

Operation description

1. Overview:

The MT6771T device with integrated Bluetooth, FM, WLAN and GPS modules, is a highly integrated baseband platform incorporating both modem and application processing subsystems to enable LTE/LTE-A and C2K smart phone applications. The chip integrates ARM® Cortex-A73 operating up to 2.0GHz, ARM® Cortex-A53 operating up to 2.0GHz and powerful multi-standard video codec. In addition, an extensive set of interfaces and connectivity peripherals are included to interface to cameras, touch-screen displays and UFS/MMC/SD cards.

The application processor, an Multi-core ARM® Cortex-A73, ARM® Cortex-A53 MPCore™ equipped with NEON engine offers processing power necessary to support the latest OpenOS along with its demanding applications such as web browsing, email, GPS navigation and games.

All are viewed on a high resolution touchscreen display with graphics enhanced by the 2D and 3D graphics acceleration. The multi-standard video accelerator and an advanced audio subsystem are also integrated to provide advanced multimedia applications and services such as streaming audio and video, a multitude of decoders and encoders. Imagination MIPS32® InterAptive, DSP, and 2G and 3G coprocessors combined provide a powerful modem subsystem capable of supporting LTE Cat 7, Category 24 HSDPA downlink and Category 7 HSUPA uplink data rates, Category 14 TD-HSDPA downlink and Category 6 TD-HSUPA uplink, as well as Class 12 GPRS, EDGE

MT6771T also embodies wireless communication device, including WLAN, Bluetooth and GPS. With four advanced radiotechnologies integrated into one single chip, MT6771T provides the best and most convenient connectivity solution in the industry. The enhanced overall quality is achieved for simultaneous voice, data and audio/video transmission on mobile phones and Media Tablets. The small footprint with low-power consumption greatly reduces the PCB layout resource.

2. PMIC

MT6358 is a power management system chip optimized for 2G/3G/4G handsets and smart phones, containing 9 buck converters and 33 LDOs optimized for specific 2G/3G/4G smart phone subsystems

3. WLAN/Bluetooth, GPS and FM function

The MT6771T includes four wireless connectivity functions:

- WLAN
- Bluetooth
- GPS
- FM Receiver

The RF parts of those four blocks are placed on chip MT6631. With four advanced radiotechnologies integrated on one chip, MT6771T/MT6631 is the best and most convenient connectivity solution in the industry, implementing advanced and sophisticated Radio Coexistence algorithms and hardware mechanisms. It supports single antenna sharing among 2.4 GHz Bluetooth, 2.4GHz/5GHz WLAN and 1.575 GHz for GPS. The

enhanced overall quality is achieved for simultaneous voice, data and audio/video transmission on mobile phones and Media Tablets. The small footprint with low-power consumption greatly reduces PCB layout resource.

3-1. Features

Single antenna for Bluetooth and WLAN/GPS/Bluetooth Supports single tri-band antenna for WLAN (2.4GHz and 5GHz), Bluetooth and GNSS Self calibration Single TCXO and TMS for GPS, BT and WLAN Best-in-class current consumption performance Intelligent BT/WLAN coexistence scheme that goes beyond PTA signaling (e.g. transmit window and duration that take into account protocol exchange sequence, frequency, etc.)

3-2. WLAN

Dual-band (2.4/5GHz) single stream 802.11 a/b/g/n/ac MAC/BB/RF SoC, 20/40/80MHz bandwidth, MCS0~9 (256-QAM)

802.11 d/e/h/i/j/k/r/v compliant

Security: WPA WPA/WPA2 personal, AES-CCMP, WPA-SM4, GCMP, WPA2.o, WAPI (hardware)

QoS: WPA WMM, WMM PS

802.11n optional features: LDPC, STBC, A-MPDU, Blk-Ack, RIFS, MCS Feedback, 20/40MHz coexistence (PCO), unscheduled PSMP

Supports 802.11w protected managed frames

Supports 802.11ac LDPC TX/RX, STBC TX/RX, 4T1R beamforming, MU-MIMO RX, WoWLAN

Supports MediaTek proprietary low power Green AP mode for portable hotspot operation

Auto rate control for optimizing the signal range and performance

Supports Wi-Fi Direct (WPA P-2-P standard) and Wi-Fi Miracast (Wi-Fi Display)

Supports Wi-Fi HotSpot 2.0

Integrated 2.4GHz PA with max. 23dBm CCK output power and 5GHz PA with max. 18.5dBm OFDM 54Mbps output power

