Transmitter

1. Audio input block

The audio input block provide audio input interface to external audio signal which is connected to the PCB via a 3.5mm jacket. A high input impedance input block with appropriate signal level reduction is implemented to ensure the later FM modulator will produce +/-60kHz modulated signal with a 1kHz 2Vpp sinusoidal input signal.

2. 3.3V voltage regulator block
A voltage supplier regulator is applied to provide a 3.3V voltage for the FM modulation system. The voltage regulator also has the function of shutting down the system when the battery level is too low to maintain the FM modulation block to generate the correct carrier frequency at 49.86MHz.

3. FM modulation block

The FM modulation block will FM modulate the input signal after signal level reduction to FM signal with carrier frequency at 49.86MHz. The modulation bandwidth is +/-60KHz maximum.

4. RF output block

The FM modulated signal is amplified by the RF amplifier in the RF output block. A two-stage RF amplification is applied to generate at least 4dBm output at low battery power.

The RF amplifier is directly connected to the 6V battery to increase the amplification efficiency by using higher VDD. At the end of the RF amplifier is a low pass filter to remove EMI, and then there is an antenna matching network which allows the amplified signal to be transmitted through a quarter-wave antenna efficiently.

5. 6V battery block

The whole system is powered by a 6V battery. The voltage level detector in the 3.3V voltage regulator will provide an appropriate monitoring of the battery level and shut down the system when the battery level is too low to ensure the correct carrier frequency are being used in the transmitter system.