

Service Manual

LG-C333

Table Of Contents

1. INTRODUCTION.....	3	4.9 Speaker Trouble	87
1.1 Purpose	3	4.10 Earphone Trouble	90
1.2 Regulatory Information	3	4.11 Receiver Trouble	93
1.3 Abbreviations.....	5	4.12 Microphone Trouble.....	96
2. PERFORMANCE.....	7	4.13 SIM1 Card Interface Trouble	98
2.1 H/W Features.....	7	4.14 KEY backlight Trouble	104
2.2 Technical Specification.....	9	4.15 Micro SD Trouble.....	106
3. TECHNICAL BRIEF	15	4.16 Bluetooth Trouble.....	108
3.1 Digital Main Processor.....	15	4.17 FM Radio Trouble	111
3.2 Power Management	23	4.18 WIFI Trouble	114
3.3 FEM with integrated Power Amplifier Module (RF7180, U202)	28	5. DOWNLOAD	117
3.4 Clocks.....	30	6. BLOCK DIAGRAM.....	130
3.5 Transceiver(AD6548,U204)	33	7. CIRCUIT DIAGRAM	142
3.6 MEMORY(PF38F4050M0Y3DE, U300	36	8. BGA PIN MAP	148
3.7 Wi-Fi Module(MT5931, U203)	41	9. PCB LAYOUT.....	151
3.8 SIM Card Interface.....	44	10. ENGINEERING MODE	154
3.9 Micro-SD Card Interface	47	11. AUTO CALIBRATION.....	157
3.10 LCD Interface.....	50	11.1 Configuration of Tachyon.....	157
3.11 Battery Charger Interface	52	11.2 How to use Tachyon.....	159
3.12 Keypad Interface.....	53	12. EXPLODED VIEW & REPLACEMENT PART LIST	161
3.13 Audio Front-End.....	56	12.1 EXPLODED VIEW.....	161
3.14 Camera Interface.....	59	12.2 Replacement Parts	162
3.15 KEY BACKLIGHT LED Interface	61	12.3 Accessory	181
3.16 Vibrator Interface	62		
4. TROUBLE SHOOTING	63		
4.1 RF Component	63		
4.2 RX Trouble	64		
4.3 TX Trouble.....	68		
4.4 Power On Trouble.....	72		
4.5 Charging Trouble.....	75		
4.6 Vibrator Trouble	78		
4.7 LCD Trouble	80		
4.8 Camera Trouble.....	84		

1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it.

The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs except as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the sign. Following information is ESD handling:



- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current – Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIO	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop

PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

2. PERFORMANCE

2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-ion Polymer, 3.7V 1100mAh	
Stand by TIME	645hours ↑ @Paging period : 5	
Talk time	9 hours ↑ @GSM, TX Level : 10	
Stand by time	645hours ↑ @Paging period : 5	
Charging time	Approx. 3 hours	
RX Sensitivity	GSM, EGSM : -109dBm, DCS : -108dBm	
TX output power	GSM850/ EGSM: 32.5dBm(Level 5), DCS /PCS : 29.5dBm(Level 0)	
GPRS compatibility	Class 12	
SIM card type	3V Small	
Display	TFT LCD 2.4" Landscape QVGA (320 x 240, 262K)	
Status Indicator	Hard icons. QWERTY Key Pad 0 ~ 9, #, *, Up/Down Navigation Key Menu Key, Clear Key, Back Key, Confirm Key Send Key, Soft Key(Left/Right) Volume Key(Up/Down), PWR Key, Camera Key	
ANT	Internal	
EAR Phone Jack	Yes	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data and Fax	Yes	
Vibrator	Yes	
Loud Speaker	Yes	
Voice Recoding	Yes	
Microphone	Yes	

2. PERFORMANCE

Item	Feature	Comment
Speaker/Receiver	18 * 10 / 2-in-1	
Travel Adapter	Yes	
MIDI		
Camera	5.0M AF	
Flash	Power LED Flash	
Bluetooth / FM Radio	Bluetooth version 2.1 / 76~108MHz supported	
Wi-Fi	IEEE 802.11b/g	

2.2 Technical Specification

Item	Description	Specification					
1	Frequency Band	GSM850 TX: 824 ~ 849 MHz RX: 869 ~ 894 MHz DCS TX: 1710 ~ 1785 MHz RX: 1805 ~ 1880 MHz PCS TX: 1850 ~ 1910 MHz RX: 1930 ~ 1990 MHz EGSM TX: 880 ~ 915MHz RX: 925 ~ 960 MHz					
2	Phase Error	RMS < 5 degrees Peak < 20 degrees					
3	Frequency Error	< 0.1 ppm					
4	Power Level	GSM850/EGSM					
		Level	Power	Toler.	Level	Power	Toler.
		5	33dBm	±2dB	13	17dBm	± 3dB
		6	31dBm	±3dB	14	15dBm	± 3dB
		7	29dBm	±3dB	15	13dBm	± 3dB
		8	27dBm	±3dB	16	11dBm	± 5dB
		9	25dBm	±3dB	17	9dBm	± 5dB
		10	23dBm	±3dB	18	7dBm	± 5dB
		11	21dBm	±3dB	19	5dBm	± 5dB
		12	19dBm	±3dB			
		DCS/PCS					
		Level	Power	Toler.	Level	Power	Toler.
		0	30dBm	±2dB	8	14dBm	± 3dB
		1	28dBm	±3dB	9	12dBm	± 4dB
		2	26dBm	±3dB	10	10dBm	± 4dB
		3	24dBm	±3dB	11	8dBm	± 4dB
		4	22dBm	±3dB	12	6dBm	± 4dB
		5	20dBm	±3dB	13	4dBm	± 4dB
		6	18dBm	±3dB	14	2dBm	± 5dB
		7	16dBm	±3dB	15	0dBm	± 5dB

2. PERFORMANCE

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	GSM850/ EGSM	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-63
		3,000~ <6,000	-65
		6,000	-71
		DCS/PCS	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-65
		3,000~ <6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	GSM850/ EGSM	
		Offset from Carrier (kHz).	Max. dBm
		400	-19
		600	-21
		1,200	-21
		1,800	-24

2. PERFORMANCE

Item	Description	Specification		
6	Output RF Spectrum (due to switching transient)	DCS/PCS		
		Offset from Carrier (kHz).		Max. dBm
		400		-22
		600		-24
		1,200		-24
		1,800		-27
7	Spurious Emissions	Conduction, Emission Status		
8	Bit Error Ratio	GSM850, EGSM BER (Class II) < 2.439% @-102 dBm DCS,PCS BER (Class II) < 2.439% @-100 dBm		
9	RX Level Report Accuracy	±3 dB		
10	SLR	8±3 dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
		4,000	0	-
12	RLR	2±3 dB		

2. PERFORMANCE

Item	Description	Specification		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	2	-7
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		
14	STMR	13±5 dB		
15	Stability Margin	> 6 dB		
16	Distortion	dB to ARL (dB)		Level Ratio (dB)
		-35		17.5
		-30		22.5
		-20		30.7
		-10		33.3
		0		33.7
		7		31.7
		10		25.5
17	Side Tone Distortion	Three stage distortion < 10%		
18	System frequency (13 MHz) tolerance	≤ 2.5 ppm		
19	32.768KHz tolerance	≤ 30 ppm		
20	Ringer Volume	At least 65 dBspl under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm		

2. PERFORMANCE

Item	Description	Specification		
21	Charge Current	Fast Charge : Typ. 430 mA Slow Charge : Typ. 80mA Total Charging Time : < 3 hours		
22	Antenna Display	Bar Number	Power	
		7	Over -93	
		7 -> 5	-93 $\pm$ 2	
		5 -> 4	-98 $\pm$ 2	
		4 -> 2	-101 $\pm$ 2	
		2 -> 1	-104 $\pm$ 2	
		1 -> 0	-106 $\pm$ 2	
		0 -> OFF	Under -106	
23	Battery Indicator	Battery Bar Status	Voltage(%)	Voltage level(V)
		16 level (Full)	100 ~ 94%	4.2V ~ 4.0V
		15	93 ~ 88%	4.0V ~ 3.96V
		14	87 ~ 82%	3.96V ~ 3.92V
		13	81 ~ 76%	3.92V ~ 3.88V
		12	75 ~ 69%	3.88V ~ 3.84V
		11	68 ~ 63%	3.84V ~ 3.80V
		10	62 ~ 57%	3.80V ~ 3.76V
		9	56 ~ 51%	3.76V ~ 3.74V
		8	50 ~ 44%	3.74V ~ 3.72V
		7	43 ~ 38%	3.72V ~ 3.70V
		6	37 ~ 32%	3.70V ~ 3.68V
		5	31 ~ 26%	3.68V ~ 3.66V
		4	25 ~ 19%	3.66V ~ 3.64V
		3	18 ~ 13%	3.64V ~ 3.62V
		2	12 ~ 7%	3.62V ~ 3.56V
		1	6 ~ 1%	3.56V ~ 3.32V
		0(Empty)	0%	3.30V

2. PERFORMANCE

Item	Description	Specification
24	Low Voltage Warning	10%, 5% 2times (standby) - Speaker
		10%, 5% 2times, ≤5% at every 1 min. (call) - Receiver
25	Shut down Voltage	0% (about 3.3V)
26	Battery Type	Li-Ion Battery, Inner pack Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 1100mAh
27	Travel Charger	Switching-mode charger Input: 100 ~ 240V, 50/60 Hz Output: 5.1 V, 700 mA

3. TECHNICAL BRIEF

3.1 Digital Main Processor

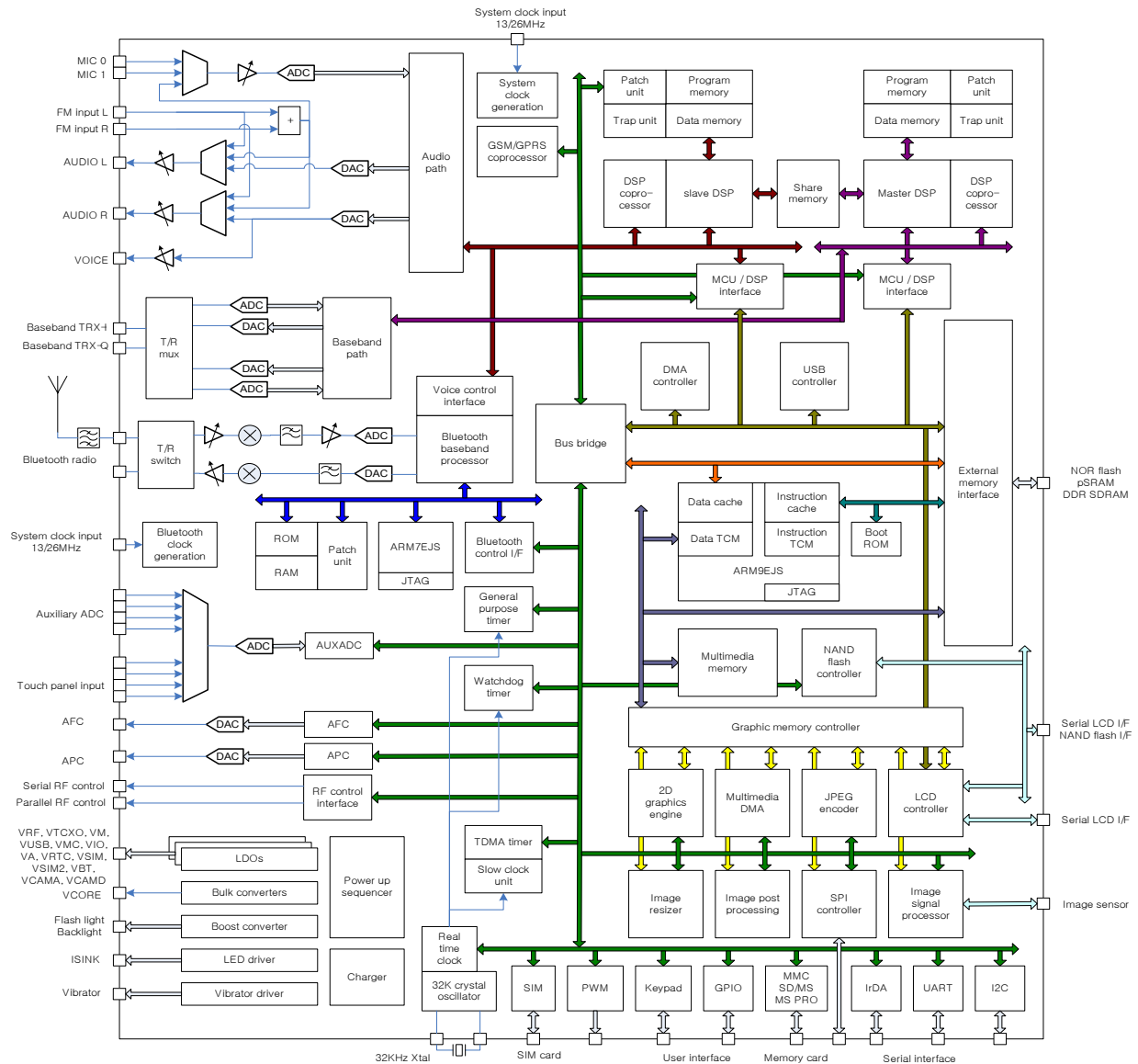


Figure 3.1.1 MT6236 Hardware Block Diagram

3.1.1 General

- Integrated voice-band, audio-band and base-band analog front ends.
- Package:
 - 12.5x12.5mm
 - 0.5 mm pitch
 - TFBGA 382balls, 0.5mm pitch package

3.1.2 MCU Subsystem

- ARM926EJ-ST[™] 32-bit RISC processor
- High performance multi-layer AMBA bus
- Operating frequency 13 / 78 / 156 / 312 MHz
- Dedicated DMA bus with 18 DMA channels
- Java hardware acceleration for fast Java-based games and applets
- On-chip boot ROM for Factory Flash Programming
- Watchdog timer for system crash recovery
- 3 sets of General Purpose Timer
- 64K Byte Instruction TCM and 176K byte Data TCM
- 16K Byte Instruction Cache and 16K byte Data Cache
- Circuit Switch Data coprocessor
- Division coprocessor
- PPP Framer coprocessor

3.1.3 External Memory Interface

- Supports up to 2 external devices
- Supports 16-bit memory components with maximum size of up to 128M Bytes for each bank
- Supports Flash and PSRAM with Burst Mode
- Support legacy industry standard parallel LCD Interface
- Support multi-media companion chips with 8/16 bits data width
- Configurable driving strength for memory interface
- Support Mobile DDR SDRAM and Cellular RAM
- Flexible I/O voltage of 1.8V ~ 2.8V for memory interface

3.1.4 User Interface

- 8-row x 8-column keypad control with hardware scanner
- Support multi key press for gaming
- Dual SIM/USIM Controller with hardware T=0/T=1 protocol control
- Real Time Clock(RTC) operating with a low quiescent current power supply
- General Purpose I/Os (GPIOs) available for auxiliary application
- 4 set of Pulse Width Modulation(PWM) Output
- 4 channel auxiliary 10 bit A/D converter
- Maximum 7 external interrupt lines

3.1.5 Security

- Support security key and 128bit chip unique ID

3.1.6 Connectivity

- 3 UARTs with hardware flow control and supports of baud rate up to 921600 bps
- IrDA modulator/demodulator with hardware framer. supports SIR / MIR / FIR operating speeds
- USB 2.0 high speed capability
- Multi Media Card/Secure Digital Memory Card/Memory Stick/Memory Stick Pro host controller with flexible I/O voltage power
- Supports SDIO interface for SDIO peripherals as well as WIFI connectivity
- DAI/PCM and I2S interface for Audio application
- I2C master interface for peripheral management including image sensor.
- SPI master interface for peripheral management including digital TV chip.

3.1.7 Power Management

- Li-ion battery charger
- High efficiency bulk converter for core power and memory power supply with programmable voltage scaling
- 13 LDOs for the power supply of memory card, camera, Bluetooth, RF, SIM card, and other diversified usage
- One boost regulator and Four Open-Drain Output Switches to Supply / control the LED
- LDO type Vibrator
- One NMOS switch to control R(GB) LED
- Thermal Overload Protection
- Under voltage Lock out Protection
- Over voltage Protection
- Different level of power down modes with sophisticated software control enables excellent power saving performance

3.1.8 Radio Interface and Baseband Front End

- GMSK modulator with analog I and Q channel outputs
- 10-bit D/A Converter for uplink baseband I and Q signals
- 14-bit high resolution A/D Converter for downlink baseband I and Q signals
- Calibration mechanism of offset and gain mismatch for baseband A/D Converter and D/A Converter
- 10-bit D/A Converter for Automatic Power Control.
- 13-bit high resolution D/A converter for Automatic Frequency Control
- Programmable Radio RX filter with adaptive bandwidth control
- Bi directional BSI interface. RF chip register read access with 3 Wire or 4 wire interface
- 2 channels Baseband Serial Interface(BSI) with 3 wire control
- 10-Pin Baseband Parallel Interface(BRI) with programmable driving strength
- Multi-band support

3.1.9 Voice and Modem CODEC

- Digital tone generation
- Voice Memo
- Noise Reduction
- Echo Suppression
- Advanced Sidetone Oscillation Reduction
- Digital sidetone generator with programmable gain
- Two programmable acoustic compensation filters
- GSM/GPRS quad vocoders for adaptive multirate(AMR), enhanced full rate(EFR), full rate(FR), and half rate(HR)
- GSM channel coding, equalization and A5/1, A5/2 and A5/3 ciphering
- GPRS GEA1, GEA2 and GEA3 ciphering
- Programmable GSM/GPRS modem
- Packet Switched Data With CS1/CS2/CS3/CS4 coding schemes
- GSM circuit switch Data

3.1.10 Voice Interface and Voice Front End

- Two microphone inputs sharing one low noise amplifier with programmable gain and automatic gain control(AGC) mechanism
- 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 03.05

3.1.11 LCD/NAND Flash Interface

- Dedicated Parallel Interface supports 3 external devices with 8_/16-bit NAND flash interface, 8_/9_/16_/18-bit parallel interface, and serial interface for LCM
- Built-in NAND Flash Controller with 1-bit ECC for mass storage

3.1.12 LCD Controller

- Supports LCM format: RGB332, RGB444, RGB565, RGB666, RGB888
- Supports LCD module with maximum resolution up to 320x480 at 24bpp
- Capable of combining display memories with up to 4 blending layers
- Supports simultaneous connection to up to 3 parallel LCD and 2 serial LCD modules
- Supports hardware display rotation for each layer
- Per pixel alpha channel
- True color engine

3.1.13 Audio CODEC

- Wavetable synthesis with up to 64 tones
- Advanced wavetable synthesizer capable of generating and 47 sets of percussions
- PCM Playback and Record
- Digital Audio Playback
- Supports HE-AAC codec decode
- Supports ASC codec decode

3.1.14 Audio Interface and Audio Front End

- Supports I2S interface
- High resolution D/A Converters for Stereo Audio playback
- Stereo analog input for stereo audio source
- Analog multiplexer for Stereo Audio
- Stereo to Mono Conversion
- Bluetooth Features

3.1.15 Image Signal Processor

- 8/10 bit Bayer format image input
- RGB565/YUV422 format image input
- Capable of processing image of size up to 5M pixels
- Color correction matrix
- Gamma correction
- Automatic exposure(AE) control
- Automatic focus control
- Automatic white balance(AWB) control
- Programmable AE/ABW windows
- Edge enhancement support
- Shading compensation
- Defect Pixel compensation

3.1.16 JPEG Decoder

- SW based JPEG decode
- Supports various YUV format, DC/AC Huffman tables, and quantization Tables

3.1.17 JPEG Encoder

- ISO/IEC 10918-1 JPEG baseline mode
- ISO/IEC 10918-2 compliance
- Supports YUV422 and YUV420 and grayscale formats
- Supports EXIF/JFIF
- Standard DC and AC Huffman tables
- Provides 14 levels of encode quality
- Supports continuous shooting

3.1.18 Image Data Processing

- Supports Digital Zoom
- Supports RGB and YCbCr image processing
- High throughput hardware scaler. Capable of tailoring an image to an arbitrary size
- Horizontal scaling with bicubic interpolation
- vertical scaling with bicubic interpolation
- Simultaneous scaling for video buffer and display buffer
- YUV and RGB color space conversion
- Boundary padding
- Pixel processing: hue/saturation/intensity/color adjustment, Gamma correction and grayscale/invert/sepia-tone effects
- Hardware accelerated image editing
- Photo frame capability
- RGB/YCbCr format thumbnail output

3.1.19 MPEG-4/H.263 CODEC

- Software Video CODEC
- ISO/IEC 14496-2 simple profile
- decode @ level 0/1/2/3
- ITU-T H.263 profile 0 @ level 10
- Encoder resync maker and HEC
- Supported visual tools for decoder: I-VOP, P-VOP, AC/DC Prediction, 4-MV, Unrestricted MV, Error Resilience, Short Header
- Error Resilience for decoder : Slice Resynchronization, Data Partitioning, Reversible VLC
- Supported visual tools for encoder : I-VOP, P-VOP, Half-Pel, DC Prediction, Unrestricted MV, Reversible VLC, Short Header
- Supports encoding motion vector of range up to -64/+63.5 pixels
- HE-AAC decode support
- AAC/AMR/WB-AMR audio decode support
- AMR/WB-AMR audio encode support

3.1.20 H.264 Decode

- Software Decoder
- ISO/IEC 14496-10 baseline profile : decode @ level 3

3.1.21 2D Accelerator

- Supports 32-bpp ARGB8888, 24-bpp RGB888, 16-bpp RGB565, and 8-bpp index color modes
- Rectangle fill with constant or gradient color
- BitBlt : capable with 7 rotation types, ROP4, Mask
- Alpha blending with 7 rotation types, per-pixel alpha and pre-multiplied alpha
- Font caching : normal and italic font
- Linear transform : Support perspective transform, truncate/nearest/bi-linear sample filter
- Command queue with max depth of 1024

3.1.22 Bluetooth Radio Features

- Fully compliant with Bluetooth specification 2.1 + EDR
- Low out-of-band spurious emissions supports simultaneous operation with GPS,GSM/GPRS worldwide radio systems
- Low-IF architecture with high degree of linearity and high order channel filter
- Integrated T/R switch and Balun
- Fully integrated PA provides 10dBm output power
- -90dBm sensitivity with excellent interference rejection performance
- Hardware AGC dynamically adjusts receiver performance in changing environments

3.1.23 Bluetooth Baseband Feature

- Up to 7 simultaneous active ACL links
- Up to 3 simultaneous SCO and eSCO links with CVSD coding
- eSCO support
- Scatternet support: Up to 4 piconets simultaneously with background inquiry/page scan
- Sniff mode, hold mode, and park mode support
- AFH and PTA collaborative support for WLAN/BT coexistence
- Idle mode and sleep mode enables ultra low power consumption
- PCM interface and built-in transcoders for A-law, u-law and linear voice with re-transmission support
- Built-in hardware modem engine for access code correlation, header error correction, forward error correction, CRC whitening, and encryption
- Channel quality driven data rate adaptation
- Channel assessment for AFH

3.1.24 Bluetooth Platform features

- Embedded ARM7 processor for Bluetooth protocol stack with built-in memory system
- Fully verified ROM based system with code patch for feature enhancement

3.2 Power Management

An power management is embedded in MT6236 to provide the rich features that an high-end feature phone supports, including Li-ion battery charger, high performance and low quiescent current LDOs, power efficient switching regulator, and drivers for LED and backlight.

The MT6236 offers various low-power features to help reduce system power consumption. MT6236 is also fabricated in an advanced low power 65nm CMOS process, hence providing an overall ultra low leakage solution.

3.2.1 Low Dropout Regulators(LDOs), Buck converter and Reference

The PMU Integrates 13 LDOs that are optimized for their given functions by balancing quiescent current, dropout voltage, line/load regulation, ripple rejection, and output noise

▪ RF LDO (Vrf)

The RF LDO is a linear regulator that could source 250mA (max) with 2.8V output voltage. It supplies the RF circuitry of the handset. The LDO is optimized for high performance and adequate quiescent current.

▪ Digital Core Buck Converter (Vcore)

The digital core regulator is a DC-DC step-down converter (Buck converter) that could source 350mA (max) with 1.3V to 0.8V programmable output voltage based on software register setting. It supplies the power for baseband circuitry of the SoC. The buck converter is optimized for high efficiency and low quiescent current.

▪ Digital Memory Buck Converter (VM)

The digital core regulator is a DC-DC step-down converter (Buck converter) that could source 300mA (max) with 1.8V. It supplies the power for baseband circuitry of the SoC. The buck converter is optimized for high efficiency and low quiescent current.

▪ Digital IO LDO (Vio)

The digital IO LDO is a linear regulator that could source 100mA (max) with 2.8V output voltage. It supplies the power for baseband circuitry of the SoC. The LDO is optimized for very low quiescent current and turns on automatically together with Vm/Va LDOs.

▪ Analog LDO (Va)

The analog LDO is a linear regulator that could source 125mA (max) with 2.8V output voltage. It supplies the analog sections of the SoC. The LDO is optimized for low frequency ripple rejection in order to reject the ripple coming from the burst at 217Hz of RF power amplifier.

▪ TCXO LDO (Vtcxo)

The TCXO LDO is a linear regulator that could source 40mA (max) with 2.8V output voltage. It supplies the temperature compensated crystal oscillator, which needs ultra low noise supply with very good ripple rejection.

▪ **Single-Step RTC LDO (Vrtc)**

The single-step RTC LDO is a linear regulator that can charge up a capacitor-type backup coin cell to 2.8 V, which also supplies the RTC module even at the absence of the main battery. The single-step LDO features the reverse current protection and is optimized for ultra low quiescent current while sustaining the RTC function as long as possible.

▪ **Memory buck converter (Vm)**

The memory regulator is a DC-DC step-down converter (Buck converter) that could source 300mA (max) with 1.8V output voltage. It supplies the memory circuitry in the handset. The buck converter is optimized for high efficiency and low quiescent current.

▪ **SIM LDO (Vsim)**

The SIM LDO is a linear regulator that could source 100mA (max) with 1.8V or 3.0V output voltage selection based on the supply specs of subscriber identity modules (SIM) card. It supplies the SIM card and SIM level shifter circuitry in the handset. The Vsim LDO is controlled independently by the register named VSIM_EN.

▪ **USB LDO (Vusb)**

The USB LDO is a linear regulator that could source 100mA (max) with 3.3V output dedicated for USB circuitry. It is controlled independently by the register named RG_VUSB_EN.

▪ **Bluetooth LDO (Vbt)**

The VBT LDO is a linear regulator that could source 100mA (max) with 1.3V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.1V or 3.3V output for Bluetooth module. It is controlled independently by the register named RG_VBT_EN.

▪ **Camera Analog LDO (Vcama)**

The Vcama LDO is a linear regulator that could source 250mA (max) with 1.5V, 1.8V, 2.5V or 2.8V output which is selected by the register named VCAMA_SEL[1:0]. It supplies the analog power of the camera module. Vcama is controlled independently by the register named RG_VCAMA_EN.

▪ **Camera Digital LDO (Vcamd)**

The Vcamd LDO is a linear regulator that could source 100mA (max) with 1.3V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V or 3.3V output which is selected by the register named VCAMD_SEL[2:0]. It supplies the digital power of the camera module. Vcamd is controlled independently by the register named RG_VCAMD_EN.

3. TECHNICAL BRIEF

	Name of PMIC	Net Name	Output Voltage(V)	Output Current(mA)	Description (Connected Device)
2 Bucks	VCORE	VCORE_1V2	0.9 to 1.3	350	Digital Core
	VM	VMEM_1V8	1.8	300	External Memory, Selectable
13 LDOs (4 Analog LDOs + 9 Digital LDOs)	VIO	VIO_2V8	2.8	100	Digital IO
	VRF	VRF_2V8	2.8	250	RF Chip
	VA	avdd_2v8	2.8	125	Analog Baseband
	VRTC	VRTC_2V8	2.8	0.6	RTC
	VTCXO	----	2.8	40	13/26 MHz Reference Clock
	VSIM	VSIM1_PWR	1.8/3.0	100	SIM Card, Selectable
	VSIM2	VSIM2_PWR	1.3/1.5/1.8/2.5/2.8/3.0/3.3	100	SIM Card2, Selectable
	VIBR	---	1.3/1.5/1.8/2.5/2.8/3.0/3.3	200	Vibrator
	VUSB	VUSB_3V3	3.3	100	USB
	VBT	VBT_2V8	1.3/1.5/1.8/2.5/2.8/3.0/3.3	100	Memory Card or Bluetooth
	VCAM_A	VCAM_2V8	1.3/1.5/1.8/2.8	250	Analog Camera Power
	VCAM_D	VCAM_1V8	1.3/1.5/1.8/2.5/2.8/3.0/3.3	100	Digital Camera Power
	VMC	VMC	1.3/1.5/1.8/2.5/2.8/3.0/3.3	100	Memory Card

Table3.2.1. Power Supply Domains (Without RF)

3.2.2 Power On Sequence

The PMU handles the powering ON and OFF of the handset. There are three ways to power-on the handset system :

1. Push PWRKEY (Pull the PWRKEY pin to the low level)

Pulling PWRKEY low is the typical way to turn on the handset. The Vcore buck converter will be turned-on first, and then Va/Vio LDOs turn-on at the same time. After Va/Vio turn-on, Vm buck and then Vusb/Vmc LDOs, and finally Vrf/Vtcxo LDOs will be turn on. The supplies for the baseband are ready and then the system reset ends at the moment when the Vcore/Va/Vio/Vm/Vusb/Vmc/Vrf/Vtcxo are fully turned-on to ensure the correct timing and function. After that, baseband would send the PWRBB signal back to PMU for acknowledgement. To successfully power-on the handset, PWRKEY should be kept low until PMU receives the PWRBB from baseband.

2. RTC module generate PWRBB to wakeup the system

If the RTC module is scheduled to wakeup the handset at some time, the PWRBB signal will directly send to the PMU. In this case, PWRBB becomes high at the specific moment and let PMU power-on just like the sequence described above. This is the case named RTC alarm.

3. Valid charger plug-in (CHRON voltage is within the valid range)

Charger plugging-in will also turn on the handset if the charger is valid (no OVP take place). However, if the battery voltage is too low to power-on the handset (UVLO state), the system won't be turned-on by any of these three ways. In this case, charger will charge the battery first and the handset will be powered-on automatically as long as the battery voltage is high enough.

Phone State	CHRON	UVLO	PWRKEY && (~PWRBB)	Vrtc	Vcore, Vio, Vm, Va	Vtcxo, Vrf
No Battery or Vbat < 2.5V	X	H	X	Off	Off	Off
2.5V < Vbat < 3.2V	L	H	X	On	Off	Off
Pre-Charging	H	H	X	On	Off	Off
Charger-on (Vbat>3.2V)	H	L	X	On	On	On
Switched off	L	L	H	On	Off	Off
Stand-by	L	L	L	On	On	Off
Active	L	L	L	On	On	On

Table 18 States of mobile handset and regulator

▪ Under-voltage Lockout (UVLO)

The UVLO state in the PMU prevents startup if the initial voltage of the main battery is below the 3.2V threshold. It ensures that the handset is powered-on with the battery in good condition. The UVLO function is performed by a hysteretic comparator which can ensure the smooth power-on sequence. In addition, when the battery voltage is getting lower and lower, it will enter UVLO state and the PMU will be turned-off by itself, except for Vrtc LDO, to prevent further discharging. Once the PMU enters UVLO state, it draws low quiescent current. The RTC LDO is still working until the DDLO disables it.

▪ Deep Discharge Lockout (DDLO)

PMU will enter to the deep discharge lockout (DDLO) state when the battery voltage drops below 2.5V. In this state, the Vrtc LDO will be shutdown. Otherwise, it draws very low quiescent current to prevent further discharging or even damage to the cells.

▪ Reset

The PMU contains a reset control circuit which takes effect at both power-up and power-down. The RESETB pin is held at low in the beginning of power-up and returns to high after the pre-determined delay time. The delay time is controlled by a large counter, which use clock from internal ring-oscillator. At power-off, RESETB pin will return to low immediately without any delay.

3.3 FEM with integrated Power Amplifier Module (RF7180, U202)

3.3.1 Internal Block Diagram

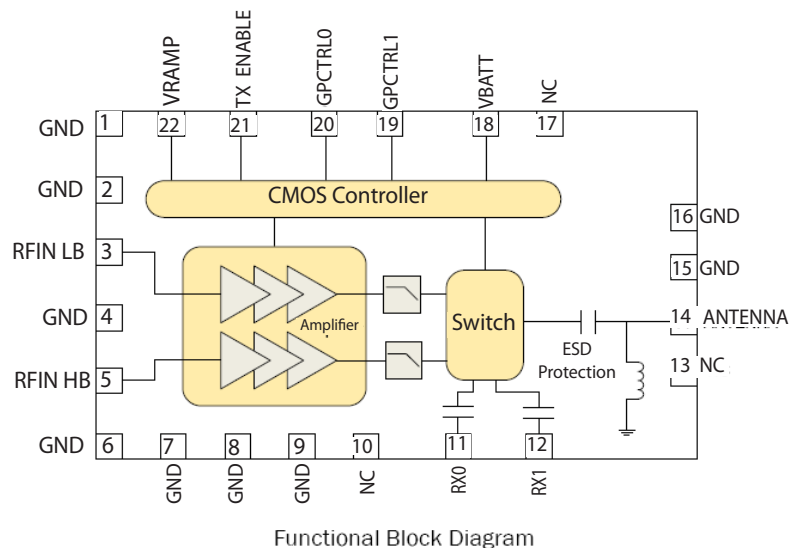


Figure. 3.3.1 RF7180 FUNCTIONAL BLOCK DIAGRAM

3.3.2 General Description

The RF7180 is a quad-band (GSM850/EGSM900/DCS1800/PCS1900) GSM/GPRS Class 12 compliant transmit module with two symmetrical receive ports. This transmit module builds upon RFMD's leading power amplifier with PowerStar® integrated power control technology, pHEMT switch technology, and integrated transmit filtering for best-in-class harmonic performance. The results are high performance, a reduced solution size, and ease of implementation.

