A3560

Operation Description

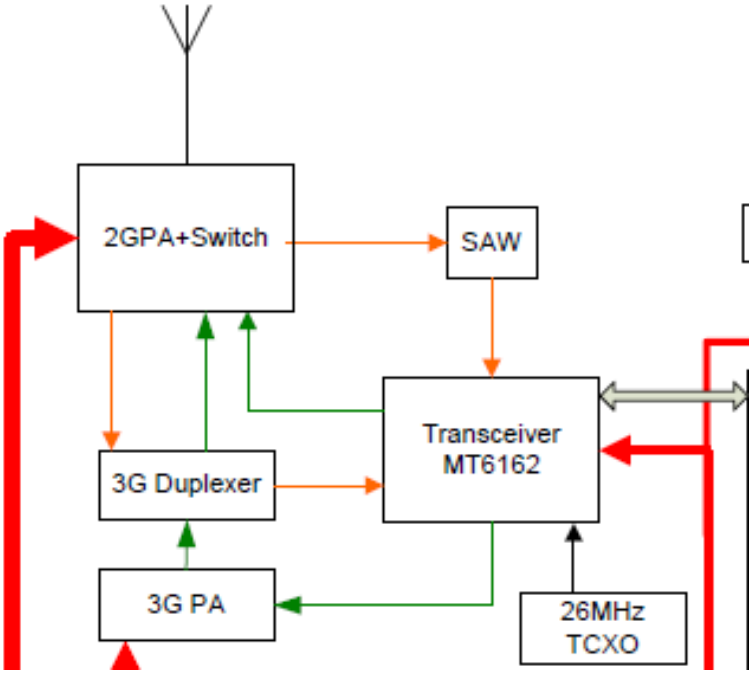
1. Overview:

A3560 works on GSM 850/EGSM 900/DCS 1800/PCS 1900 and WCDMA Band II / Band V, CPU(MT6276W) chip runs up to 411MHz.The main IC include CPU (MT6276W) , FLASH (1Gb NAND Flash + 512Mb Mobile DDR SDRAM) , TRANSCEIVR（MT6162）, PA(SKY77551/ RF7242 / RF7245) , WIFI（MT5931A/B）

2.System diagram Overview:

2.1RF:

RF (Radio Frequency) section is in charge of the signal transmit and receiving, signal modulation and demodulation.



The following is the GSM (Figure 1) and WCDMA (Figure 2) transceiver block diagrams.

Product technical parameters:

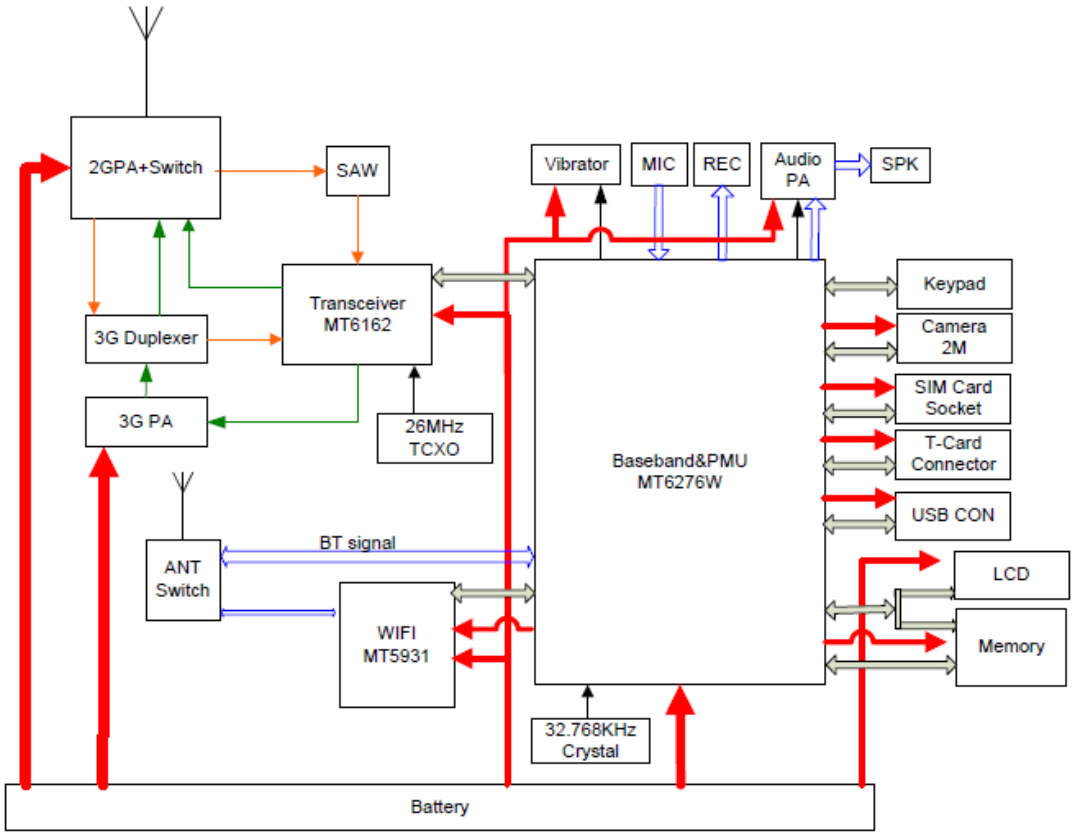
GENERAL:

Items	Frequency allocation	Channel band width	Channel	Modulation	TX/RX channel space	(Fn)Freq. calculating formula
GSM 850	TX(Uplink) 824 – 849 MHz RX(Downlink) 869 – 894 MHz	200 KHz	128~251	GMSK,BT=0.3	45 MHz	Fn = 824.2 + (0.2 x (n-128)) n: channel NO. Unit: MHz
GSM 900	TX(Uplink) 880 – 915 MHz RX(Downlink) 925 – 960 MHz	200 KHz	975~1023 0~124	GMSK,BT=0.3	45 MHz	Fn = 890 + (0.2 x n) 0 <= n <= 124 Fn = 890 + (0.2 x (n – 1024)) 975 <= n <= 1023 n: channel NO. Unit: MHz
DCS	TX(Uplink) 1710 – 1785 MHz RX(Downlink) 1805 – 1880 MHz	200 KHz	512~885	GMSK,BT=0.3	95 MHz	Fn = 1710.2 + (0.2 x (n – 512)) 512 < n < 885 n: channel NO. Unit: MHz
PCS	TX(Uplink) 1850 – 1910 MHz RX(Downlink) 1930 – 1990 MHz	200 KHz	512~810	GMSK,BT=0.3	80 MHz	Fn= 1850.2 + (0.2 x (n – 512)) 512 < n < 810 n: channel NO. Unit: MHz
WCDMA BAND II	TX(Uplink) 1850 – 1910 MHz RX(Downlink) 1930 – 1990MHz	5 MHz	TX(Uplink) 9262~9538 RX(Downlink) 9662~9938	TX(Uplink) BPSK RX(Downlink) QPSK	80MHz	Fn = 1852.4 + (0.2 x (n – 9262)) 9262 ≤ n ≤ 9538 n: channel NO. Unit: MHz
WCDMA BAND V	TX(Uplink) 824 – 849 MHz RX(Downlink) 869 – 894 MHz	5 MHz	TX(Uplink) 4132– 4233 RX(Downlink) 4357~4458	TX(Uplink) BPSK RX(Downlink) QPSK	45 MHz	Fn = 826.4 + (0.2 x (n – 4132)) 4132 ≤ n ≤ 4233 n: channel NO. Unit: MHz

2.BB:

BB (Base-Band) section is the control & management center of the mobile where OS (Operate System) running and provides the MMI for the mobile.

