WiMAX Based Audio/Video Transmission

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Abstract

In this article, we present the idea of a WiMAX based audio/video transmission. The data transmitter will transmit an audio/video signal, which will be received by the receiver side. The hardware of the data transmitter consists of a CCD camera and audio mic. The CCD camera will capture the image and give the analog video signal to a fixed filter of 12 MHz. The filter is designed in such a way that it can only pass a signal of 12 MHz and 4 KHz audio signal. The analog signal is given at the base of C1815 transistor, which will amplify this analog signal. To remove the unwanted signals, we have used capacitors. The amplified signal is then passed through a capacitor of capacitance 504 pf. the output signal at the capacitor is than pass through an RF amplifier. The RF amplifier will give strength and power to the signal. In RF amplifier section we have used a variable tuned circuit. The inductor used at the RF amplifier section act as antenna that will transmit the video signal and audio to the air.

1. Introduction

We have designed and implemented a WiMAX transmitter and receiver in which we have used a CCD Camera and mic that will capture the video signal and audio signal, this signal is amplified using transistor and then it is transmitted in the air. On the receiver side we have used a 3 GHZ demodulator with which a monopole antenna is connected to receive the signal. The signal is than amplified using video amplifier. Finally the signal is given to the television where we see the effect in real time.

WiMAX stands for worldwide interoperability for microwave access that enables the actual broadband wireless network with high speed. It operates same like Wi-Fi but Wi-Fi operates with some limitations, like it is baseband technology and covers only 100 feet radius with slow speed. WiMAX covers radius of 50km and work with speed of 70mbs. It is replacement of wired broadband. In near future, all the intelligent systems will be incorporated with WiMAX technology and a user will be connected to Internet even if he is driving a car with speed of 120km [4].

2. WiMAX Transmitter

This is the one of the advanced technology of the world. In Wimax transmitter we are using highest band of the radio frequency. Its frequency range starts up to from 2.4GHZ. In this transmitter we have use very small antenna and achieve a long distance. Wimax transmitter provide wide bandwidth due to which we load heavy data on Wimax transmitter to transmitting in it voice frequency is 4KHZ and video frequency is 12MHZ. Wimax data can transmit heavy signal. In it we can transmit audio & video data at the same time due wide bandwidth due to high frequency the size of antenna decrease and due to small antenna we get speed of faster than usual.

For example; if a video is transmitting from a TV transmitter it takes several seconds to receive. But in WiMAX data is received in real time. Wimax transmitter has no distortion effect, like gravity, electromagnetic field and other effects. Due to which we receive a signal very clear.

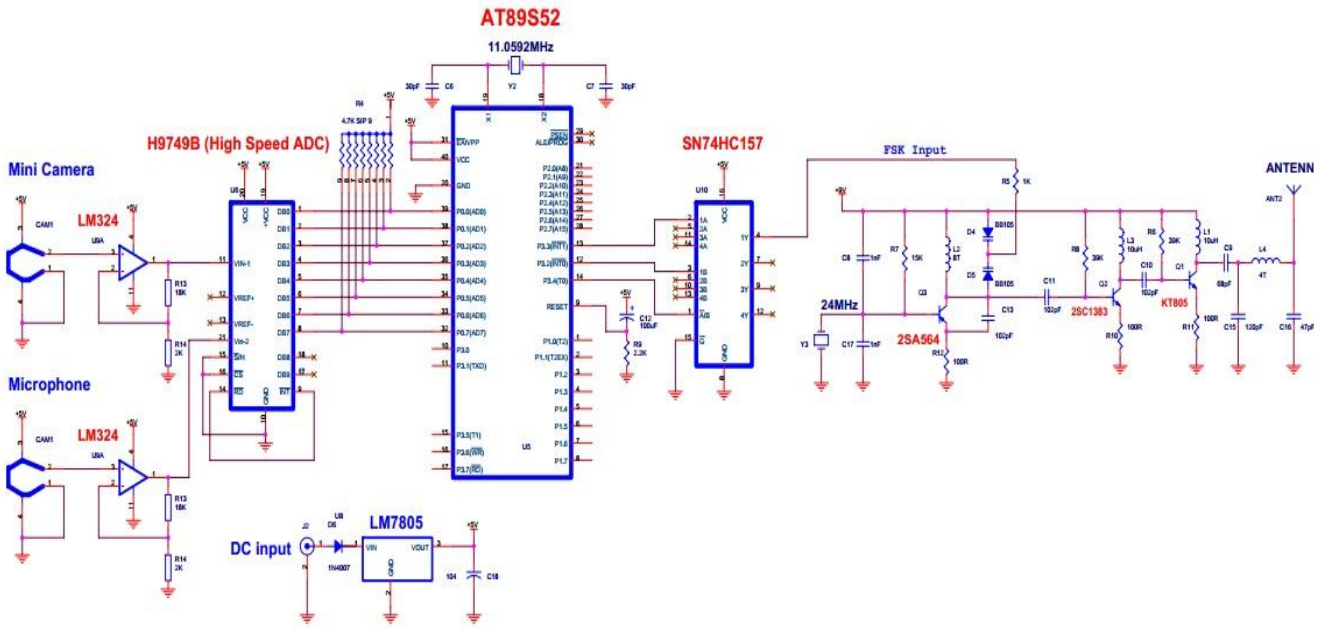

Figure 1: Circuit diagram of transmitter

3. WiMAX Receiver

The function of the receiver is opposite to that of the transmitter. At the transmitter side the analog signals are transmitted and the receiver receives those signals. Due to no distortion effects e.g. gravity, electric magnetic field and other effects clear signals can be received. The receiver will receive the amplified analog video signal, and its effects can be seen at the television in real time.