The device is designed for use as the final portion of the transmitter section in a GSM850 / EGSM900 / DCS1800 / PCS1900 handset and eliminates the need for PA-to-antenna switch module matching network. The device provides 50 Ω matched input and output ports requiring no external matching components. The RF7180 features RFMD's latest integrated power-flattening circuit, which significantly reduces current and power variation into load mismatch. Additionally, a VBATT tracking feature is incorporated to maintain switching performance as supply voltage decreases. The RF7180 also integrates an ESD filter to provide excellent ESD protection at the antenna port.

3. TECHNICAL BRIEF

TX Module Mode	Tx ENABLE	GpCtrl1	GpCtrl0
Off	0	0	0
RX 0	0	1	0
RX 1	0	1	1
GSM850/900 TX Mode	1	1	0
DCS1800/PCS1900 TX Mode	1	1	1

Table 3.3.1 Band SW Logic Table

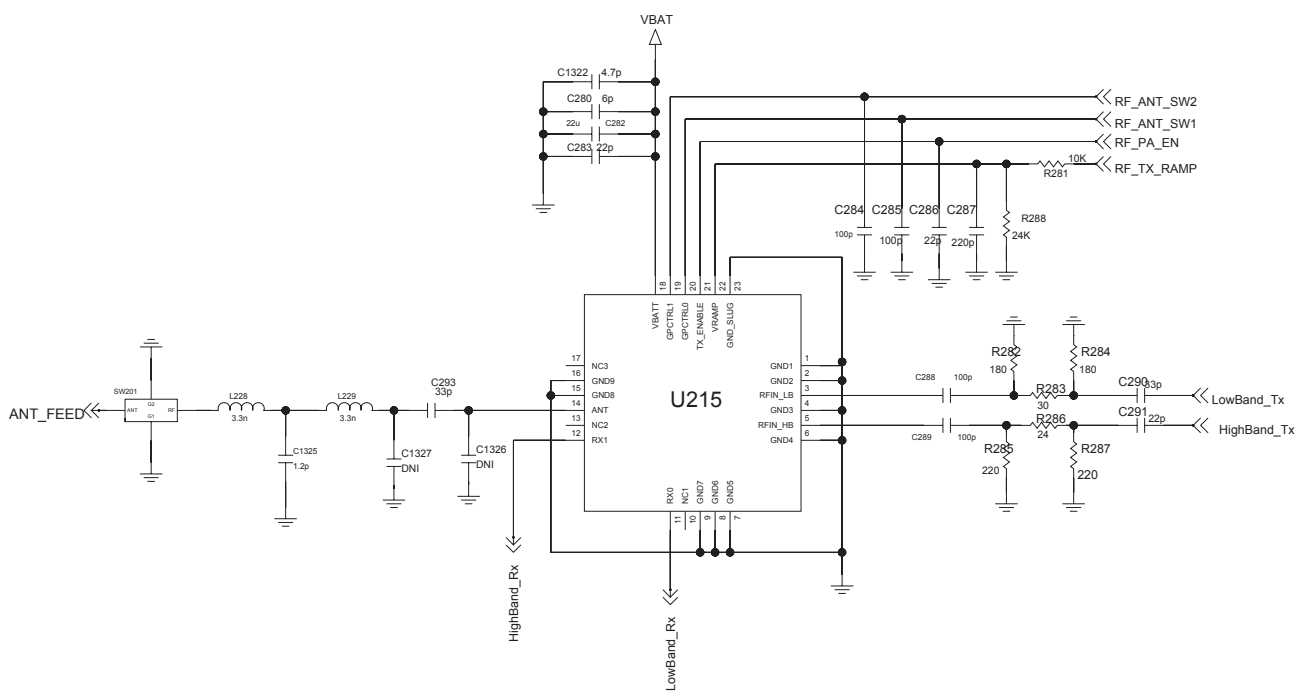


Figure 3.3.2 RF-module CIRCUIT DIAGRAM

3.4 Clocks

There are two major time bases in the MT6236. For the faster one is the 26 MHz clock originated from the digital control oscillator(DCXO) of RF chip. This signal is then converted to the square-wave signal through CLKSQ. The other time base is the 32768 Hz clock generated by an on-chip oscillator connected to an external crystal. Figure 3.4.1 shows the clock sources as well as their utilizations inside the chip.

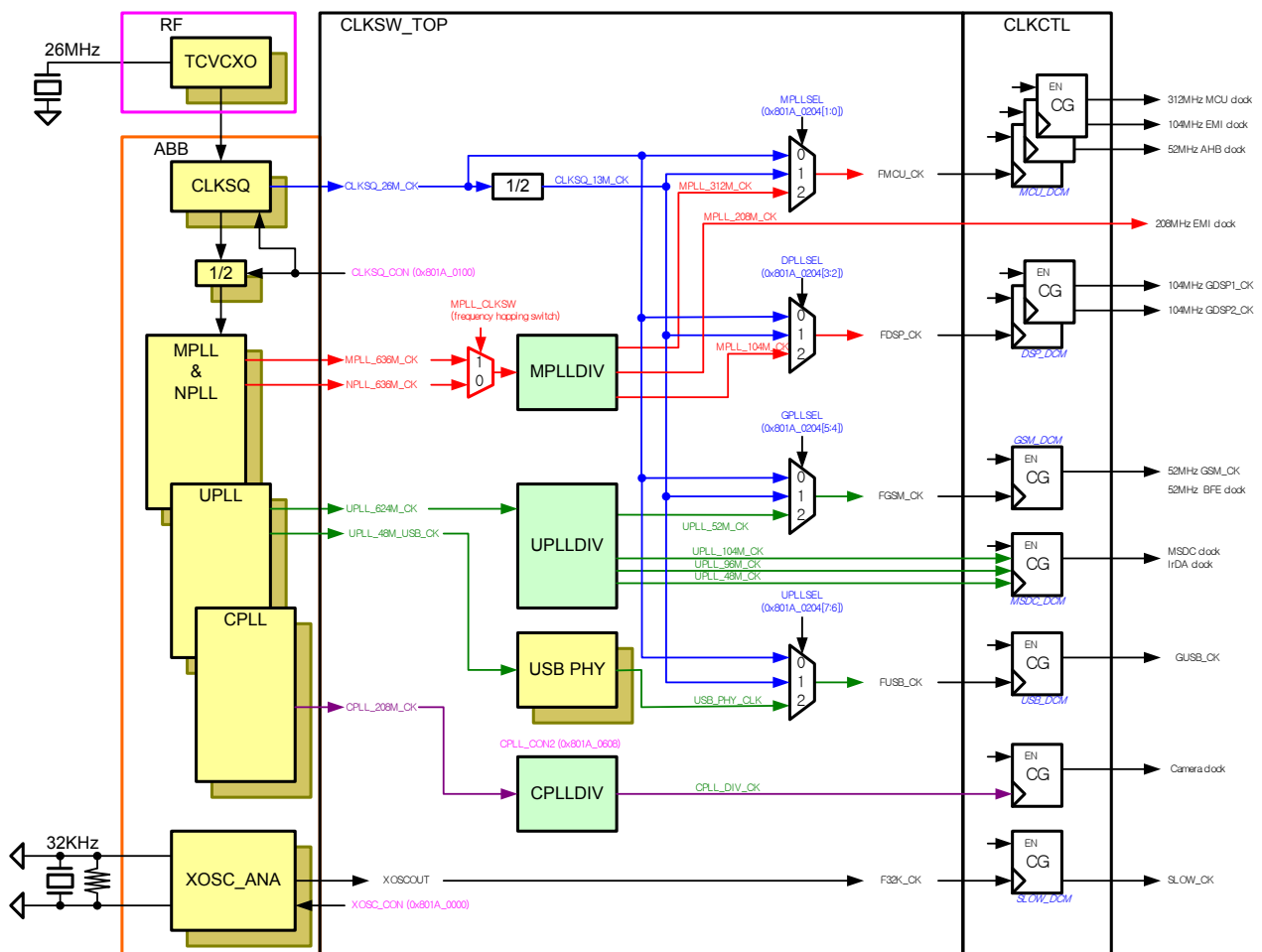


Figure 3.4.1 Clock distributions inside the MT6236.

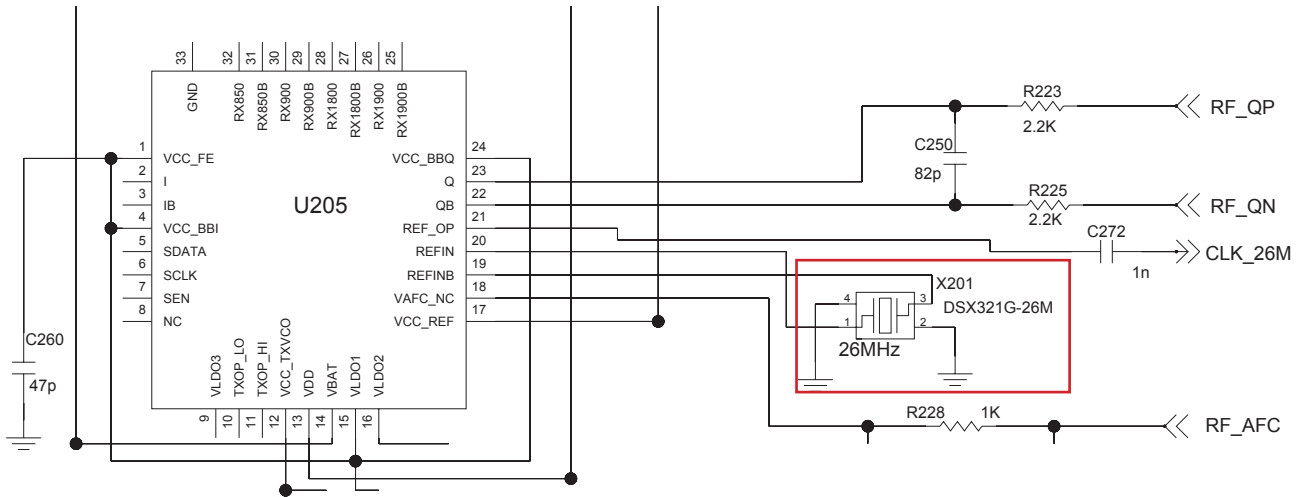


Figure. 3.4.2 Crystal Oscillator External Connection

3.4.1 32.768KHz Time Base

The 32768 Hz clock is always running. It's mainly used as the time base of the Real Time Clock(RTC) module, which maintains time and date with counters. Therefore, both the 32768Hz oscillator and the RTC module is powered by separate voltage supplies that shall not be powered down when the other supplies do. In low power mode, the 13Mhz time base is turned off, so the 32768Hz clock shall be employed to update the critical TDMA timer and Watchdog Timer. This time base is also used to clocks the keypad scanner logic

3.4.2 26MHz Time Base

Since PLL are based on 13MHz reference clock. There is an 1/2-dividers for PLL existing to allow using 26MHz DCXO.

There are 3 phase-locked loops(PLL) in MT6236. The UPLL generates 624Mhz clock output, then a frequency divider to generate fixed 52Mhz and 48Mhz for GSM_CLOCK and USB_CLOCK respectively. The MPLL generates dynamically programmable clock from 624 ~ 660Mhz for MCU_CLOCK and DSP_CLOCK. These four primary clocks then feed into GSM, USB, MCU and DSP clock Domain, respectively. Besides, There is a CPLL generates 6.5 ~ 208Mhz clock output, with a post-divider from 1 ~ 1/16 clock for Camera-Sensor. These 3 PLLs require no off-chip components for operations and can be turn off in order to save power. After power-on, the PLLs are off by default and the source clock signal is selected through multiplexers. The software shall take cares of the PLL lock time while changing the clock selections. The PLL and usages are listed below.

- PLL supply four clock source : MCU_CLOCK(312~330Mhz), DSP_CLOCK(104~110Mhz), GSM_CLOCK(104Mhz) and USB_CLOCK(48Mhz)
- For DSP/MCU system clock, MCU_CLOCK and DSP_CLOCK. The outputted 624~660Mhz clock is controlled by MCU for 1.0Mhz per step and settled time is under 100uS. The clock is also connected to DSP/MCU DCM (dynamic clock manager) for dynamically adjusting clock rate by digital clock divider. MCU_CLOCK paces the operations of the MCU cores, MCU memory system, and MCU peripherals as well
- Modem system clock, GSM_CLOCK, which paces the operations of the GSM/GPRS hardware, coprocessors as well. The outputted 52Mhz clock is connector to GSM_DCM for dynamically adjusting clock rate by digital clock divider.

Note that PLL need some time to become stable after being powered up. The software shall take cares of the PLL lock time before switching them to the proper frequency. Usually, a software loop longer than the PLL lock time is employed to deal with the problem.

For power management, the MCU software program may stop MCU Clock by setting the Sleep Control Register. Any interrupt requests to MCU can pause the sleep mode, and thus MCU return to the running mode.

AHB also can be stop by setting the Sleep Control Register. However the behavior of AHB in sleep mode is a little different from that of MCU. After entering Sleep Mode, it can be temporarily waken up by any "hreq"(bus request), and then goes back to sleep automatically after all "hreqs" de-assert. Any transactions can take place as usual in sleep mode, and it can save power while there is no transaction on it. However the penalty is losing a little system efficiency for switching on and off bus clock, but the impact is small

3.5 Transceiver(AD6548,U204)

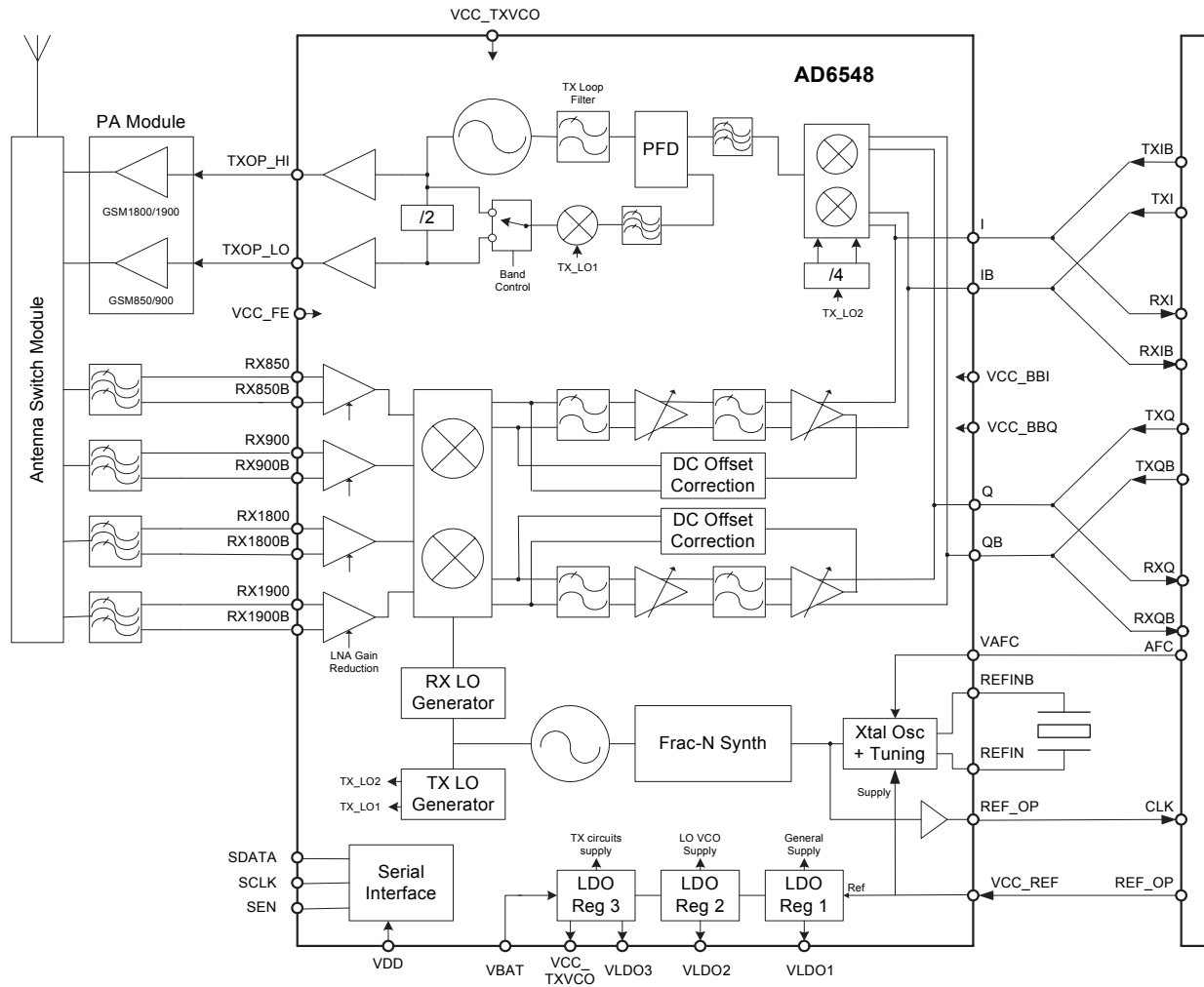


Figure. 3.5.1 Block DIAGRAM AD6548

3.5.1 GENERAL DESCRIPTION

The AD6548 provides a highly integrated direct conversion radio solution that combines, on a single chip, all radio and power management functions necessary to build the most compact GSM radio solution possible. The only external components required for a complete radio design are the Rx SAWs, PA, Switch plexer and a few passives enabling an extremely small cost effective GSM Radio solution.

The AS6548 uses the industry proven direct conversion receiver architecture of the Othello™ Family. For Quad band applications the front end features four fully integrated programmable gain differential LNAs. The RF is then downconverted by quadrature mixers and then fed to the baseband programmable-gain amplifiers and active filters for channel selection. The Receiver output pins can be directly connected to the baseband analog processor. The Receive path features automatic calibration and tracking to remove DC offsets.

The transmitter features a translation-loop architecture for directly modulating baseband signals onto the integrated TX VCO.

The translation-loop modulator and TX VCO are extremely low noise removing the need for external SAW filters prior to the PA.

The AD6548 uses a single integrated LO VCO for both the receive and the transmit circuits. The synthesizer lock times are optimized for GPRS applications up to and including class12. To dramatically reduce the BOM both TX Translational loop and main PLL Loop Filters are fully integrated into the device.

AD6548 incorporates a complete reference crystal calibration system. This allows the external VCTXO to be replaced with a low cost crystal. No other external components are required.

The AD6548 also contains on-chip low dropout voltage regulators(LDOs) to deliver regulated supply voltages to the functions on chip, with a battery input voltage of between 2.9V and 5.5V. Comprehensive power down options are included to minimize power consumption in normal use.

A standard 3 wire serial interface is used to program the IC. The interface features low-voltage digital interface buffers compatible with logic levels from 1.6V to 2.9V

3.5.2 Features

Fully integrated GSM Transceiver including.

- Direct Conversion Receiver
 - 4 Differential LNAs
 - Integrated Active RX channel Select Filters
 - Programmable gain baseband amplifiers

- Translation Loop Direct VCO Modulator
 - Integrated TX VCO and tank
 - External TX filters eliminated
 - Integrated Loop filter components

- High performance multi band PLL system
 - Fast Fractional-N-Synthesizer
 - Integrated Local Oscillator VCO
 - Fully integrated Loop filters
 - Crystal Reference Oscillator & Tuning System

- Power Management
 - Integrated LDOs allow direct battery supply connection

- Small footprint
 - 32-Lead 5X5mm Chip scale Package

- Dual Triple and Quad band radios
 - GSM850,EGSM900,DCS1800 and PCS1900
 - GPRS to Class 12-EDGE RX

3.6 MEMORY(PF38F4050M0Y3DE, U300)

3.6.1 Functional Description

Hynix NAND Flash is a 128Mx16bit with spare 4Mx16 bit capacity.

The device is offered in 1.8 Vcc Power Supply, and with x16 I/O interface

its NAND cell provides the most cost-effective solution for the solid state mass storage market.

The memory is divided into blocks that can be erased independently so it is possible to preserve valid data while old data is erased.

The device contains 2048 blocks, composed by 64 pages.

Memory array is split into 2 planes, each of them consisting of 1024 blocks.

Like all other 2KB - page NAND Flash devices, a program operation allows to write the 2112-byte page in typical 250us and an erase operation can be performed in typical 3.5ms on a 128K-byte block.

In addition to this, thanks to multi-plane architecture, it is possible to program 2 pages at a time (one per each plane) or to erase 2 blocks at a time (again, one per each plane). As a consequence, multi-plane architecture allows program time to be reduced by 40% and erase time to be reduction by 50%. In case of multi-plane operation, there is small degradation at 1.8V application in terms of program/erase time.

The multiplane operations are supported both with traditional and ONFI 1.0 protocols.

Data in the page can be read out at 45ns cycle time per byte. The I/O pins serve as the ports for address and data input/output as well as command input. This interface allows a reduced pin count and easy migration towards different densities, without any rearrangement of footprint.

Commands, Data and Addresses are synchronously introduced using CE#, WE#, ALE and CLE input pin.

The on-chip Program/Erase Controller automates all read, program and erase functions including pulse repetition, where required, and internal verification and margining of data.

A WP# pin is available to provide hardware protection against program and erase operations.

The output pin RB# (open drain buffer) signals the status of the device during each operation. In a system with multiple memories the RB# pins can be connected all together to provide a global status signal.

Each block can be programmed and erased up to 100,000 cycles with ECC (error correction code) on. To extend the lifetime of Nand Flash devices, the implementation of an ECC is mandatory.

The chip supports CE# don't care function. This function allows the direct download of the code from the NAND Flash memory device by a microcontroller, since the CE# transitions do not stop the read operation.

In addition, device supports ONFI 1.0 specification.

The copy back function allows the optimization of defective blocks management: when a page program operation fails the data can be directly programmed in another page inside the same array section without the time consuming serial data insertion phase. Copy back operation automatically executes embedded error detection operation: 1 bit error out of every 264-word (x16) can be detected. With this feature it is no longer necessary to use an external to detect copy back operation errors.

Multiplane copy back is also supported, both with traditional and ONFI 1.0 protocols. Data read out after copy back read (both for single and multiplane cases) is allowed.

In addition, Cache program and multi cache program operations improve the programming throughput by programming data using the cache register.

The devices provide two innovative features: page re-program and multiplane page re-program.

The page re-program allows to re-program one page. Normally, this operation is performed after a previously failed page program operation. Similarly, the multiplane page re-program allows to re-program two pages in parallel, one per each plane. The first page must be in the first plane while the second page must be in the second plane; the multiplane page re-program operation is performed after a previously failed multiplane page program operation. The page re-program and multiplane page re-program guarantee improve performance, since data insertion can be omitted during re-program operations, and save ram buffer at the host in the case of program failure.

The devices support the ONFI1.0 specification and come with four security features:

- OTP (one time programmable) area, which is a restricted access area where sensitive data/code can be stored permantely.
- Serial number (unique identifier), which allows the devices to be uniquely indentified.
- Read ID2 extension

These security features are subject to an NDA (non-disclosure agreement) and are, therefore, no described in the datasheet. For more details about them, contact your nearest Hynix sales office.

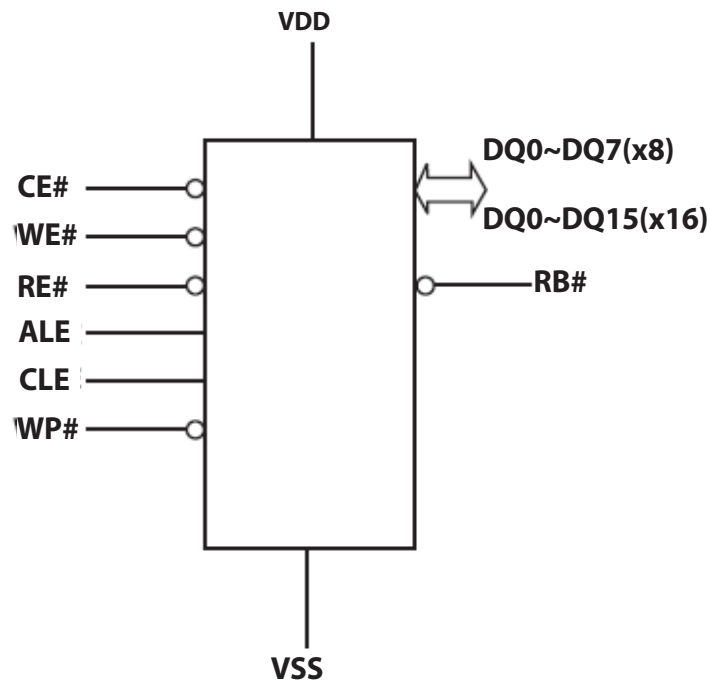


Figure. 3.6.1 LOGIC DIAGRAM

DQ0~DQ15	Data Input /outputs(x16)
CLE	Command latch enable
ALE	Address latch enable
CE#	Chip Enable
RE#	Read Enable
WE#	Write Enable
WP#	Write Protect
RB#	Ready / Busy
Vcc	Power supply
Vss	Ground
NC	No Connected internally

Table 3_6_1 Signal Names

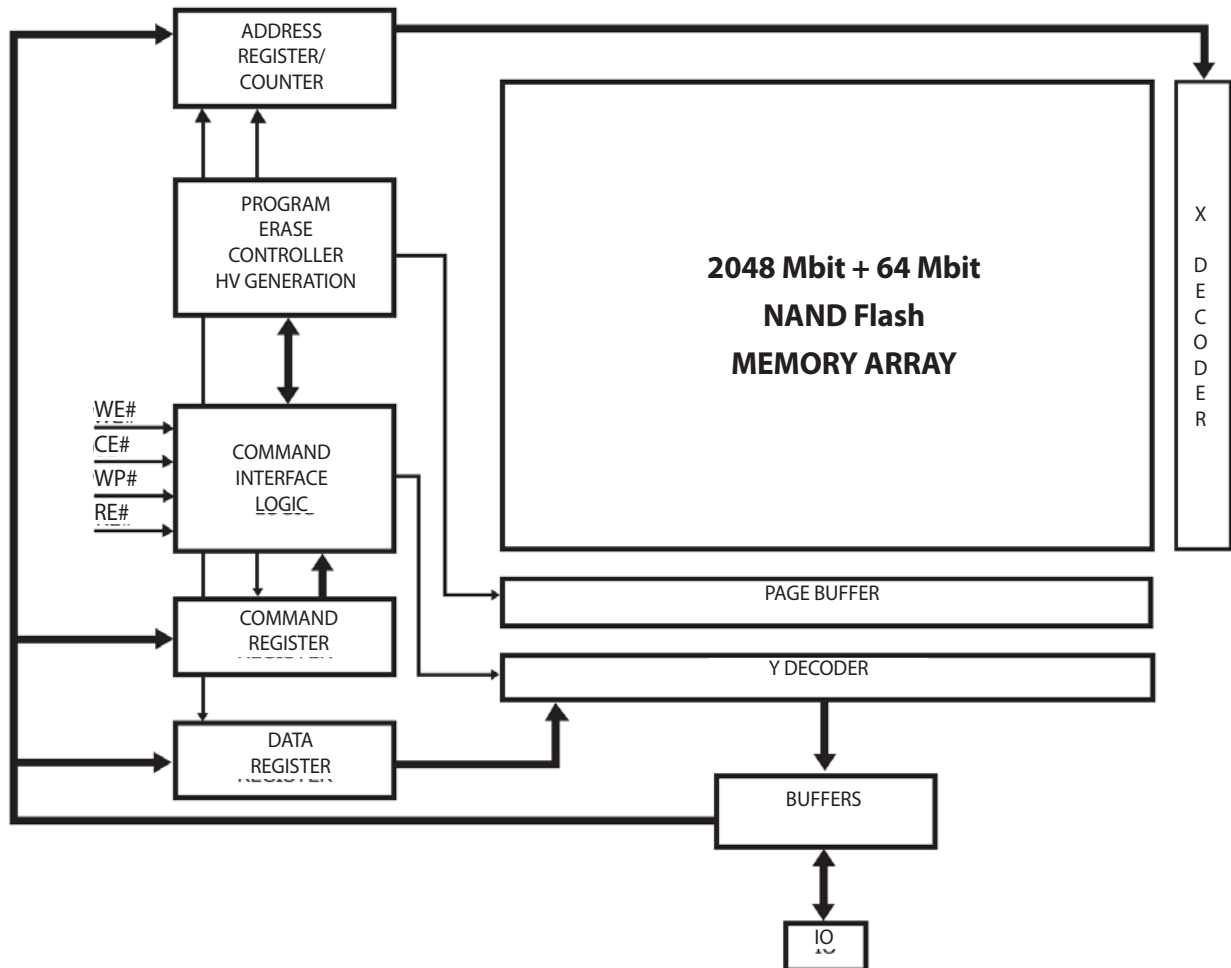


Figure. 3.6.2 BLOCK DIAGRAM

3.6.2 Features

[MCP]

- Operation Temperature
 - -30oC ~ 85oC
- Package
 - 130-ball FBGA - 8.0x9.0mm², 1.0t, 0.65mm pitch
 - Lead & Halogen Free

[NAND Flash]

- MULTIPLANE ARCHITECTURE
- SUPPLY VOLTAGE
 - V_{cc} = 1.7 - 1.95 V
- MEMORY CELL ARRAY
 - (1K + 32) Words x 64 pages x 2048 blocks
- PAGE SIZE
 - (1K+ 32 spare) Words
- BLOCK SIZE
 - (64K + 2K spare) Words
- PAGE READ / PROGRAM
 - Random access : 25us (max.)
 - Sequential access : 45ns (min.)
 - Page program time : 250us (typ.)
 - Multi-page program time (2 pages): 250us (Typ.)
- BLOCK ERASE / MULTIPLE BLOCK ERASE
 - Block erase time: 3.5 ms (Typ)
 - Multi-block erase time (2 blocks): 3.5ms (Typ.)
- SECURITY
 - OTP area
 - Serial number (unique ID)
 - Hardware program/erase disabled during power transition
- ADDITIONAL FEATURE
 - Multiplane Architecture:
 - Array is split into two independent planes.
 - Parallel operations on both planes are available, having program and erase time.
 - Single and multiplane copy back program with automatic EDC (error detection code)
 - Single and multiplane page re-program
 - Single and multiplane cache program
 - Cache read
 - Multiplane block erase

- RELIABILITY
 - 100,000 Program / Erase cycles (with 1bit /528Byte ECC)
 - 10 Year Data retention
- ONFI 1.0 COMPLIANT COMMAND SET
- ELECTRICAL SIGNATURE
 - Manufacture ID: ADh
 - Device ID

[DDR SDRAM]

- Double Data Rate architecture
 - two data transfer per clock cycle
- x16 bus width
- Supply Voltage
 - VDD / VDDQ = 1.7 - 1.95 V
- Memory Cell Array
 - 16Mb x 4Bank x 16 I/O
- Bidirectional data strobe (DQS)
- Input data mask signal (DQM)
- Input Clock
 - Differential Clock Inputs (CK, /CK)
- MRS, EMRS
 - JEDEC Standard guaranteed
- CAS Latency
 - Programmable CAS latency 2 or 3 supported
- Burst Length
 - Programmable burst length 2 / 4 / 8 with both sequential and interleave mode

3.7 Wi-Fi Module(MT5931, U203)

MT5931 is Wi-Fi device which includes.

- 802.11 b/g/n
- PA
- LNA
- TR-Switch

MT5931 provides the best and most convenient connectivity functions. MT5931 implements advanced and sophisticated Radio Coexistence algorithms and hardware mechanisms. Enhanced overall quality for simultaneous voice, data, and audio/video transmission on mobile phone and Tablet PC be achieved. The small package size with low power consumption reduces PCB layout area.

