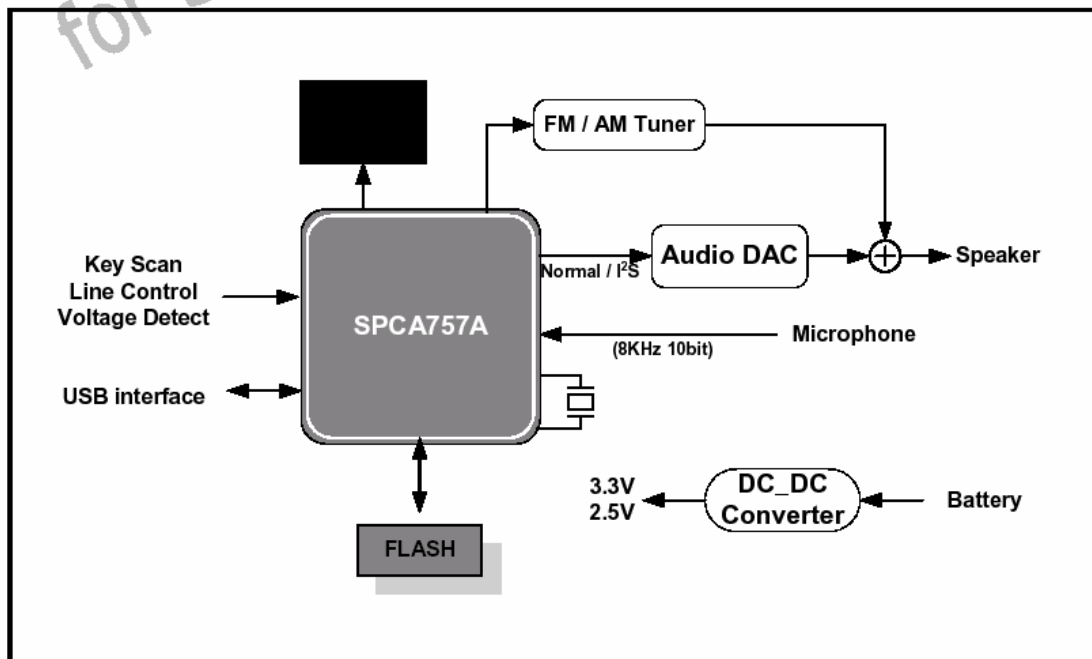


THE WORK FLOW OF EM193F :

The EM193F Car MP3 Player is mainly connect of three parts : 1: the center controller and the MP3 encoder/decoder circuit . 2: the frequency modulator part . 3: the power supply circuit .



Part 1 :

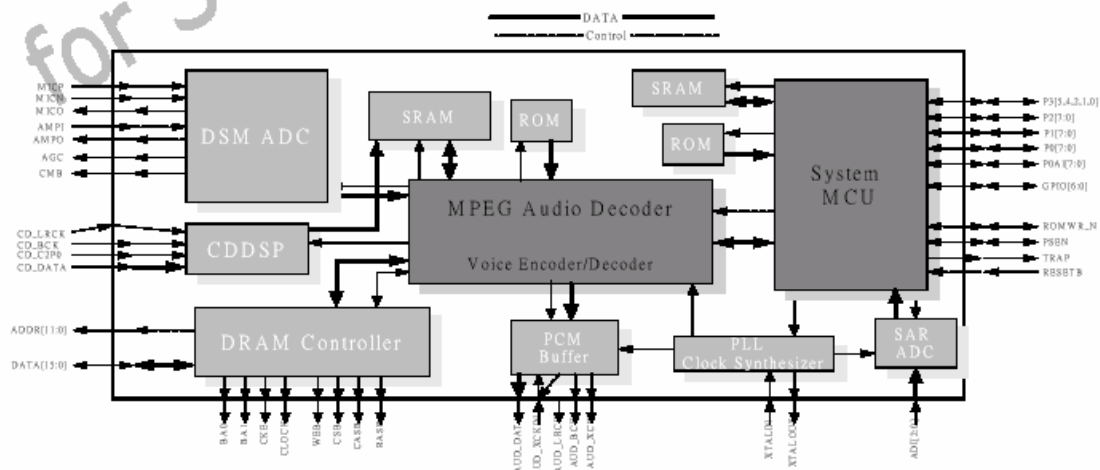
The center controller and the MP3 encoder/decoder circuit is the most important part of this player. Refer the schematic and the block diagram, we can know that: the SPCA757A is a high performance, low power, single chip, MPEG 1/2 layer 2/3 audio decoder. High integration (including audio decoder, system MCU, Flash storage media controller, USB interface and PLL 's) makes the SPCA757A perfect for FLASH-based MP3 player systems. The SPCA757A also contains a 10-bit 8/16 kHz sampling rate audio ADC for voice recording applications.

