6 Circuit Description

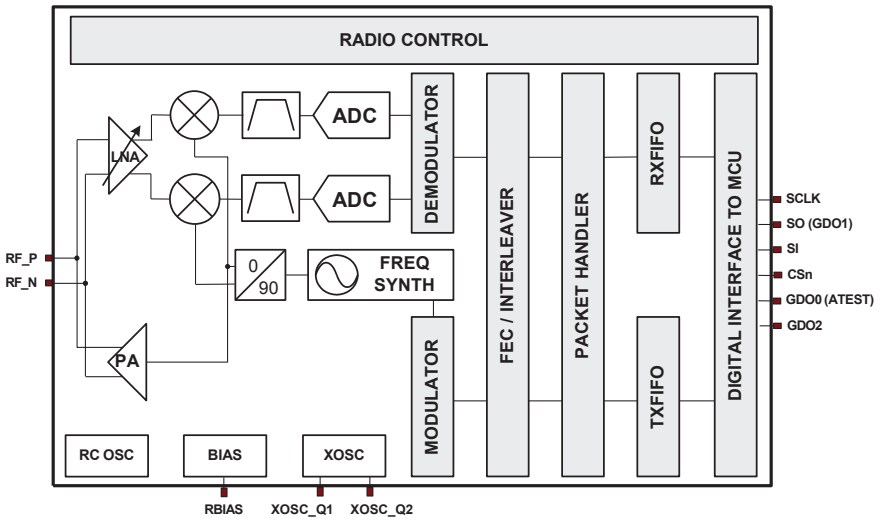

Figure 9: CC1101 Simplified Block Diagram

A simplified block diagram of CC1101 is shown in Figure 9.

CC1101 features a low-IF receiver. The received RF signal is amplified by the low-noise amplifier (LNA) and down-converted in quadrature (I and Q) to the intermediate frequency (IF). At IF, the I/Q signals are digitised by the ADCs. Automatic gain control (AGC), fine channel filtering, demodulation, and bit/packet synchronization are performed digitally.

The transmitter part of CC1101 is based on direct synthesis of the RF frequency. The frequency synthesizer includes a completely on-chip LC VCO and a 90 degree phase shifter for generating the I and Q LO signals to the down-conversion mixers in receive mode.

A crystal is to be connected to XOSC_Q1 and XOSC_Q2. The crystal oscillator generates the reference frequency for the synthesizer, as well as clocks for the ADC and the digital part.

A 4-wire SPI serial interface is used for configuration and data buffer access.

The digital baseband includes support for channel configuration, packet handling, and data buffering.

7 Application Circuit

Only a few external components are required for using the CC1101. The recommended application circuits for CC1101 are shown in Figure 10 and

Figure 11. The external components are described in Table 20, and typical values are given in Table 21.

The 315 MHz and 433 MHz CC1101EM reference design [1] use inexpensive multi-layer inductors. The 868 MHz and 915 MHz CC1101EM reference design [2] use wire-wound inductors as this give better output power, sensitivity, and attenuation of harmonics compared to using multi-layer inductors. Refer to design note DN032 [24] for information about performance when using wire-wound inductors from different vendors. See also Design Note DN013 [15], which gives the output power and harmonics when using *multi-layer* inductors. The output power is then typically +10 dBm when operating at 868/915 MHz.

7.1 Bias Resistor

The bias resistor R171 is used to set an accurate bias current.