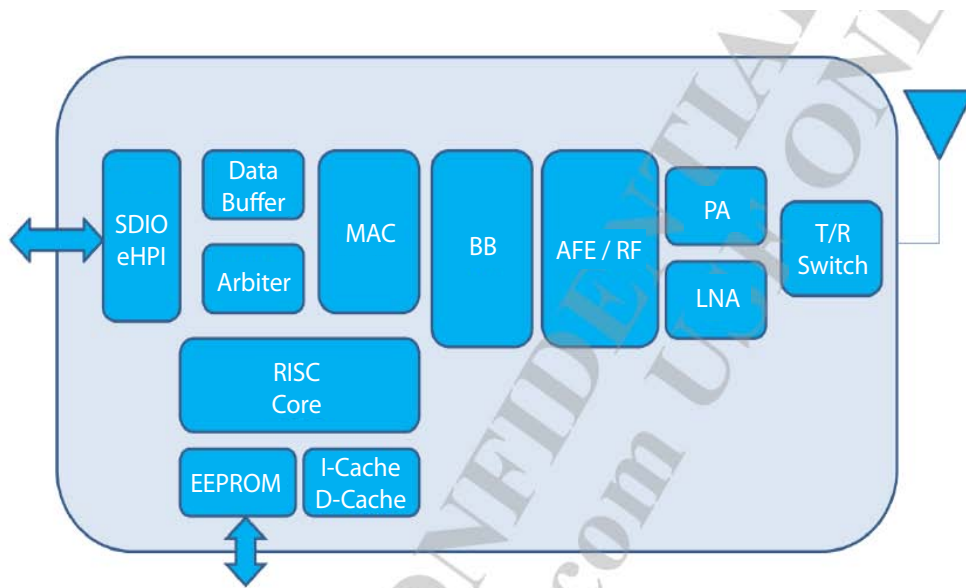


Figure 3.7.1. Wi-Fi BLOCK DIAGRAM

3.7.1 Feature

* General description

- Embedded RISC Core for better system level management
- Coexistence : IEEE 802.15.2 external three-wire coexistence scheme to support additional wireless technologies such as 3G, GPS and Wi-MAX
- Self Calibration
- Integrated switching regulator enables direct connection to battery
- Best-In-class current consumption performance
- Intelligent BT/WLAN coexistence scheme that goes beyond PTA signaling (for example, transmit window and duration that take into account of protocol exchange sequence, frequency, etc.)
- TFBGA(5.1×5.3)(C333)
- 802.11 d/h/k compliant
- Security : WPA/WPA2 personal, WPS2.0, WAPI (Hardware)
- QoS : WMM, WMM PS
- Support 802.11n optional features : STBC, A-MPDU, Block-Ack, RIFS, MCS Feedback, 20/40MHz coexistence (PCO), unscheduled PSMP
- Support 802.11w Protected Managed Frames Support Wi-Fi Direct
- Interface : SDIO 2.0 (4-bit & 1-bit), SPI, EHPI-8/16 (TFBGA only)
- Per packet Tx power control

MT5931 WIFI

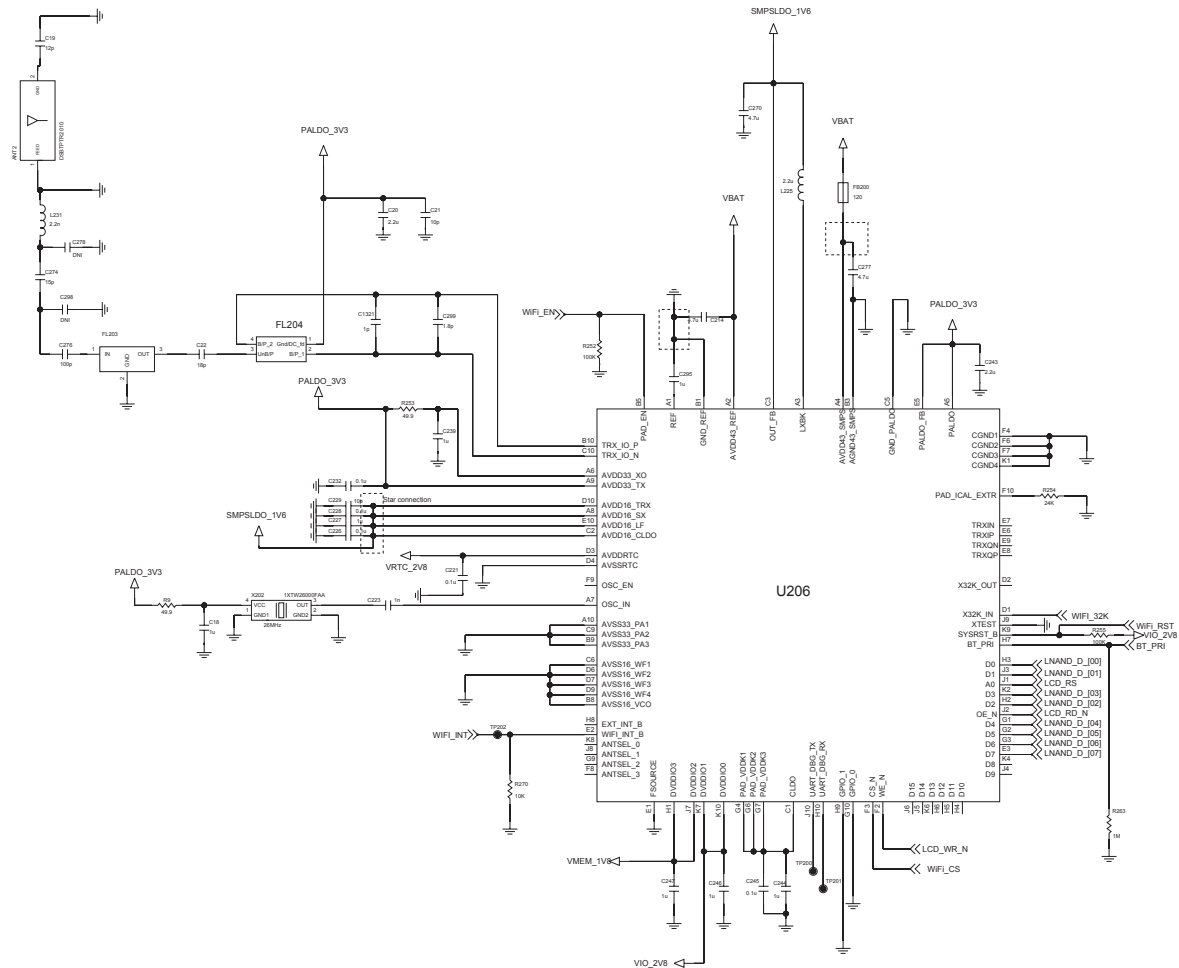


Figure 3.7.2. WiFi CIRCUIT DIAGRAM

3.8 SIM Card Interface

The Main Base Band Processor(MT6236) contains two dedicated smart card interfaces to allow the MCU to access the two SIM cards. Each interface can operate via 5 terminals. As shown in the Figure 3.8.2, SIMVCC, SIMSEL, SIMRST, SIMCLK and SIMDATA are for one SIM interface, while SIM2VCC, SIM2SEL, SIM2RST, SIM2CLK and SIM2DATA are for the other one.

The functions of the two SIM interfaces are identical. And C333 support only single-SIM. therefore, only first SIM interface will be described in this document. The VSIM is used to control the external voltage supply to the SIM card and SIM SEL determines the regulated smart card supply voltage. SIMRST is used as the SIM card reset signal. Besides, SIMDATA and SIMCLK are used for data exchange purpose.

C333 is using U202 as SIM controller to be able to use triple SIM.

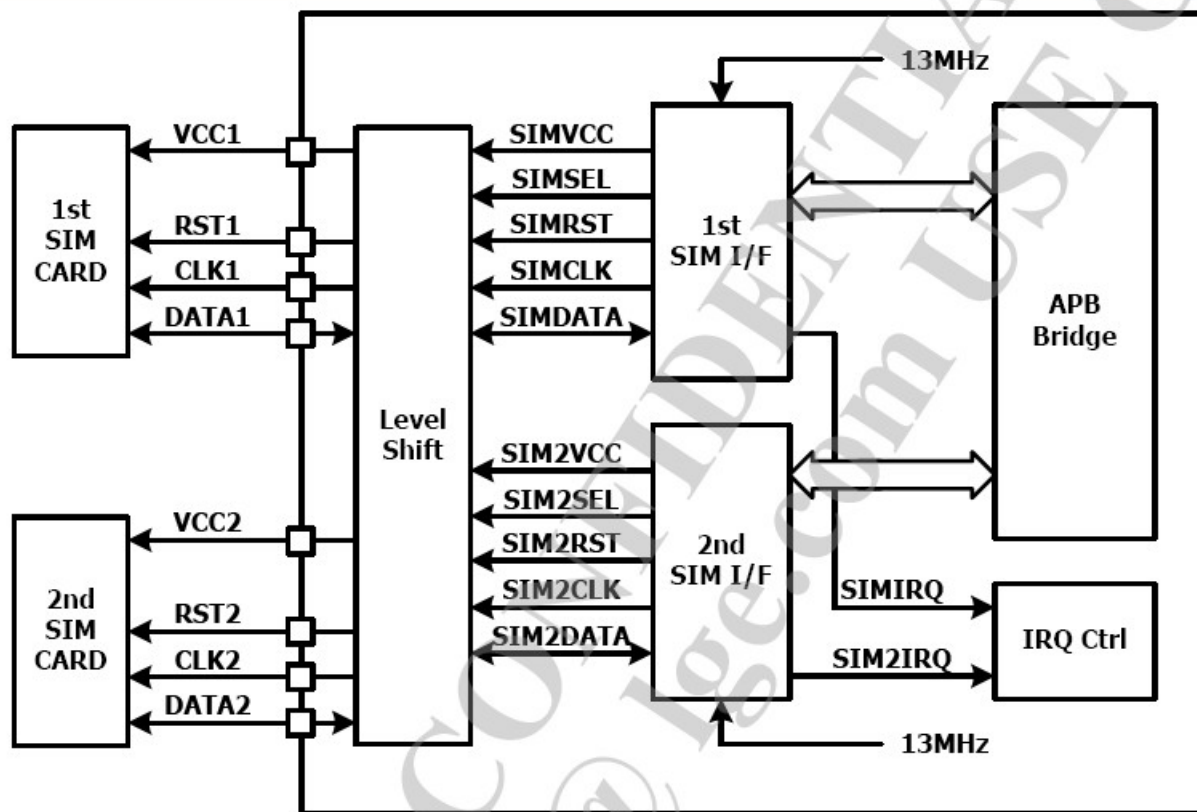


Figure 3.8.21 SIM Interface block diagram

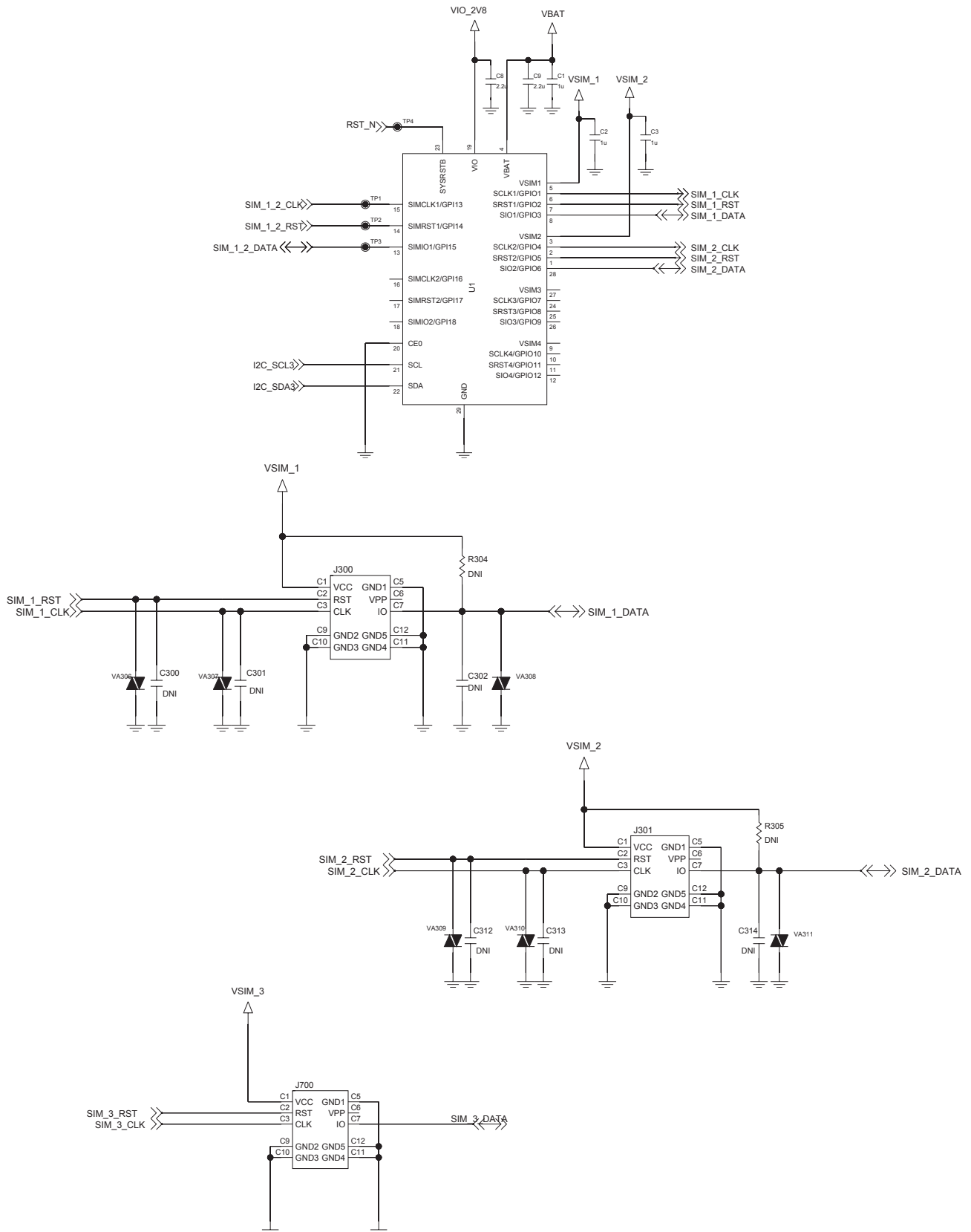


Figure 3.8.2 SIM Connector Circuit Diagram

3.8.1 Dual SIM controller(MT6306, U202)

• General Description

The MT6306 is a SIM card / GPIO control chip optimized for GSM handsets, especially those based on the MediaTek MT62xx system solution. It supports up to four SIM interfaces or 12 GPIOs plus six GPIOs. Each SIM interface can be individually programmed as GPIOs. The SIM interface supports both 1.8V and 3V SIM cards. An I2C interface is used to control SIM channel individually. The MT6306 is available in 28-pin 4mm x 4mm QFN package. The operating temperature range is from -25°C to +85°C.

• Features

Control and communication through an I2C interface with baseband processor. Independent 1.8V/3V VCC control for each SIM card Power management and control for quad SIM cards Independent clock stop mode (at high or low level) for each SIM card Programmable SIM interface pins (can be SIM interface pins or GPIO pins) Compatible with MediaTek baseband processor chips, MT6252, MT6253, MT6235, MT6236, etc. 28-Pin 4mm x 4mm QFN Package.

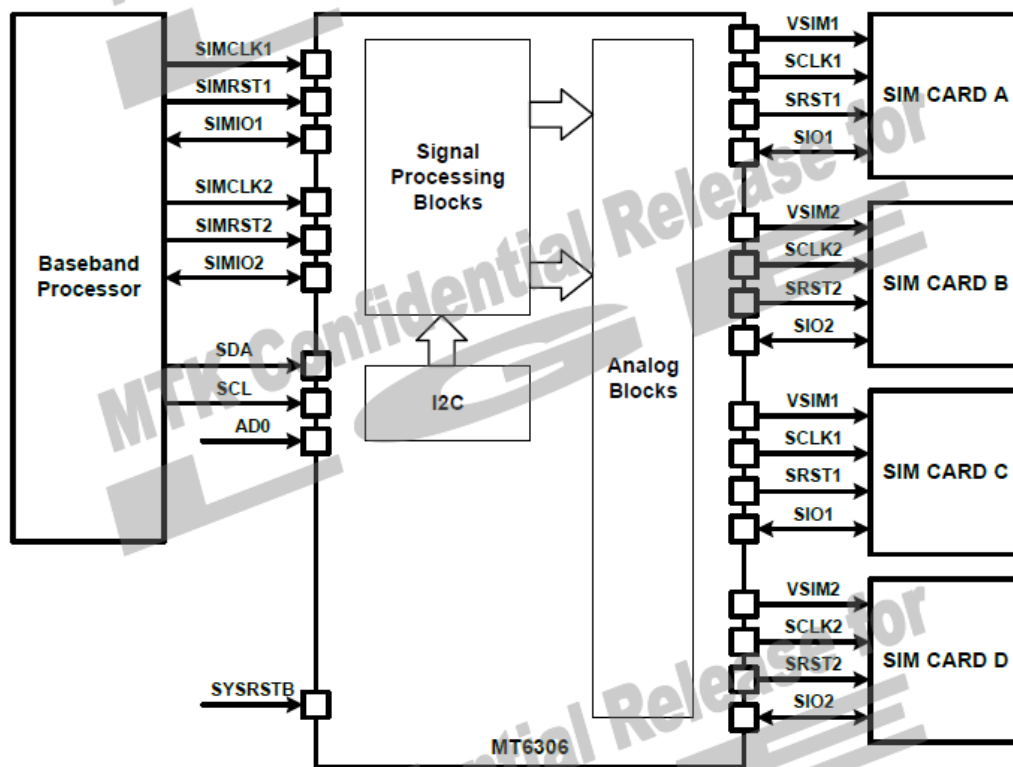


Figure 1. MT6306 block diagram

Figure 3.8.3 SIM Controller block diagram

3.9 Micro-SD Card Interface

u-SD CARD

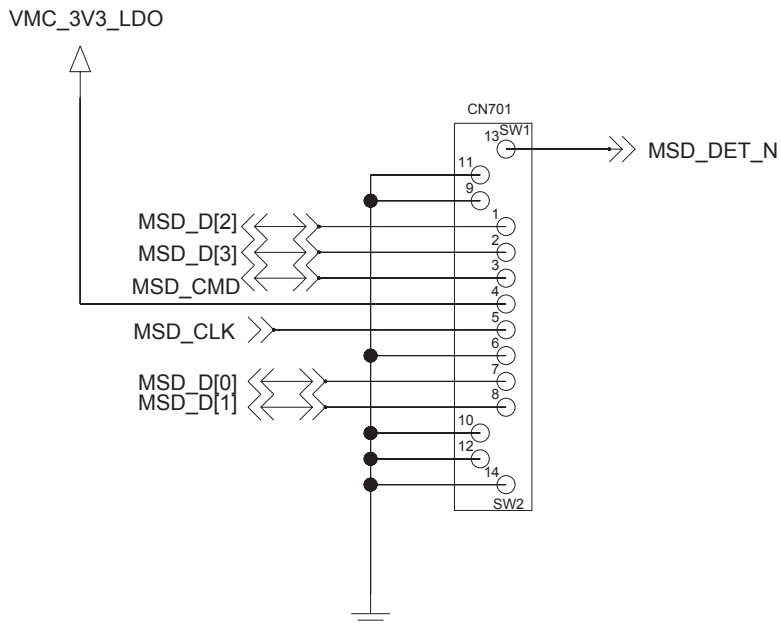


Figure 3.9.1 Micro-SD Card Interface

3.9.1 Pin Assignment

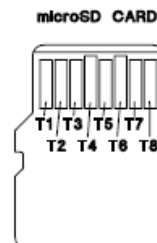
Since the controller can only be configured as either the host of Memory Stick or the host of SD/MMC Memory Card at one time, pins for Memory Stick and SD/MMC Memory Card are shared in order to save pin counts. The following lists pins required for Memory Stick and SD/MMC Memory Card. Figure 3.9.2 shows how they are shared. In Table 3.9.1, all I/O pads have embedded both pull up and pull down resistor because they are shared by both the Memory Stick and SD/MMC Memory Card. Pins 2,4,5,8 are only useful for SD/MMC Memory Card. Pull down resistor for these pins can be used for power saving. All embedded pull-up and pull-down resistors can be disabled by programming the corresponding control registers if optimal pull-up or pull-down resistor are required on the system board. The pin VDDPD is used for power saving. Power for Memory Stick or SD/MMC Memory Card can be shut down by programming the corresponding control register. The pin WP(Write Protection) is only valid when the controller is configured for SD/MMC Memory Card. It is used to detect the status of Write Protection Switch on SD/MMC Memory Card.

No	Name	Type	MMC	SD	MS	MSPRO	Description
1	SD_CLK	O	CLK	CLK	SCLK	SCLK	Clock
2	SD_DATA3	I/O/PP		CD/DAT3		DAT3	Data Line [Bit 3]
3	SD_DATA0	I/O/PP	DAT0	DAT0	SDIO	DAT0	Data Line [Bit 0]
4	SD_DATA1	I/O/PP		DAT1		DAT1	Data Line [Bit 1]
5	SD_DATA2	I/O/PP		DAT2		DAT2	Data Line [Bit 2]
6	SD_CMD	I/O/PP	CMD	CMD	BS	BS	Command or Bus State
7	SD_PWRON	O					VDD ON/OFF
8	SD_WP	I					Write Protection Switch in SD
9	SD_INS	I	VSS2	VSS2	INS	INS	Card Detection

Table 3.9.1 Sharing of pins for Memory Stick and SD/MMC Memory Card controller

[microSD CARD PIN-MAP]

PIN NUMBER	DESCRIPTION
T1	DAT2
T2	CD/DAT3²
T3	CMD
T4	V_{DD}
T5	CLK
T6	V_{SS}²
T7	DAT0
T8	DAT1



3.9.2 Card Detection

For SD/MMC Memory Card, detection of card insertion/removal by hardware is also supported.

Because a pull down resistor with about 470 K Ω resistance which is impractical to embed in an I/O pad is needed on the signal CD/DAT3, and it has to be capable of being connected or disconnected dynamically onto the signal CD during initialization period, an additional I/O pad is needed to switch on/off the pull down resistor on the system board. The scenario of card detection for SD/MMC Memory Card is shown in Figure 3.9.2. Before SD/MMC Memory Card is inserted or powered on, SW1 and SW2 shall be opened for card detection of the host side. Meanwhile, pull down resistor R_{CD} on system board shall attach onto the signal CD/DAT3 by the output signal RCDEN. In addition, SW3 on the card is default to be closed. Upon insertion of SD/MMC Memory Card the signal CD/DAT3 will have a transition from low to high. If SD/MMC Memory Card is removed then the signal CD/DAT3 will return to logic low. After the card identification process, pull down resistor R_{CD} on system board shall disconnect with the signal CD/DAT3 and SW3 on the card shall be opened for normal operation. Since the scheme above needs a mechanical switch such as a relay on system board, it is not ideal enough. Thus, a dedicated pin "INS" is used to perform card insertion and removal for SD/MMC. The pin "INS" will connect to the pin "VSS2" of a SD/MMC connector.

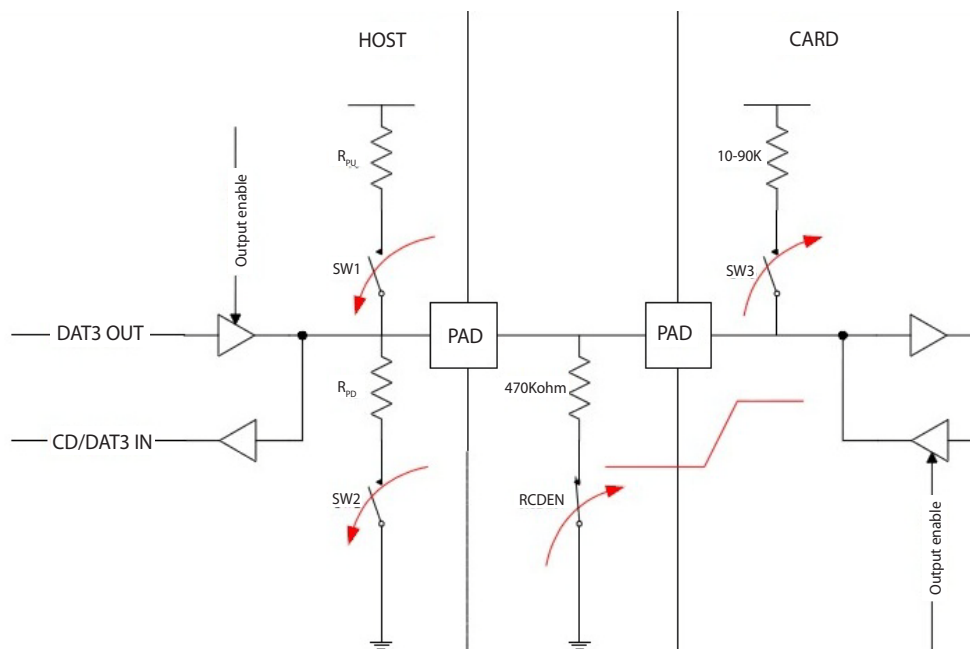


Figure 3.9.2 Card Detection for SD/MMC Memory Card

3.10 LCD Interface

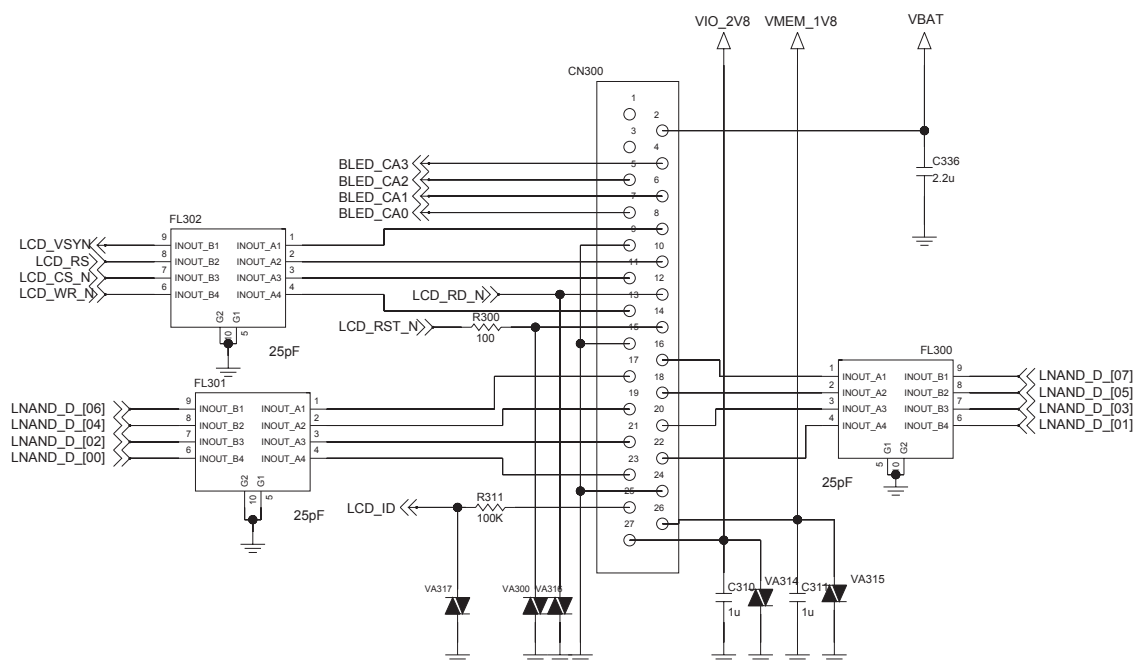


Figure 3.10.1 LCD Interface

MT6236 contains a versatile LCD controller which is optimized for multimedia applications.

This controller supports many types of LCD modules and contains a rich feature set to enhance the functionality.

These features are:

- Up to 320 x 480 resolution
- The internal frame buffer supports 8bpp indexed color, RGB 565, RGB 888, ARGB 8888, PARGB 8888 and YUYV422 format.
- Supports 8-bpp (RGB332), 12-bpp (RGB444), 16-bpp (RGB565), 18-bpp (RGB666) and 24-bpp (RGB888) LCD modules.
- 4 Layers Overlay with individual color depth, window size, vertical and horizontal offset, source key, alpha value and display rotation control(90°, 180°, 270°, mirror and mirror then 90°, 180° and 270°)
- One Color Look-Up Table
- Three Gamma Correction Tables

For parallel LCD modules, the LCD controller can reuse external memory interface or use dedicated 16/18-bit parallel interface to access them and 8080 type interface is supported. It can transfer the display data from the internal SRAM or external SRAM/Flash Memory to the off-chip LCD modules.

For serial LCD modules, this interface performs parallel to serial conversion and both 8- and 9- bit serial interface is supported. The 8-bit serial interface uses four pins – LSCE#, LSDA, LSCk and LSA0 – to enter commands and data.

Meanwhile, the 9-bit serial interface uses three pins – LSCE#, LSDA and LSCK – for the same purpose. Data read is not available with the serial interface and data entered must be 8 bit.

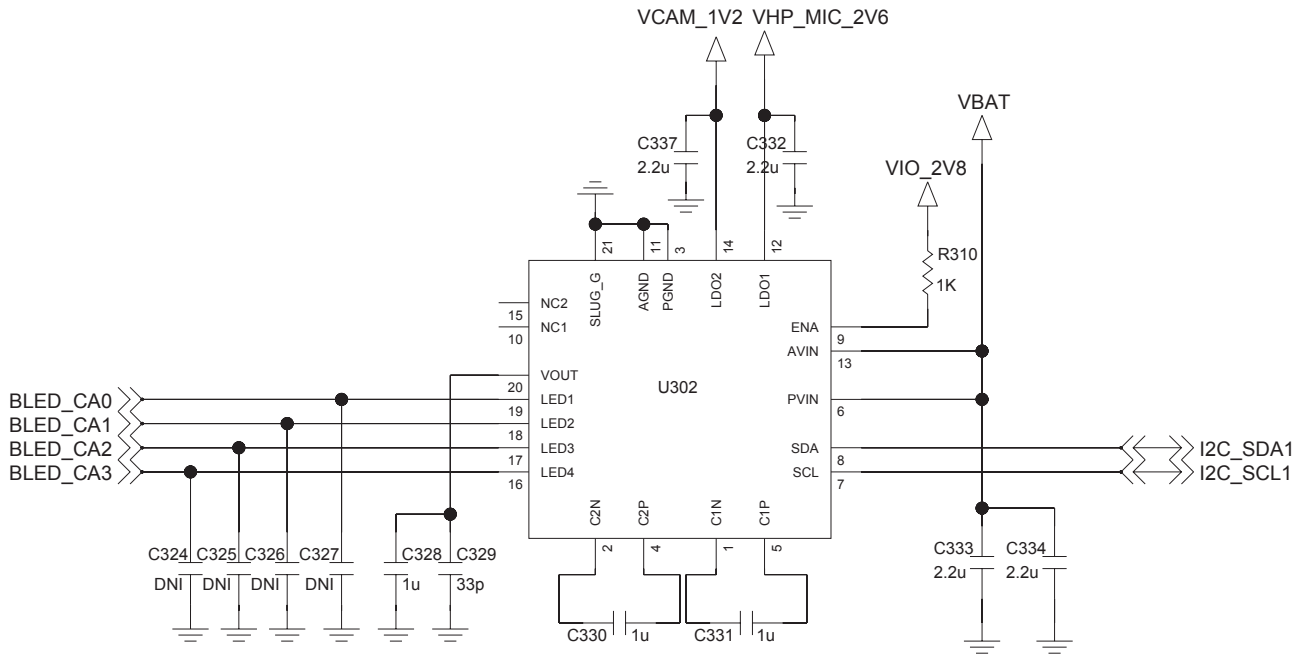


Figure 3.10.2 Charge Pump CIRCUIT DIAGRAM

The RT9396 is a power management IC (PMIC) for backlighting and phone camera applications. The PMIC contains a 6-Channel charge pump white LED driver and four low dropout linear regulators.

The charge pump drives up to 6 white LEDs with regulated constant current for uniform intensity. Each channel (LED1 to LED6) supports up to 25mA of current. These 6-Channels can be also programmed as 4 plus 2-Channels or 5 plus 1-Channels with different current setting for auxiliary LED application. The RT9396 maintains highest efficiency by utilizing a x1/ x1.5/ x2 fractional charge pump and low dropout current regulators. An internal 6-bit DAC is used for backlight brightness control. Users can easily configure up to 64-steps of LED current via the I2C interface control.

The RT9396 also comprises low noise, low dropout regulators, which provide up to 200mA of current for each of the four channels. The four LDOs deliver 3% output accuracy and low dropout voltage of 200mV @ 200mA. Users can easily configure LDO output voltage via the I2C interface control. The LDOs also provide current limiting and over-temperature functions. The RT9396 is available in a WQFN-24L 3x3 package.

3.11 Battery Charger Interface

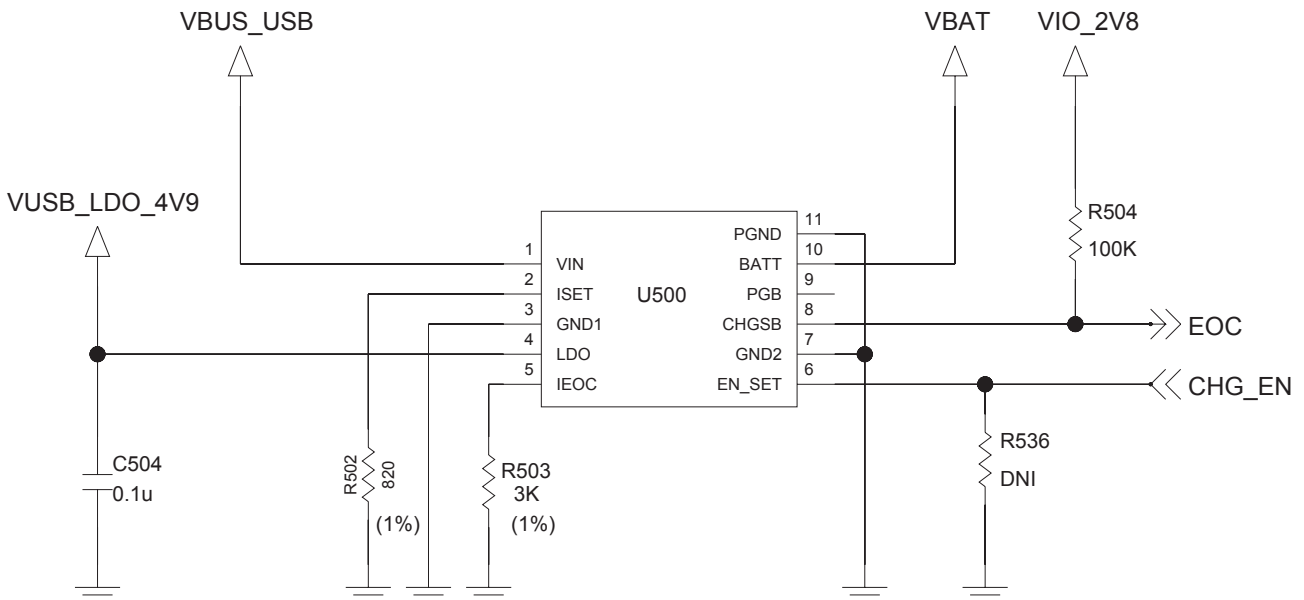


Figure 3.11.1 BATTERY CHARGER BLOCK

The RT9524 is a fully integrated single-cell Li-Ion battery charger IC ideal for portable applications. The RT9524 optimizes the charging task by using a control algorithm including pre-charge mode, fast charge mode and constant voltage mode. The input voltage range of the VIN pin can be as high as 30V. When the input voltage exceeds the OVP threshold, it will turn off the charging MOSFET to avoid overheating of the chip.