RX sensitivity at 11n HT20 MCS7 mode and -62dBm 5GHz RX sensitivity at 11ac VHT80 MCS9 mode

Supports 32 multicast address filters and TCP/UDP/IP checksum offload

- Per packet TX power control

3-3. Bluetooth

- Bluetooth specification v2.1+EDR
- Bluetooth specification 3.0+HS compliance
- Bluetooth v4.1+HS compliant
- Supports BT4.2
- PIP RX only, public indoor position (Direction Finding) (HW+FW+SW)
- AOD RX (for product) , AOA TX(test only)
- Integrated PA with 12dBm (class 1) transmit power
- Typical RX sensitivity with companion chip modem: GFSK -94dBm, DQPSK -95dBm, 8-DPSK -89dBm, BLE -96dBm
- Best-in-class BT/Wi-Fi coexistence performance
- Up to 4 piconets simultaneously with background inquiry/page scan
- Supports BT legacy, BLE scatternet
- Packet Loss Concealment (PLC) function for better voice quality
- Low-power scan function to reduce power consumption in scan modes
- Supports Wideband speech (16KHz sampling rate)
- SBC encode include mono and stereo
- SBC decode only support mono
- mSBC support in controller
- Supports secure connection with AES128 and ECC256
- Supports LTE coexistence enhanced features: Clock nudge and generalized interlace scan
- Supports FM over BT A2DP

3-4.GPS

- Supports

GPS/Glonass/Beidou/Galileo/QZSS tri-band reception concurrently

- GPS/Galileo only (GPS only)
- GPS/Galileo - GLONASS (G+G)
- GPS/Beidou (G+B)
- GPS/GLONASS/Beidou (G+G+B)

- GPS/Galileo/GLONASS (G+G+G)
- Supports SBAS (Satellite-Based Augmentation Systems): WAAS/MSAS/EGNOS/GAGAN
- Best-in-class sensitivity performance
 - -165 dBm tracking sensitivity
 - -163 dBm hot start sensitivity
 - -148 dBm cold start sensitivity
 - -151 dBm warm start sensitivity
- AGPS sensitivity is 8dB design margin over 3GPP
- Full A-GPS capability (E911/SUPL/EPO/HotStill)
- Active interference cancellation for up to 12 in-band tones
- Supports both TCXO and TMS (Thermister Crystal) clock source
- 5Hz update rate