The hardware consists of small size monopole antenna, demodulator, video amplifier, and tuner, step down transformer and TV. The monopole antenna is connected to a 3 GHz demodulator. A tuner is also connected to the demodulator, which can be tuned between 2.5 GHz and 3 GHz. The monopole antenna can receive the analog signals having the frequency range - 2.4 GHz to 3 GHz.The demodulator is than connected with a video amplifier to amplify the signals. The signals are than given to television through lead from amplifier. On the screen of the TV we can see the image in the real time. In the video amplifier there is an IC L7805 whose function is to provide 5 volt to the demodulator.

4. Operation

In our project we have used Wimax based Audio/video transmitter and receiver shown in Figure 1 and Figure 2 respectively. The data transmitter will transmit an audio & video signal, which will be received by the receiver side. The hardware of the data transmitter consists of a CCD camera and audio mic. The CCD camera will capture the image and mic will capture audio and give the analog signal to a fixed filter of 12 MHz and 4 KHz. The filter is designed in such a way that it can only

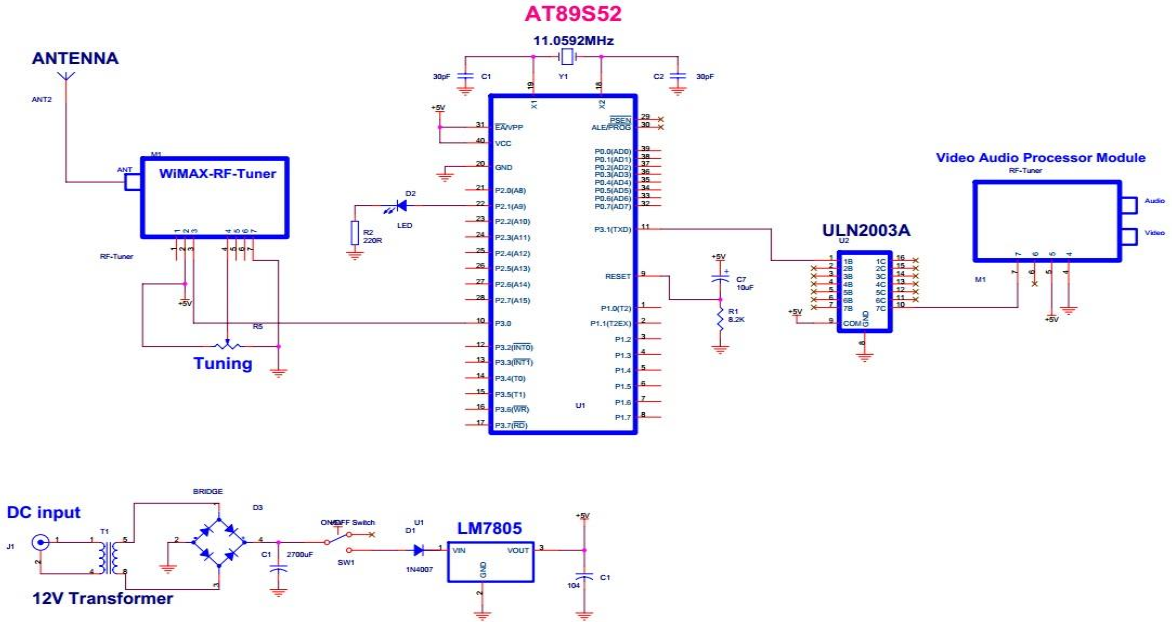

Figure 2: Circuit Diagram of Receiver

pass a signal of 12 MHz and 4 KHz. The analog signal is given at the base of C1815 transistor, which will amplify this analog signal. To remove the unwanted signals we have used capacitors as to remove unwanted signal coming from surrounding. The amplified signal is than pass through a capacitor of capacitance 504 pf. the output signal at the capacitor is than pass through an RF amplifier. The RF amplifier will give strength and power to the signal. In RF amplifier section we have used a variable tuned circuit. The inductor used at the RF amplifier section act as antenna that will transmit the video signal to the air. The receiver will receive the amplified analog video signal and its effect can be seen at the television in real time. The hardware consists of small size monopole antenna, demodulator, video amplifier, and tuner, step down transformer and TV. The monopole antenna is connected to a 3 GHz demodulator. A tuner is also connected to the demodulator, which can be tuned from 2. 5 GHz to 3 GHz. the monopole antenna can receive the analog signal having the frequency range from 2. 5 GHz to 3 GHz. THE demodulator is than connected with a video amplifier to amplify the signal. The signal is than given to television through lead from amplifier. In the video amplifier there is an IC L7805 whose function is to provide 5v voltage to the demodulator. On the screen of the TV we can see the image in the real time and listen the sound.

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