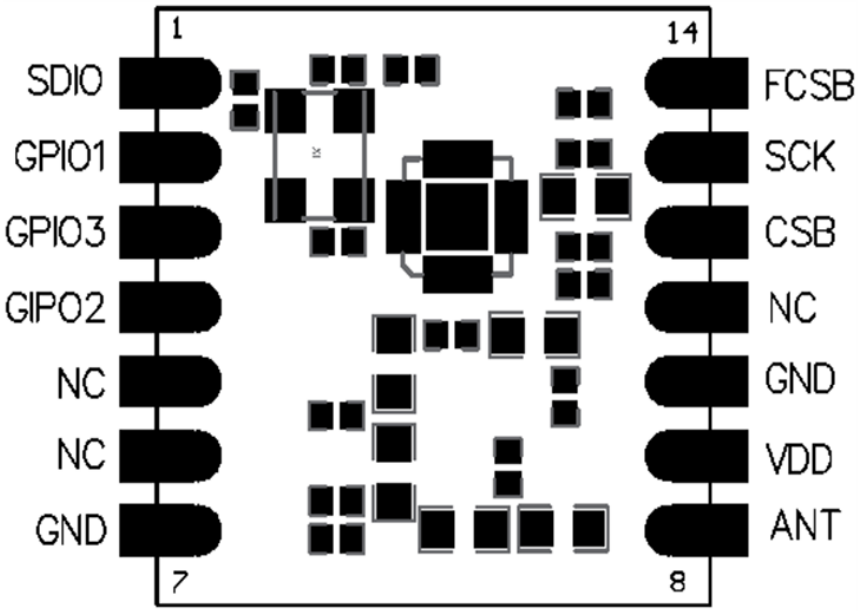


Figure 1. RFM119B Pin Assignment (Top View)

Table 1. RFM119B pin functions

Pin No.	Name	Description
1	SDIO	SPI Data input & output
2	GPIO1	Configurable as：DIN,INT1,INT2,DCLK(TX)
3	GPIO3	Configurable as：CLKO,DIN,INT2,DCLK(TX)
4	GPIO2	Configurable as：DIN,INT1,INT2,DCLK(TX)
5	NC	Not connected
6	NC	Not connected
7	GND	Ground
8	ANT	antenna
9	VDD	Positive power supply
10	GND	Ground
11	NC	Not connected
12	CSB	SPI Selection to access registers
13	SCK	SPI clock
14	FCSB	SPI selection to access FIFO

Electrical parameters

Testing conditions: Power supply 3.0V, temperature 25 ℃

Recommended operating conditions

Table 2. Recommended Operating Conditions

Parameter	Symbol	Conditions	Minimum	Maximum	Unit
Supply Voltage	V_{DD}		1.8	3.6	V
Operating Temperature	T_{OP}		-40	85	℃
Power Supply Voltage Slope			1		mV/us

Absolute Maximum Rating

Table 3. Absolute Maximum Rating

Parameter	Symbol	Conditions	Minimum	Maximum	Unit
supply voltage	V_{DD}		-0.3	3.6	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}	Lasting 30s at least		255	℃
ESD Level[2]		HBM	-2	2	kV
Latch current		@ 85 ℃	-100	100	mA

DC Characteristics

Table 4. DC characteristics

Parameter	Conditions	Minimum	Typical	Maximum	Unit
RFM119B Working Conditions	315MHz band, Pout =+20dBm		80	85	mA
	433MHz band, Pout =+20dBm		85	90	mA
	868MHz band, Pout =+20dBm		85	90	mA
	915MHz band, Pout =+20dBm		80	85	mA
RFM119B sleep current	full band			2	uA
RFM119B Working band	Different matching networks are needed	760	868、915	1020	MHz
		380	433.92	510	MHz
		190	315	340	MHz

Parameter	Conditions	Minimum	Typical	Maximum	Unit
		127		170	MHz
FSK data rate		0.5		300	kbps
OOK data rate		0.5		40	kbps
FSK Frequency deviation range		2		200	KHz
Frequency deviation resolution			25		Hz