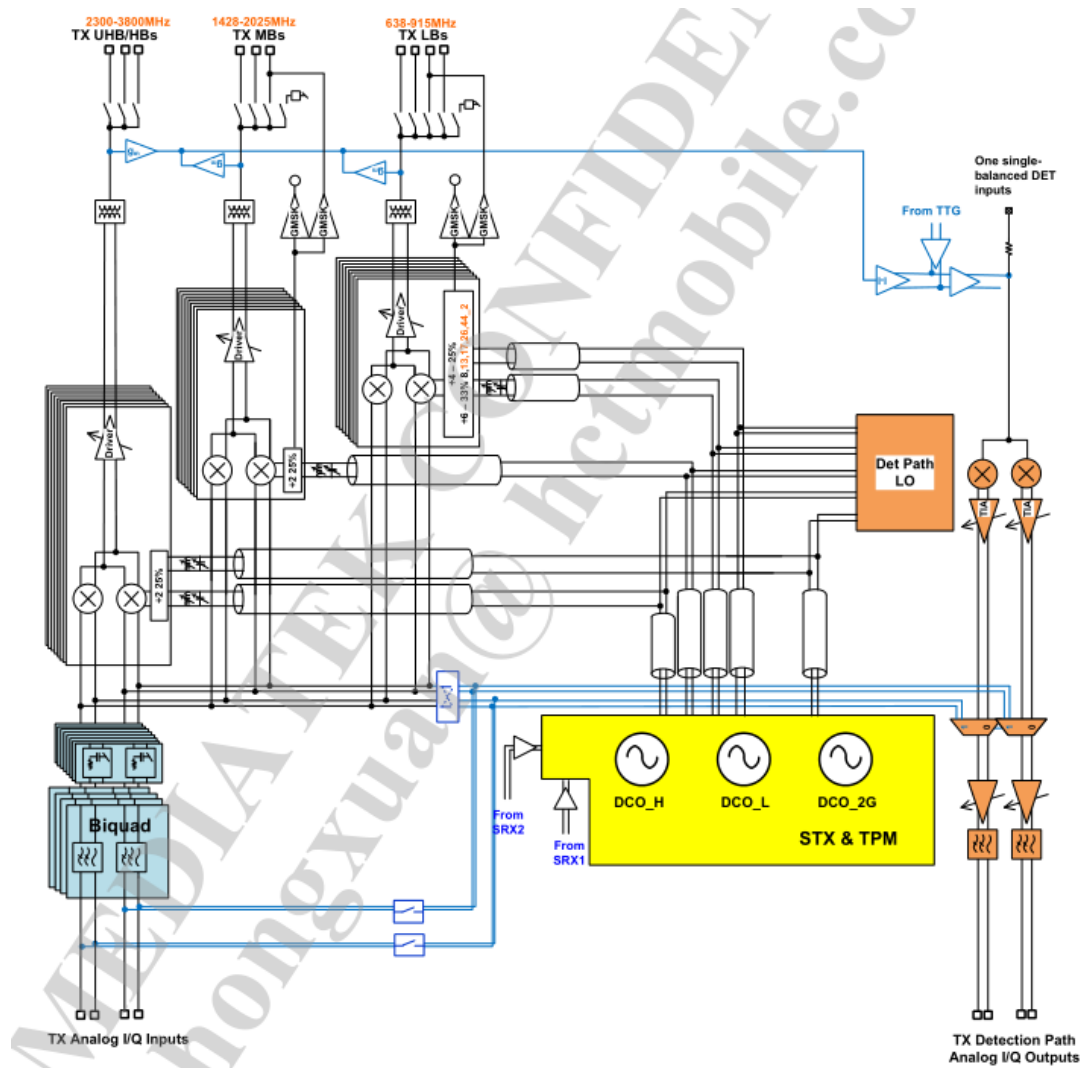
3-5.FM

- 65-108MHz with 50kHz step
- RDS/RBDS
- Digital stereo demodulator
- Simplified digital audio interface (I2S)
- Stereo noise reduction
- Audio sensitivity 2dB μ Vemf (SINAD=26dB)
- Audio SINAD 6odB
- Anti-jamming
- Integrated short antenna