In RT9524, the maximum charging current can be programmed with an external resistor. For the USB application, user can set the current to 100mA/500mA through EN/SET pin. For the factory mode, the RT9524 can allow 4.2V/2.3A power pass through to support system operation. It also provides a 50mA LDO to support the power of peripheral circuit. The internal thermal feedback circuit regulates the die temperature to optimize the charge rate for all ambient temperatures. The RT9524 provides protection functions such as under voltage protection, over voltage protection for VIN supply and thermal protection for battery temperature.

The RT9524 is available in a WDFN-10L 2x3 package to achieve optimized solution for PCB space and thermal considerations.

3.12 Keypad Interface

KEY MATRIX

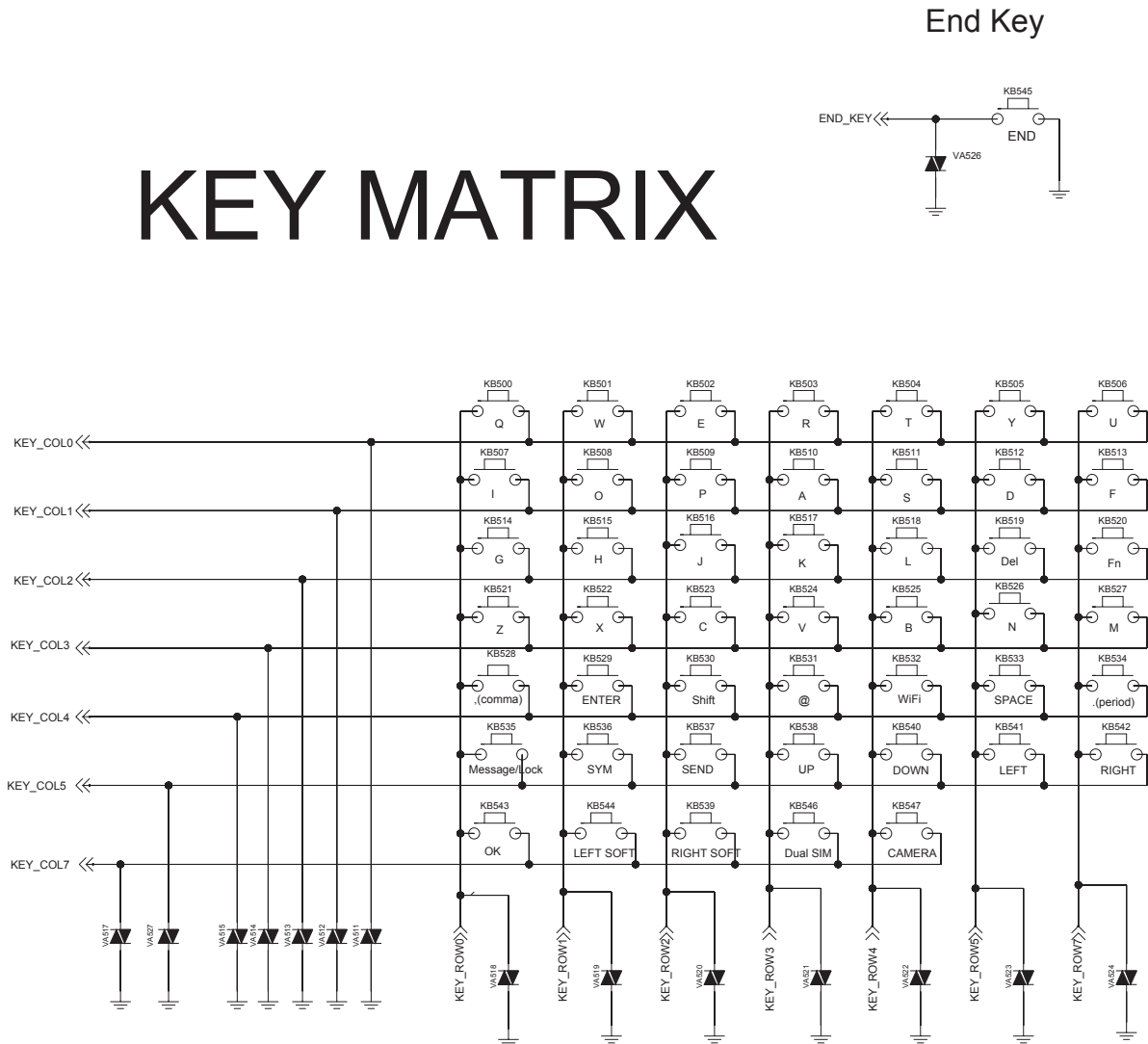


Figure 3.12.1 MAIN KEY STRUCTURE

The keypad can be divided into two parts: one is the keypad interface including 8 columns and 8 rows with one dedicated power-key, as shown in Figure 3.12.2; the other is the key detection block which provides key pressed, key released and de-bounce mechanisms. Each time the key is pressed or released, i.e. something different in the 8 x 8 matrix or power-key, the key detection block senses the change and recognizes if a key has been pressed or released. Whenever the key status changes and is stable, a KEYPAD IRQ is issued. The MCU can then read the key(s) pressed directly in KP_MEM1, KP_MEM2, KP_MEM3, KP_MEM4 and KP_MEM5 registers. To ensure that the key pressed information is not missed, the status register in keypad is not read-cleared by APB read command. The status register can only be changed by the key-pressed detection FSM.

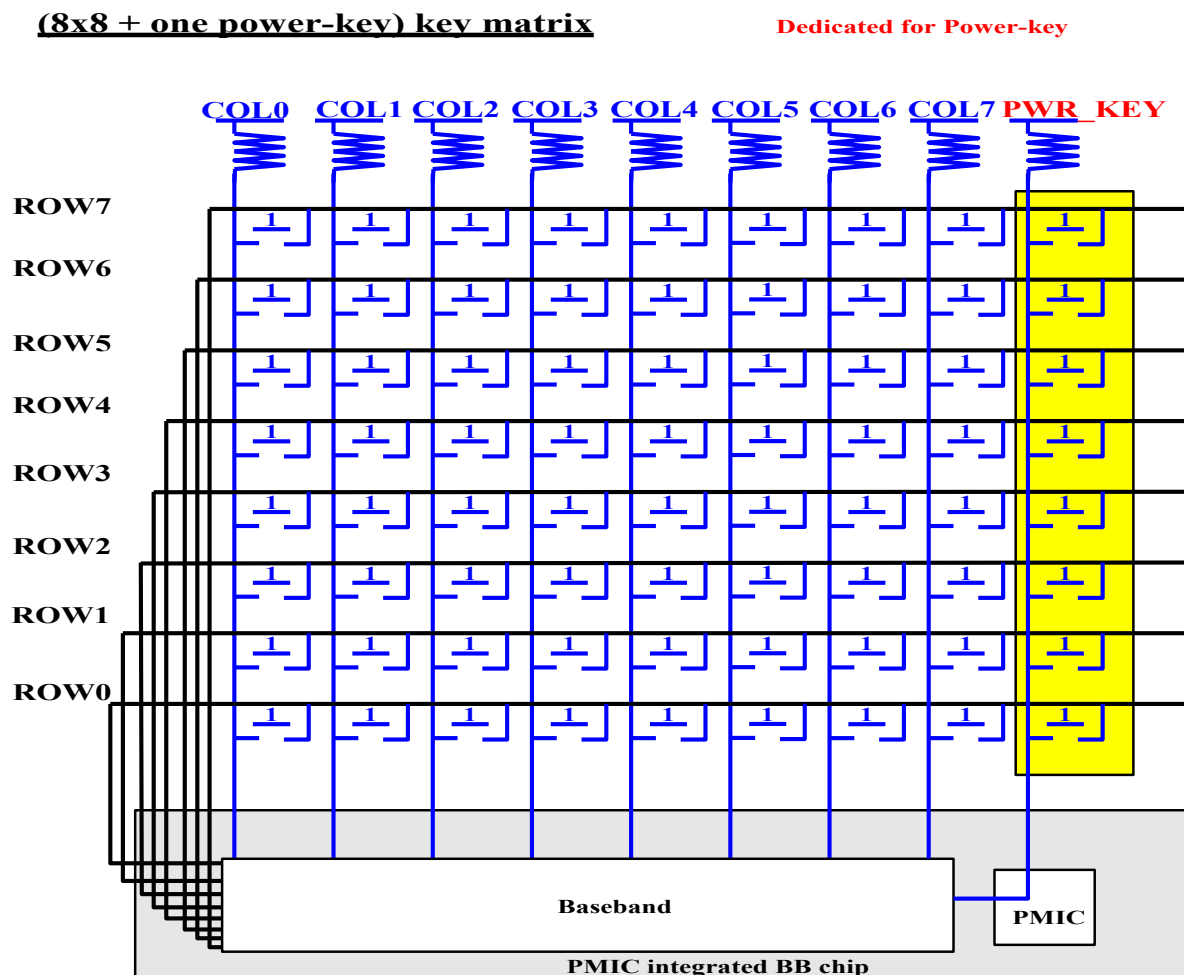


Figure 3.12.2 8x8 matrix with one power-key

This keypad can detect one or two key-pressed simultaneously with any combination. Figure 3.12.3 shows one key pressed condition. Figure 3.12.4(a) and Figure 3.12.4(b) illustrate two keys pressed cases. Since the key press detection depends on the HIGH or LOW level of the external keypad interface, if keys are pressed at the same time and there exists a key that is on the same column and the same row with the other keys, the pressed key cannot be correctly decoded. For example, if there are three key presses: key1 = (x1, y1), key2 = (x2, y2), and key3 = (x1, y2), then both key3 and key4 = (x2, y1) are detected, and therefore they cannot be distinguished correctly. Hence, the keypad can detect only one or two keys pressed simultaneously at any combination. More than two keys pressed simultaneously in a specific pattern retrieve the wrong information.

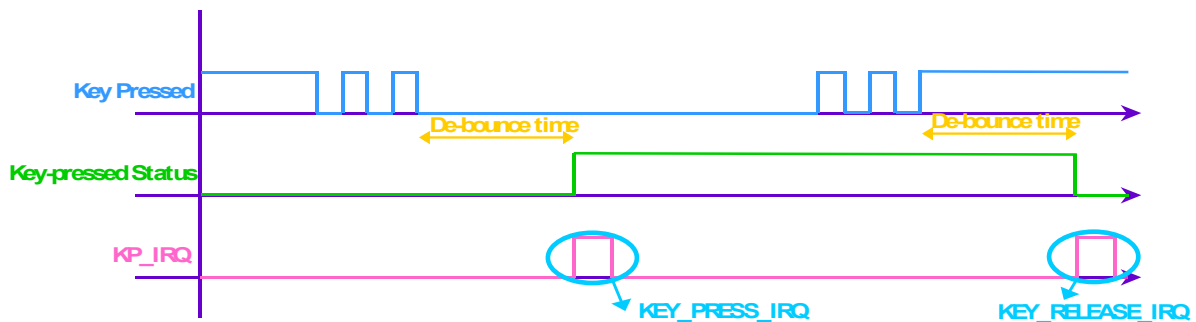


Figure 3.12.3 One key pressed with de-bounce mechanism denoted

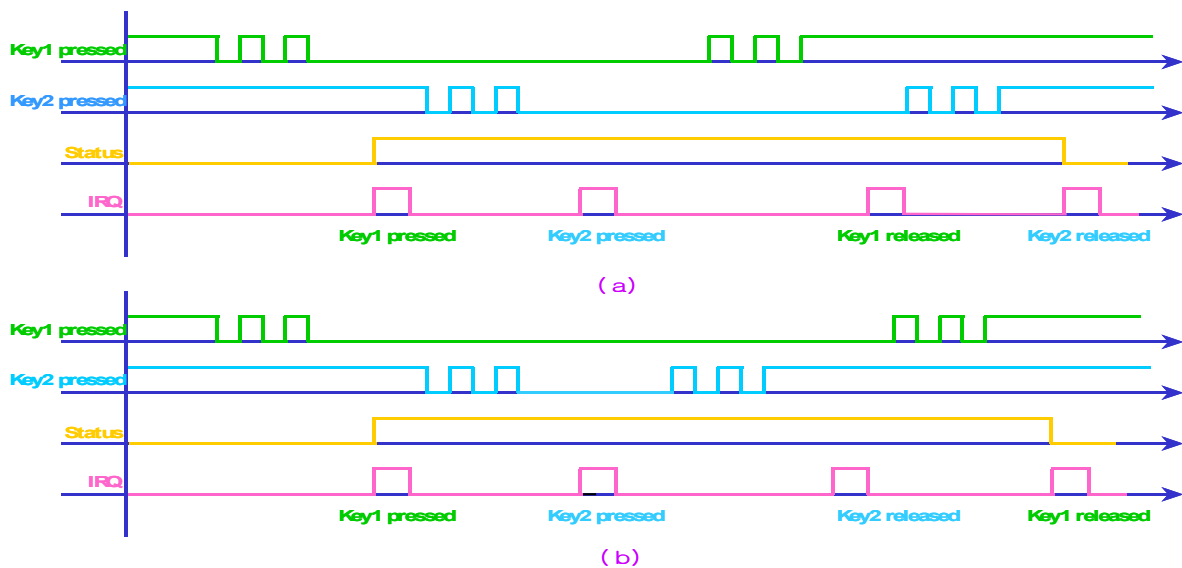


Figure 3.12.4 Two keys pressed, case 1 (b) Two keys pressed, case 2

3.13 Audio Front-End

3.13.1 General Description

The audio front-end essentially consists of voice and audio data paths. Figure 3.13.1 shows the block diagram of the audio front-end. All voice band data paths comply with the GSM 03.50 specification. Mono hands-free audio or external FM radio playback paths are also provided. The audio stereo path facilitates CD-quality playback, external FM radio, and voice playback through a headset.

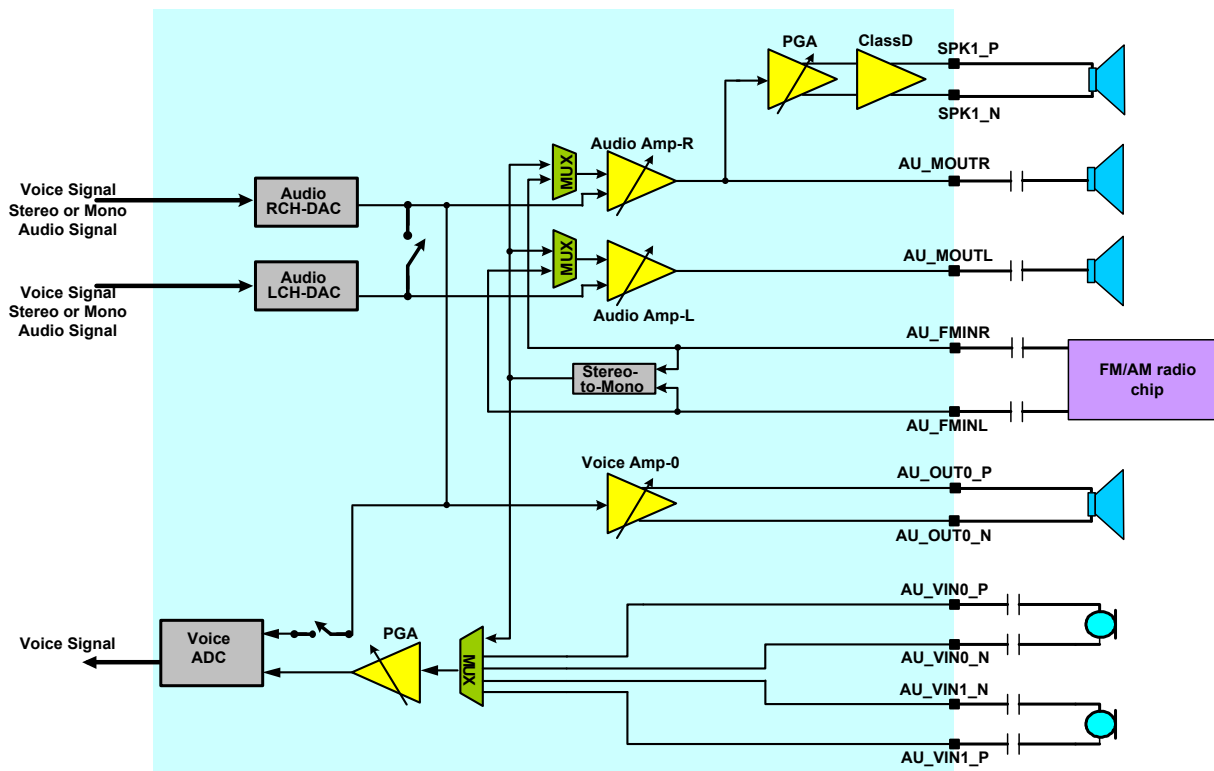


Figure 3.13.1 Block diagram of audio front end

Figure 3.13.2 shows the digital circuits block diagram of the audio front-end. The APB register block is an APB peripheral that stores settings from the MCU. The DSP audio port (DAP) block interfaces with the DSP for control and data communications. The digital filter block performs filter operations for voice band and audio band signal processing. The Digital Audio Interface (DAI) block communicates with the System Simulator for FTA or external Bluetooth modules.

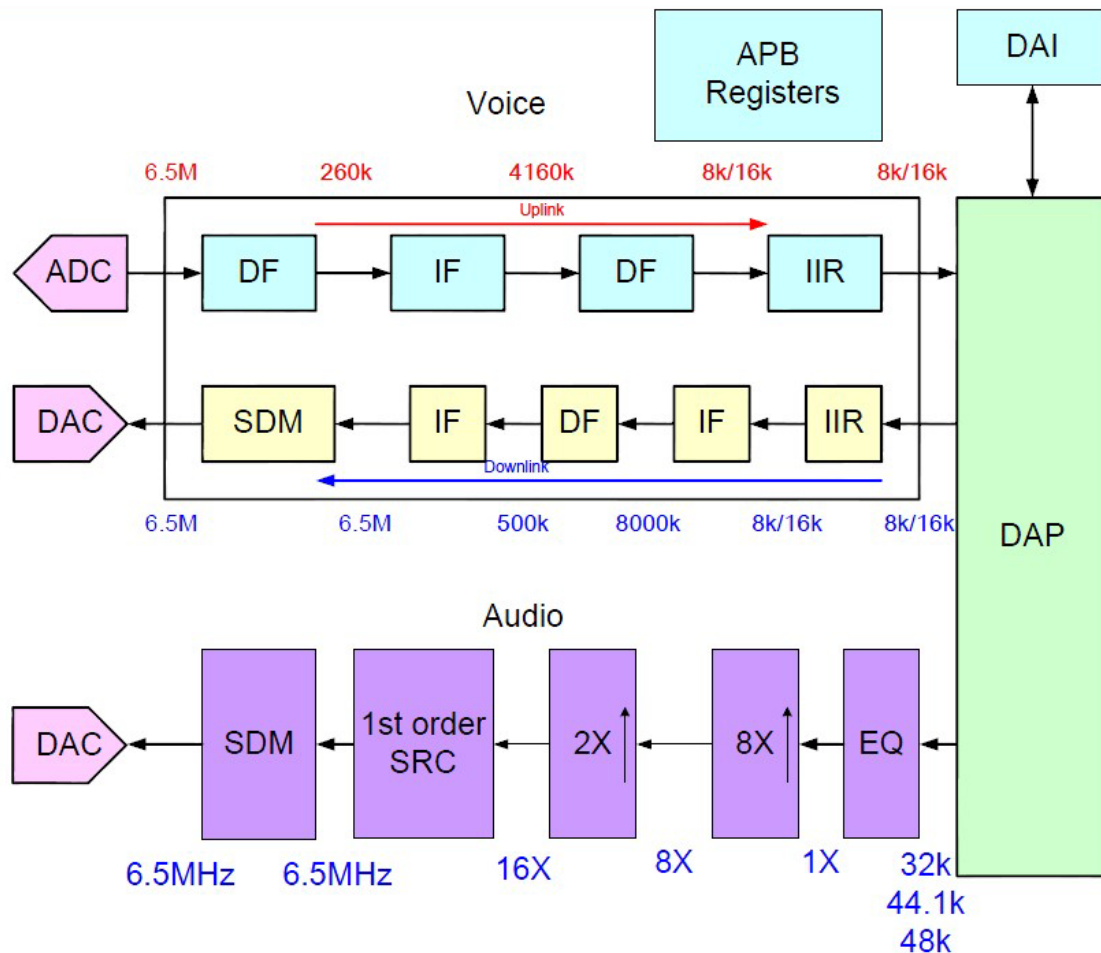


Figure 3.13.2 Block diagram of digital circuit of audio front end

To communicate with the external Bluetooth module, the master-mode PCM interface and master-mode I2S/EIAJ interface are supported. The clock of PCM interface is 256 kHz while the frame sync is 8 kHz. Both long sync and short sync interfaces are supported. The PCM interface can transmit 16-bit stereo or 32-bit mono 8 kHz sampling rate voice signal. Figure 3.13.3 shows the timing diagram of the PCM interface. Note that the serial data changes when the clock is rising and is latched when the clock is falling.

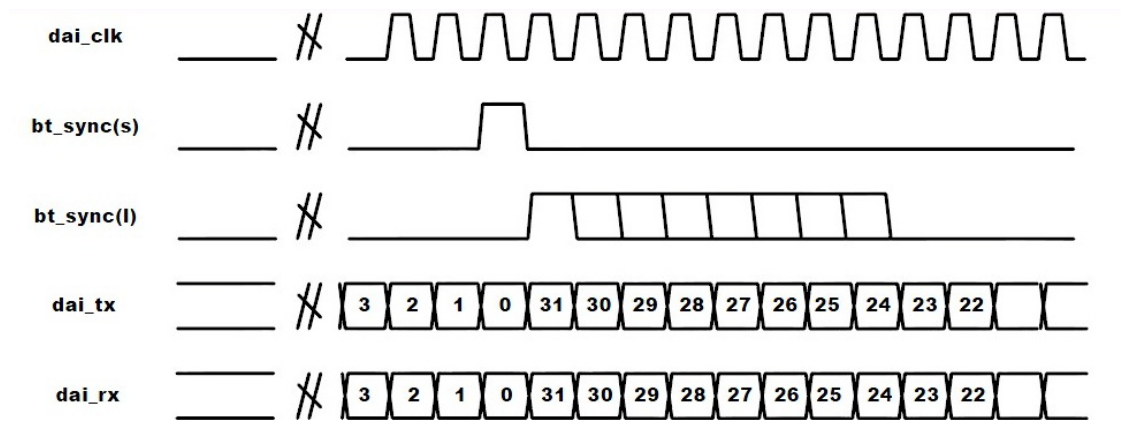


Figure 3.13.3 Timing diagram of Bluetooth application

I2S/EIAJ interface is designed to transmit high quality audio data. Figure 3.13.4 and Figure 3.13.5 illustrate the timing diagram of the two types of interfaces. I2S/EIAJ can support 32 kHz, 44.1 kHz, and 48 kHz sampling rate audio signals. The clock frequency of I2S/EIAJ can be $32 \times (\text{sampling frequency})$, or $64 \times (\text{sampling frequency})$. For example, to transmit a 44.1 kHz CD-quality music, the clock frequency should be $32 \times 44.1 \text{ kHz} = 1.4112 \text{ MHz}$ or $64 \times 44.1 \text{ kHz} = 2.8224 \text{ MHz}$.

I2S/EIAJ interface is not only used for Bluetooth module, but also for external DAC components. Audio data can easily be sent to the external DAC through the I2S/EIAJ interface. In this document, the I2S/EIAJ interface is referred to as EDI (External DAC Interface).

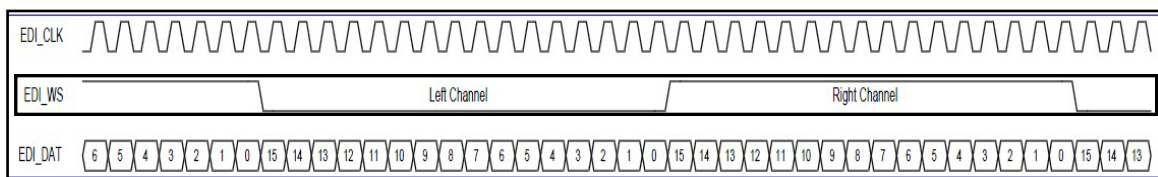


Figure 3.13.4 Block diagram of digital circuit of audio front end

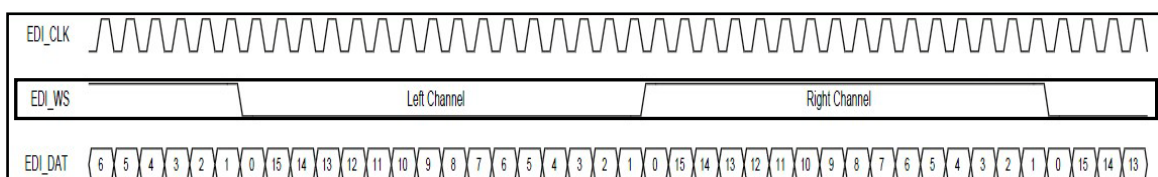


Figure 3.13.5 Block diagram of digital circuit of audio front end

3.14 Camera Interface

3M_CAM

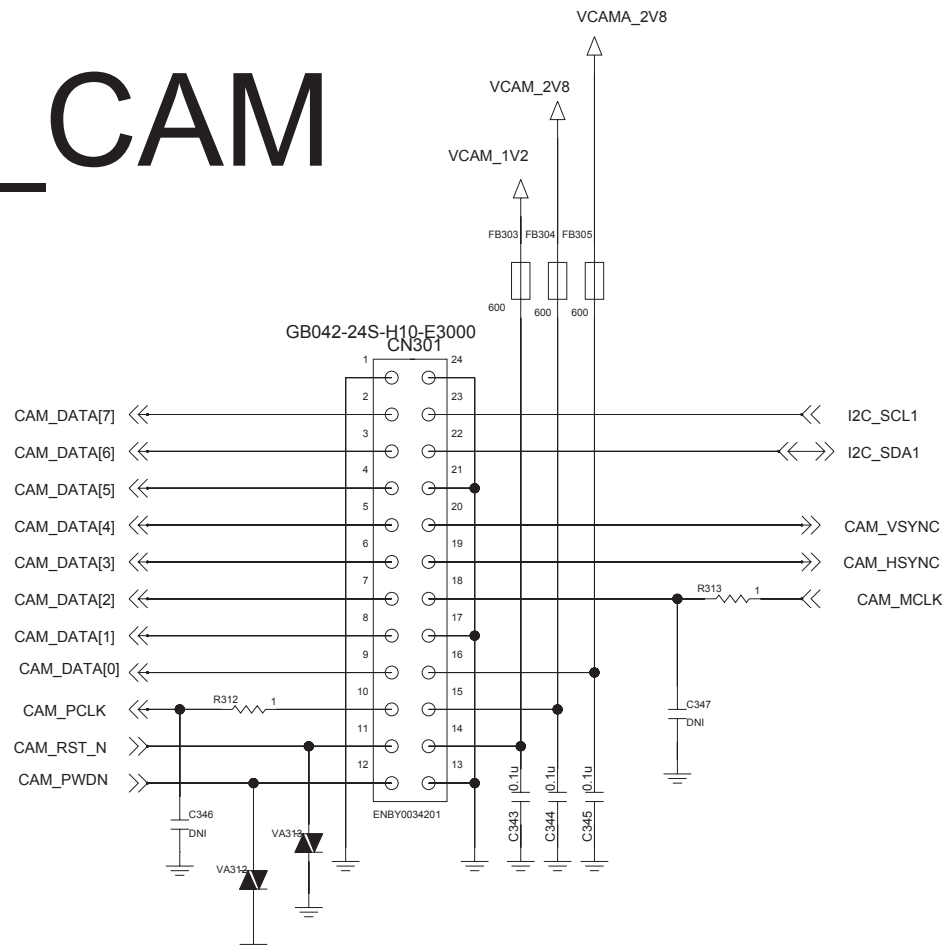


Figure 3.14.1 Camera Interface

YACE5B1S99CC is a high quality 3mega-pixel single chip CMOS image sensor(CIS) for mobile phone camera applications and digital still camera products.

YACE5B1S99C Consists of 2080x1568 effective pixels that meet with th 1/5 inch optical format, on-chip 10-bit ADC, an image signal processor(ISP) and JPEG. Unique sensor technology enhances image quality by reducing FPN (Fixed Pattern Noise), horizontal/vertical line noise, and random noise. The YACE5B1S99CC is MIPI CSI2-compliant. The ISP performs sophisticated image processing function including color correction and enhance, lens shading correction, edge enhancement, rgb gamma correction, flicker detect and correction, noise reduction, auto focus(AF), auto white balance(AWB), auto exposure(AE), and image free scaling, color noise correction and support several image effect

3.14.1 FEATURES

- Pixel Size: 1.4um X 1.4um
- Effective Pixel Array Size : 2.912mm(H) x 2.1952mm(V) x 3.6467mm(D)
- Effective resolution: 2048(H) x 1536(V), QXGA
- Optical Format: 1/5 inch
- Frame Rate: 30fps@HD/30fps@XGA
- Power Supply: 2.8V for analog, 1.8~2.8V for I/O, and 1.2V for digital core
- Power Consumption: 270mW @ QXGA
- Operation Temperature: -
- 10bit ADC and PLL On-Chip
- Master Clock: 48MHz(Max)
- Output Format: YUV4:2:2(ITU-R.601), RGB565, JPEG, 8bit ITU-R.656-Like,
- Embedded MCU for AE/AWB/AF
- Support MIPI CSI2 – Single lane data transmission
- Color Correction
- Noise reduction (Y-NR/C-NR/B-NR)
- Lens Shading Correction
- Contrast & Brightness, Color Saturation & Hue
- Edge Enhancement
- Continuous pseudo zoom
- Programmable Gamma correction
- Image Effect : Mono, Sepia, Solarization, Negative, Sketch, Embossing
- Black Level Calibration
- Automatic adjustment for various light conditions
- Anti-Flicker (50Hz/60Hz) : Auto Cancellation and Manual mode flicker adjustment
- Auto Exposure (AE) / Auto White Balance (AWB) / Auto Focus (AF)
- JPEG on-the-fly compression with embedded JPEG file size control (BRC)
- JPEG image rotation support that need to macro rearrangement at host
- Embedded SpeedTag for Fast JPEG management by Scalado SpeedView
- Standard frame fake mode. Status lines embedded in frame footer
- Support Analog Binning 2x2 and 1/2, 1/4 Sub- Sample mode
- Host Interface : two-wire serial bus interface
- On-Chip OTP memory to support Chip ID and DPC and LSC and correction module variation

3.15 KEY BACKLIGHT LED Interface

Two built-in open-drain output switches drive the FLASH and Keypad LED in the handset. Each switch is controlled by baseband with enable registers. The switch of keypad LED can sink 150mA. The switch of FLASH can sink 300mA. And both the open-drain output switches are high impedance when disabled.

Current Sink (ISINK)

Five built-in current sinks output drive the backlight LED in the handset. Each current sink is controlled by baseband with enable registers and provide six options for output current selection (4mA, 8mA, 12mA, 16mA, 20mA, 24mA) The current sink output are high impedance when disabled.

Backlight Driver (BL)

The backlight (BL) driver control is responsible for controlling the external boost DC/DC converter, which is required to drive up to 6 white LEDS (2 legs, 3 in series or 1 leg, 6 in series). BLDRV connects to the gate of the external MOSFET; CS_BL senses the current flow through the MOSFET, and FB_BL feeds the voltage drop on ballast resistor back to the PMIC for LED light intensity control. DC_OV helps prevent the over-voltage of the output.

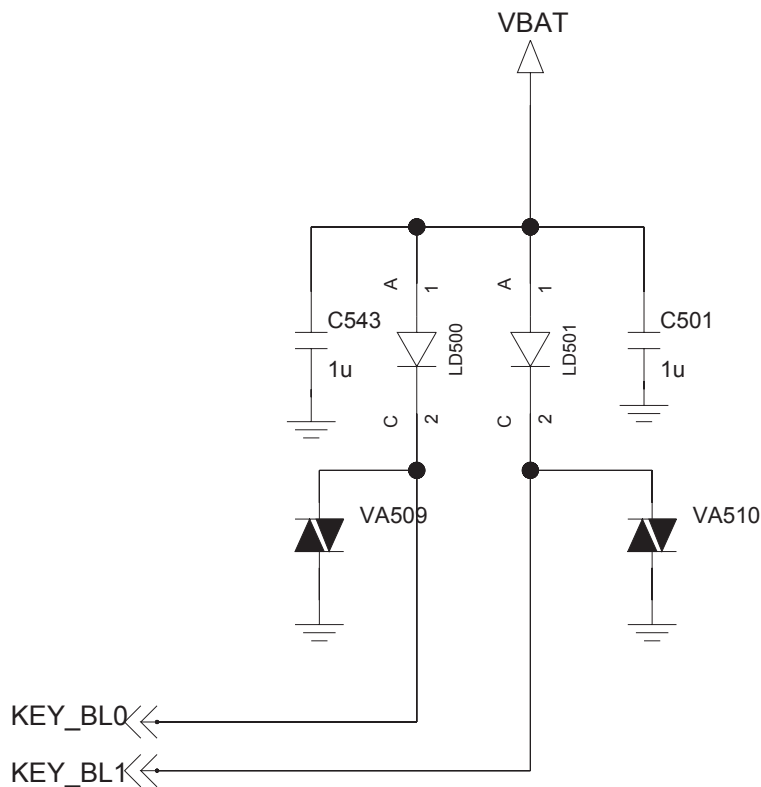


Figure 3.16.1 Key Backlight Block

3.16 Vibrator Interface

Vibrator is driven by MT6236.

VBAT is connected with + terminal of vibrator and –terminal is connected with VB_N. It is controlled by VIBRATOR signal of MT6253 with 8 step function.

