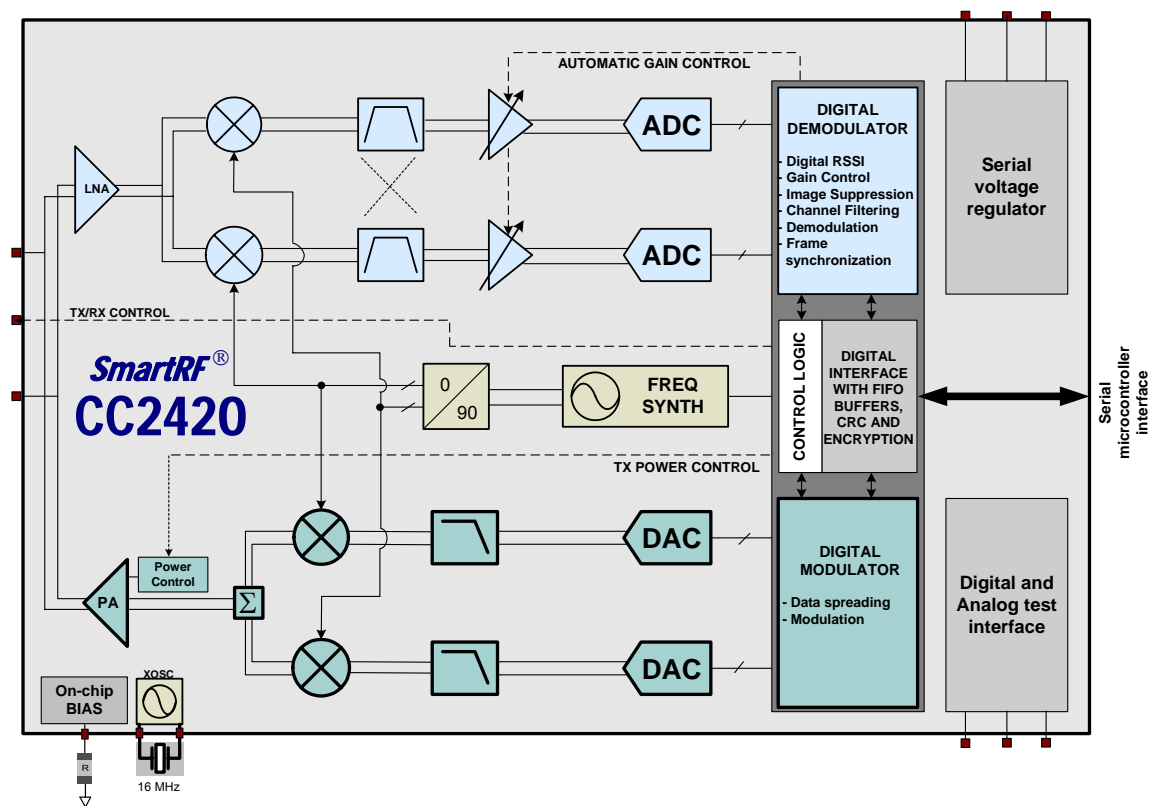


## 8 Circuit Description



**Figure 2. CC2420 simplified block diagram**

A simplified block diagram of **CC2420** is shown in Figure 2.

**CC2420** 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 (2 MHz), the complex I/Q signal is filtered and amplified, and then digitized by the ADCs. Automatic gain control, final channel filtering, de-spreading, symbol correlation and byte synchronisation are performed digitally.

When the **SFD** pin goes high, this indicates that a start of frame delimiter has been detected. **CC2420** buffers the received data in a 128 byte receive FIFO. The user may read the FIFO through an SPI interface. CRC is verified in hardware. RSSI and correlation values are appended to the frame. CCA is available on a pin in receive mode. Serial (unbuffered) data modes are also available for test purposes.