4、RF Front End

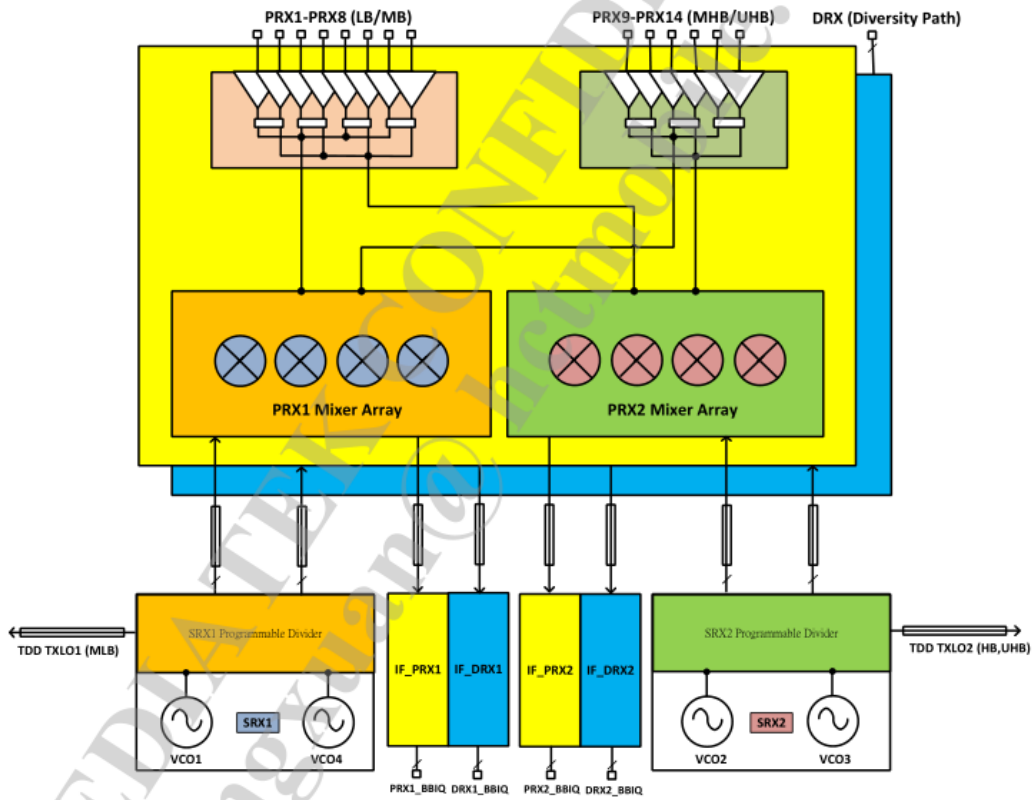
4-1. Transmitter principle

- 1) Audio signal input from Microphone, Microphone convert the voice signal to analog signal and input to CPU (MT6771T).
- 2) After A/D in CPU, then send the digital signal to DSP pass ASI. Then processed logic signal pass D/A converter divided into four signals (IQ), output from CPU (MT6771) to RF Transceiver I/Q input.
- 3) After modulated, Then to PA
- 4). Tx signals output from PA, flow through RF-Connector to antenna



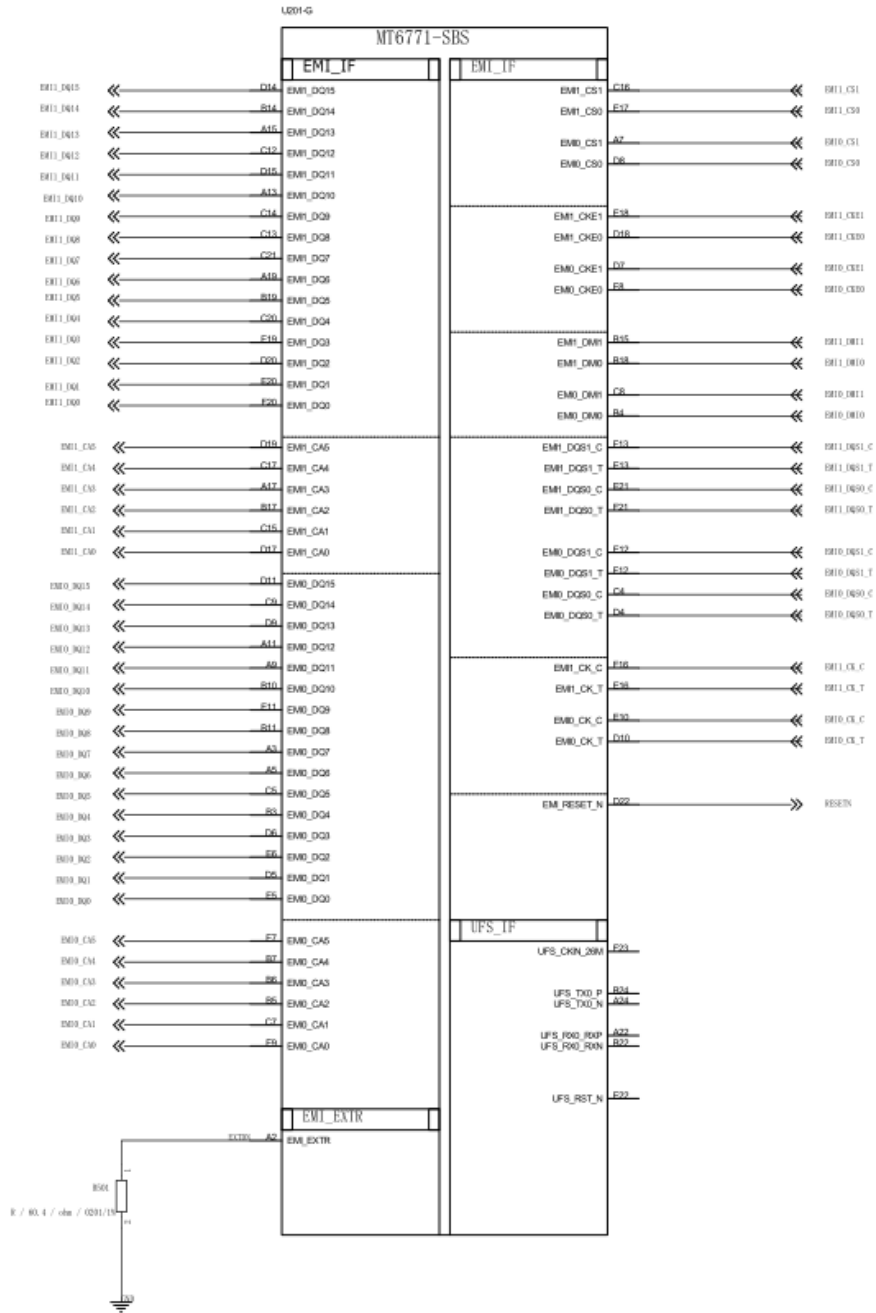
4-2. Receiver principle

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.