A 32.768 KHz crystal oscillator which also connect to MT6276W provides a low frequency clock. This clock is used to keep the Real-Time Clock (RTC) block functioning, so that the platform can keep track of the time and date.



Main Features:

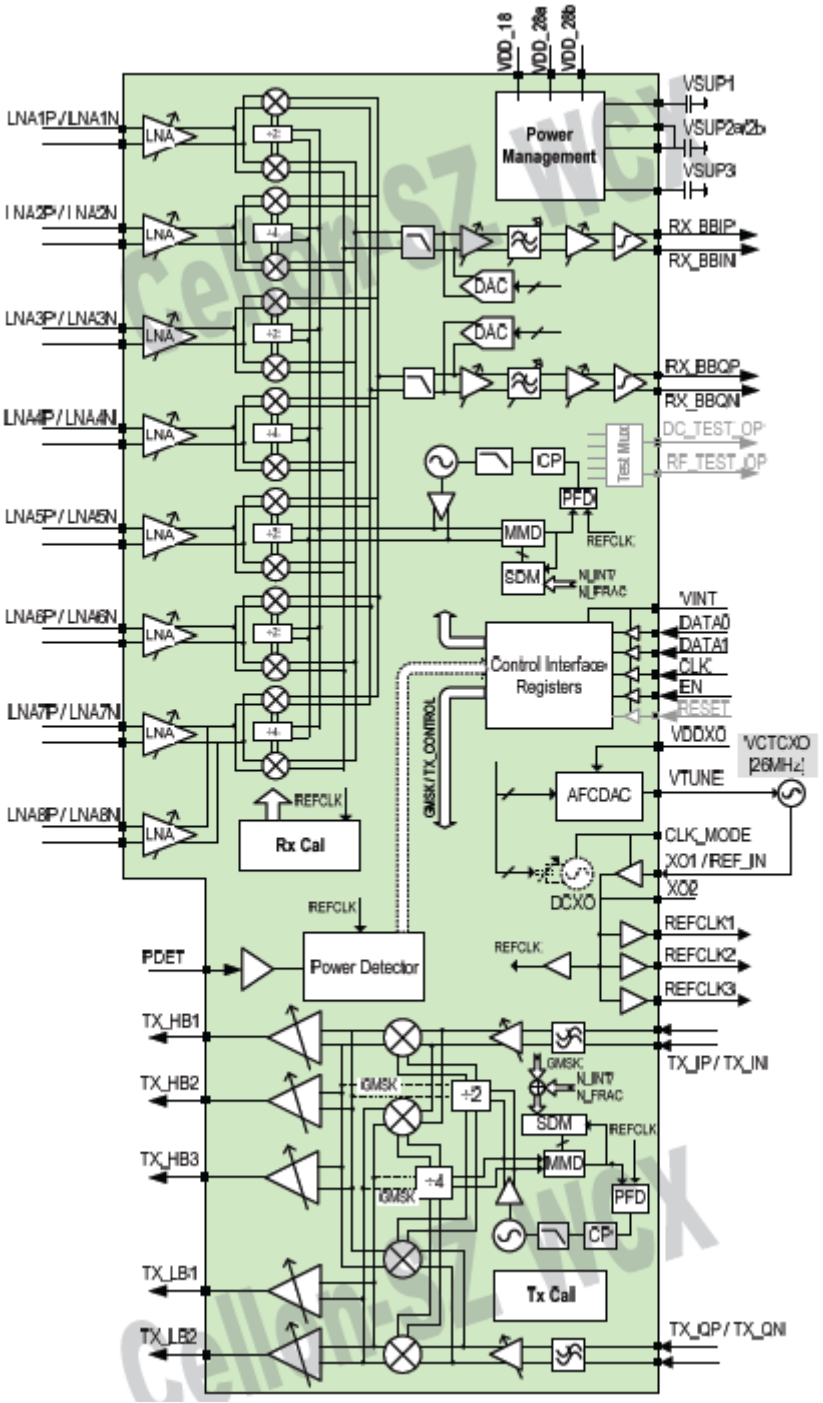
Items	Characters	Remark
LCD	**2.0“TFT 170*220 + 262K TFT**	**TFT**
Memory	1Gb (64M x16) NAND Flash + 512Mb (32M x16) Mobile DDR SDRAM	K521H12ACB
Midi	**Up to 64 polyphonic**	**SW Midi**

3. Signal Flow and Circuit Description

Brief of the mobile signal flow as below:

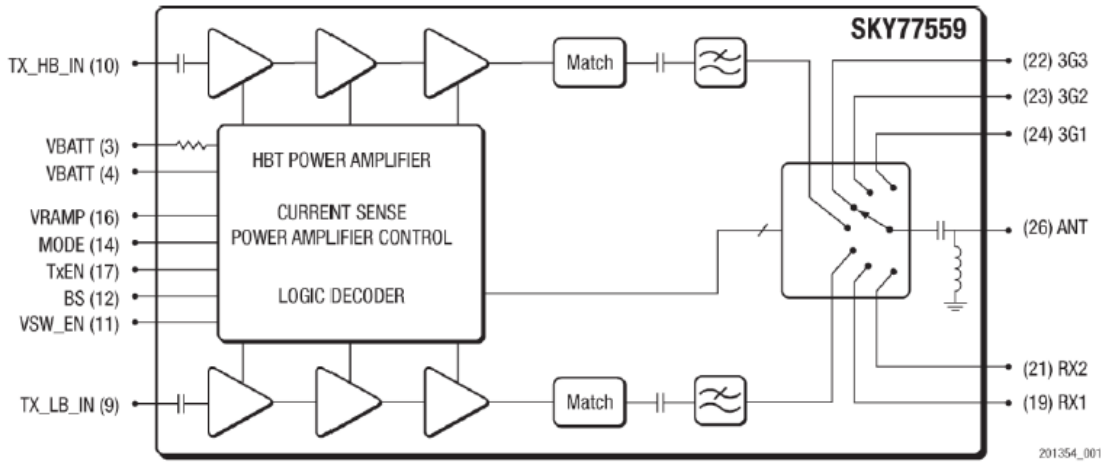
3.1. Transceiver

Transceiver (MT6162 and SKY77559) dedicates to signal modulation and demodulation.



MT6162

Figure 3



SKY77559

Figure 4

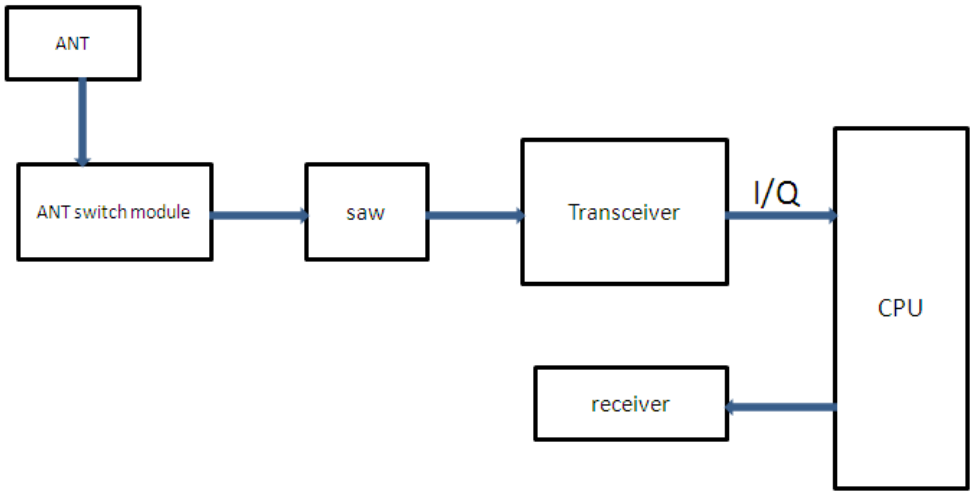
SKY77559: The SKY77559 is a complete triple band WCDMA transceiver offering unparalleled integration and feature set,With only a handful of external component, consisting of mostly passives for decoupling a full multi-band 3G transceiver can be implemented. For multi-mode applications, the SKY77559 is easily combined with Othello GSM/EDGE products, to produce a high performance compact radio solution.The SKY77559 reciever section direct conversion architecture is the ideal choice for highly integrated Wideband CDMA receivers, reducing the Bill of materials(BOM) by full integrating all interstage filtering.The front end includes three high performance single ended Low Noise Amplifiers(LNAs), allowing the device to support tri-band applications. The transmitter uses an innovative direct conversion modulator the achieves high modulation accuracy with exceptionally low noise eliminating the need for external transmit SAW filters. The device offers a fully integrated high precision TX power management system. This includes RMS power detector and PA DACs to support a variety of PAs.

