Technical Description of the Circuit 941Y:

The product can divide into two part, RF and Baseband, the RF circuit is a single conversion, super-heterodyne architecture receiver IC. The incoming RF signal received by the antenna is fed to the RF input terminal of the IC RX3310A, then the RF signal is then amplified by the LNA in the IC RX3310A. The amplified signal will fed to the mixer input, the LO for the mixer is generated by the external LC tank circuit, in the above circuit, the LO is 433.12MHz, the IF (F_{RF}-F_{LO}) is then demodulated by the demodulator in the IC RX3310A and the IC RX 3310A provide the raw data. The data is then fed to the baseband MCU TM8706-K316 for decoding and the MCU TM8706-K316 will display the decoded temperature at the LCD.

Functional Description

RF amplifier

The RF amplifier uses a common emitter configuration with a separate emitter connection (VEE). The input signal (VIRF) should be ac-coupled externally. The output of the amplifier is open collector so that the gain may be set with an external tuned load.

Mixer

The mixer is doubly-balanced configuration and has an ac-coupled input.

Oscillator

A balanced oscillator configuration is used with an L-C tank externally connected across the OSC1 and OSC2 pins. The frequency of the oscillator is determined by the external capacitor, C1, and inductor, L1 (please refer to application circuit schematic).

IF amplifier

The IF amplifier is a differential input, single-ended output emitter-coupled pair. It is used to provide additional gain in order to reduce the influence of the noise of the succeeding limiter amplifier on the total receiver noise figure.

IF filter

To minimize external component costs, an active IF filter is fully integrated.

Limiter

The limiting amplifier consists of several dc-coupled amplifier stages and outputs an RSSI signal.

Comparator

Following the limiting amplifier, the RSSI signal is passed through an additional buffer stage and is then fed to the comparator's positive and negative terminals, which possess different R-C filter time constants. A larger off-chip capacitor is used at the negative comparator input and hence, its terminal voltage represents the average value of the RSSI signal. A smaller off-chip capacitor is used at the positive comparator input and this allows the positive input to follow the RSSI signal instantaneously. When the received RSSI signal exceeds its average value (when an ASK **on** signal is received), the comparator output is switched on.

Band gap reference

A band gap reference provides precise biasing of the entire chip over temperature.