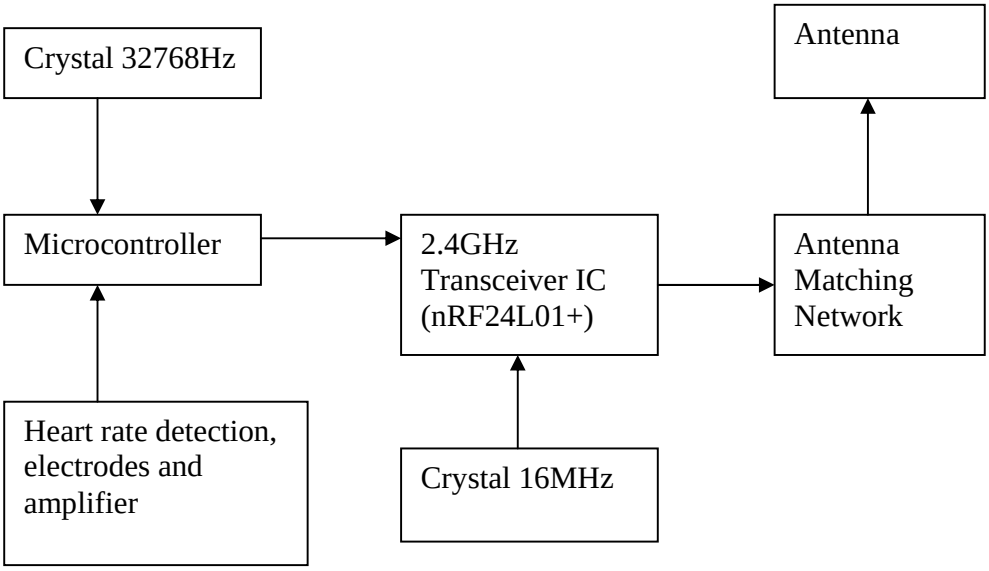
SZ912 Theory of operation



The SZ912 chest belt is a one way wireless chest belt that operates in conjunction with SE833 or other compatible watches. It is worn on the chest and detects the user's heart rate. The microcontroller in the chest belt calculates the heart rate of the user and transmits the heart rate to the watch and the watch display the heart rate reading on its LCD and may store the received heart rate information in its internal memory.
The SZ912 chest belt contains a pair of heart rate detection electrodes and an amplifier to detect and convert the ECG signal from the chest of the user into digital signal for the microcontroller to read. The microcontroller calculates the heart rate and transmits the data to the watch via a radio link that operates at 2.457 GHz.

The data signal is transferred through matching network(L1,L8,L9,L10,C42,C41,L3,C36,L4 and C43) fed to antenna.

1.2 Block diagram

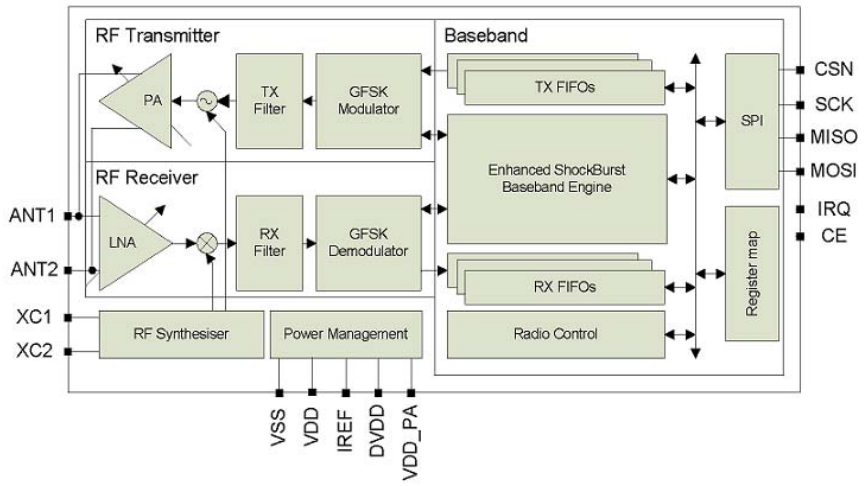


Figure 1. nRF24L01 block diagram

NRF24L01/ NRF24L01+ is a single-chip 2.4GHz transceiver for operation in the world wide ISM band at 2.4-2.4835 GHz.
This transceiver include :

- RF Synthesizer
  1. Fully integrated synthesizer
  2. Accepts low cost 16MHz crystal
- Transmitter and Receiver
  1. Worldwide 2.4GHz ISM band operation
  2. Common Rx and Tx pins
  3. GFSK modulation
  4. 1 and 2Mbps air data rate
  5. Programmable output power:0,-6,-12 or -18dBm
  6. Integrated channel filters
- Power Management
  1. Integrated voltage regulator
  2. 1.9 to 3.6V supply range
  3. Idle modes with fast start-up times for advanced power management
- Host Interface
  1. 4-Pin hardware SPI(serial peripheral interface),through SPI all configuration registers is available
  2. 3 separate Tx and Rx FIFOs
- Enhanced ShockBurst
  1. Automatic packet handling
  2. Auto packet transaction handling

The radio front end uses GFSK modulation. it has user configurable parameters like frequency channel, output power and air data rate.