MT6162: The transmitter section consists of Base-band (BB) I/Q filters, I/Q modulators, frequency dividers, output buffers and a bias-core circuit. BB I/Q signals are fed into the one-pole RC low-pass filter first for better out-of-the-band noise performance. The I/Q modulators are responsible for translating the BB I/Q signals to the transmitting frequencies. The low-noise divided-by-2/4 frequency dividers provide the necessary carriers for frequency translation while minimizing VCO pulling effect. The output buffers are adopted to amplify the modulator output signals to an adequate level to fulfill Pin requirement of Power Amplifiers.

3.2. Receiver principle

RX signal flow chart (Figure 5)：

Figure 5

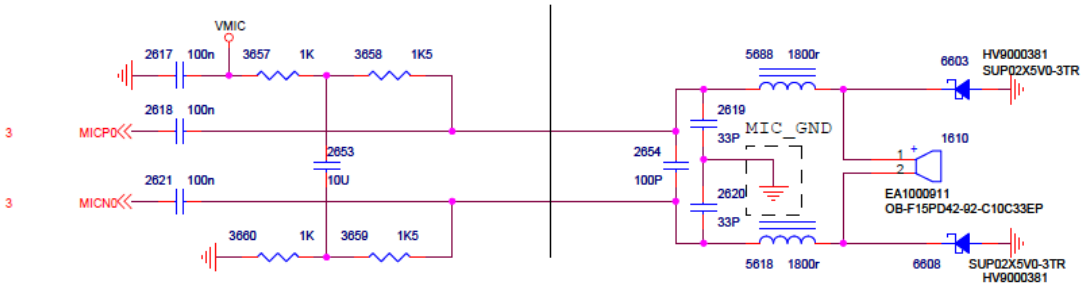


The aerial signal mobile received go to RF Connector, and then transmit to transceiver via the selected band in RF switcher & SAW filter. Four IQ signals input to CPU, Go through A/D, DSP, and D/A section in CPU, then output to receiver.

3.3. Transmitter principle

1) Audio signal input from Microphone.Microphone convert the voice signal to analog signal and input to CPU

Microphone Circuit:



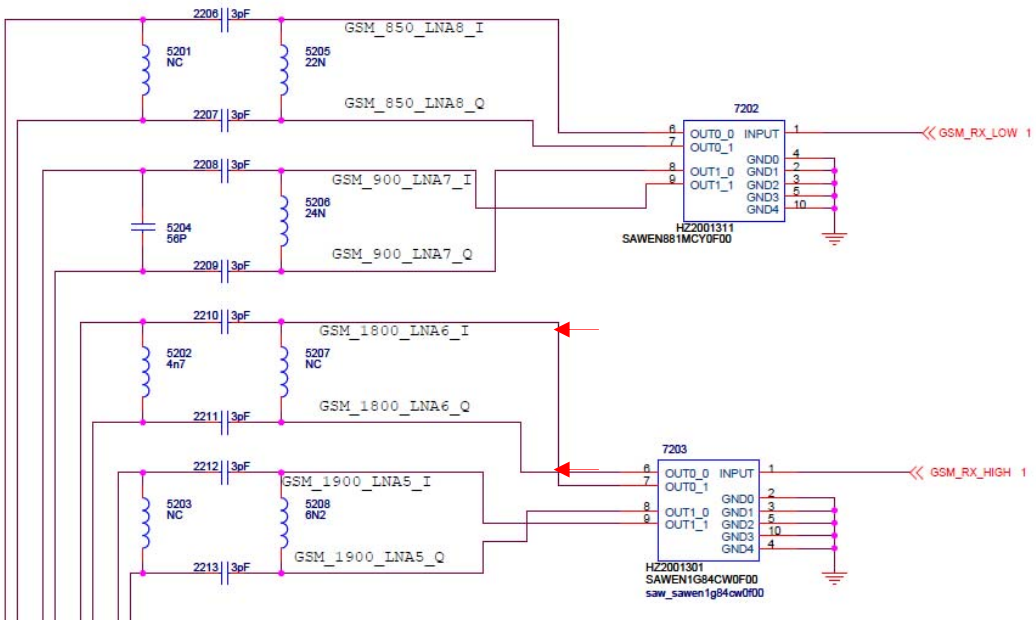
2) After A/D in CPU, then send the digital signal to DSP and finish IQ modulation. Then output from CPU to Transceiver I, IB, Q, QB.


3
UMTSRX_QN
3
UMTSRX_QP
3
UMTSRX_IN
3
UMTSRX_IP
M1
N2
P1
R2
RX_BBQN
RX_BBQP
RX_BBIN
RX_BBIP

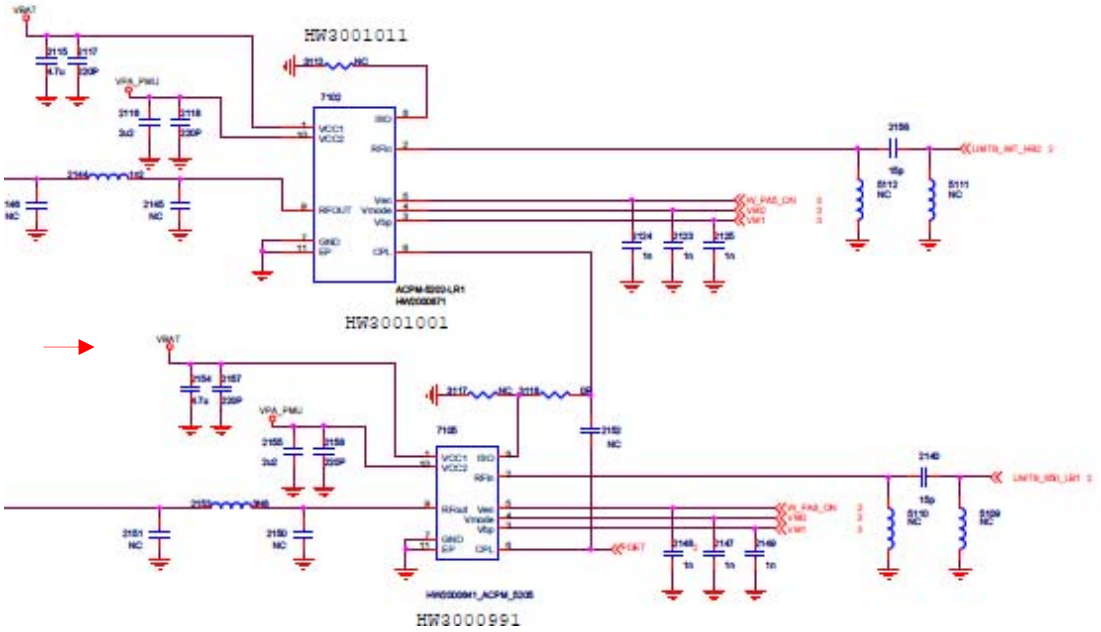
3) Goes to Transceiver MT6162

4) After modulated and passed by Matching Circuit. Then to PA.