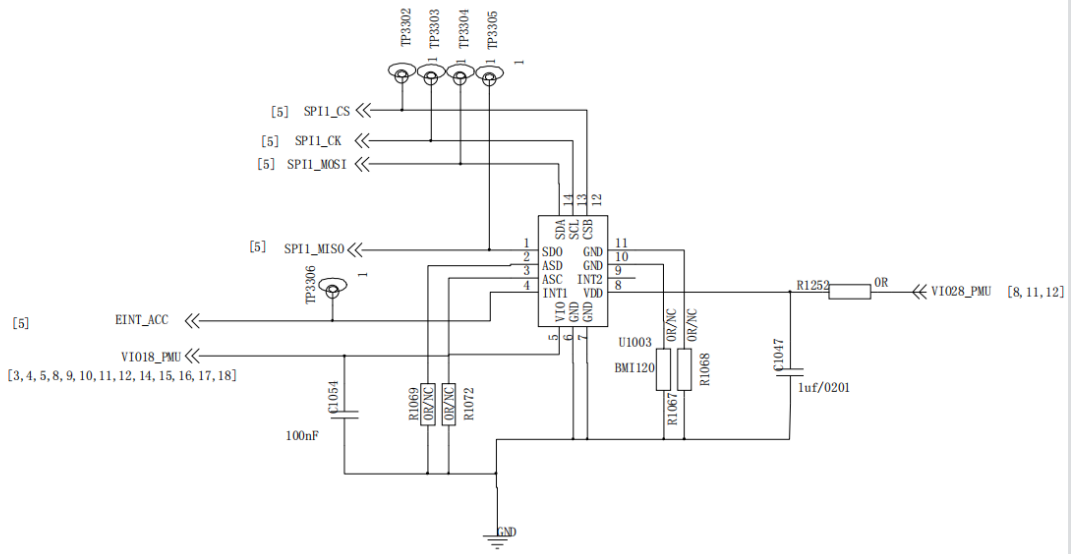


5-1. BB:

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

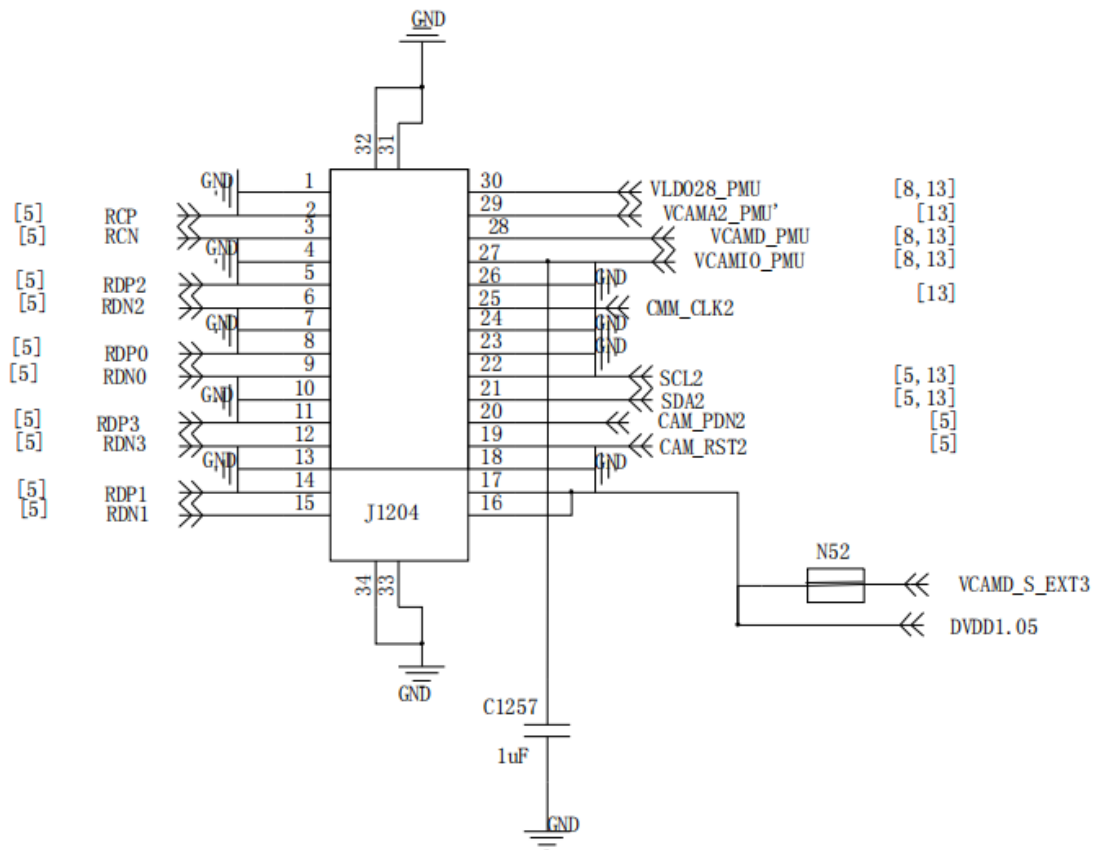


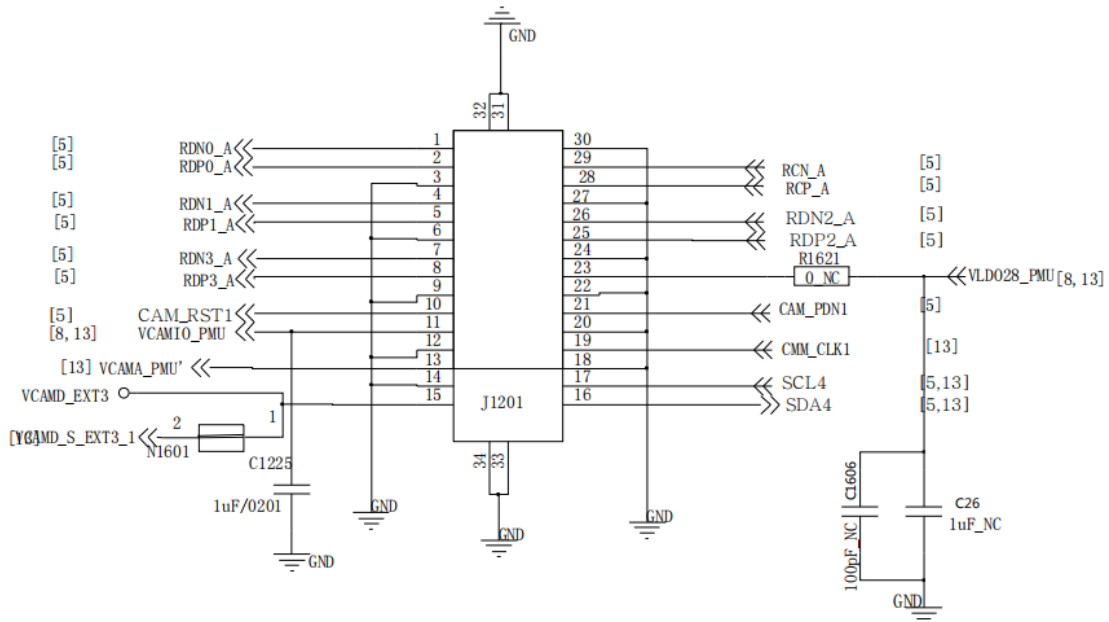
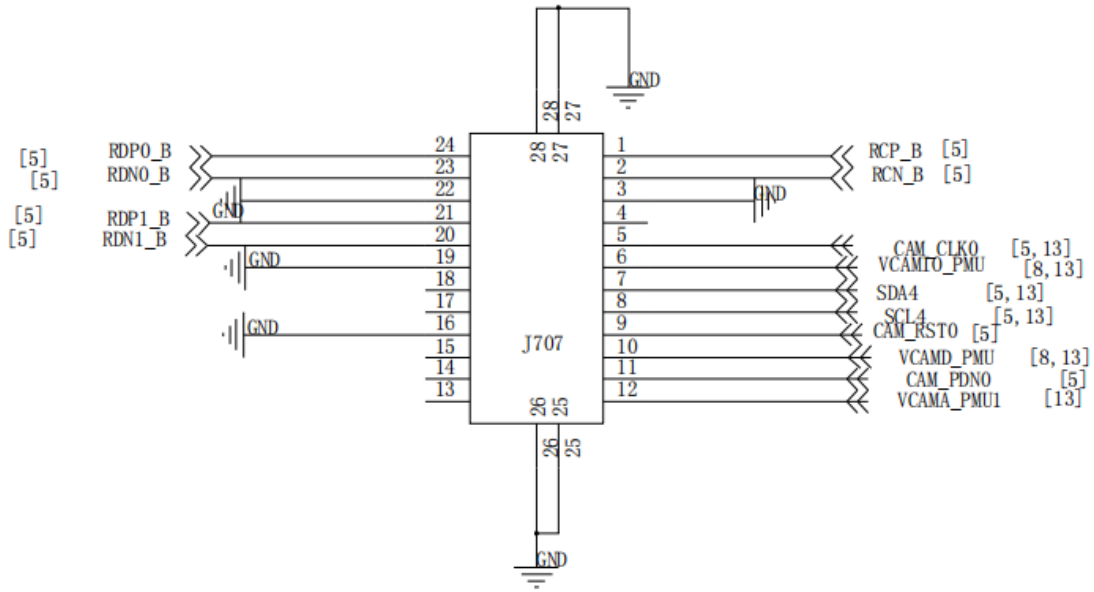
5-2. G+Gyro sensor circuit