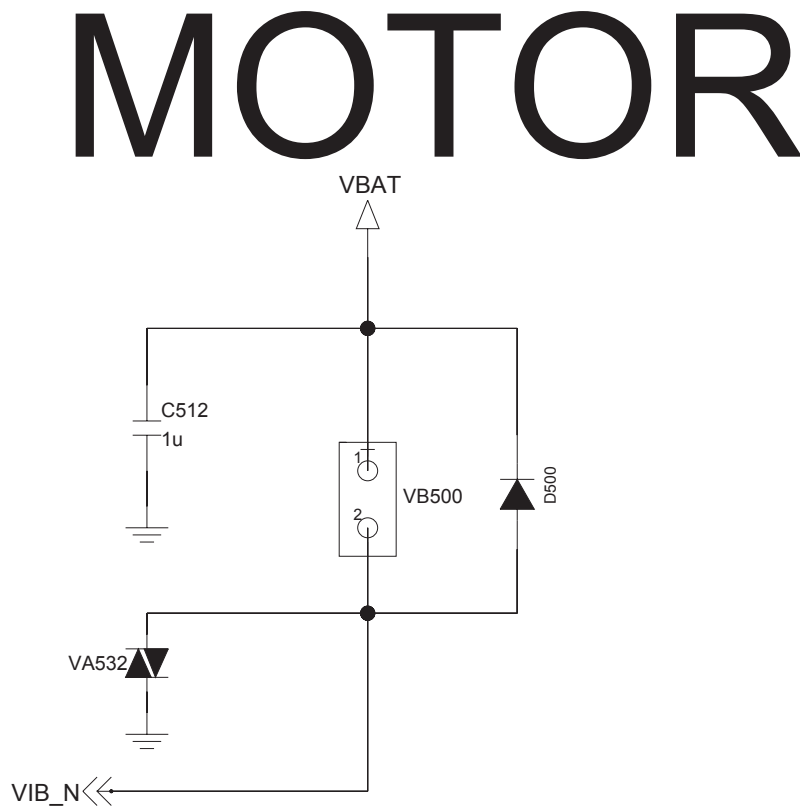


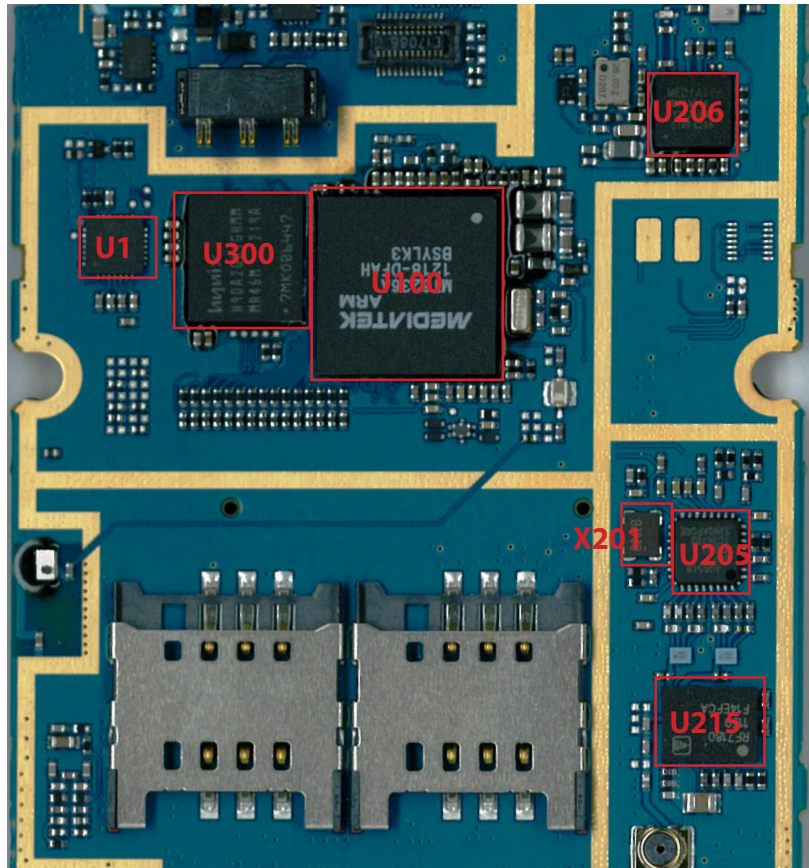
Figure 3.17.1 Vibrator Driver Block

Vibrator Driver					
Output voltage (PIN:VIBR)	0x801B_08B0[6:4]=000	1.2	1.3	1.4	V
	0x801B_08B0[6:4]=001	1.4	1.5	1.6	V
	0x801B_08B0[6:4]=010	1.7	1.8	1.9	V
	0x801B_08B0[6:4]=011	2.375	2.5	2.625	V
	0x801B_08B0[6:4]=100	2.66	2.8	2.94	V
	0x801B_08B0[6:4]=101	2.85	3.0	3.15	V
	0x801B_08B0[6:4]=110	3.135	3.3	3.465	V
Output current (Ivibr_max)			200		mA

Figure 3.16.1 Key Backlight Block

4. TROUBLE SHOOTING

4.1 RF Component



U100	Main Chip (MT6236)
U215	TX Module (RF7180)
U206	WIFI (MT5931)
U205	GSM Transceiver (AD6548)
U300	Memory(2G/1G DDR) H9DA2GH1GHMMMR-46M
X201	Crystal, 26MHz Clock

4.2 RX Trouble

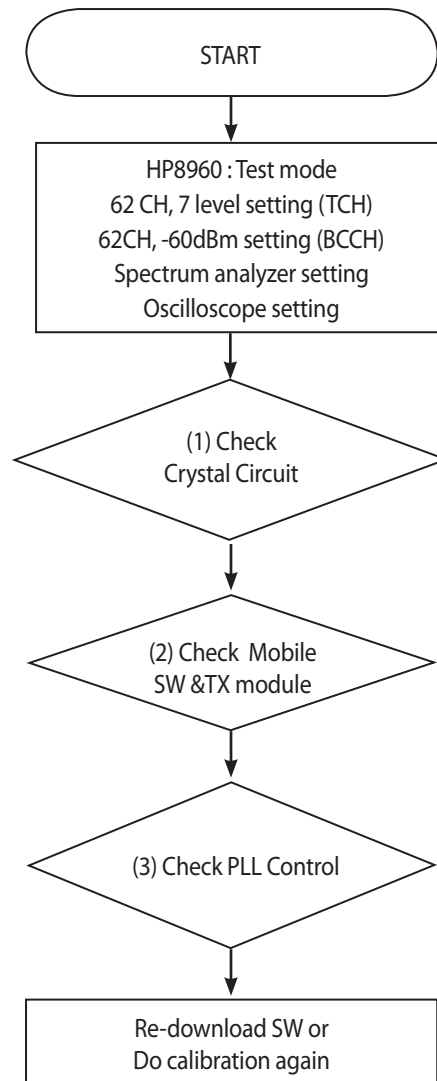


Figure 4.2.1 Rx CHECKING FLOW

(1) Checking Crystal Circuit

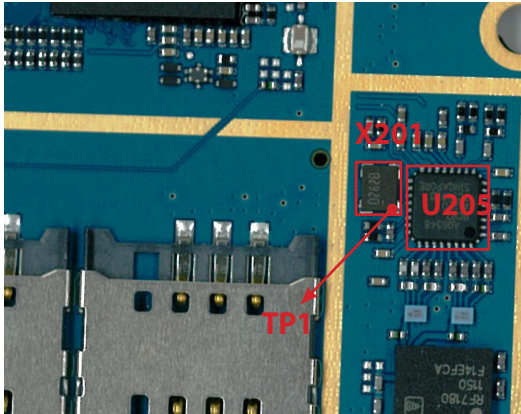


Figure 4.2.2 CLOCK PLACEMENT

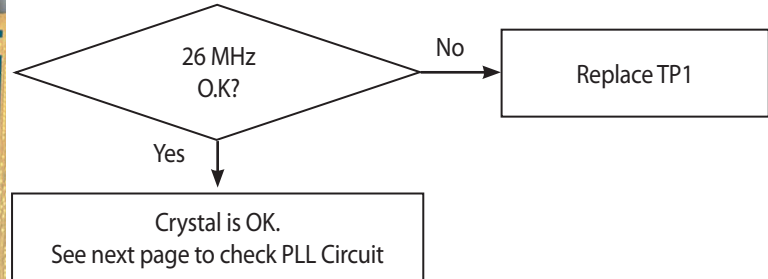


Figure 4.2.3 CHECKING DIAGRAM(CLOCK)

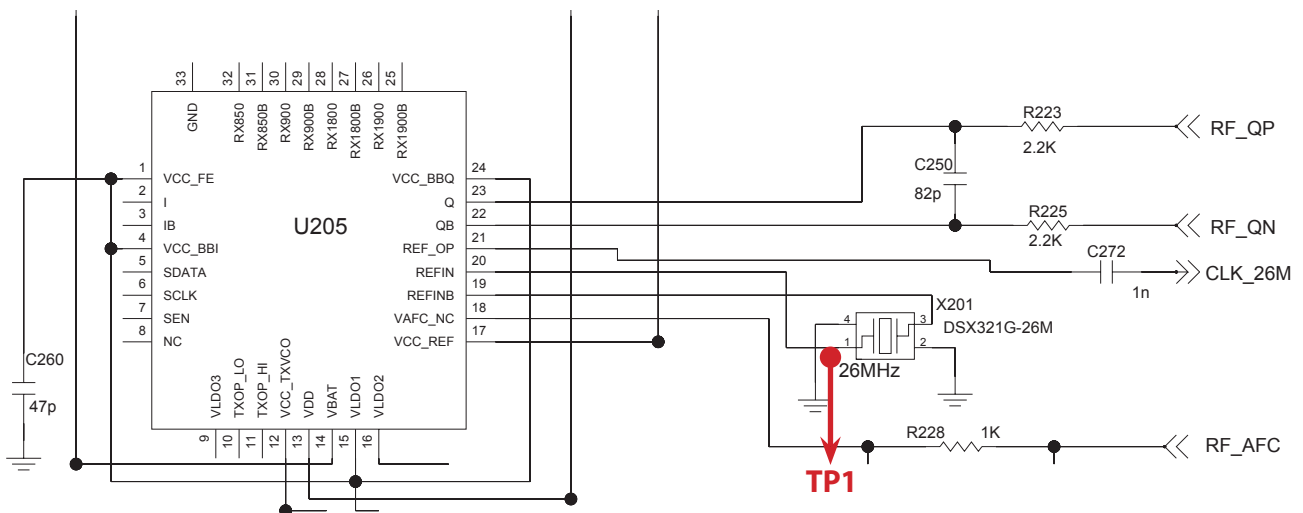


Figure 4.2.4 CIRCUIT DIAGRAM

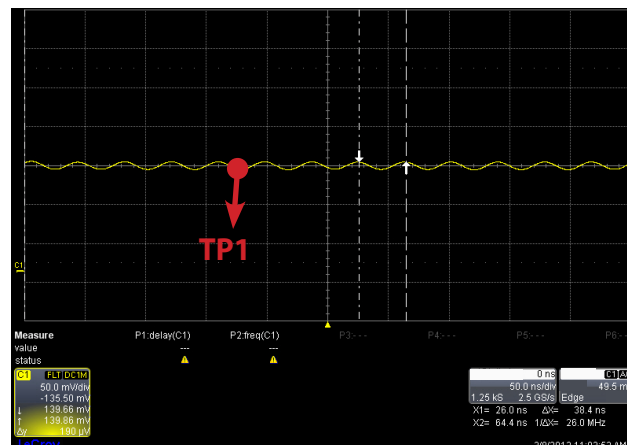


Figure 4.2.5 26M CLOCK

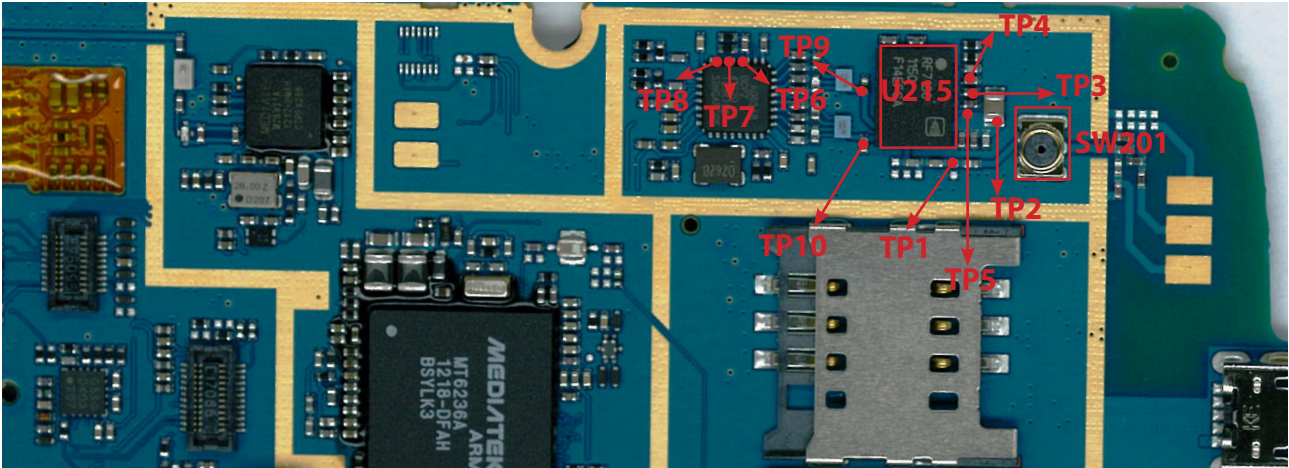


Figure 4.2.6 RF COMPONENT PLACEMENTS

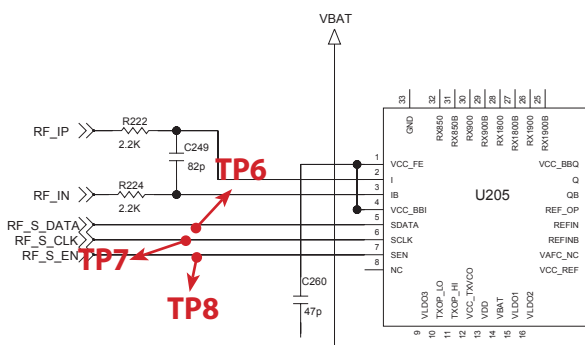


Figure 4.2.7 transceiver circuit diagram

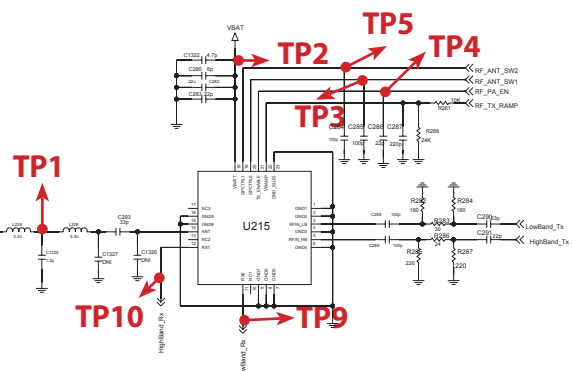


Figure 4.2.8 Tx module circuit diagram

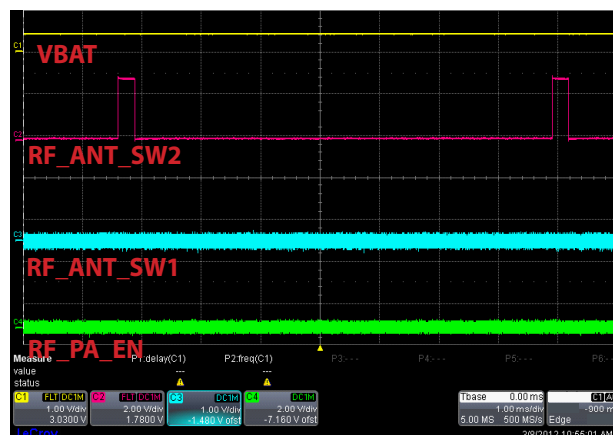


Figure 4.2.9 Tx Control signal(EGSM)

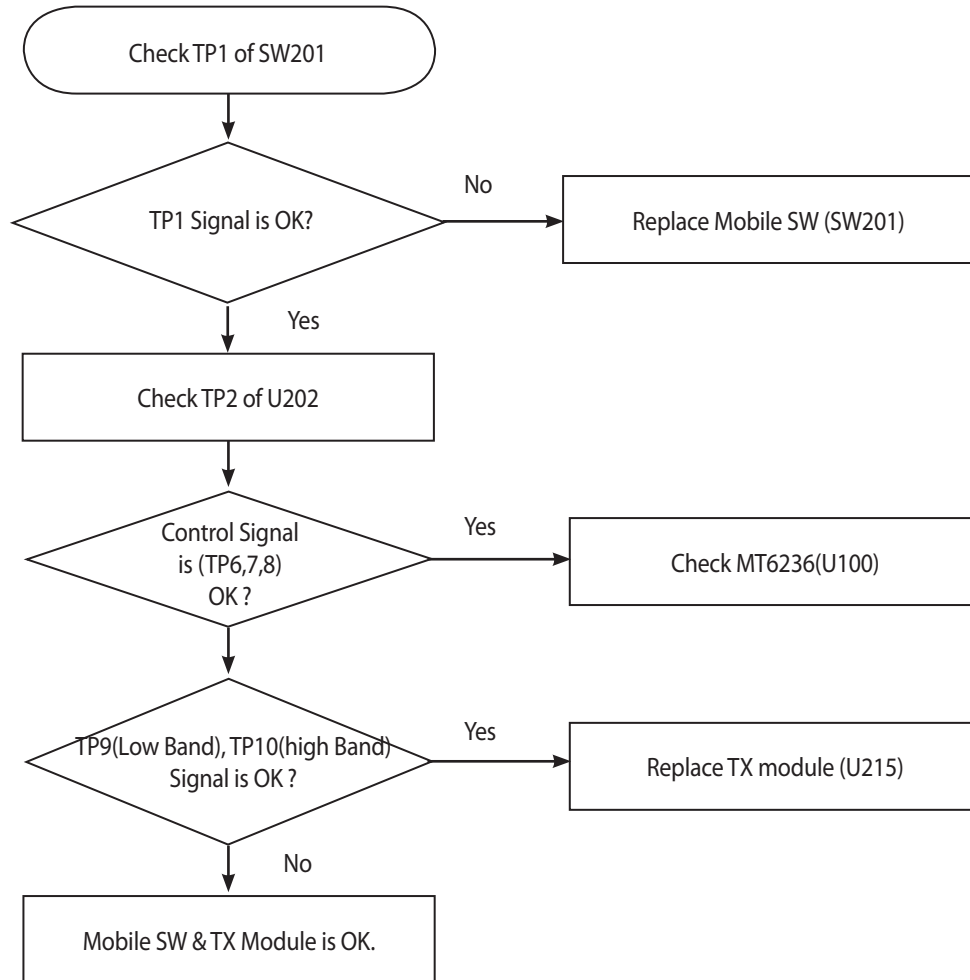


Figure 4.2.10 Rx CHECKING FLOW_1

TX Module Mode	Tx ENABLE	GpCtrl1	GpCtrl0
Off	0	0	0
RX 0	0	1	0
RX 1	0	1	1
GSM850/900 TX Mode	1	1	0
DCS1800/PCS1900 TX Mode	1	1	1

4.3 TX Trouble

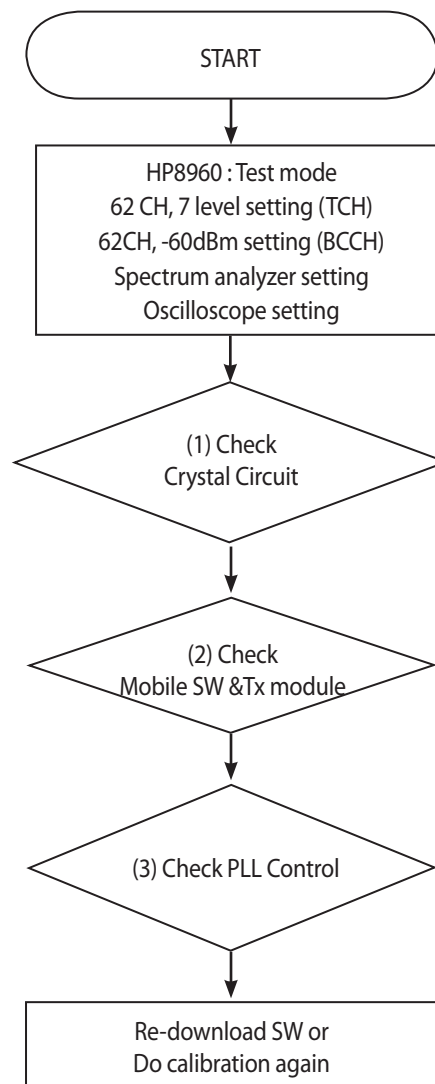


Figure 4.3.1 Tx CHECKING FLOW

(1) Checking Crystal Circuit

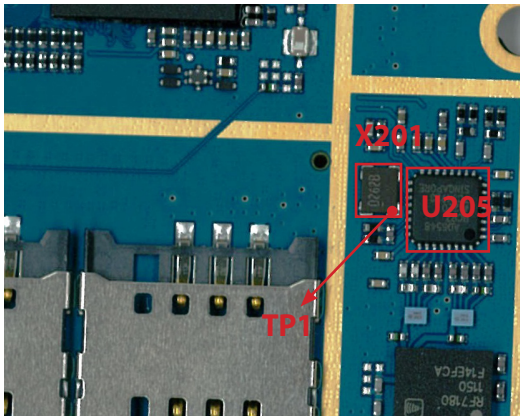


Figure 4.2.2 CLOCK PLACEMENT

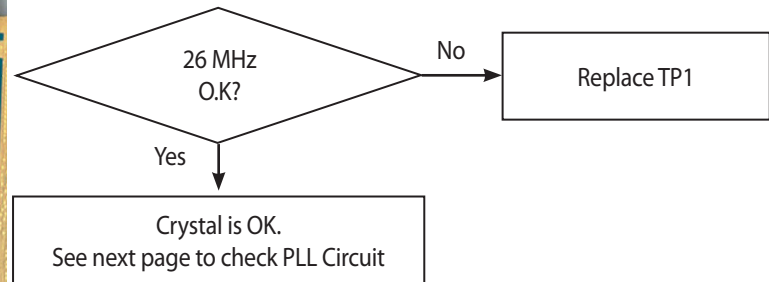


Figure 4.2.3 CHECKING DIAGRAM(CLOCK)

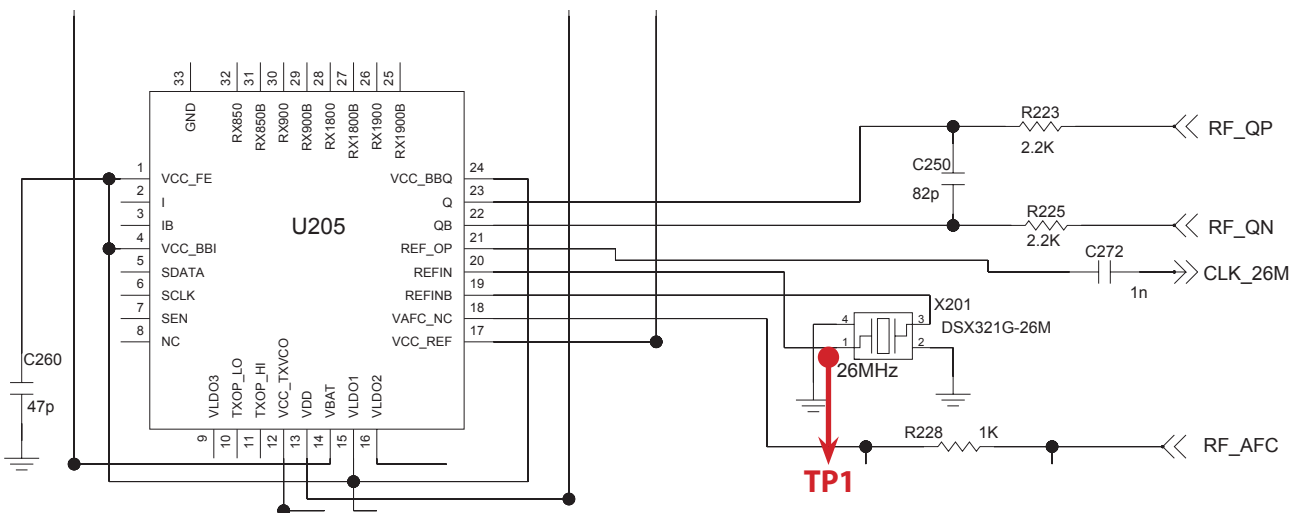


Figure 4.3.4 CIRCUIT DIAGRAM

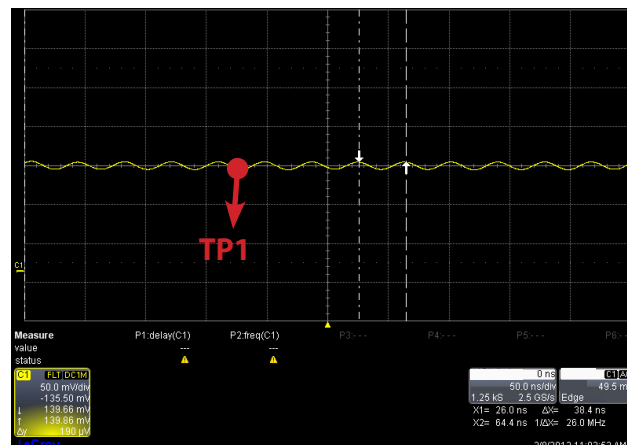


Figure 4.3.5 26M CLOCK

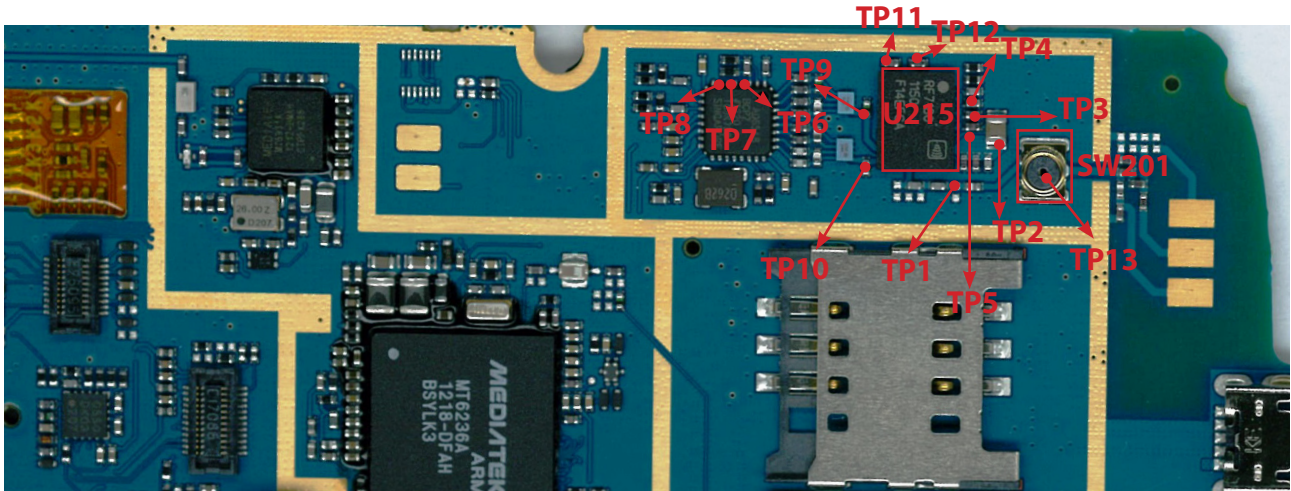


Figure 4.3.6 RF COMPONENT PLACEMENTS

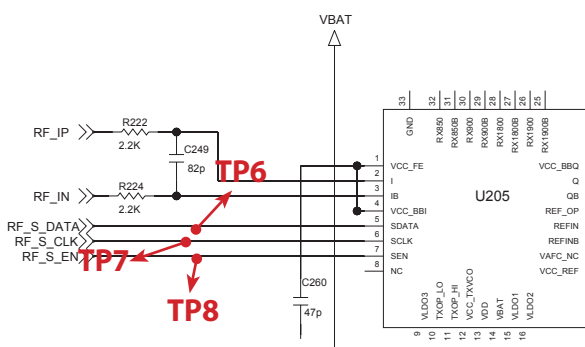


Figure 4.3.7 circuit diagram tranceiver

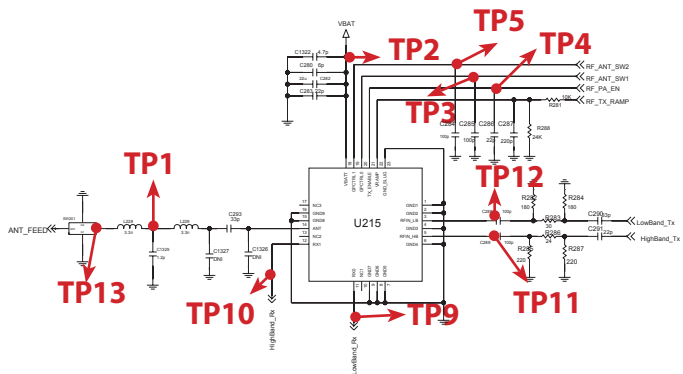


Figure 4.3.8 circuit diagram Tx module

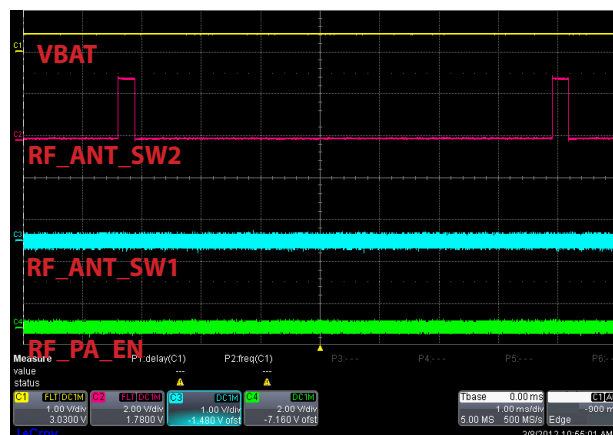


Figure 4.3.9 Tx control signal(EGSM)

4. TROUBLE SHOOTING

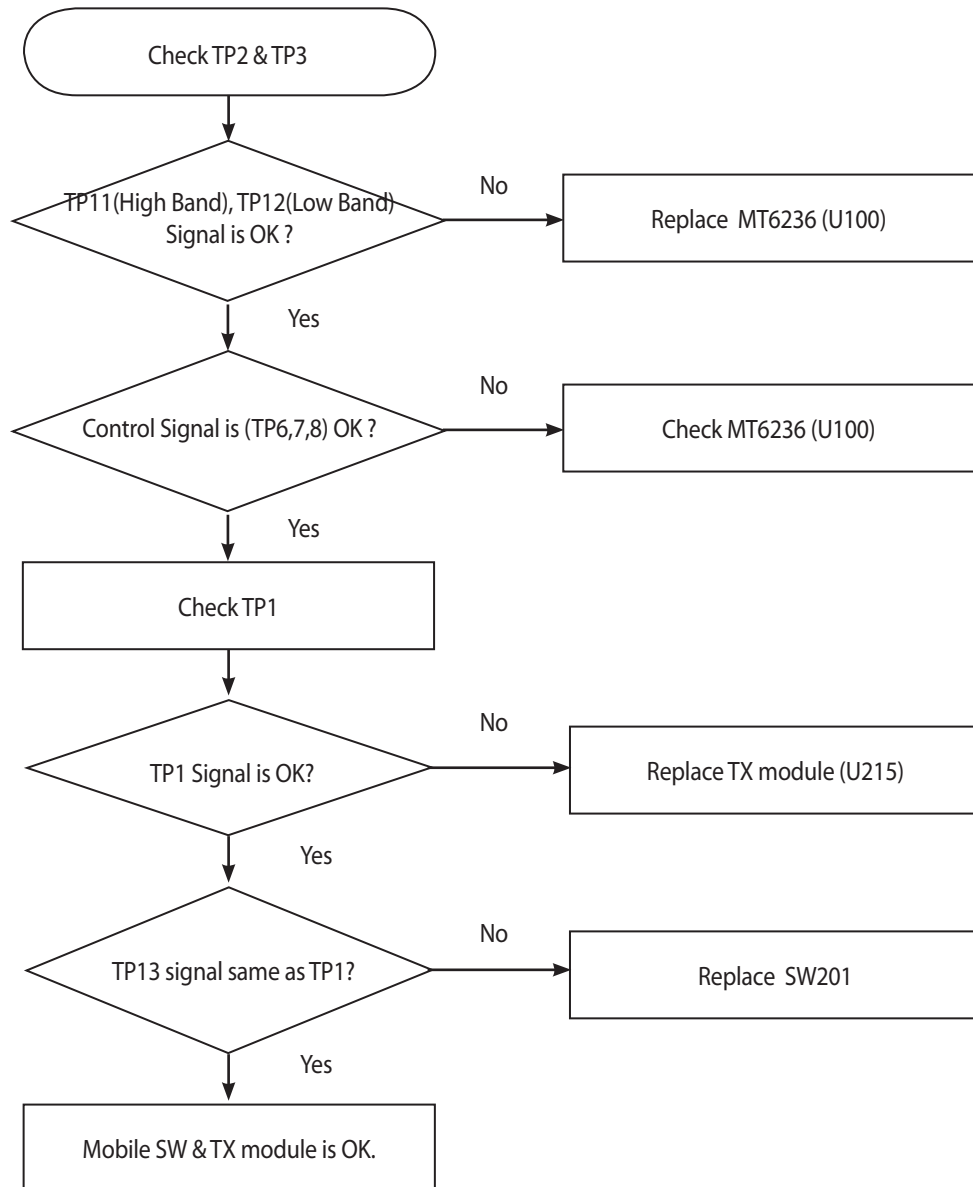


Figure 4.3.10 Tx CHECKING FLOW_1

TX Module Mode	Tx ENABLE	GpCtrl1	GpCtrl0
Off	0	0	0
RX 0	0	1	0
RX 1	0	1	1
GSM850/900 TX Mode	1	1	0
DCS1800/PCS1900 TX Mode	1	1	1