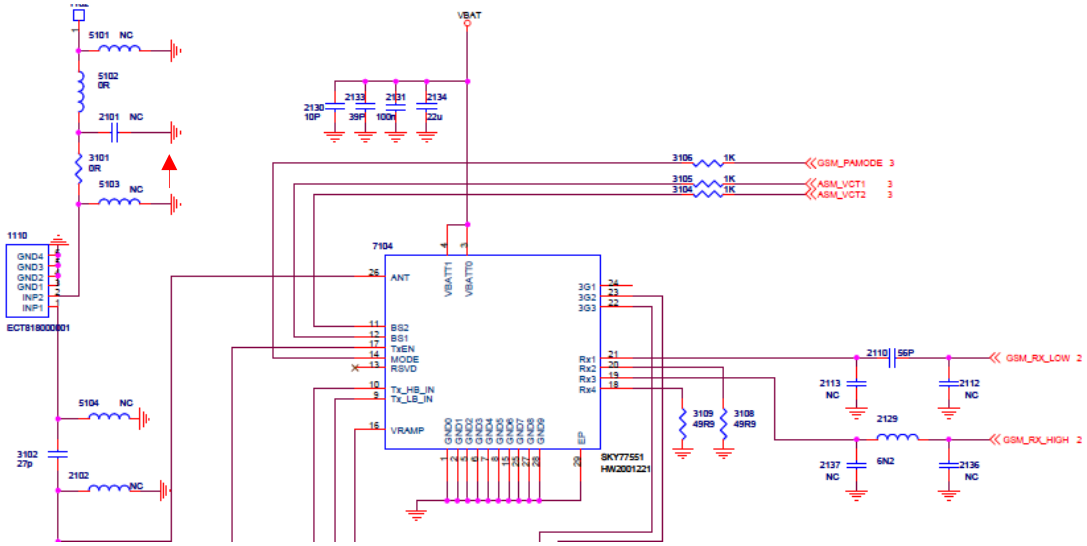
4.1) 2G part



4.2)3G part



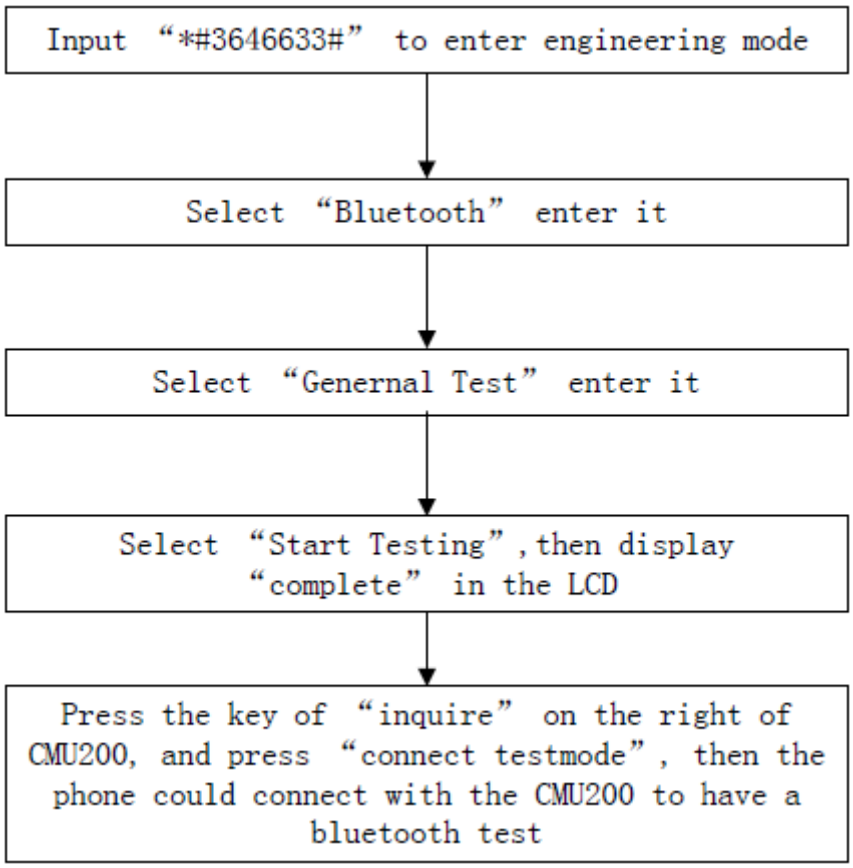
5). Tx signals output from PA IC, RF-Connector to antenna.

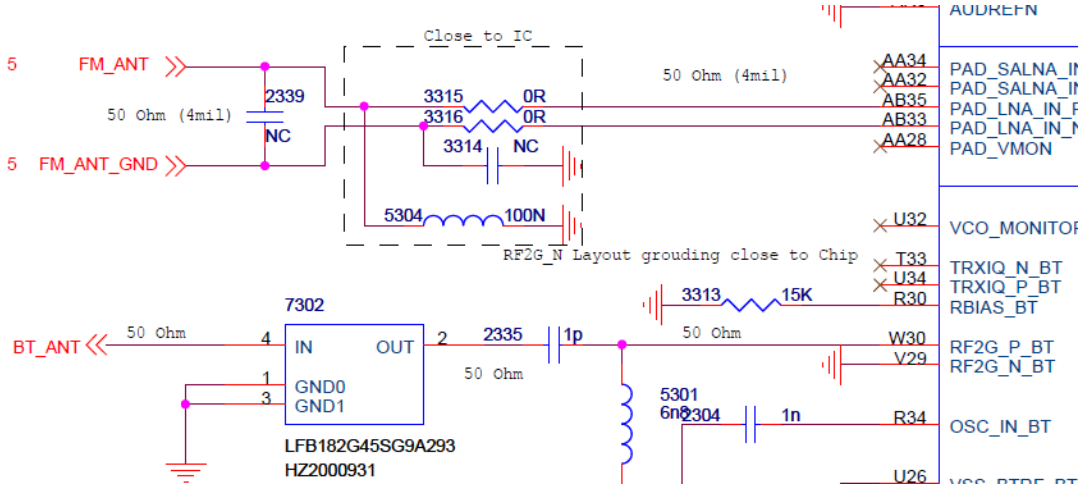


3.4. Bluetooth and FM

MT6276W is a highly integrated Bluetooth and FM IC. It includes powerful baseband processing capabilities with rich features and a high performance transceiver, all in a compact single package.