The SPCA757A provides an ALL-IN-ONE solution that is ideally optimized for FLASH-based portable MP3 players with voice recording and playback functions. The built-in 8051-based MCU provides a programmable interface to the LCD controller, and key inputs. Encoded MPEG audio data stored in FLASH storage media is sent to the SPCA757A through a media controller interface which is programmable to fit different FLASH type media. The USB interface builds a fast communication path between the storage media and PC 's. Decoded audio PCM data is output to an external DAC through a programmable DAC interface such that most common audio DAC 's can cooperate with the SPCA757A to meet different customer requirements. A high quality 10-bit 8/16 KHz sampling rate

ADC is embedded for voice recording. Based on the ADPCM algorithm, voice is compressed to a low data rate of 32/6.3 Kbps, while retaining a good resolution of the original speech/audio.

The SPCA757A is designed for 2.5V(Core)/3.3V(I/O) applications and the built-in PLL 's are able to synthesize the system clock and the audio clocks from 6/16.9344 MHz crystal oscillator source. The high performance SPCA757A signal processor can operate with very low power dissipation, which makes the SPCA757A extremely suitable for portable systems. The SPCA757A has been designed with, not only the latest technology, but the full service and support of Sunplus.

BLOCK DIAGRAM of SPCA757A

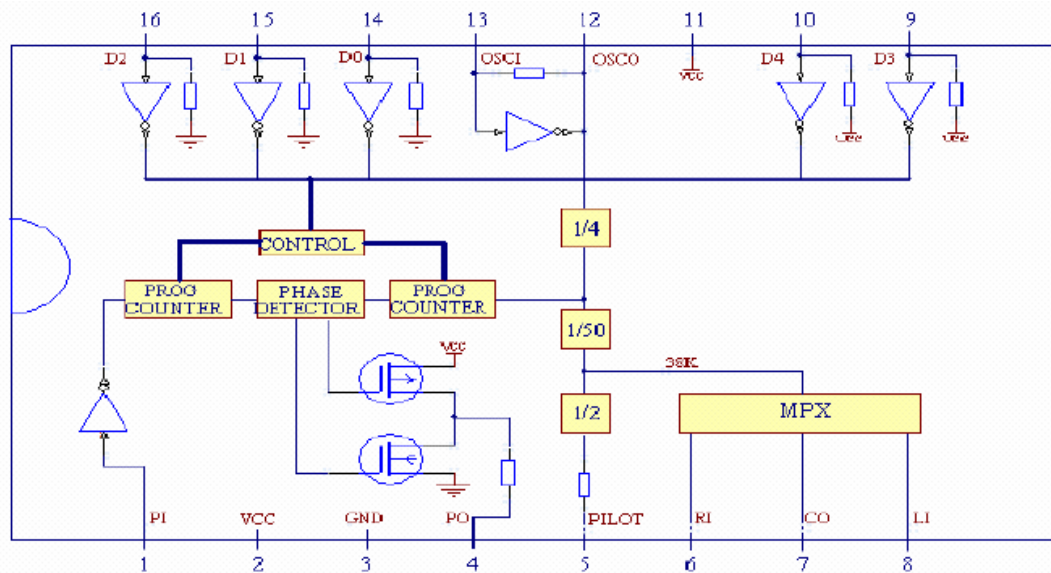


Part 2 :

The HY1417LP is a low-power stereo FM (frequency modulation) transmitter. It uses CMOS technology, with supply voltage from 2.8V to 5.5V, and very low standard current of 2.5mA. So these devices are well suited for low voltage and battery powered applications. The HY1417LP consists of a stereo modulator for generating stereo composite signals and PLL (phase lock loop) circuit, and a FM transmitter for broadcasting a FM signal on the air. The HY1417LP IC also has a built-in 38KHz oscillator circuit and the programmable control circuit. Stereo audio signal from WM8759 (pin 6.9) and the 38KHz signal will be mixed and processed, then this stereo modulated signal will be added to the outside oscillator (L2,DF1,DF2,CX,Q1 and the assemble circuit). The voltage/frequency control pulse signal from pin5 will be added to there too. After amplified by Q2, the modulated radio signal will be sent to space by one antenna (The antenna is internal wire connect to transmitter PCB) at last. Stereo audio signal can also be input from the audio jack which connects to the outside audio player.

Change the voltage of the programmable control port (pin9,14,15,16,connected to the controller SPCA757A) , the output frequency from antenna could be change into point :88.1MHz, 88.3MHz, 88.5MHz, 88.7MHz, 88.9MHz, 89.1MHz, 106.7MHz,106.9MHz,107.1MHz,107.3MHz,107.5MHz,107.7MHz,107.9MHz.

BLOCK DIAGRAM of HY1417LP



Part 3 :

The power supply circuit is mainly consist of two DC/DC converter UTC7805 and XC6201P182 and RT9169-30CV. 12V DC voltage from the battery of the car can be convert to +5V DC by the UTC7805, and then this voltage could be convert to 3.3V DC by the RT9169-30CV or 1.8V DC by the XC6201P182 So, this part can supply +5V and +3.3V and 1.8V voltage to all other IC and circuit to work.

