

1.0 Introduction

LW112M-F receiver module employs a 315/433MHz FSK/FM/ASK RFIC to form various circuit configurations to meet a number of different customer requirements. The double-conversion superheterodyne configuration has two mixers MIX1 and MIX2 being driven by the internal local oscillator signals LO1 and LO2 respectively. Achieved in conjunction with an RF front-end filter, this allows a high degree of image rejection. Efficient RF front-end filtering is realized by using a SAW, ceramic or helix filter in front of the LNA and an LC filter at the LNA output.

The LW112M-F receiver module consists of the following integrated building blocks:

- Low-noise amplifier (LNA) for high receiving sensitivity
- PLL synthesizer (PLL SYNTH) for generation of the first and second local oscillator signals LO1 and LO2. PLL SYNTH consists of the high-frequency VCO1, the feedback dividers DIV_8 and DIV_2, a phase-frequency detector (PFD) with charge pump (CP) and a crystal-based reference oscillator (RO)
- First mixer (MIX1) for down converting the RF signal to the first IF (IF1)
- Second mixer (MIX2) for down converting the IF1 to the second IF (IF2)
- IF amplifier (IFA) to amplify and limit the IF2 signal and for RSSI generation
- Phase coincidence demodulator (DEMOM) to demodulate the IF signal
- Operational amplifier (OA) for filtering, data slicing and ASK detection
- Bandgap biasing and circuit shutdown

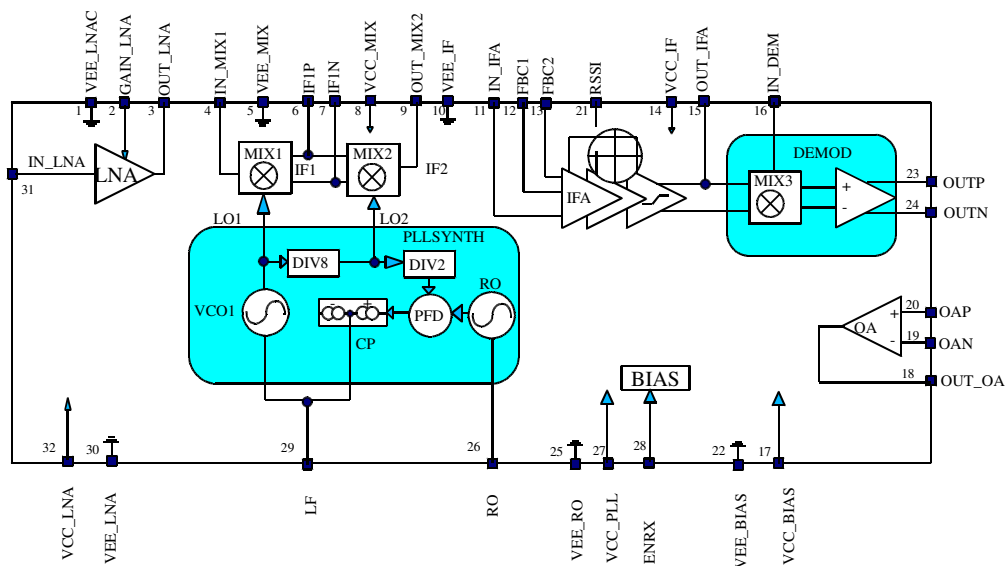
2.0 Features

- Double-conversion approach for high image rejection
- FM reception for analog signal transmission and FSK for digital data
- Stepped LNA gain for improved dynamic range
- RSSI allows ASK detection and signal strength indication
- Low current consumption

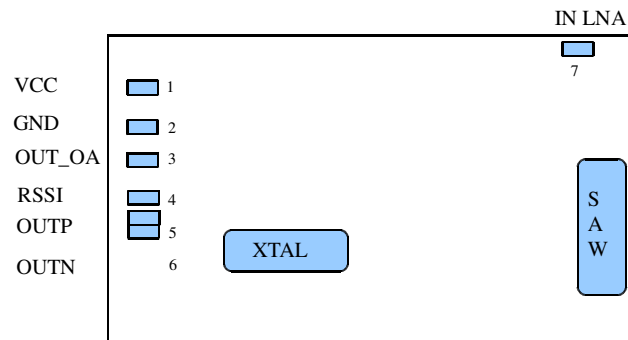
3.0 Applications

- General data transmission
- Tire Pressure Monitoring Systems
- Remote controllers
- Remote Keyless Entry
- Wireless access control
- Security and alarm systems
- Garage door openers
- Home and building automation
- Monitoring systems