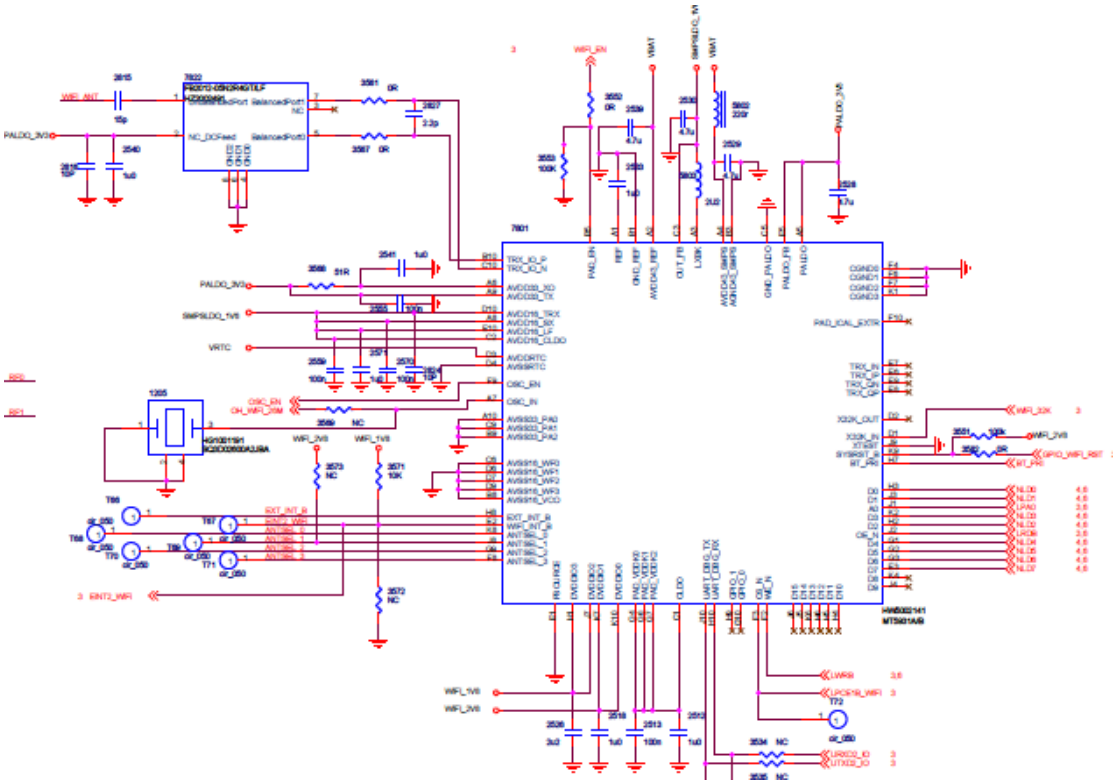
Please do following testing operation for Bluetooth on the phone:





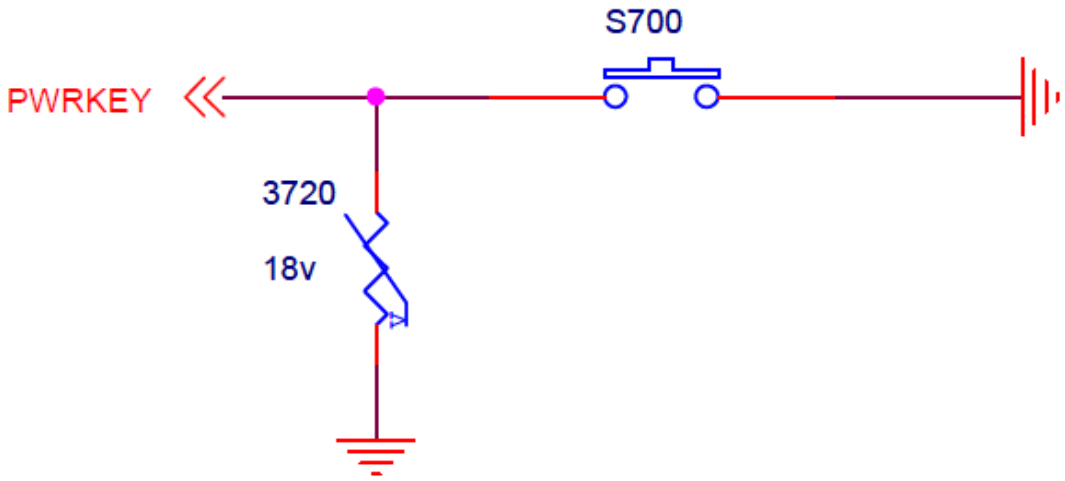
3.5 WiFi

The A3560 used the highly integrated WiFi module MT5931, works at 2.4GHz~2.484GHz.



3.6 Power on/off Circuit

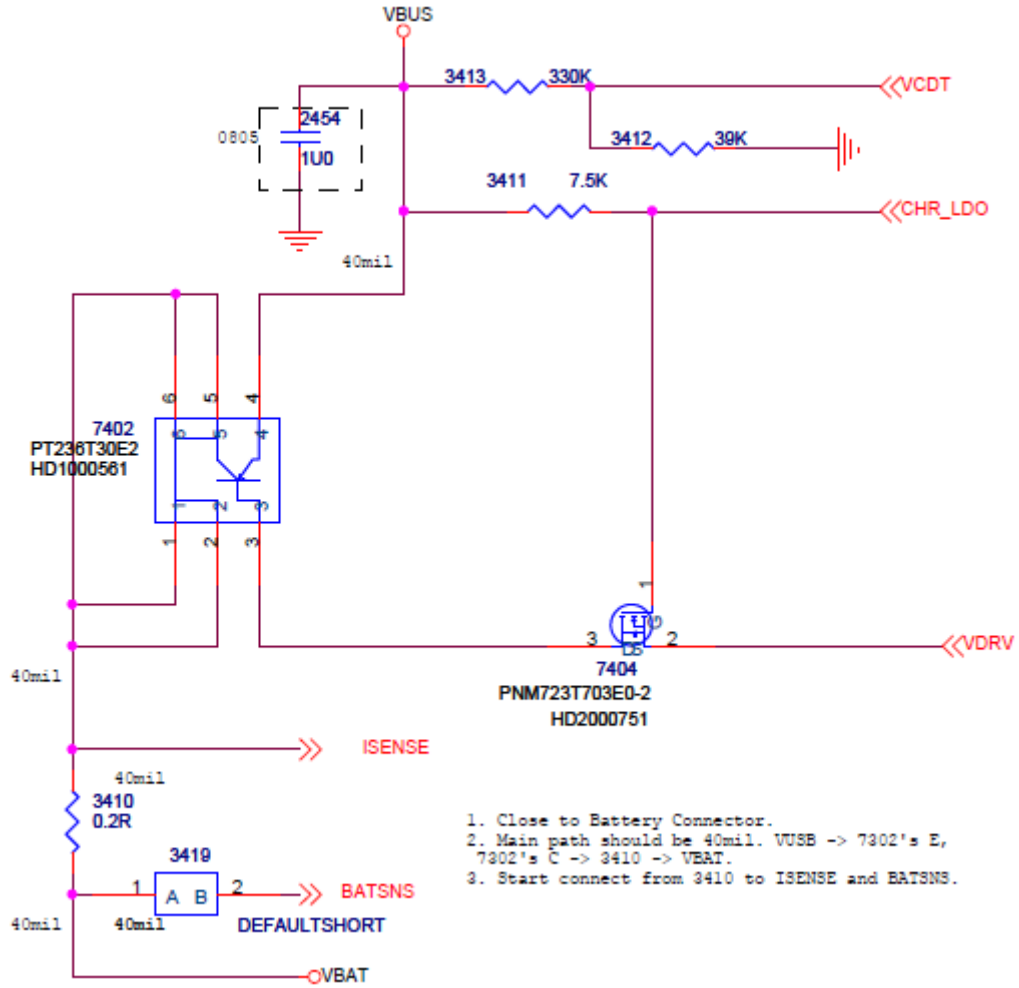
After inserting the battery, press the power on/off switch (S700) about 2s at normal work status, CPU will detect the signal and start the power off/on program.