4.4 Power On Trouble

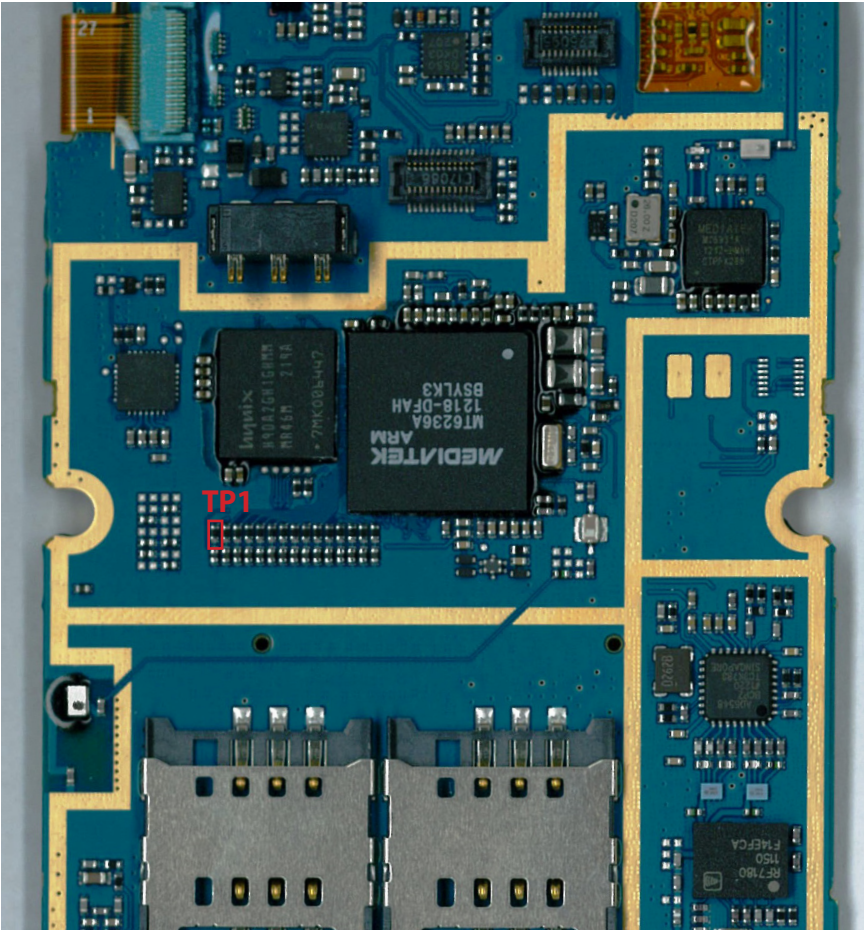


Figure 4.4.1 Power ON Test Point

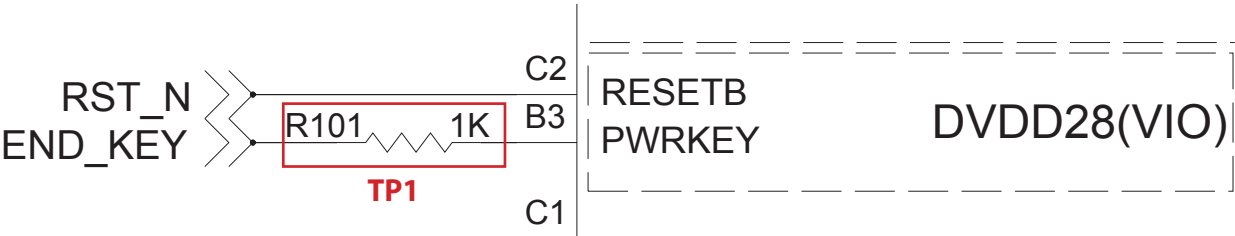
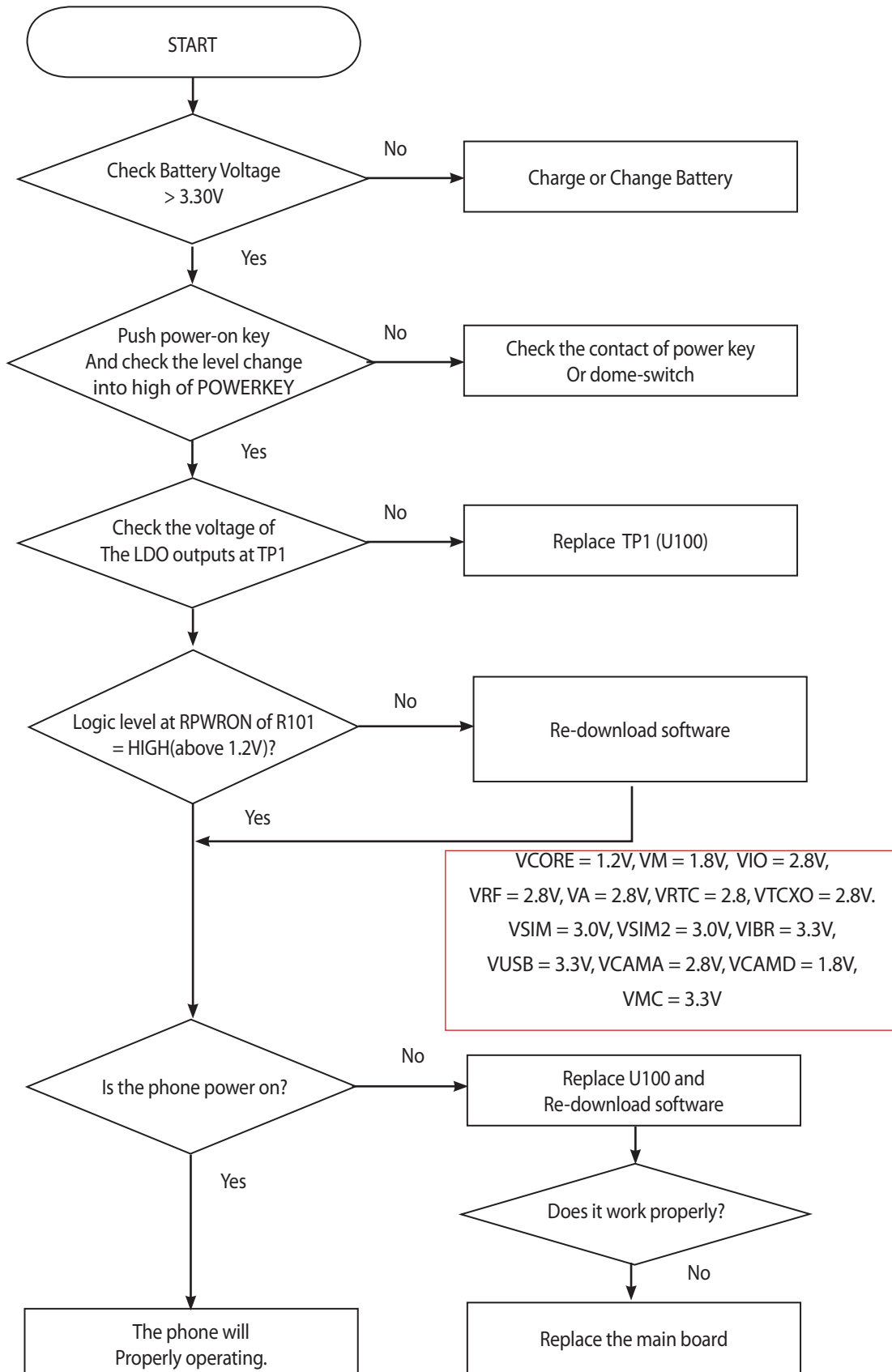


Figure 4.4.2





4.5 Charging Trouble

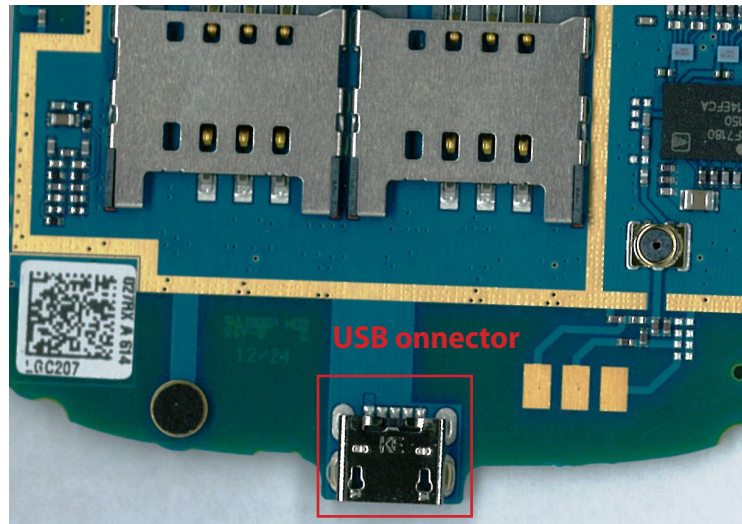


Figure 4.5.1 USB Connector

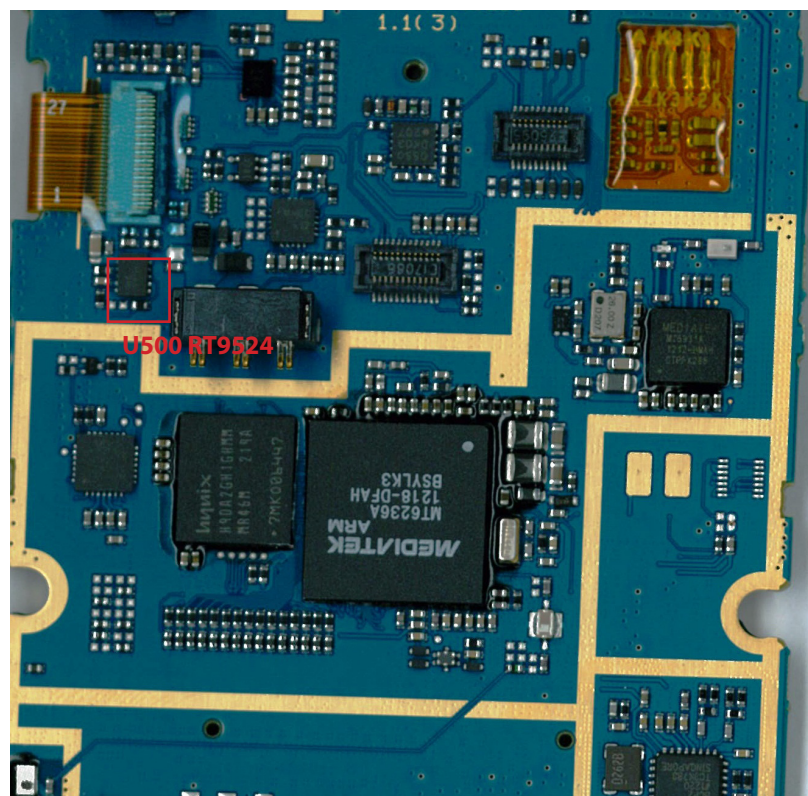


Figure 4.5.2 U500 RT9524

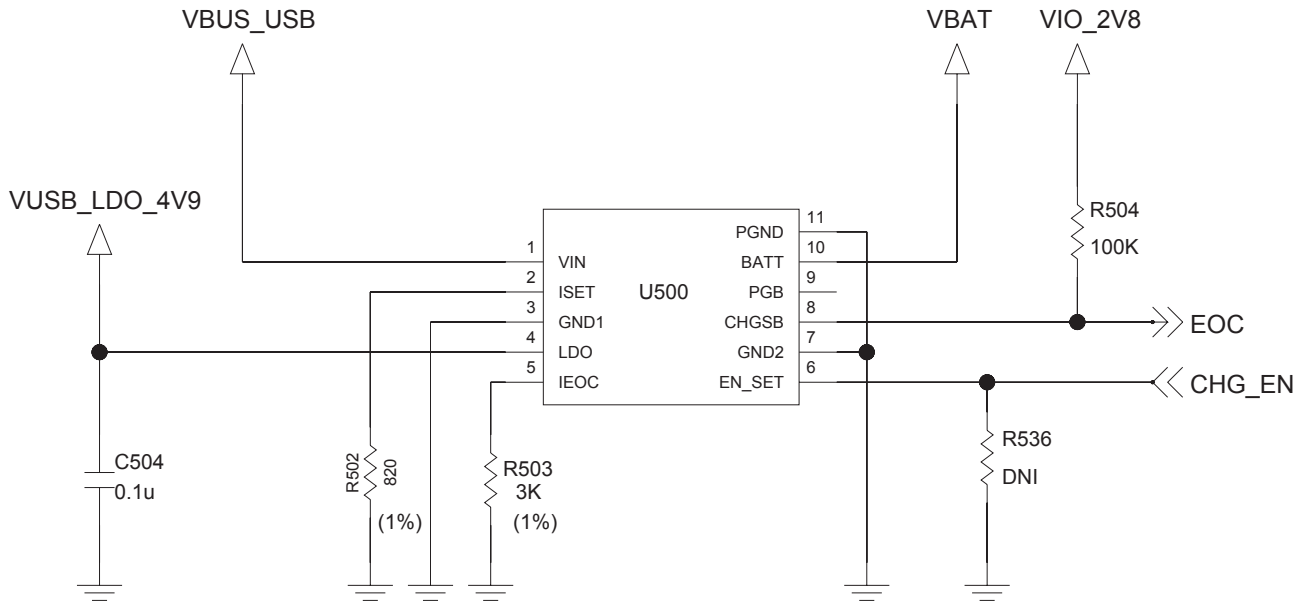


Figure 4.5.3 circuit diagram single charging IC

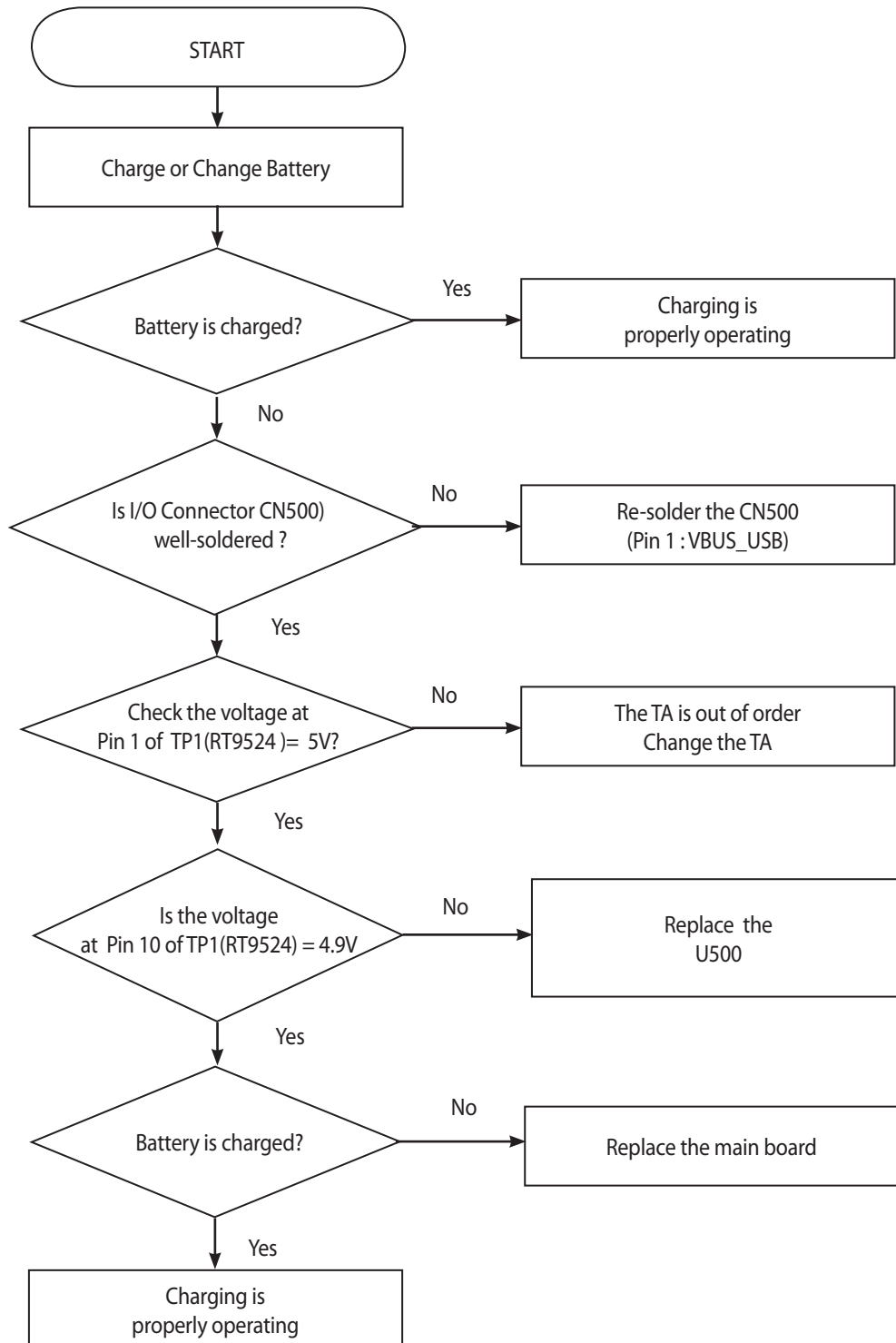


Figure 4.5.4 Checking flow

4.6 Vibrator Trouble

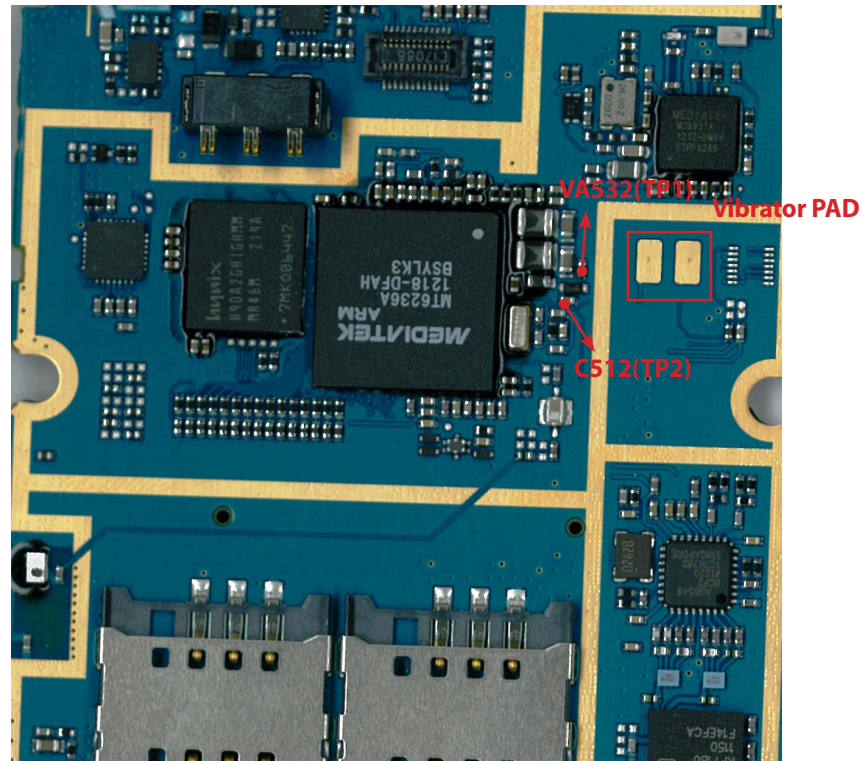


Figure 4.6.1 Vibrator Pad

MOTOR

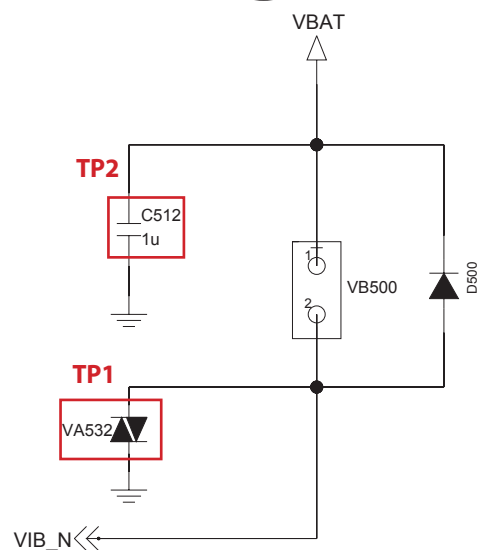


Figure 4.6.2 Vibrator Circuit Diagram

SETTING : Enter the engineering mode, and set vibrator on at vibration of BB test menu

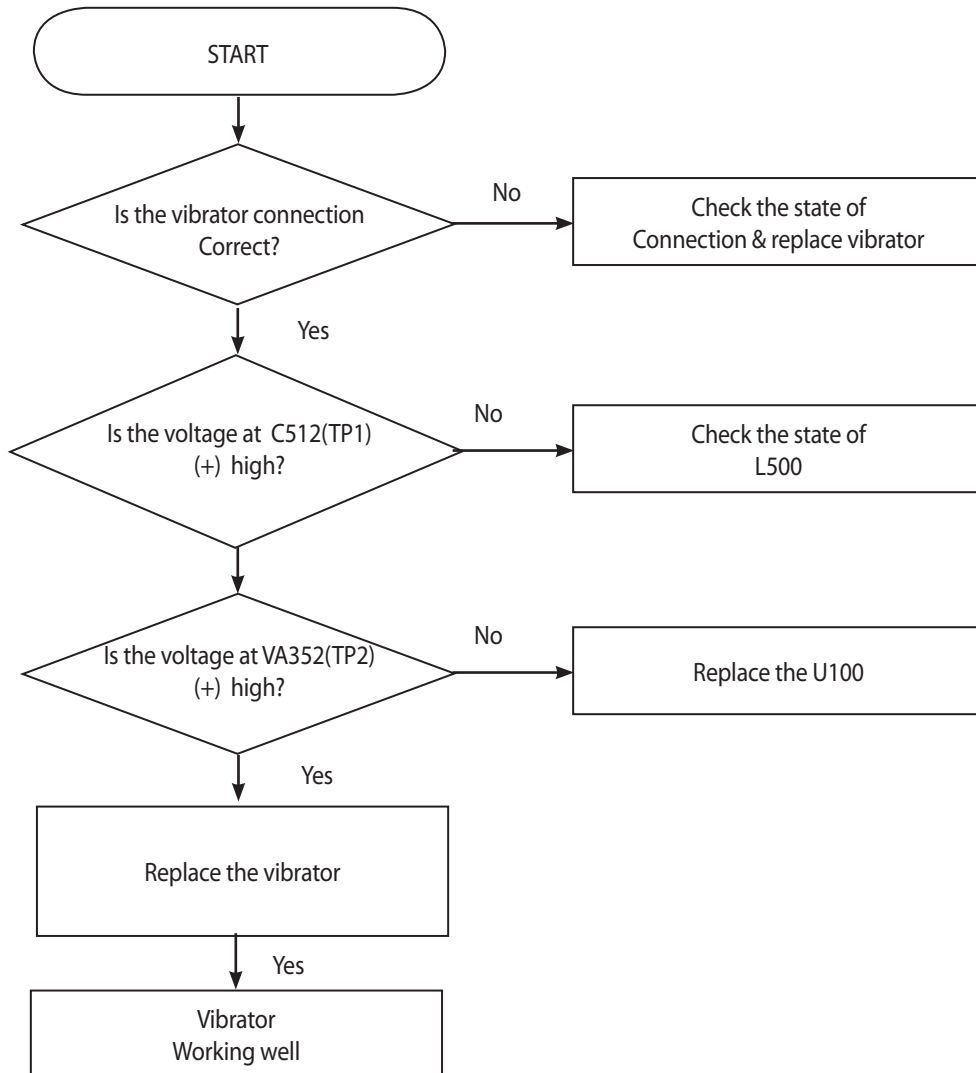


Figure 4.6.3 Checking flow

4.7 LCD Trouble

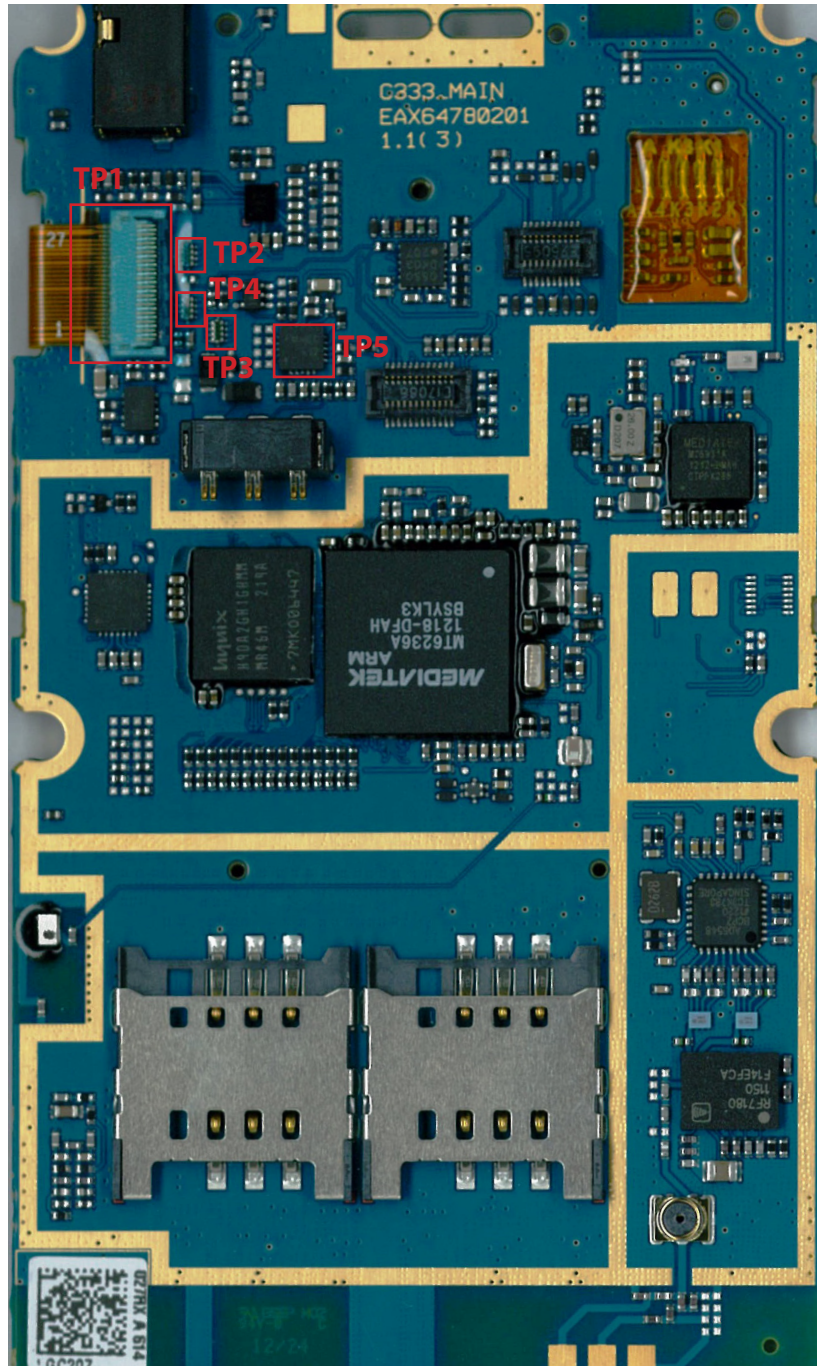


Figure 4.7.1 LCD

4. TROUBLE SHOOTING

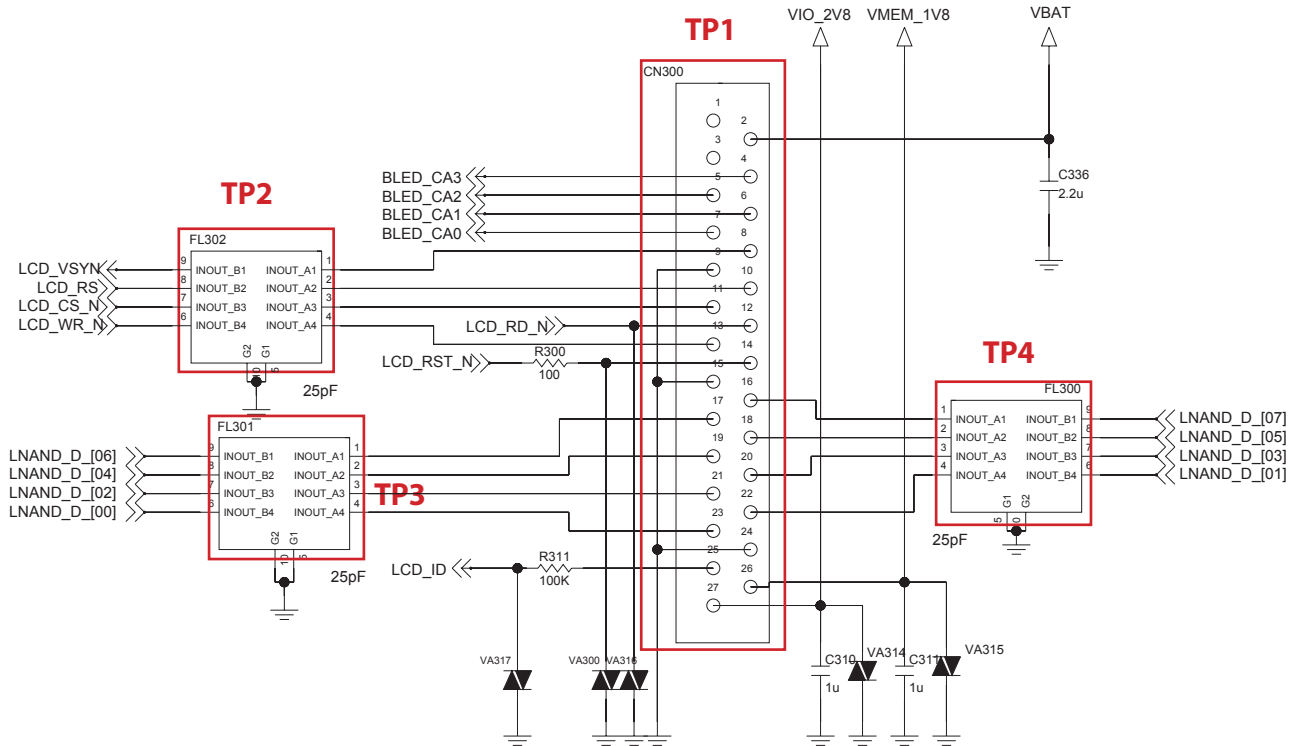


Figure 4.7.2 LCD Interface Circuit

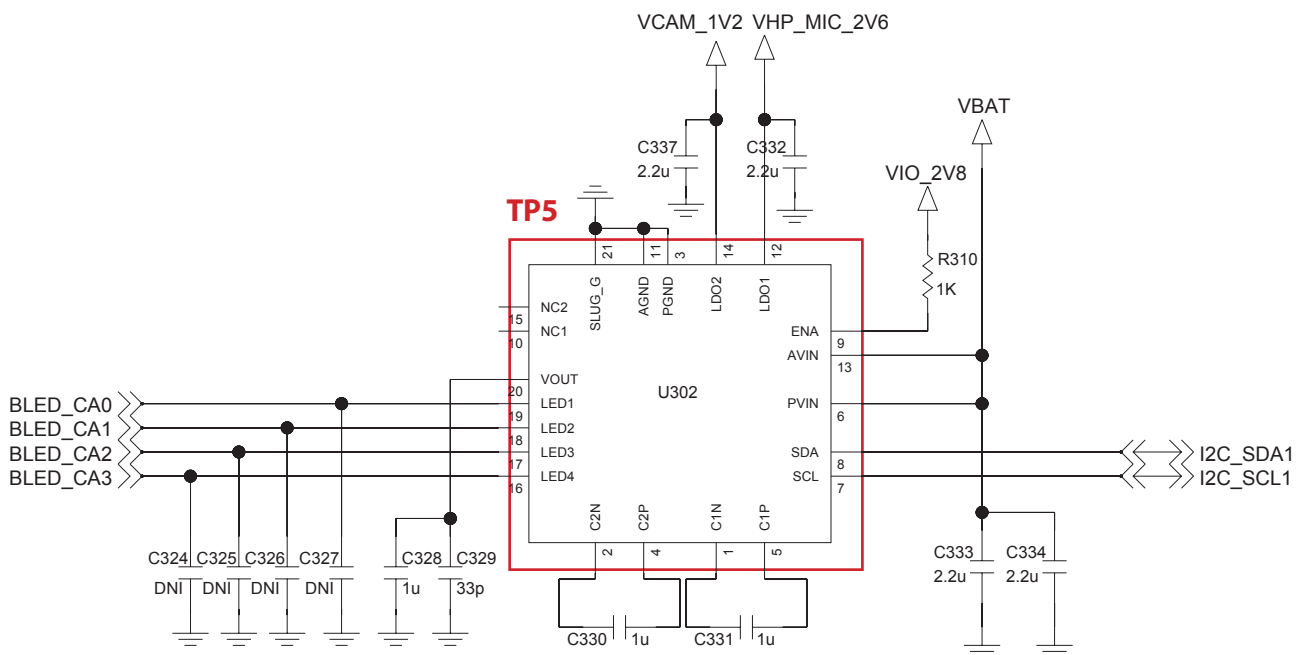
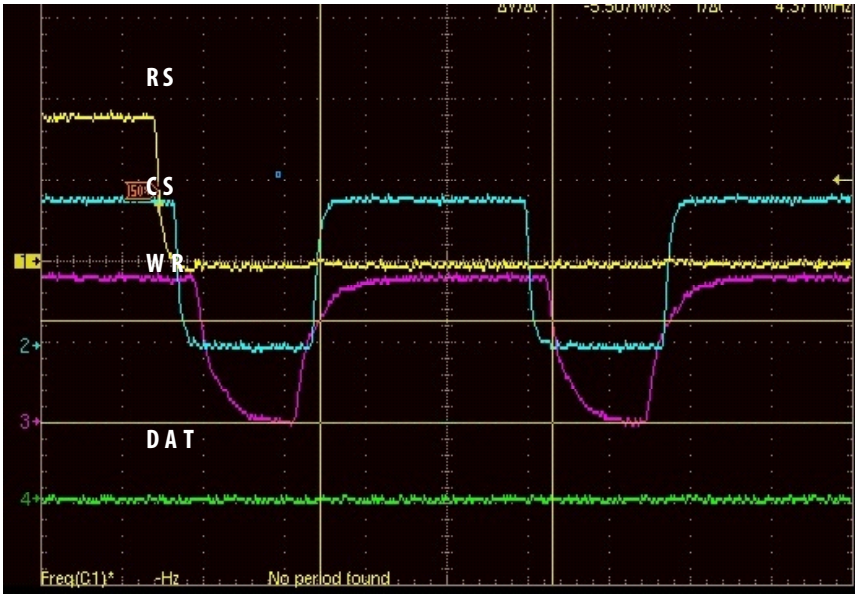


