System working principle

First power on the cell phone , (Power supply's voltage is set to 3.6 v-4.2 v, power is supplied to RF PA, audio PA circuit firstly.The pmu LDO will be opened once the power key is pressed.The LDO regulator power will be supplied to RF,BT ,MCP ect devices. Then the handset will detected if the sim card is existed or not.If existed ,the handset will attempt to register on the network.

The 2G mobile phone have bluetooth function option inside, the bluetooth is a wireless data transmission function, and the radio ferquency is from 2402 to 2480MHz with GFSK modulation. The uplink frequency band is from 824MHz to 849MHz for GSM850, the uplink frequency band is from 1850MHz to 1910MHz for PCS1900

1.2.1 Baseband chipset

SC6600 is a highly integrated mixed signal baseband processor for GSM/GPRS applications, Which is designed to provide a cost-effective, low-power and

high-performance solution for mobile phones. It consists of an embedded 32-bit microcontroller and an embedded 16-bit DSP core and integrates many GSM/GPRS-specific hardware accelerators and analog functions, such as power management unit, analog baseband, audio DAC and ADC, and many drivers, even some resistors to simplify the system design and minimize the total number of system components. Further more, embedded PSRAM is supported in SC6600 for the purpose of decreasing the system complexity.

The embedded MCU runs a real-time operation system (RTOS), performs the system control functions according to the GSM/GPRS protocol stack, and serves all peripheral components including man-machine interface.

The embedded DSP provides data processing for many GSM/GPRS-specific physical layer signal.

To reduce the total system cost and enhance overall functionality, SC6600 integrated digital still camera processor, MPEG4/H.263/JPEG codec engines and a rich set of peripherals for functionality extensions, such as SPI, IrDA, UART, IIS, PCM, I2C, keypad, SIM card, 4-port external memory interface, LCM and USB. To enhance system performance, a cache controller is added with 8k bytes ram space.

The embedded PSRAM simplifys the design complexity of PCB and reduce the system cost.

Proprietary architectures and algorithms are developed for low power ASIC design and advanced power management for SC6600. Unique techniques are utilized for noise/offset calibration and cancellation at the same time. Therefore, SC6600 is particularly suitable for cost-sensitive and power-sensitive applications.

SC6600 Platform features：

(1) GENERAL Features

  Low power and high-performance device of mixed signal CMOS technology

  External supply voltages: battery 3.6 V (typical), optional backup battery 3.0 V (typical)

  Internal supply voltages: analog 3.0 V or 3.3 V, digital I/O 3.0 V or 1.8 V (typical), digital core 1.8 V (typical) and RTC power supply 1.8 V (typical)

   Integrated power management; voice band, audio band, and base band analog front ends; keypad LED driver, vibrator motor driver, and LCD backlight driver; aux ADC and some resistors

  Embedded PSRAM, ADMUX, 32 M is supported

  Serial flash controller is integrated to support external serial flash memory

  LFBGA , 9mm x 9 mm, 200-ball, 0.5 ball pitch package

(2) MCU

  ARM7TDMI-S   , 32-bit RISC processor

  High performance ARM AMBA   bus

  Dedicated DMA bus

  High performance CACHE controller

  22 DMA channels

  16 KByte on-chip RAM

  52 KByte on-chip ROM

  Watch dog timer for system crash recovery

  Three sets of general purpose timer

  System timer

  RTC timer

  LCM controller

  Serial flash controller

  Support MCU bus monitor for software debug and ROM code patch

  JTAG port for test and In-Circuit Emulation

(3) Embedded PSRAM Memory

  Supports embedded PSRAM memory with size of 32M bits

  Supports ADM PSRAM of 16-bit data width

  Asynchronous single access

  Synchronous burst access

(4) External serial flash memory

  External serial flash memory supported

  Standard SPI mode, SCLK/SDI/SDO

  Dual SPI mode, SCLK/IO0/IO1

  Quad SPI mode, SCLK/IO0/IO1/IO2/IO3

  QPI mode supported

  up to 78M bus clock frequency supported

(5) Peripherals

Thriple SIM card interface, support 1.8 V or 3.0 V SIM cards

7-row x 8-column keypad controller, support multiple key presses

Real Time Clock (RTC) and alarm operating at 32.768 kHz with a separate power supply

General purpose I/Os (GPIO)

Pulse Width Modulation (PWM) output

Full-speed USB 1.1 Device controller

Two sets of UART up to 900K baud rate

Support IrDA

Two sets of SPI, support both two-wire and three-wire serial interfaces

I2S/PCM and DAI interface for audio application

I2C, for, e.g., camera configuration

SBI for RF control

T-card supported with SPI mode

SC6600 Multimedia features：

Compatible with GSM/GPRS Release 1999, DCS1800 and PCS1900 recommendations

Dedicated GSM/GPRS signal processing engine for equalization, channel encoding/decoding for all traffic and control channels, GMSK modulation and encryption/decryption (A5/1 and A5/2, GEA 1 and GEA 2 algorithms)

GMSK modulator with analog I and Q channel outputs

10-bit D/A converter for uplink baseband I and Q signals

12-bit high resolution A/D converter for downlink baseband I and Q signals

Calibration mechanism of offset and gain mismatch for baseband A/D converters and D/A converters

10-bit D/A converter for Automatic Power Control

Programmable radio Rx filter

GSM system timing

Low swing 26 MHz master clock input

Programmable TDMA timing with 1/4 bit resolution

Timing tracking in power saving mode

Complete in-phase and quadrature (I/Q) component interface between the Digital Signal Processor (DSP) and RF module

Dedicated RF serial control interface and parallel control signals

Programmable GSM/GPRS modem

Packet switched data with CS1/CS2/CS3/CS4 coding schemes

Multi-band support

Complete voice band codec

Audio signal conversion between microphone/earphone and DSP

Second set converters for auxiliary microphone/speaker

Supports Digital Audio Interface (DAI)

Stereo audio output

Integrated microphone bias

GSM/GPRS quad vocoders for adaptive multirate (AMR), enhanced full rate (EFR), full rate (FR) and half rate (HR)

FR error concealment

Dial tone generation

Voice memo

Noise reduction

Echo suppression/echo cancellation

Advanced side tone oscillation reduction

Digital side tone generator with programmable gain

Voice power amplifier with programmable gain

2nd order sigma-delta A/D converter for voice uplink path

D/A converter for voice downlink path

Supports half-duplex hands-free operation

Compliant with GSM 03.50

Five auxiliary analog inputs to a 10-bit analog-to-digital converter (ADC) for measurement purposes