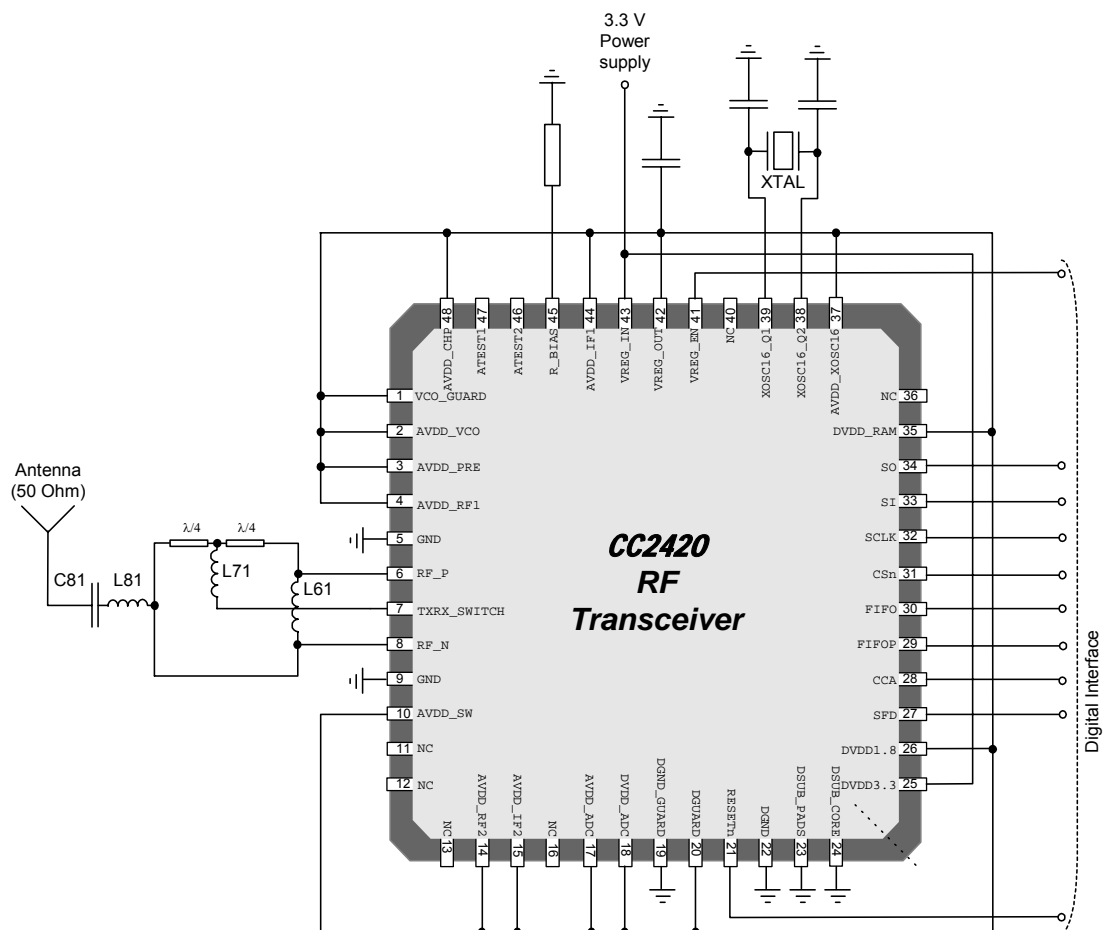
The **CC2420** transmitter is based on direct up-conversion. The data is buffered in a 128 byte transmit FIFO (separate from the receive FIFO). The preamble and start of frame delimiter are generated by hardware. Each symbol (4 bits) is spread using the IEEE 802.15.4 spreading sequence to 32 chips and output to the digital-to-analog converters (DACs).

An analog lowpass filter passes the signal to the quadrature (I and Q) upconversion mixers. The RF signal is amplified in the power amplifier (PA) and fed to the antenna.

The internal T/R switch circuitry makes the antenna interface and matching easy. The RF connection is differential. A balun may be used for single-ended antennas. The biasing of the PA and LNA is done by connecting **TXRX\_SWITCH** to **RF\_P** and **RF\_N** through an external DC path.

The frequency synthesizer includes a completely on-chip LC VCO and a 90

Ref	Description
C42	Voltage regulator load capacitance
C61	Balun and match, see page 55
C62	DC block to antenna and match
C71	Front-end bias decoupling and match, see page 55
C81	Balun and match, see page 55
C381	16MHz crystal load capacitor, see page 54
C391	16MHz crystal load capacitor, see page 54
L61	DC bias and match, see page 55
L62	DC bias and match, see page 55
L71	DC bias and match, see page 55
L81	Balun and match, see page 55
R451	Precision resistor for current reference generator
XTAL	16MHz crystal, see page 54

**Table 1. Overview of external components**

**Figure 3. Typical application circuit with transmission line balun for single-ended operation**