Figure 4.7.3 LCD Chargepump Circuit



Graph 4.7.4. LCD Backlight Control Signal Waveform



Graph 4.7.5. LCD Data Waveform

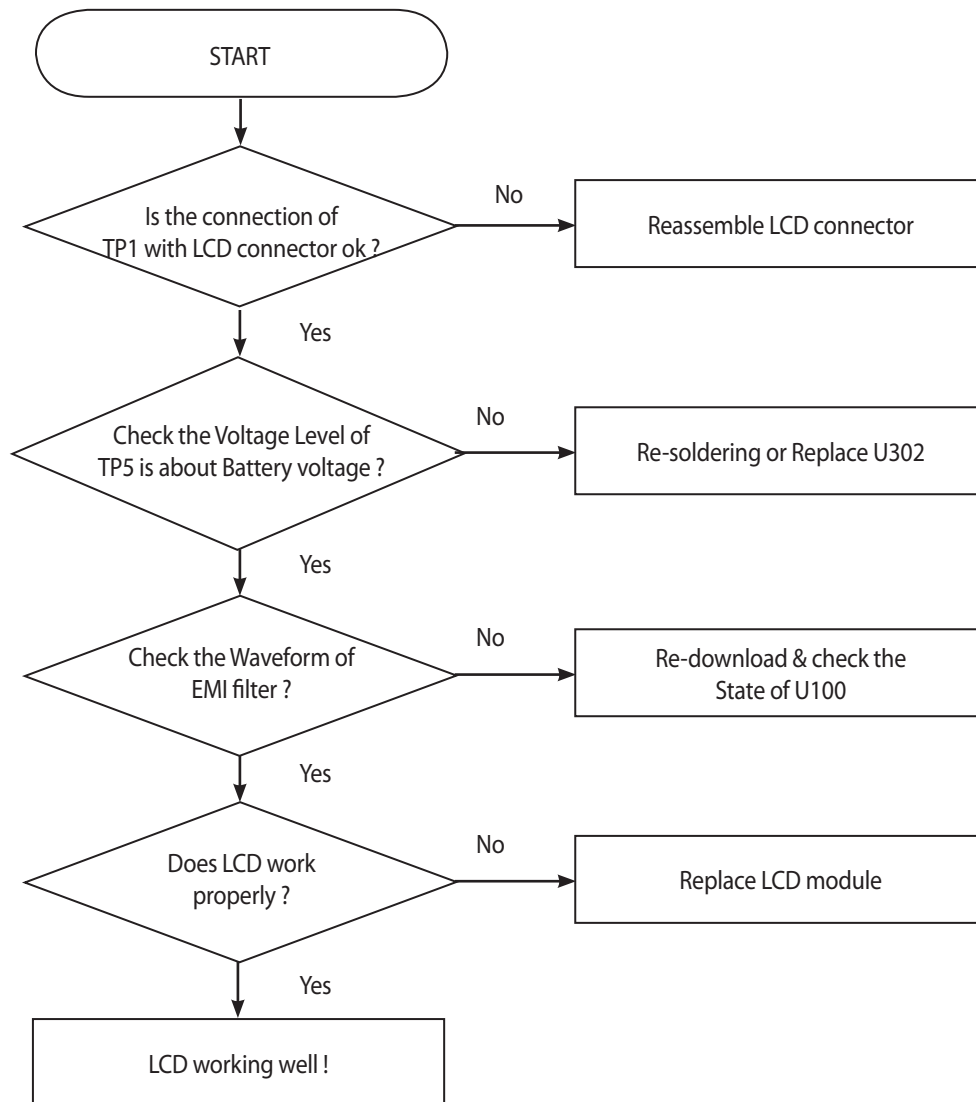


Figure 4.7.6 LCD Checking Flow

4.8 Camera Trouble

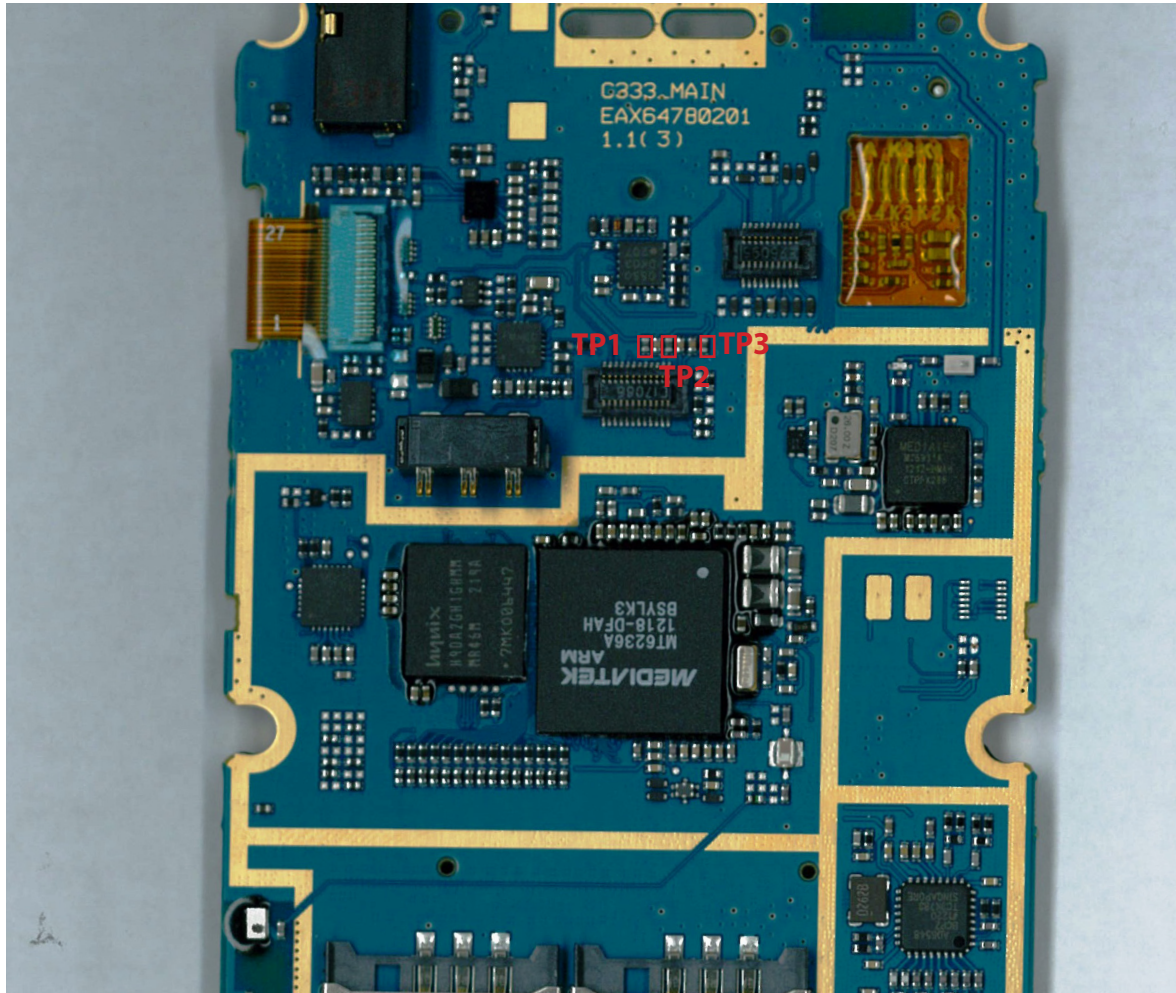


Figure 4.8.1 Camera Test Point

3M_CAM

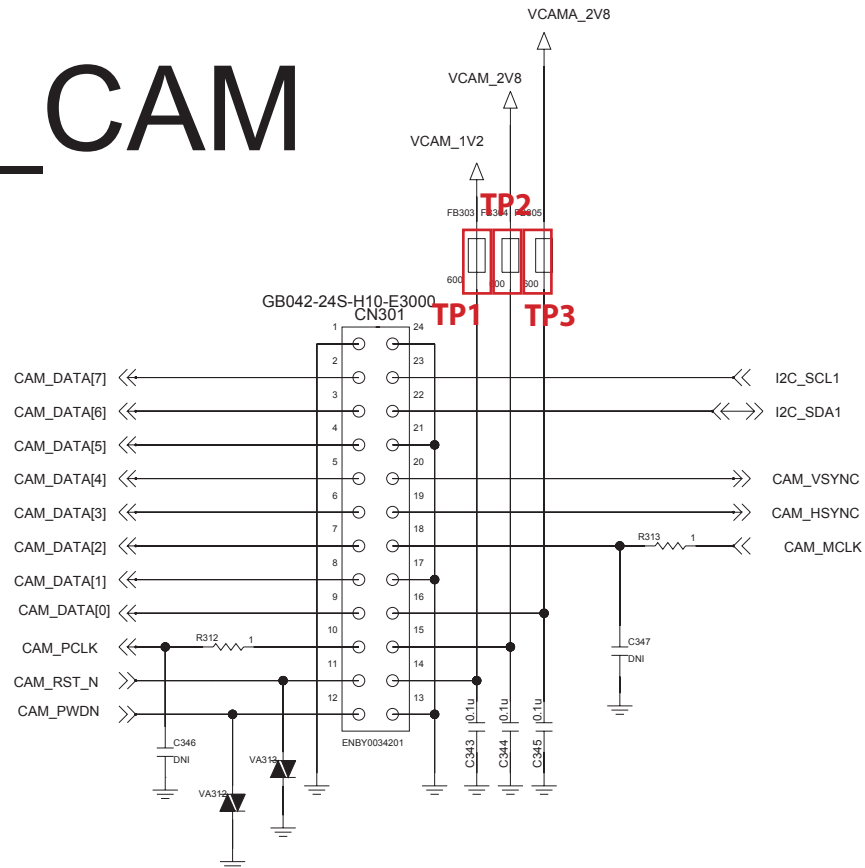


Figure 4.8.2 Camera Circuit

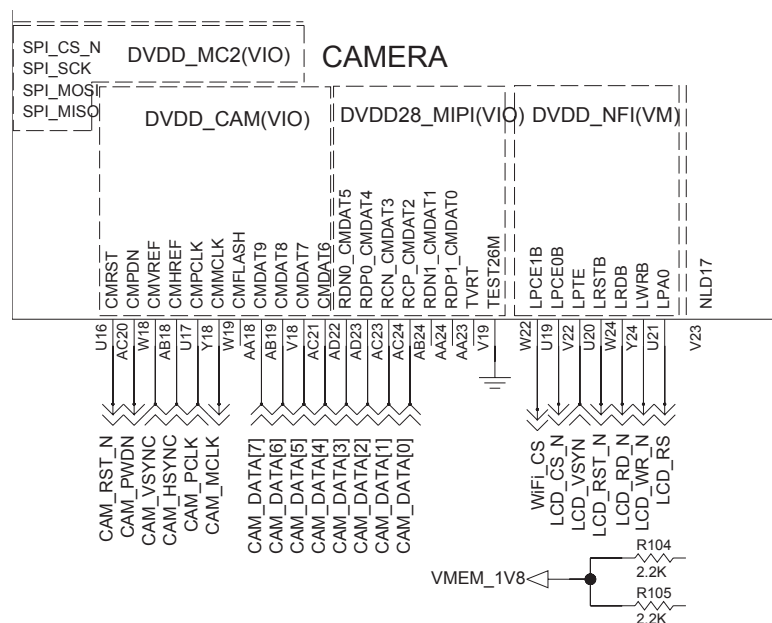
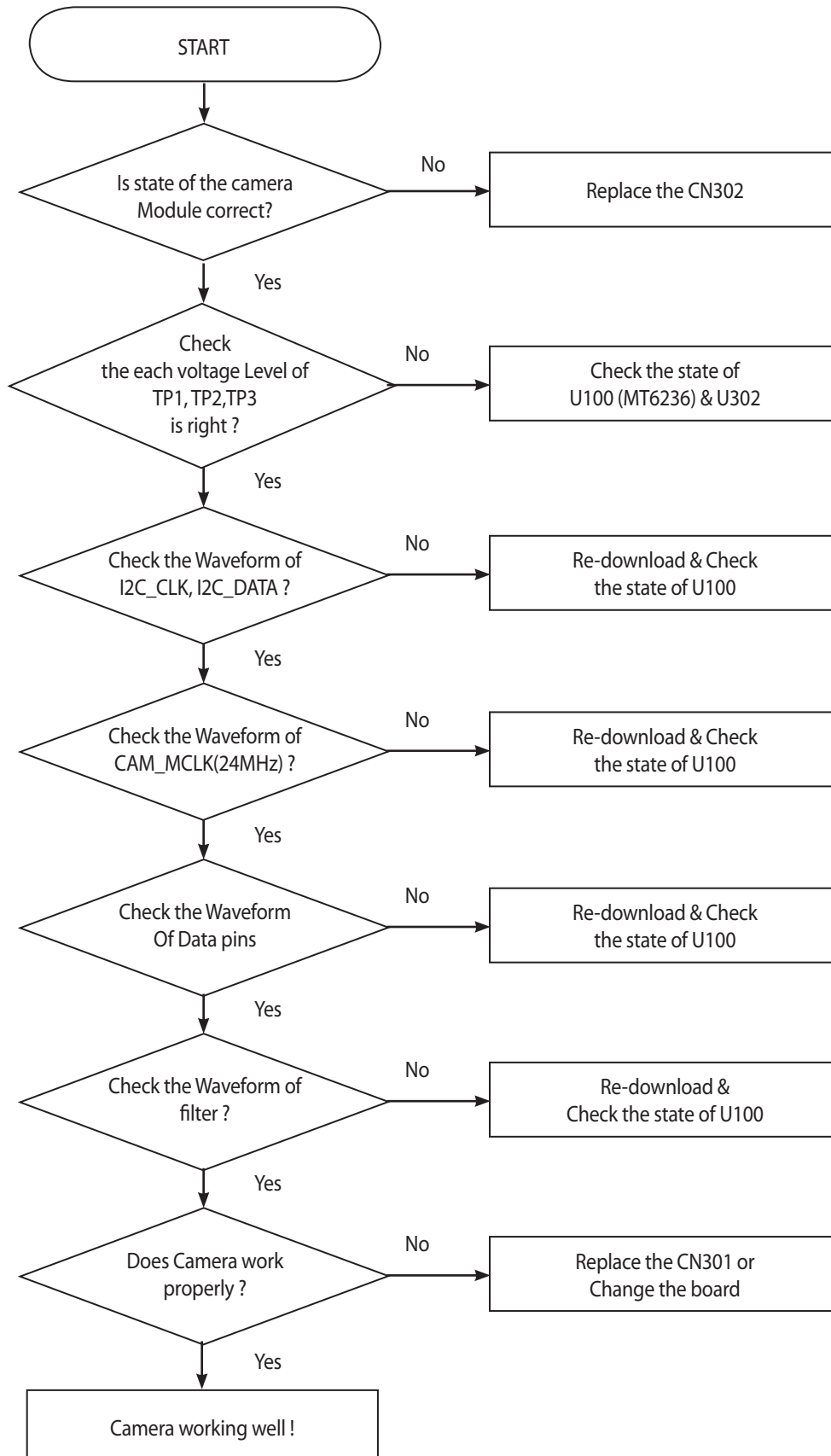


Figure 4.8.3 Camera Circuit

4. TROUBLE SHOOTING



4.9 Speaker Trouble

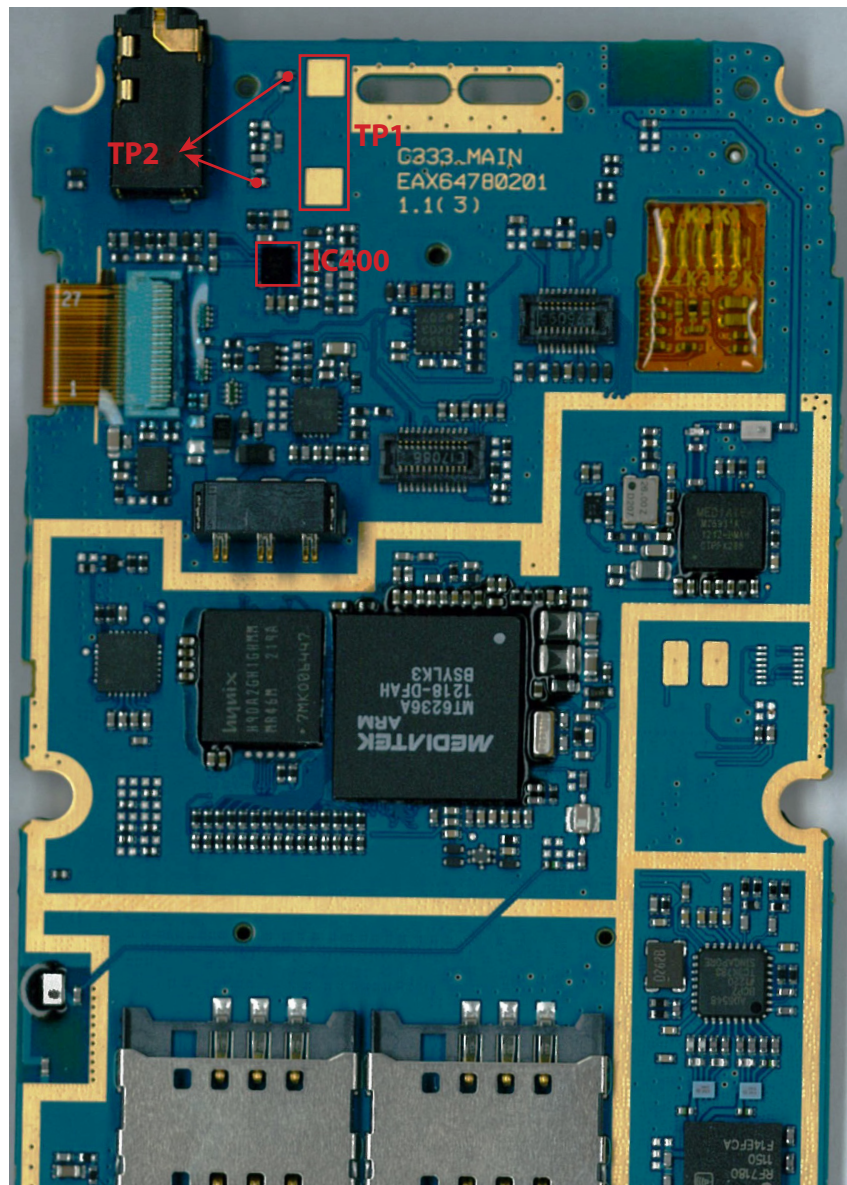


Figure 4.9.1 Speaker Test Point



RCV Circuit

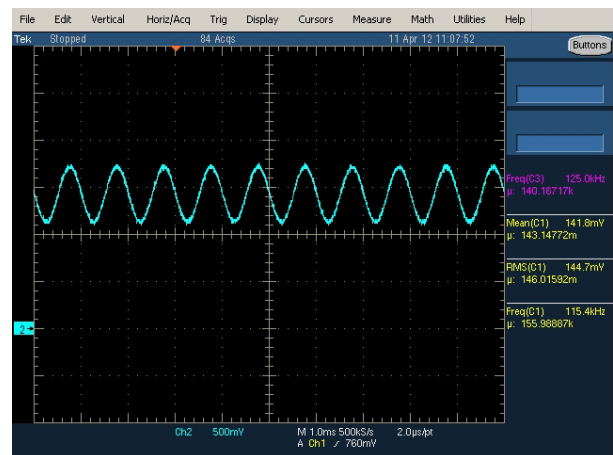
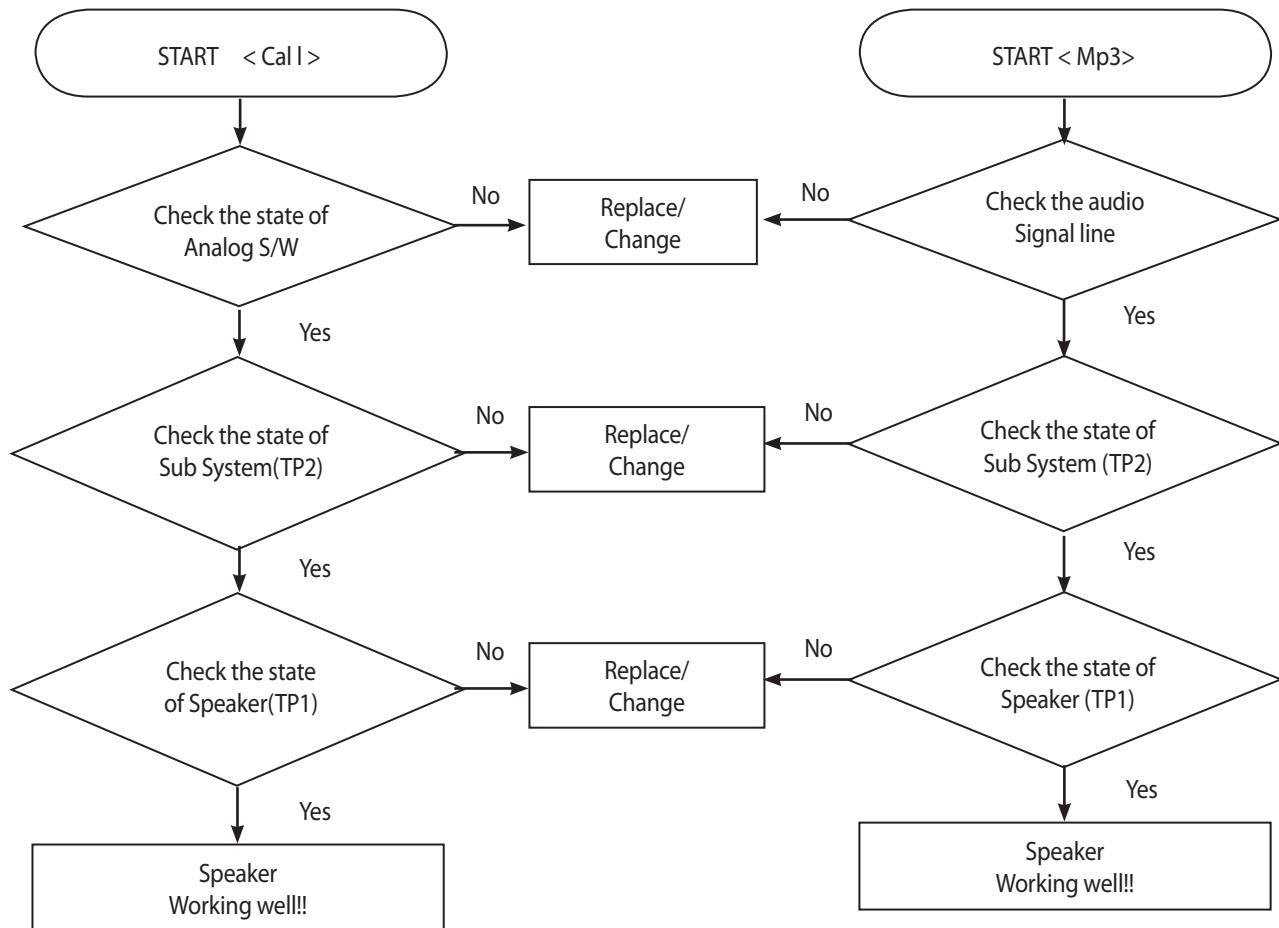


Figure 4.9.5 Tp1 Signal Waveform(1KHz mp3 play)

4. TROUBLE SHOOTING



4.10 Earphone Trouble

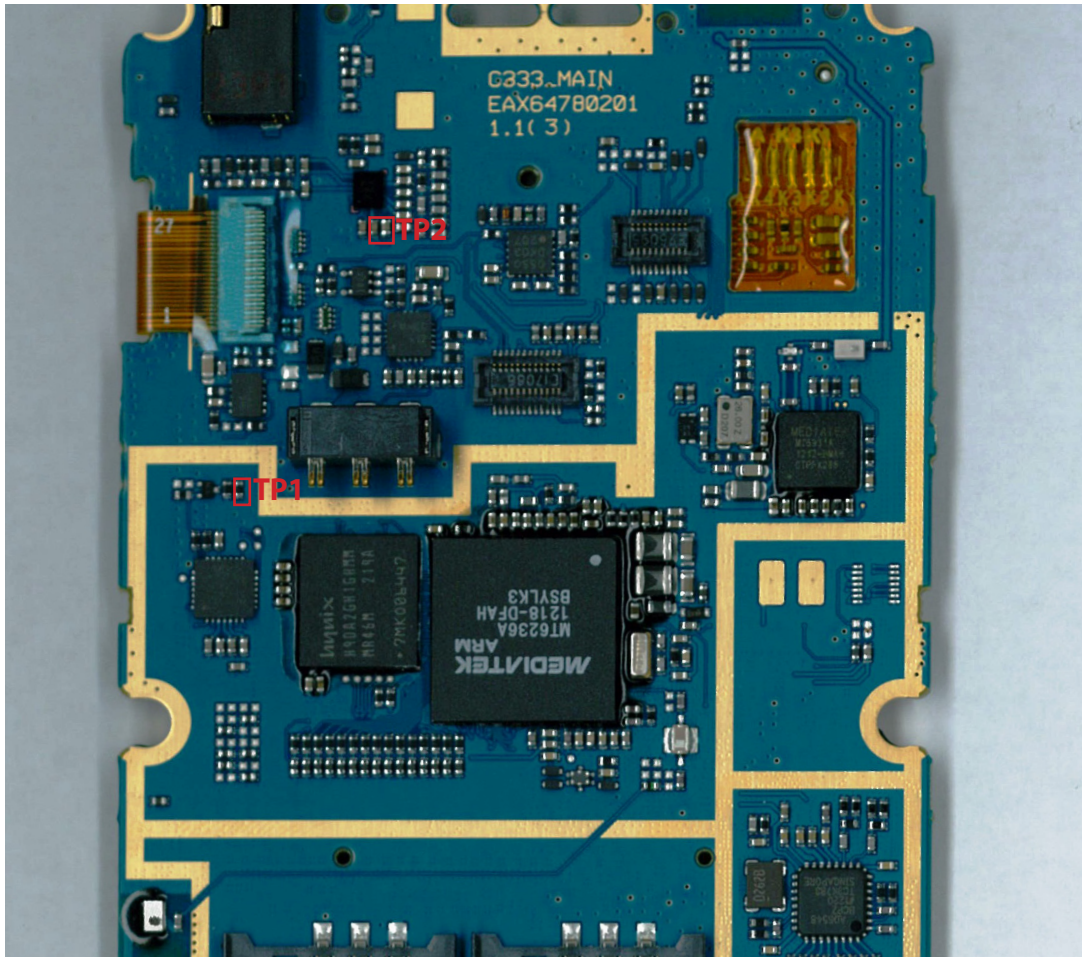


Figure 4.10.1 Earphone Test Point



Figure 4.10.5 Audio Amp Circuit



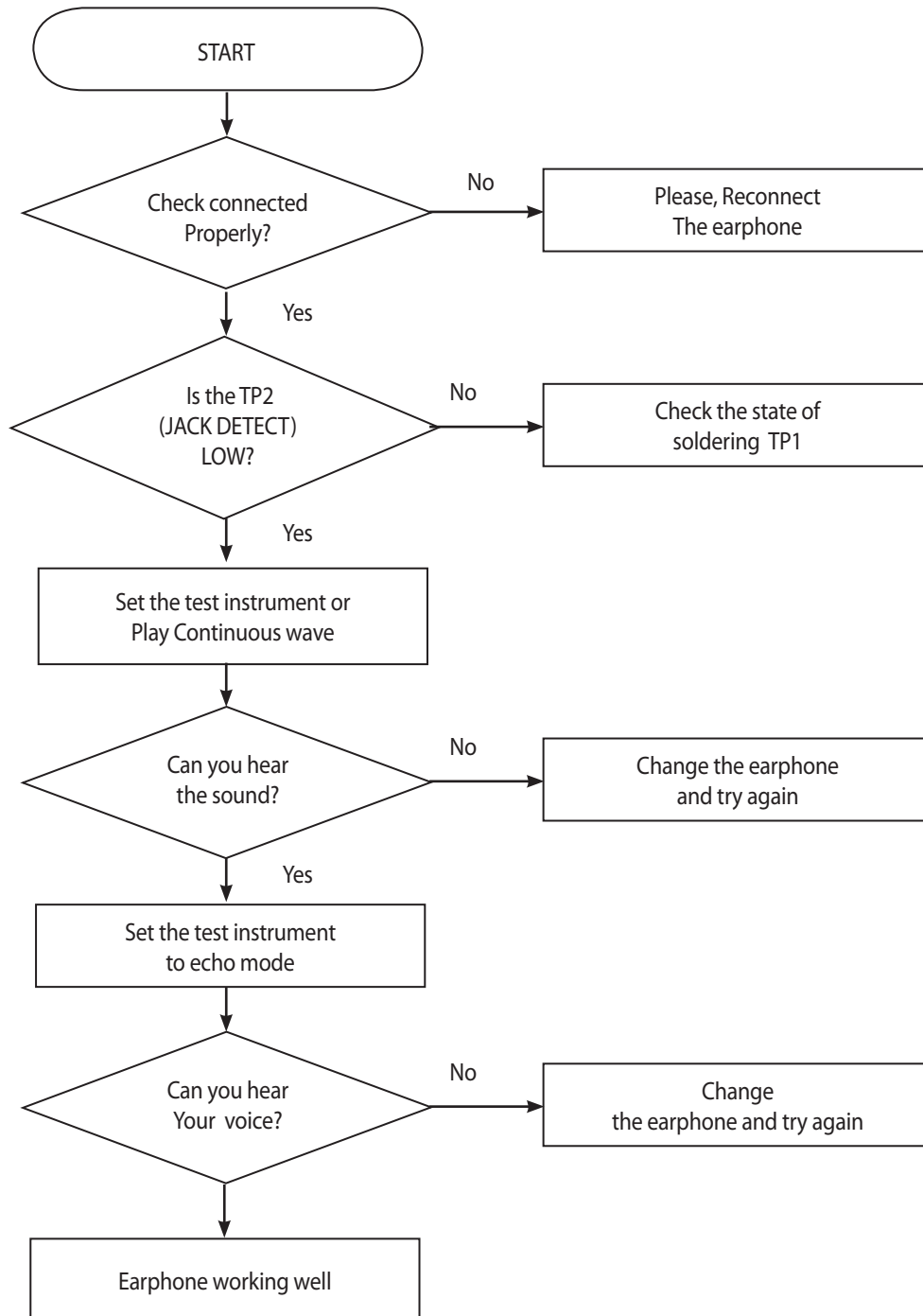


Figure 4.10.7 Earphone Checking Flow

4.11 Receiver Trouble

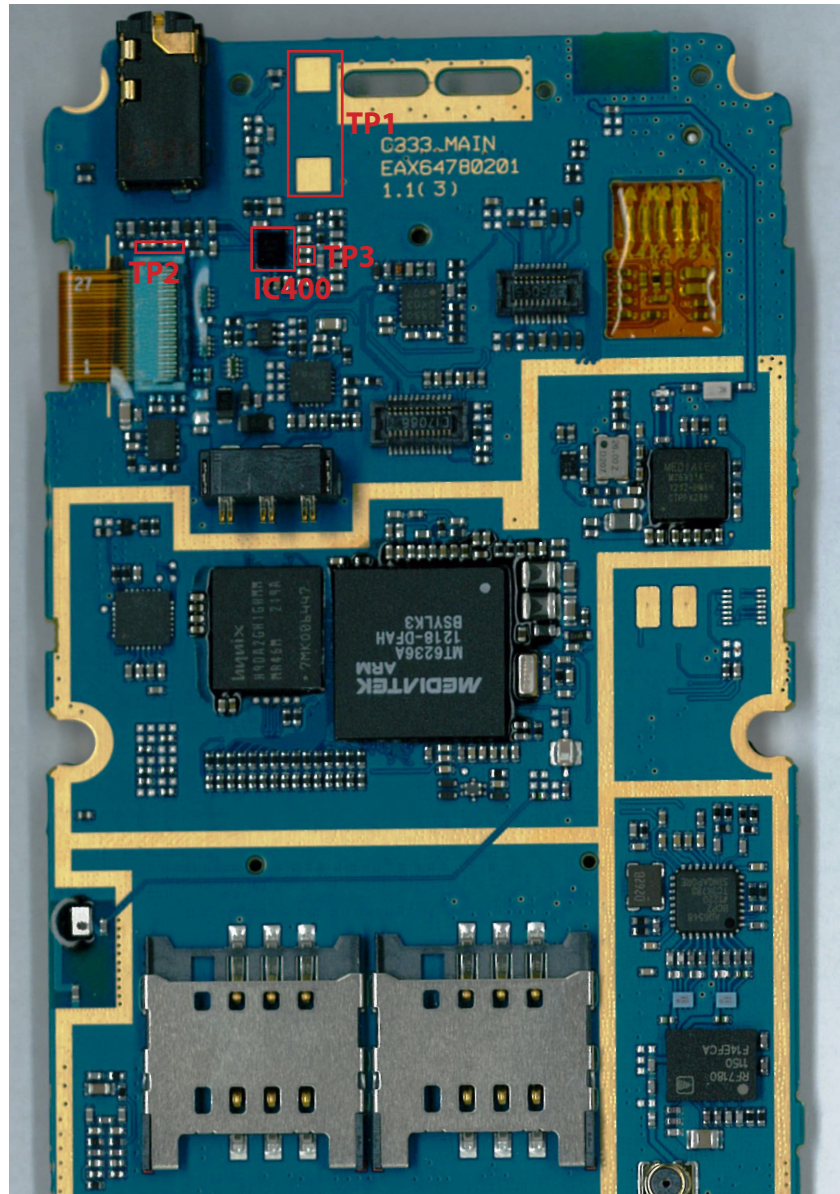


Figure 4.11.1 Receiver Pad Test Point
Receiver Test Point

SK_RCV

RCV Circuit

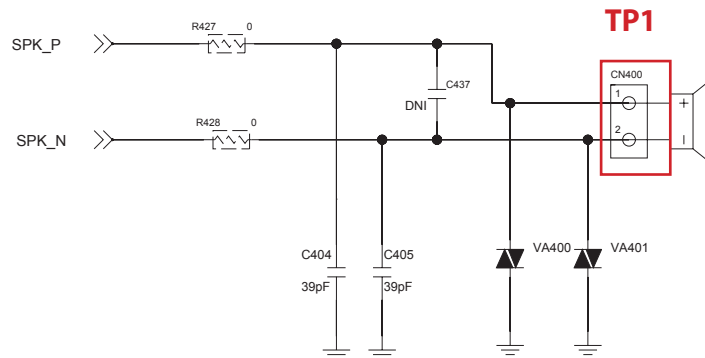


Figure 4.11.2 Receiver Circuit

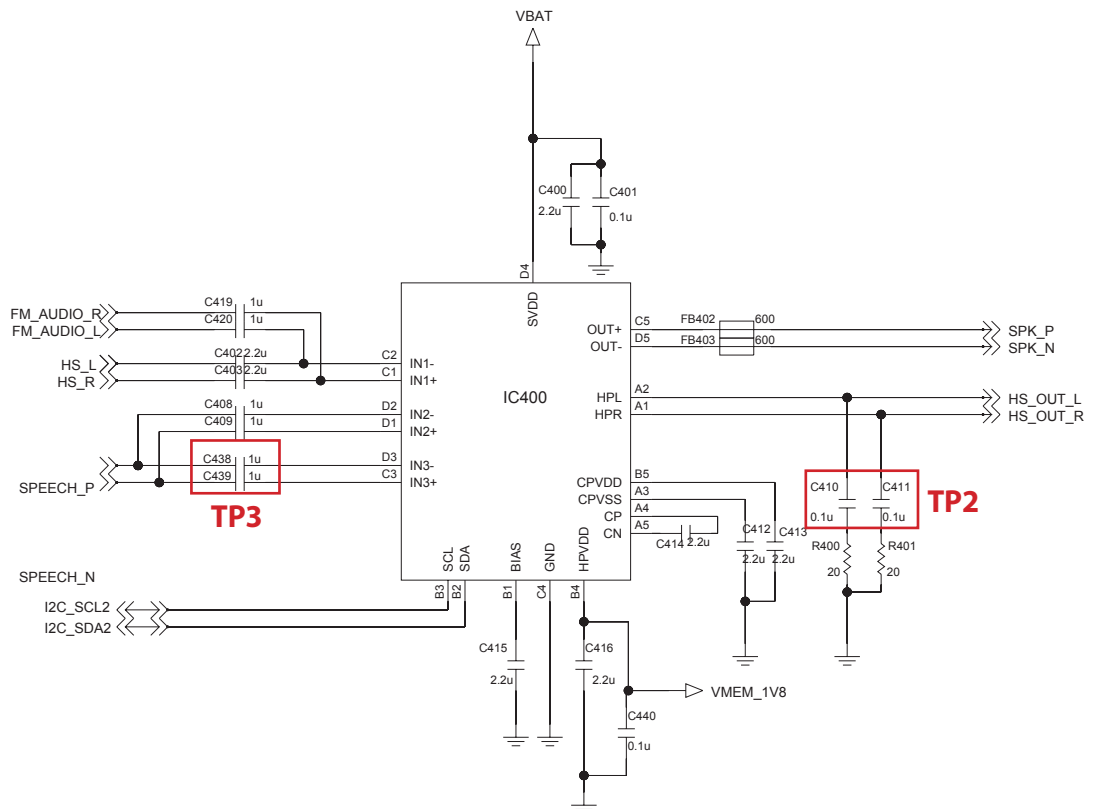


Figure 4.11.3 Audio Amp Circuit

SETTING : After initialize Agilent 8960, Set the speech option at continuous wave.