Typical Application

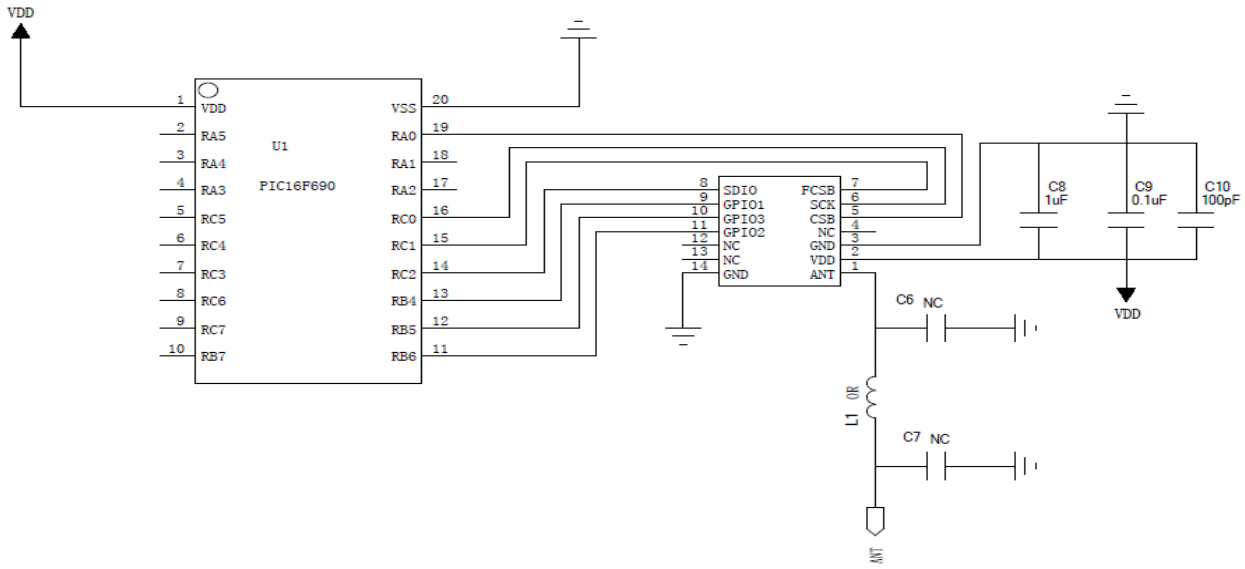
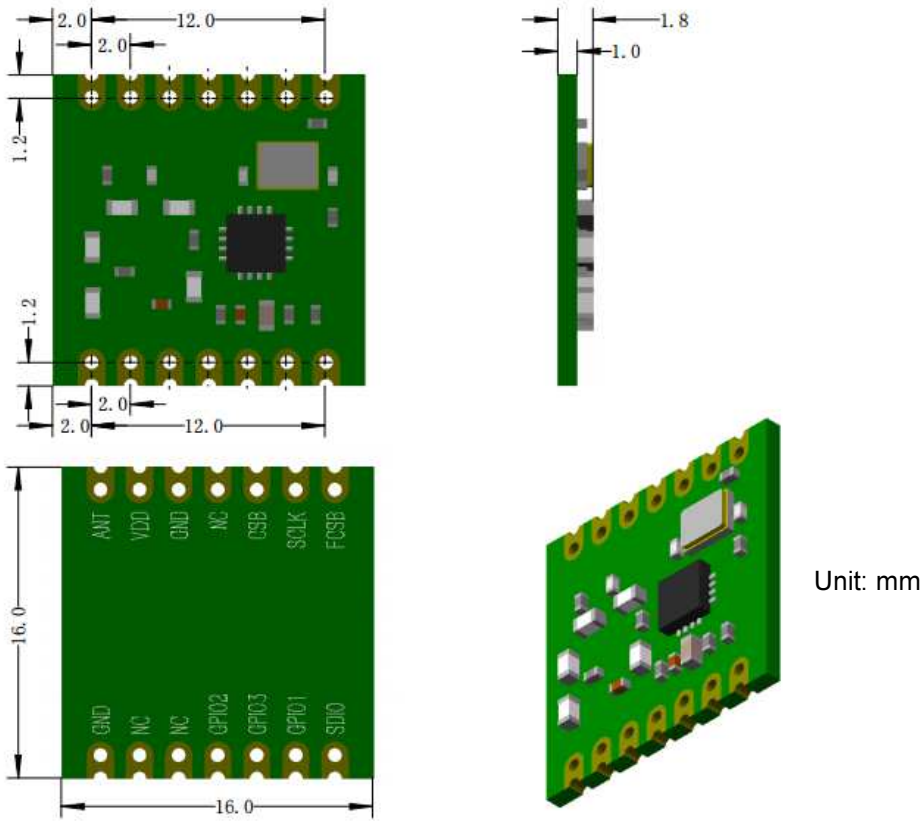


Figure 2. RFM119B Application Reference Diagram

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

Dimensions



Unit: mm

Figure3. Dimensions

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