5-3. CAMERA Circuit

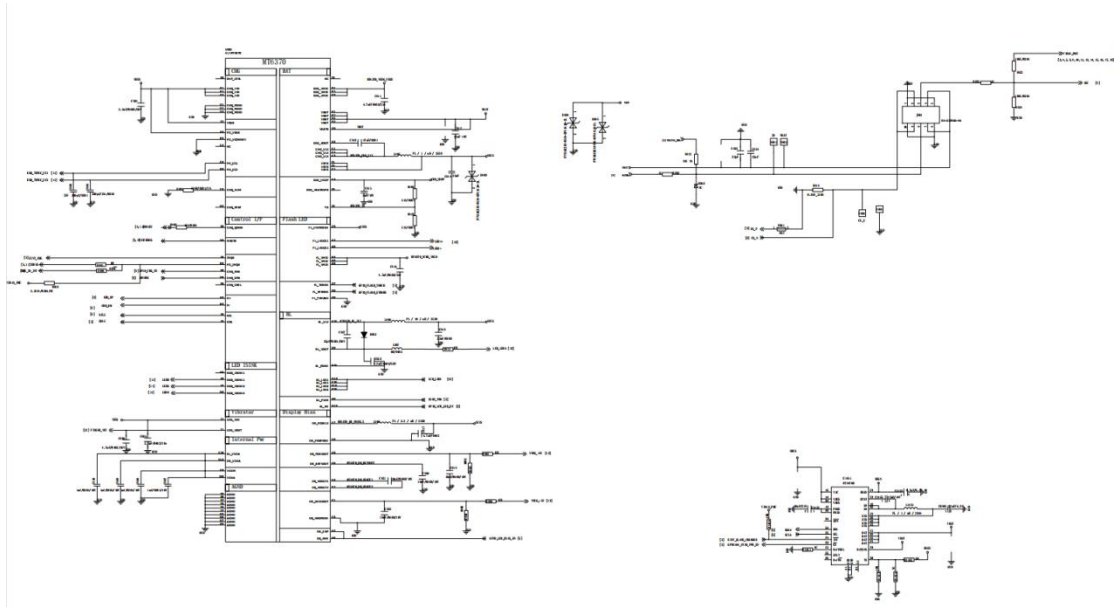
The camera connects to MT6771 through Camera interface.





