PAL101 Circuit Description

Brand	Model Number	Version
PAL	PAL101	V00

PAL adopts GSM communication system as main design; its circuit mainly consists of the following six parts,

1: BASEBAND (baseband, power supply, logic control)
2: GSM_RF TRANSCEIVER
3: AUDIAO_USB_INTERFACE
4: KEYPAD_LCD_BACKLIGHT
5: SIM_MEMORY
6: BLUE TOOCH

The description for each part is as follows,

1. BASEBAND (baseband, power supply, logic control)

Baseband mainly contains main control chip MT6223 and charging chip SI4833. MT6223 is an extensively high-degree integrated chip provided by MTK，which integrates system control, power management, GSM system controller, A-D signal processing, audio signal input/output control, mic signal input/output control, LCD display driver, memory interface, USB, UART interface, Bluetooth control interface, system clock(32.768khz) and logic control.

2. GSM_RF TRANSCEIVER

GSM_RF TRANSCEIVER is a quad-band transceiver (GSM850\900\DCS1800\PCS1900MHZ). It contains transceiver chip AD6548, RF PA moduleRF3166/AD6212, antenna switch B085TK, SAW (GSM850\900\DCS1800\PCS1900MHZ), 26MHz crystal and antenna. The power is supplied to VDD\VRF by VBAT and MT6223.

The transceiver is mainly controlled by MT6223, which supply GSM operating time base, signal processing and logic control.

While receiving the signal, GSM antenna receives signal from base station, and then transmit it to SAW filter by B085TK. After amplifying by AD6548, the signal detected will be sent to MT6223 for processing and then to D\A converter, finally it will be amplified to drive earphone or speaker.

While transmitting the signal, MT6223 send command to AD6548 by I\Q interface, and then the data will be processed according to GSM regulations. RF signal will be amplified to 0~2dBM and then to 30~33DBM. Finally it will send signal to base station by GSM antenna, then the whole process is completed.

3. AUDIAO_USB_INTERFACE

Audio amplifier contains LM4890 and analog switch SGM4684. Audio signal is output from

MT6223 and transmitted to LM4890 for amplifying. And then it will be sent to speaker or headphone.
USB function is reserved in this board.
UART interface is used for downloading and calibration. This model does not provide UART cable. And all functions will be accomplished internally in MT6223.

4. KEYPAD_LCD_BACKLIGHT

KEYPAD function is supplied by MT6223. It contains kcol0~kcol4 and krow0~krow4.
LCD contains AR2043 and MT6223. MT6223 provides 8bit data flow control (lcd0~lcd7), which could supply 176*220 pixel with LCD. The power is supplied by VDD 2.8v.
BACKLIGHT is the circuit for LCD backlight, which includes LCD module and keypad backlight. It consists of LCD module AR2043, 3V LDO RT9193-30PB and LED array. At working mode, LDO—3V is turned on, and LCD backlight will light. Meanwhile keypad led (8pc) will light. It will be turned off automatically after 15-30s, while the time can be customized.

5. SIM_MEMORY

SIM circuit consists of SIM socket and MT6223. Insert SIM card, the card type and network selection will be auto recognized.
Memory circuit consists of memory chip K5L2833ATA and MT6223. The power is supplied by MT6223 VMEM interface and the voltage is 1.8v. (1.8v/2.8v to be selected, which depends on the operating voltage of memory chip)

6. BLUE TOOTH

Bluetooth circuit consists of MT6601, 2.8V_LDO RT9193-28PB, MT6223, 32MHZ crystal, Bluetooth filter LFB182G45SG9A293 and Bluetooth antenna.
At working mode, MT6223 will send work command, and LDO begin supplying power to create Bluetooth working mode. The audio signal or data will be sent to Bluetooth filter, and then be transmitted by Bluetooth antenna. The launching power of Bluetooth is 0~4dbm. Since Bluetooth uses high-speed frequency-hopping mode, which is 1600 times per second, 32 MHz crystal will provide high-speed steady frequency to phase-locked loop circuit, to ensure that it work well.