

Functional block diagram

The transceiver module is based on the IC RF2915, (RF MICRO-DEVICES INC.) which was specially designed for wireless data transceiver and IC LMX2315. Functionally, the IC RF2915 provides a monolithic superheterodyne receiver and a FM transmitter. The main building block of the receiver consists of LNA, RF Mixer, IF Amplifiers, Received Signal Strength Indicator (RSSI), FM Demodulator and Data Amplifier. The receiver also utilizes the on-chip VCO. The FM transmitter includes variable gain amplifier, power amplifier (PA) and on chip VCO. A message to be transmitted is packed by MCU HD6472246 into frames with 50 or 200 bytes length and sent to MCU AT90S2313. The MCU AT90S2313 encodes the frames by adding synchronization bits and sends with Manchester encoding..

The data stream coming from the controller AT90S2313 goes through a low-pass filter LPF1 to the varactor diode V1 that modulates the frequency of the VCO. The low-pass filter helps to limit the bandwidth occupied by transmitter. RF signal from TX OUT RF2915 goes through RF filter to the permanently attached antenna A1.

Receiving frequency modulation signal from antenna pass through RF filter in RX IN pin of RF2915. From out RF2915 (pin 29) the signal goes through a low-pass filter LPF2 to AT90S2313 for decoding, and then frames come to MCU HD6472246 for further processing. The DC/DC converters LT1613 and LT1615 is used to generate a fixed power supply voltage 3.3 V for all IC and 17.8 V for LCD.

The DC/DC converters is designed for the application of 2 NiMn cells.

The LMX2315 is high performance frequency synthesizers with integrated prescalers.

Serial data is transferred into the LMX2315 from MCU AT90S2313 via a three line interface (Data, Enable, Clock).

The PCF8593 is a CMOS clock/calendar circuit, optimized for low power consumption. Addresses and data are transferred serially in MCU via the two-line bidirectional I²C-bus. He has built-in 32.768 kHz oscillator circuit.