FCC ID: Y4B-MST-RFM

FCC 15.247 Certification Information

Operational Description

1. Circuit Principle:

The MST-RFM product incorporates a Texas Instruments CC1110 system-on-chip radio transceiver. This implements a direct down conversion radio transceiver operating in the 900MHz ISM band. The maximum transmitter output power of this device is 10dBm. The AIC-EGW devices utilize a wideband digital modulation physical layer with the addition of a carrier sense multiple access (CSMA) medium access control (MAC) layer on each frequency channel. The data transmission rate is set to 100kpbs maximum.

Modulation	2-FSK, 240Khz frequency deviation
Radio Type	Low-IF Super heterodyne
Data rate	100kbps
Radio IF Frequency	270.13Khz (fixed)
Signal RF Bandwidth (6db)	540Khz
Maximum transmit power	9dBm
RF transmit frequencies	908.56 + 1.123*n MHz (where 0<=n<=10)
RF channel spacing	1123.54Khz
Maximum packet size	1392 bits
MAC protocol	Carrier sense multiple access (CSMA)
PHY protocol	Digital modulation spread spectrum (>500Khz)

Table 1 Transmitter Details of Operation

Frequency channel	Transmitter Base Channel frequency (MHz)	Receiver Base Channel frequency (MHz)	Frequency channel	Transmitter Base Channel frequency (MHz)	Receiver Base Channel frequency (MHz)
1	908.56	908.56	6	914.17	914.17
2	909.68	909.68	7	915.29	915.29
3	910.81	910.81	8	916.41	916.41
4	911.93	911.93	9	917.54	917.54
5	913.05	913.05	10	918.66	918.66
			11	919.80	919.80

Table 2 Radio Frequency Channels

2. Radio Signal Flow and Baseband Operations:

The Radio is based on the Texas Instrument CC1110 system-on-chip (SoC) module. The CC1110 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 digitized by the ADCs. Automatic gain control (AGC), fine channel filtering, demodulation, and bit/packet synchronization is performed digitally.

The transmitter part of the CC1110 is based on direct synthesis of the RF frequency. The frequency synthesizer includes a complete on-chip LC VCO and a 90 degrees phase shifter for generating the I and Q signals to the down-conversion.

3. Antenna:

The antenna is a permanently attached ¼ wavelength monopole. The antenna is permanently affixed to the PCB.