3.7 Charge Circuit

MT6276W integrates the charger control circuit. When inserting the charging adapter,

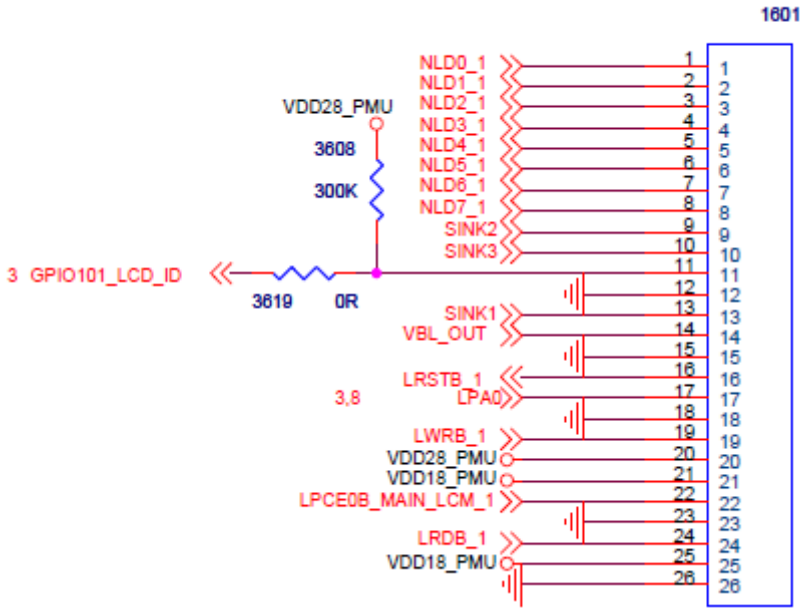
CHGIN detect high level, and start the charging program. When the charger is on, MT6276W controls the charging phase and turns on the appropriate LDOs according to the battery status. The battery voltage is constantly monitored by ISENSE.



3.8 LCD and Backlight circuit

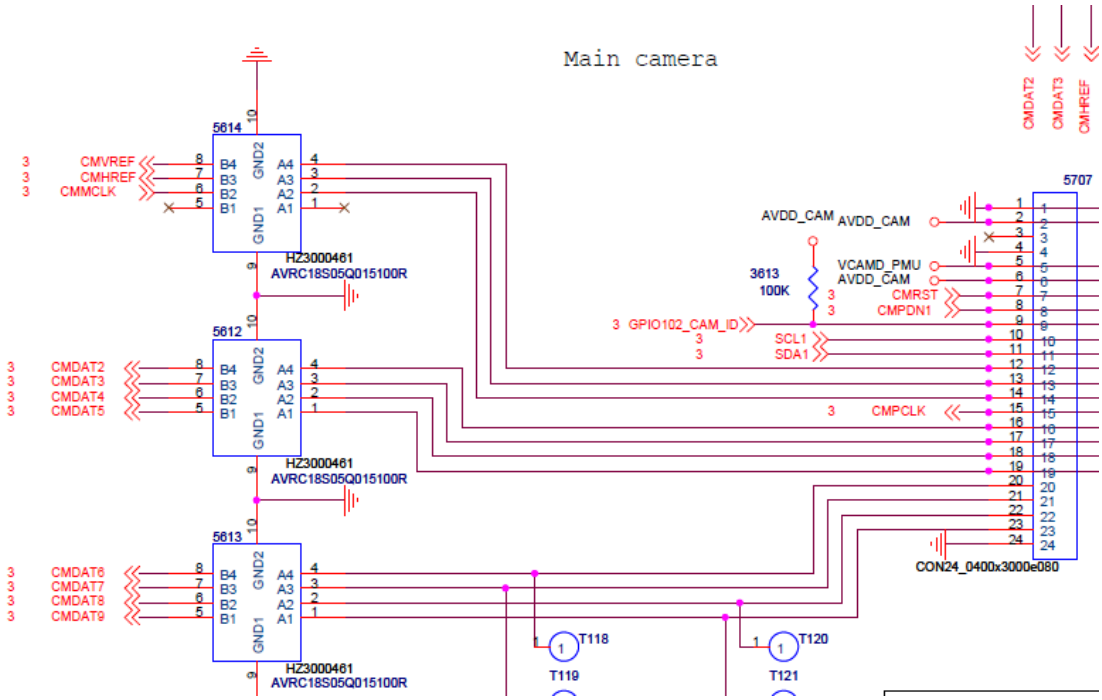
The LCD signals are defined as follows:
VDD/VMEM：LCD inner driver voltage，provided by MT6276W
LPEC0B_MAIN_LCM：Chip select signal
LRSTB：Reset signal
LWRB：LCD writing signal
LRDB：LCD reading signal
LPA0： LCD data/command select signal
NLD[0:8]：9bits 8080 LCD data bus signal

VBOOST1: LCD backlight power Supply (Anode)
SINK[1:3]: LCD backlight power Supply (Cathode)