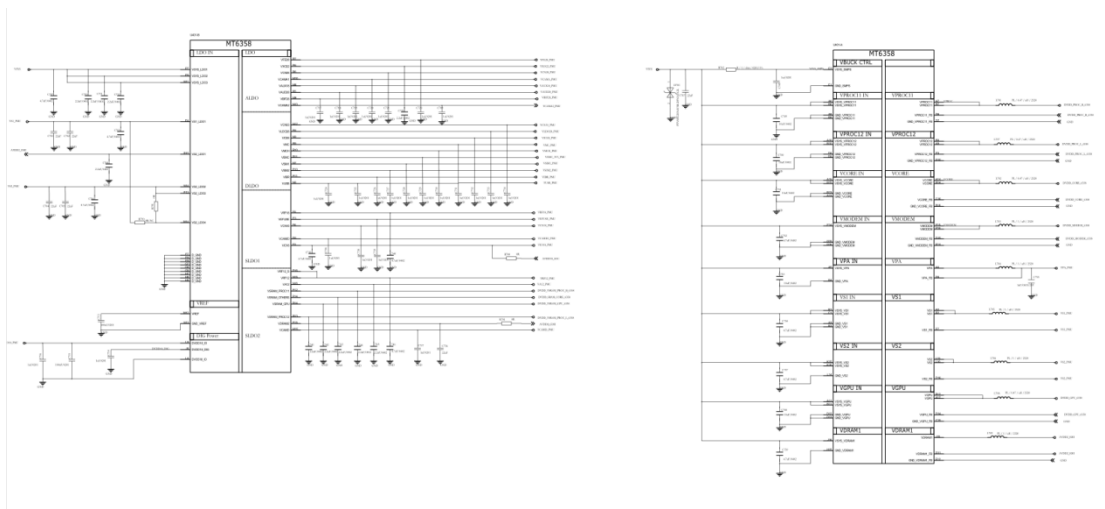
5-4. Charger Circuit

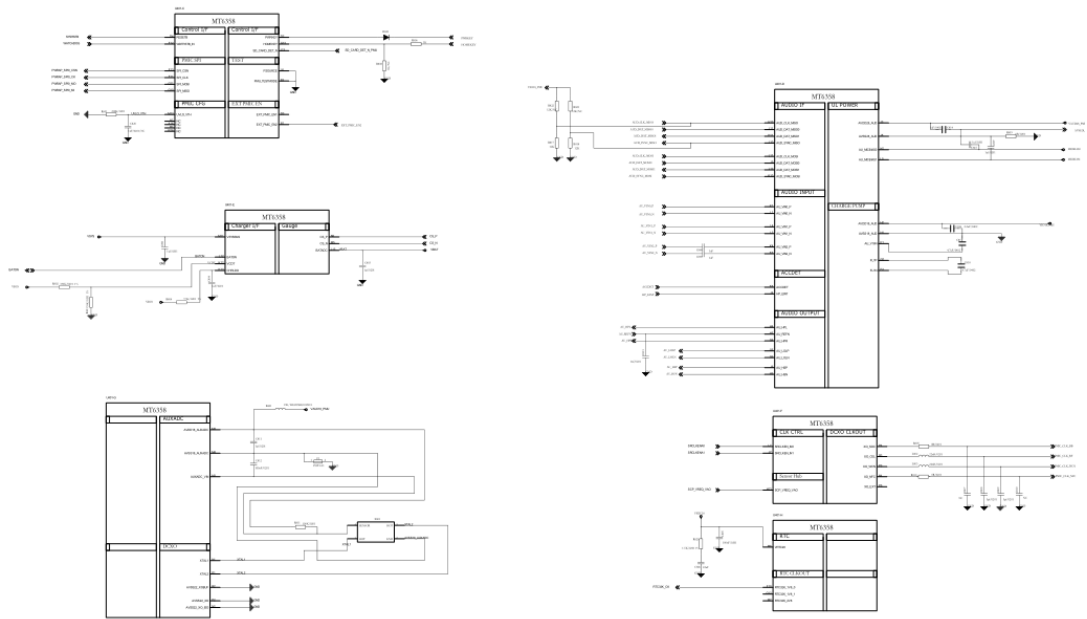
The MT6370 integrates the charger control circuit. The switching charger integrates a synchronous PWM controller, power MOSFETs, input current sensing and input current regulation, high-accuracy voltage regulation, and charge termination circuitry. Besides, the charge current is regulated through the integrated sensing resistors. It also features USB On-The-Go (OTG) support.



5-5. PMU Part Circuit

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Operation Frequency:

GSM850: 824.2 ~ 848.8 MHz

PCS 1900: 1850.2 ~ 1909.8 MHz

WCDMA BandII: 1852.4 ~ 1907.6 MHz

WCDMA BandIV: 1712.4 ~ 1752.6 MHz

WCDMA BandV: 826.6 ~ 846.6 MHz

CDMA BC 0: 824.7 ~ 848.31 MHz

CDMA BC 1: 1850 ~ 1909.9 MHz

FDD LTE Band 2 :1850MHz~1909.9MHz

FDD LTE Band 4 :1710MHz~1980MHz

FDD LTE Band 5 :824MHz~848.9MHz

FDD LTE Band 7 :2500MHz~2570MHz

FDD LTE Band 12 :698MHz~715.9MHz

FDD LTE Band 17 :704MHz~715.9MHz

Bluetooth: 2402 MHz ~ 2480 MHz

Wi-Fi: 802.11b/g/n-HT20: 2412MHz ~ 2462 MHz

802.11n-HT40 :2422MHz~2452MHz

802.11a/ac/n: 5180MHz~5825MHz