Block Diagram



4.0 Pin Description



Pin no.	Symbol	Description
1	VCC	Power supply
2	GND	RF ground
3	OUT_OA	Analog output
4	RSSI	RF signal strength
5	OUTP	Demodulated output +
6	OUTN	Demodulated output -
7	IN LNA	RF input

5.0 Electrical Characteristics

- Input frequency range: 260 MHz to 510 MHz
- Power supply range: 2.7 V to 5.5 V @ FSK
- Operating current: 8.2 mA @ high gain mode
6.5 mA @ low gain mode
- Standby current: 50 nA
- Temperature range: -40 °C to +85 °C
- Sensitivity: -104 dBm @ FSK
(4Kbps, 180KHz IF BW, 3dB SAW filter loss)
- Range of IF1: 10 MHz to 80 MHz
- Range of IF2: 400 kHz to 22 MHz
- Maximum input level: 0 dBm
- Image rejection: > 65 dB
- Spurious emission: < -70 dBm
- Input frequency acceptance range: up to ± 100 kHz
- FM/FSK deviation range: ± 2.5 kHz to ± 80 kHz
- Maximum analog modulation frequency: 15 kHz
- RSSI range: 70 dB

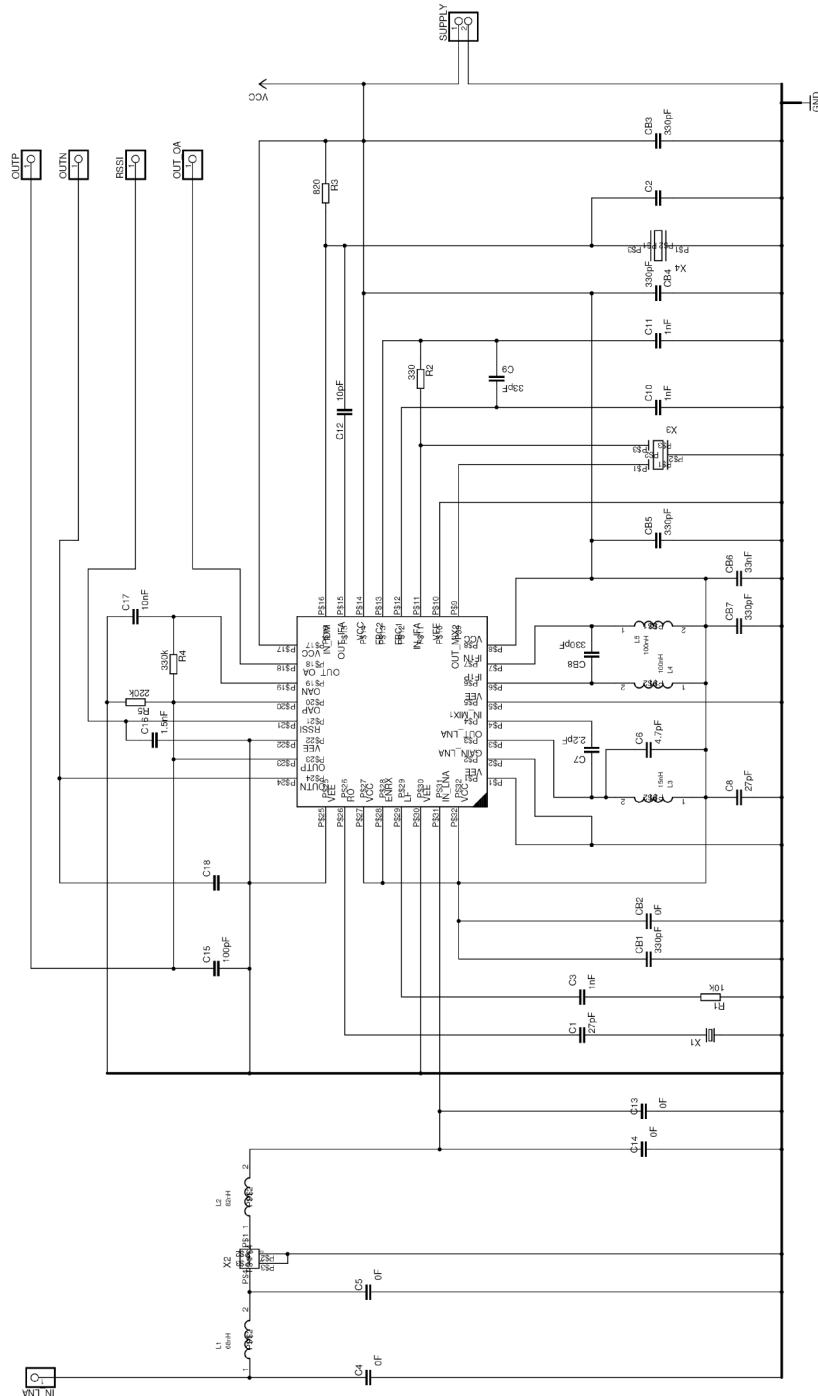
5.1 Mode Configurations

ENRX	Mode	Description
0	RX standby	Disable RX
1	RX active	Enable RX

5.2 LNA Gain Control

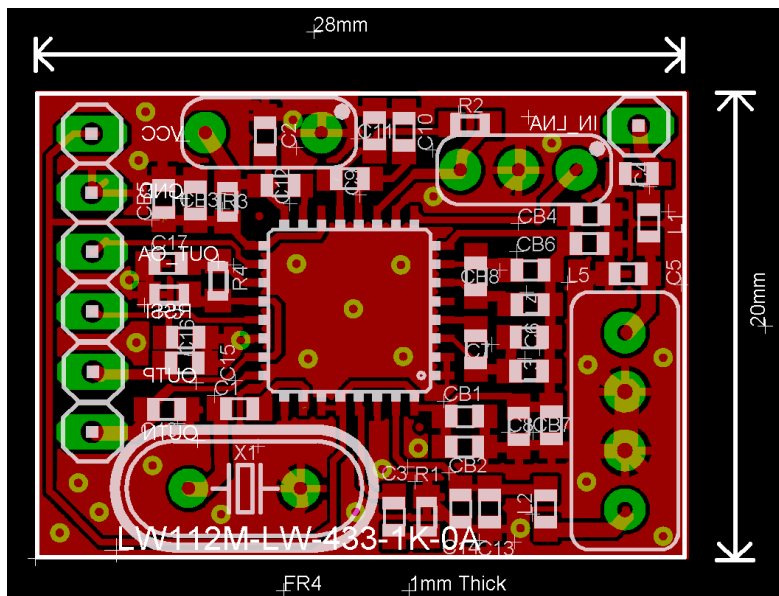
$V_{\text{GAIN_LNA}}$	Mode	Description
<0.8V	HIGH GAIN	LNA in high gain mode
>1.4V	LOW GAIN	LNA in low gain mode

6.0 Schematic Diagram

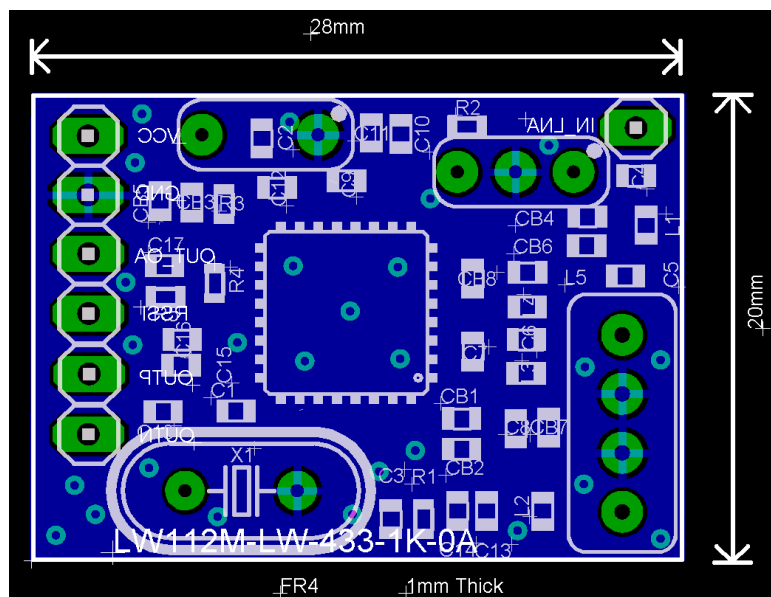


7.0 PCB Layout

LW112M-F PCB Top Layer (28 x 20 x 1 mm)



LW112M-F PCB Bottom Layer (28 x 20 x 1 mm)



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LW112M-F 315/433MHz FSK/FM Receiver Module
Preliminary Data Sheet
Subject to change without prior notice



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