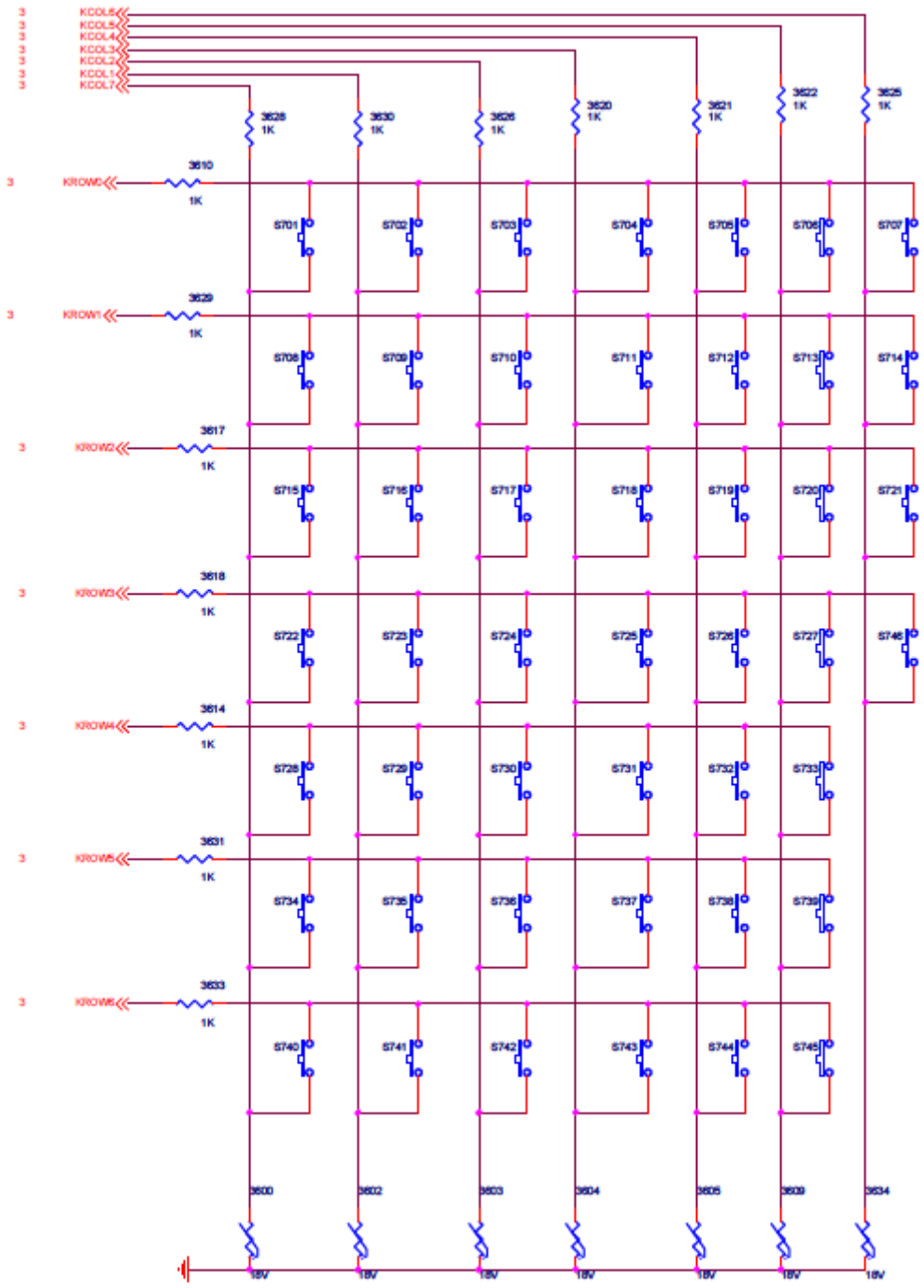
3.9 Camera circuit

The Camera signals are defined as follows:
VCAM_1V8/VCAM_2V8：Camera inner driver voltage，provided by MT6326BN
CMRST：Reset signal
CMVREF/CMHREF：Camera Horizontal/Vertical synchronization signal
CMPCLK/CMMCLK：Camera Clock signal
CAMDATA[2:9]：8bits Camera data bus singal
VBOOST1: Torch Light Power supply(Anode)
FLASH: Torch Light Power supply (Cathode)
CMPDN: Camera chip select signal



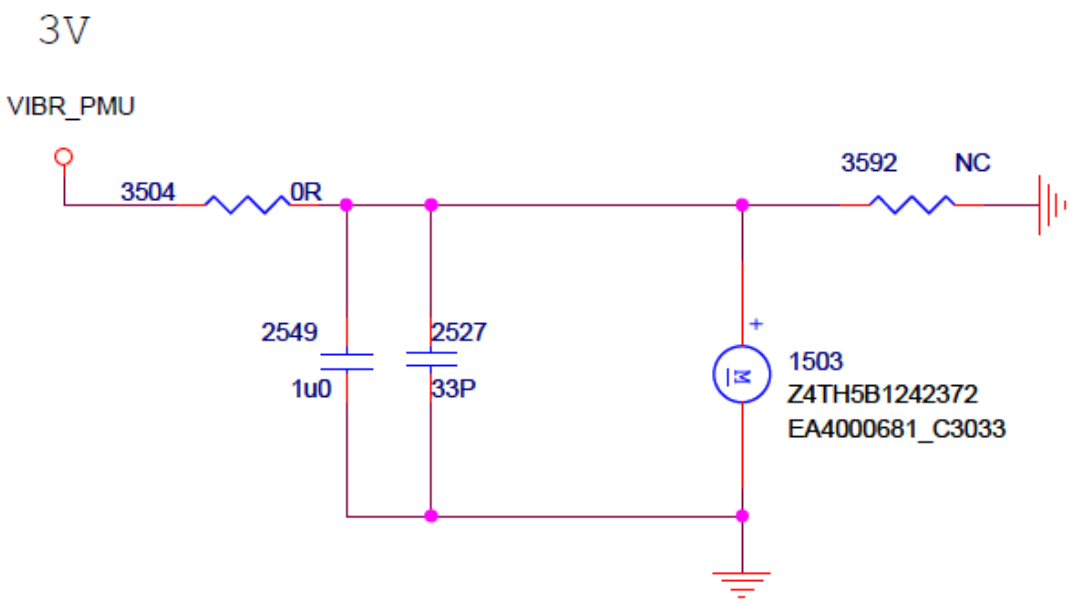
3.10 Keypad Circuit

There are keys totally ,KROW is output for row scan, and KCOL is input for column scan. When some key is pressed,the column detects low level, CPU start the keypad scan program, judge the key value,and start the corresponding operation.



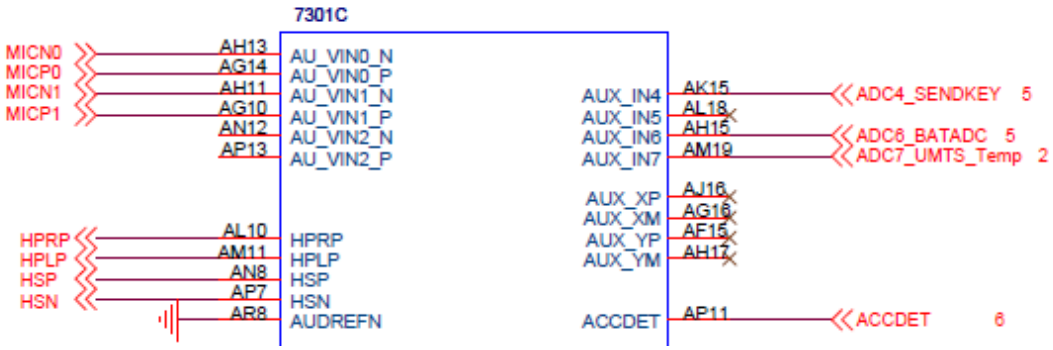
3.11 Vibrator Circuit

We used one of MT6276W current sink PIN (VIB_DRV_N) to drive vibrator.



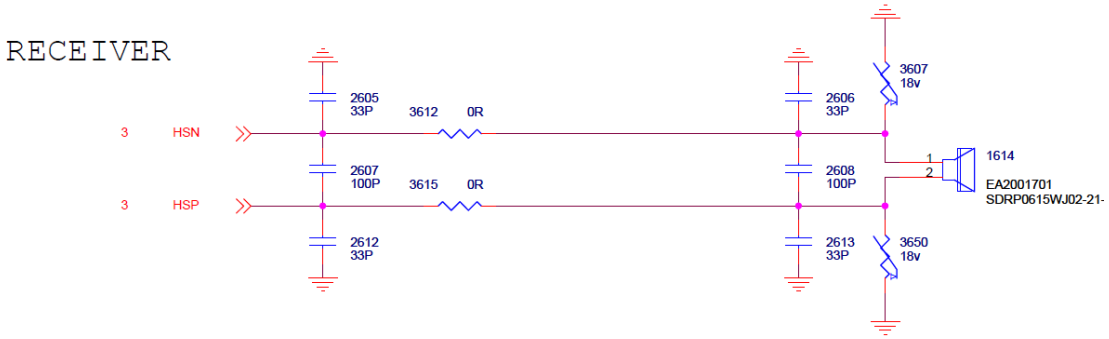
3.12 Audio Circuit

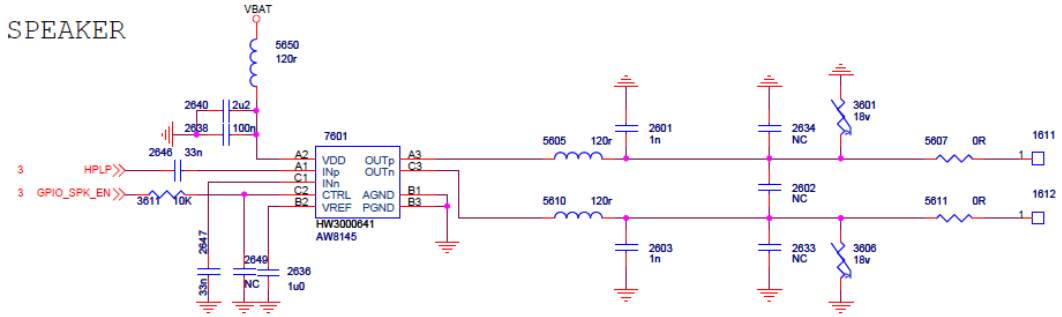
CPU part:



> Receiver & Speaker Circuit

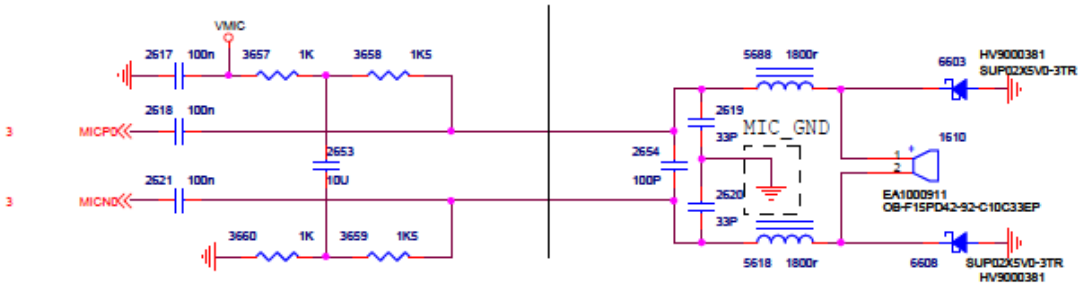
CPU output signal SPKN0 and SPKP0 to driver receiver;

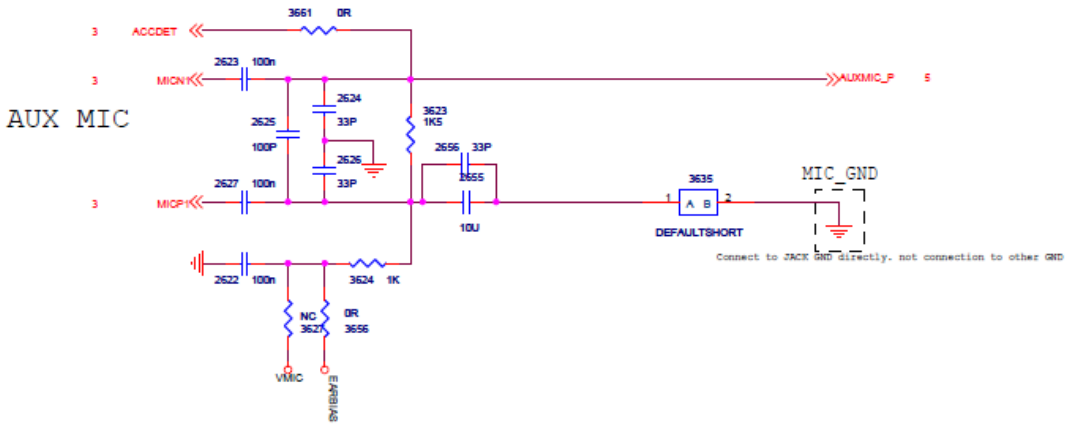




> **Microphone Circuit**

This is microphone circuit. MICBIASP& MICBIASN provide the bias voltage for microphone.



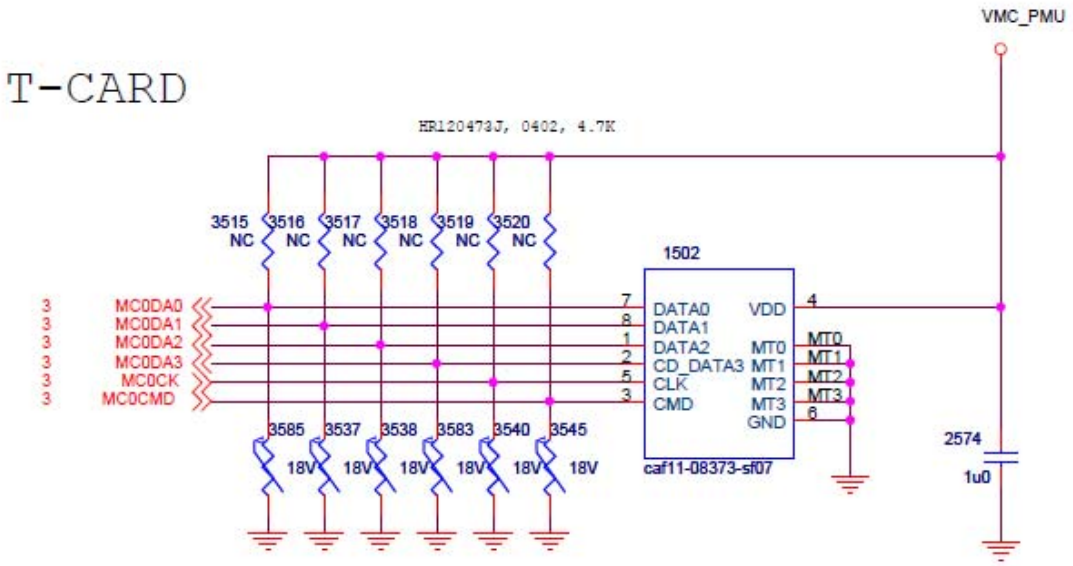


>Headset circuit

CPU MT6276W output MP3_OUTL/R signal to headset (MP3_HL/R signal).
EINT3_Headset signal tells CPU MT6276W about headset plug & unplug detection.

3.13 SD Card Circuit

The SD card signals are defined as follows:
VSDIO：SD card Power supply
MC0CK：Clock signal
MC0CMD：SD CARD Command singal
MC0DA[0:3]：8bits Cam data bus singal



3.14 SIM card Circuit

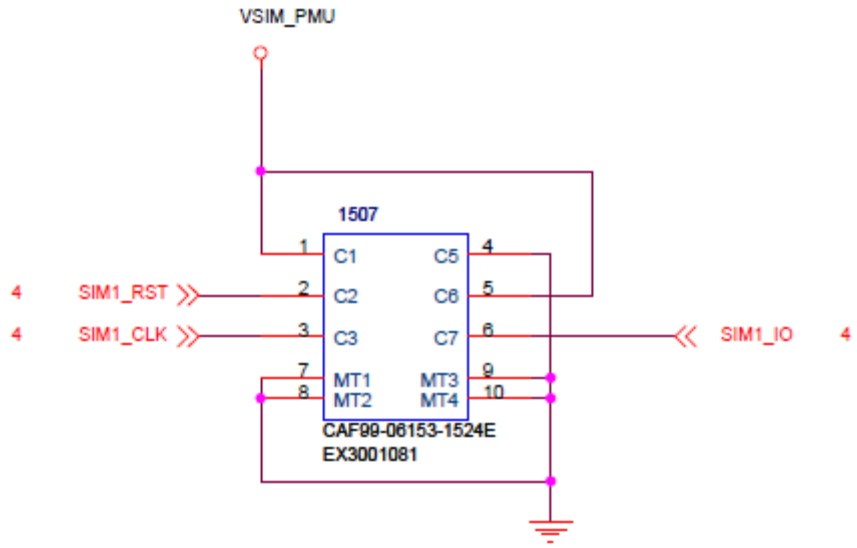
The SIM Card signals are defined as follows:

VSIM1: VSIM1 card Power supply

SIM1_RST：Reset signal

SIM1_CLK：SIM card Clock signal

SIM1_IO: SIM1 DATA signal


VSIM_PMU
1507
1
C1
C5
4
4
SIM1_RST
2
C2
C6
5
4
SIM1_CLK
3
C3
C7
6
SIM1_IO
4
7
MT1
MT3
9
8
MT2
MT4
10
CAF99-06153-1524E
EX3001081