Set the receiving volume of mobile as Max.

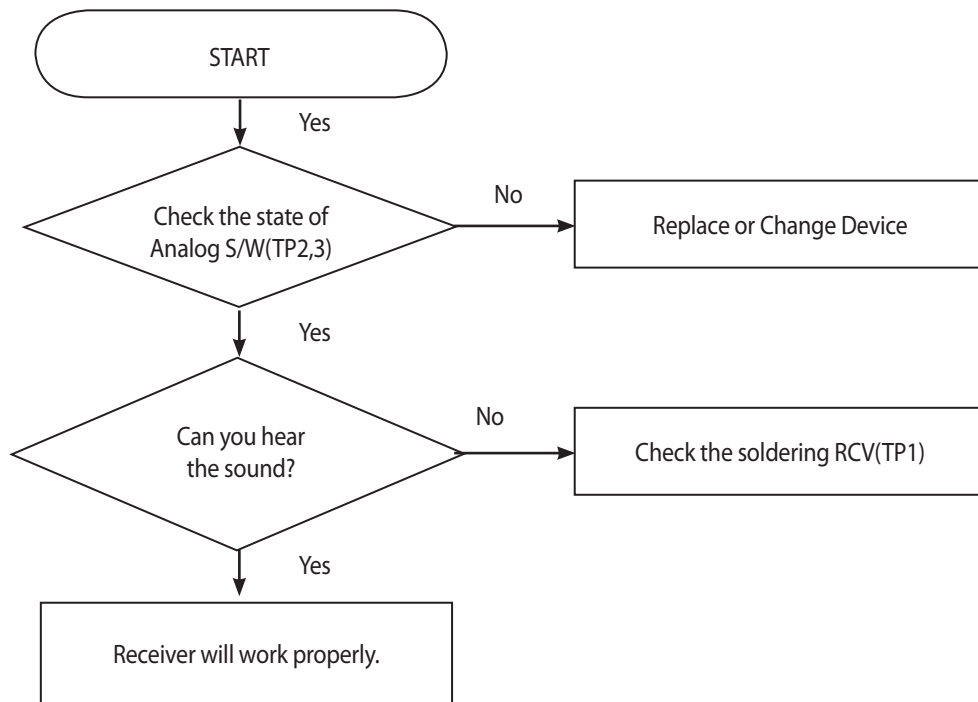


Figure 4.11.4 Receiver Checking Point

4.12 Microphone Trouble

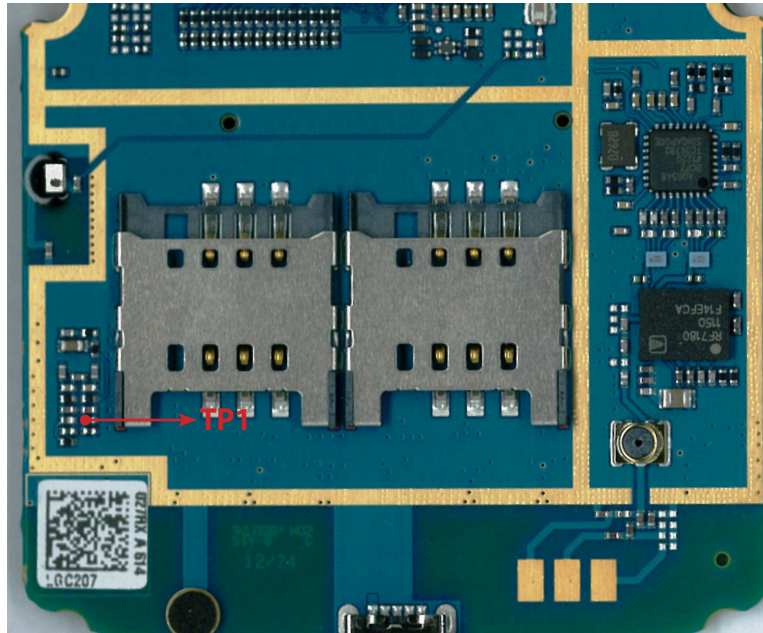


Figure 4.12.1 Microphone Test Point

MAIN MIC

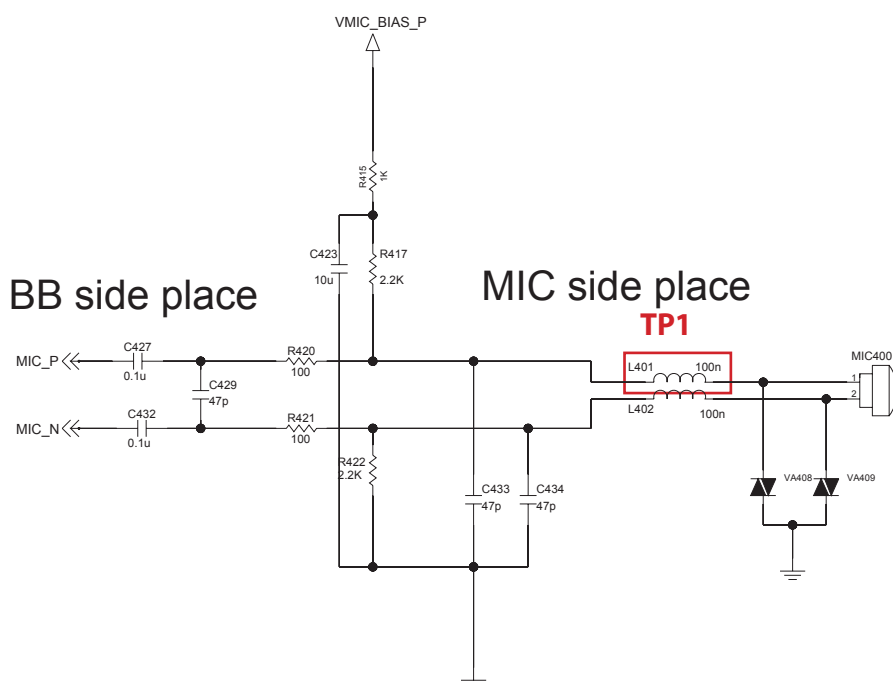
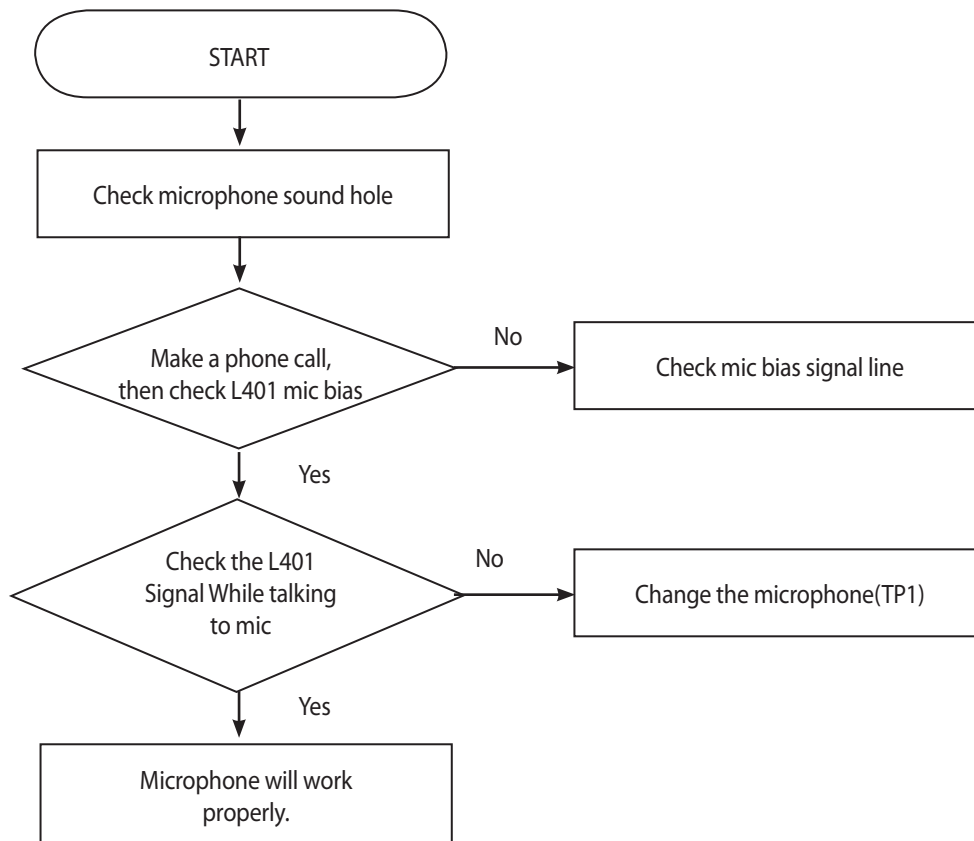


Figure 4.12.2 Microphone Circuit

4. TROUBLE SHOOTING

SETTING : After initialize Agilent 8960, set the speech option at loopback.



4.13 SIM Card Interface Trouble

4.13.1 SIM1 Card Interface Trouble

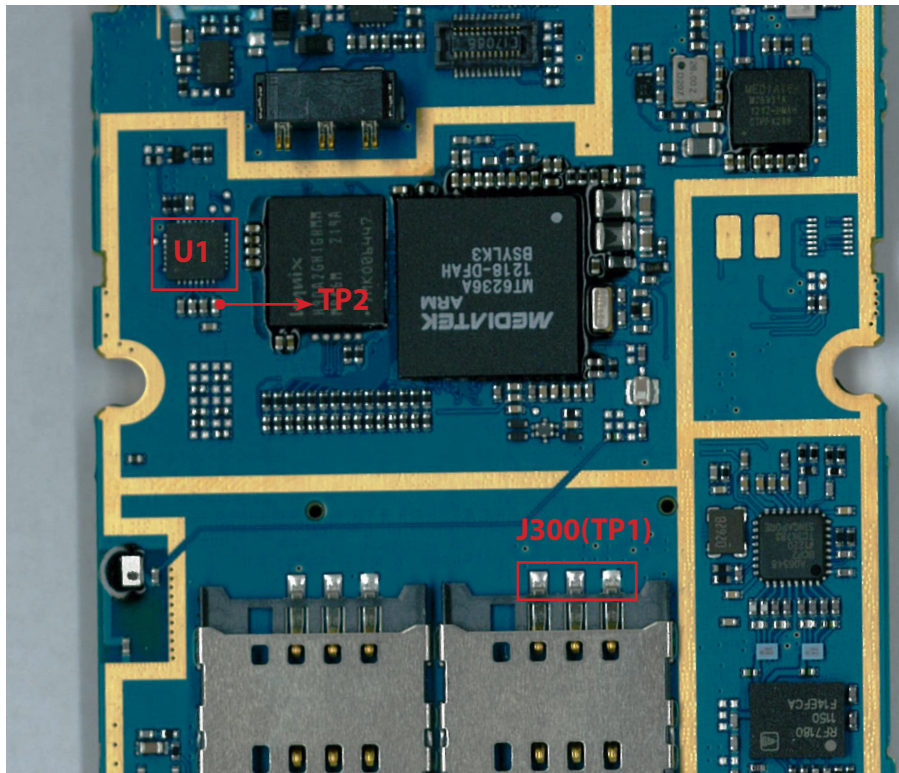


Figure 4.13.1 Sim Card Test Point

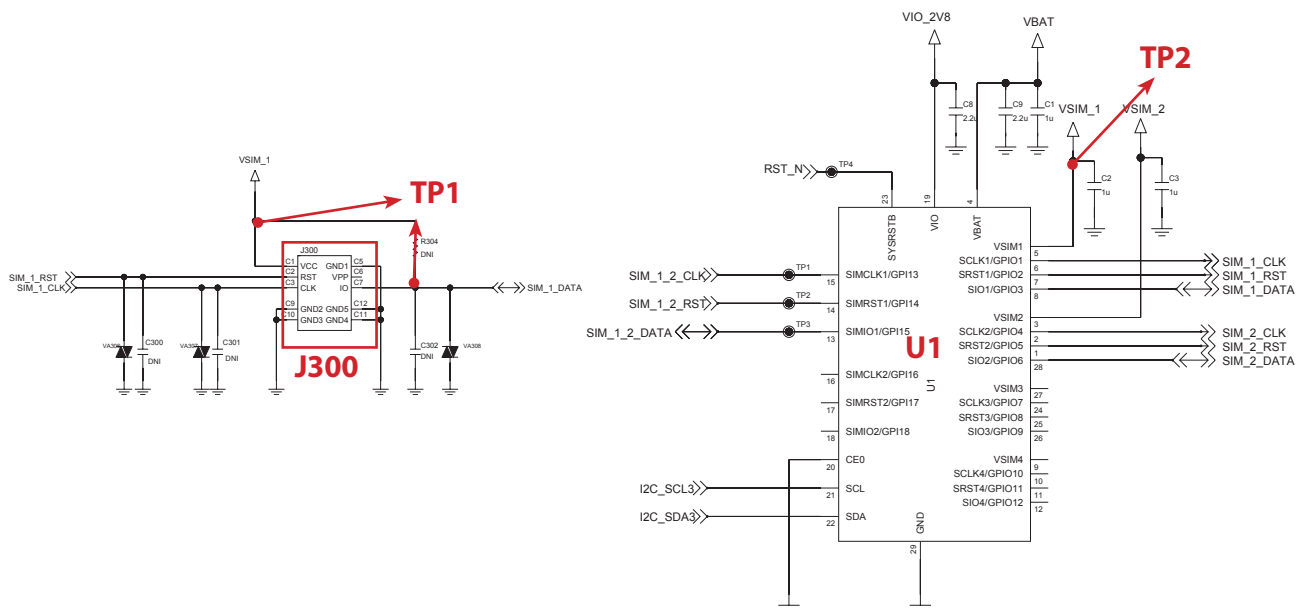


Figure 4.13.2 Sim Card Circuit

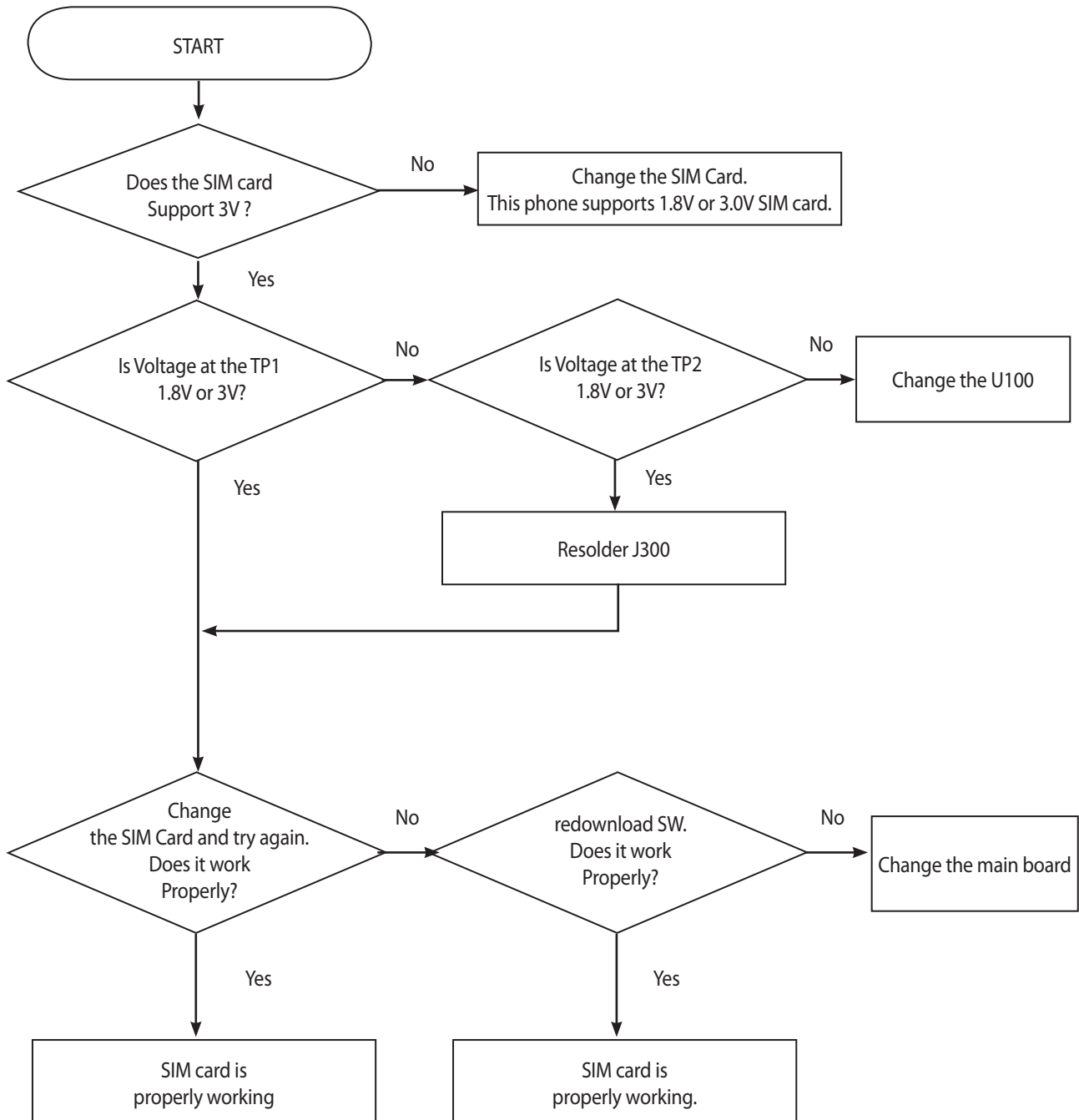


Figure 4.13.3 Sim Card Checking Flow

4.13.2 SIM2 Card Interface Trouble

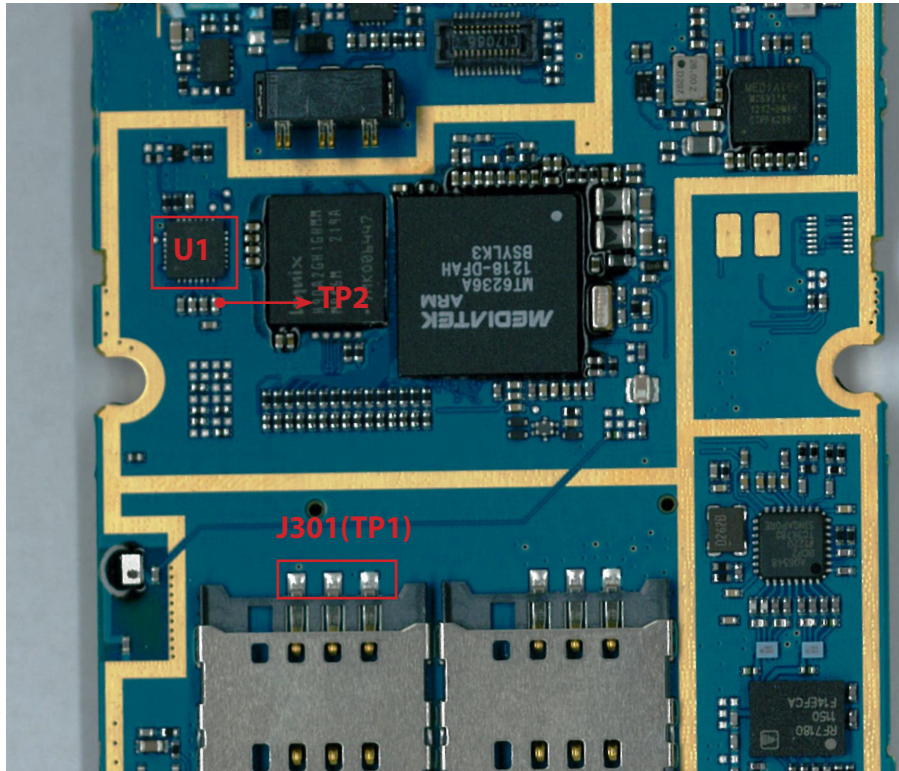


Figure 4.13.4 Sim Card Test Point

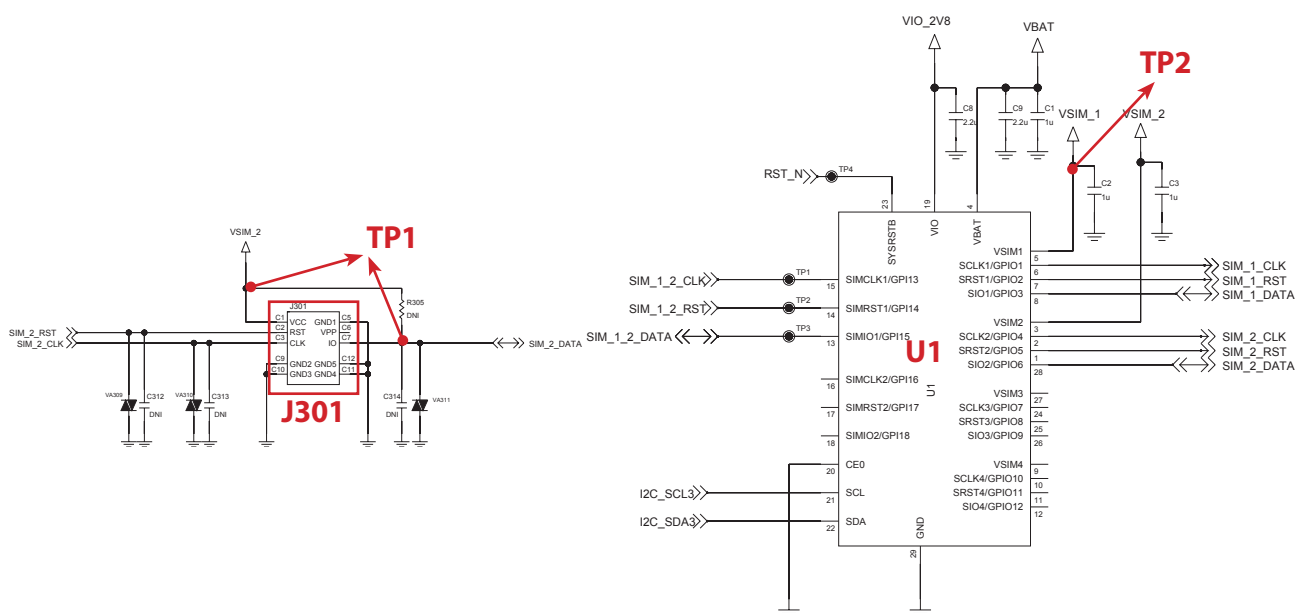


Figure 4.13.5 Sim Card Circuit

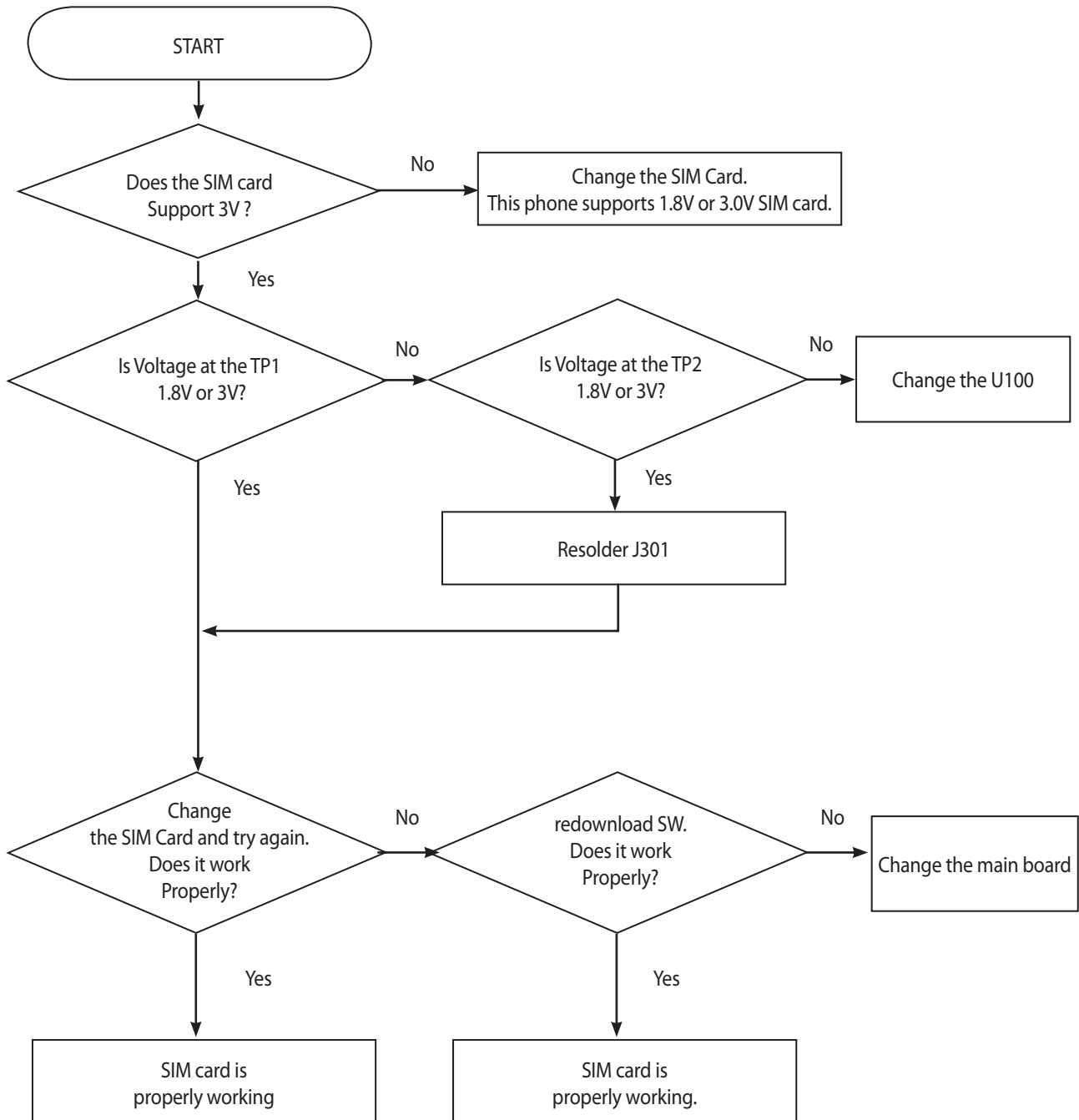


Figure 4.13.3 Sim Card Checking Flow

4.13.3 SIM3 Card Interface Trouble

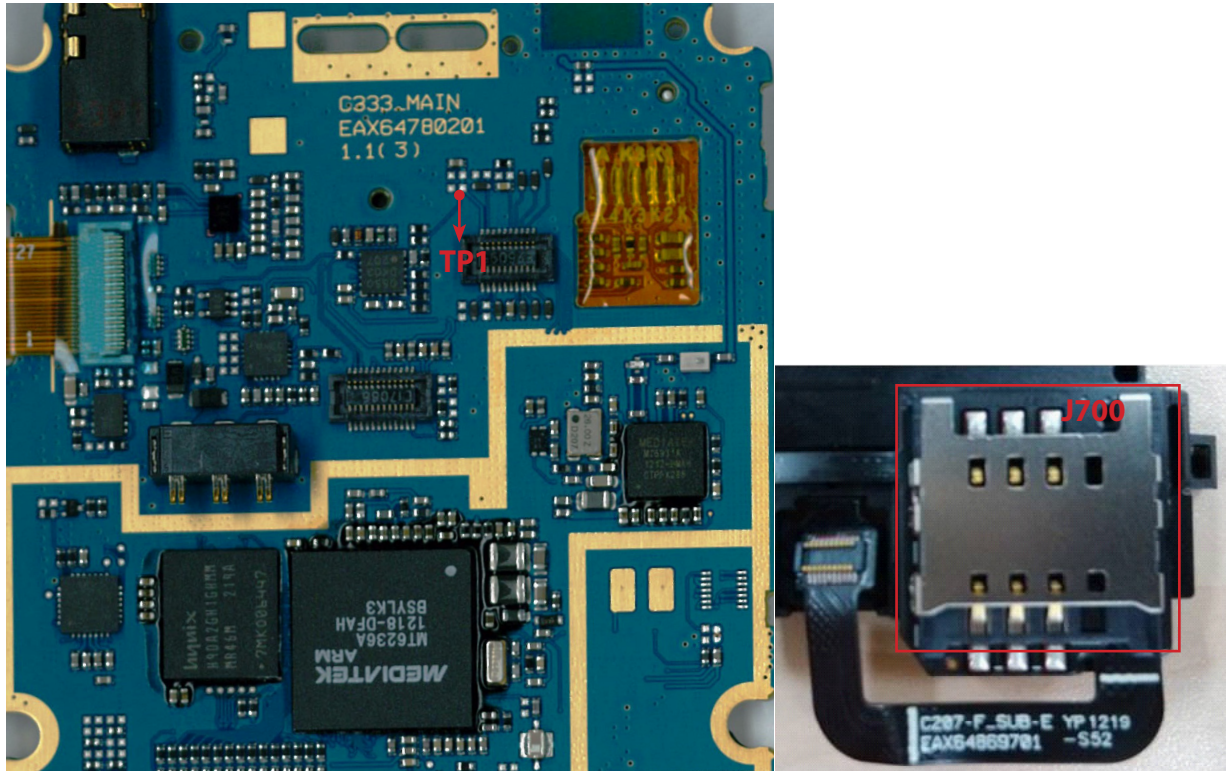


Figure 4.13.7 Sim Card Test Point

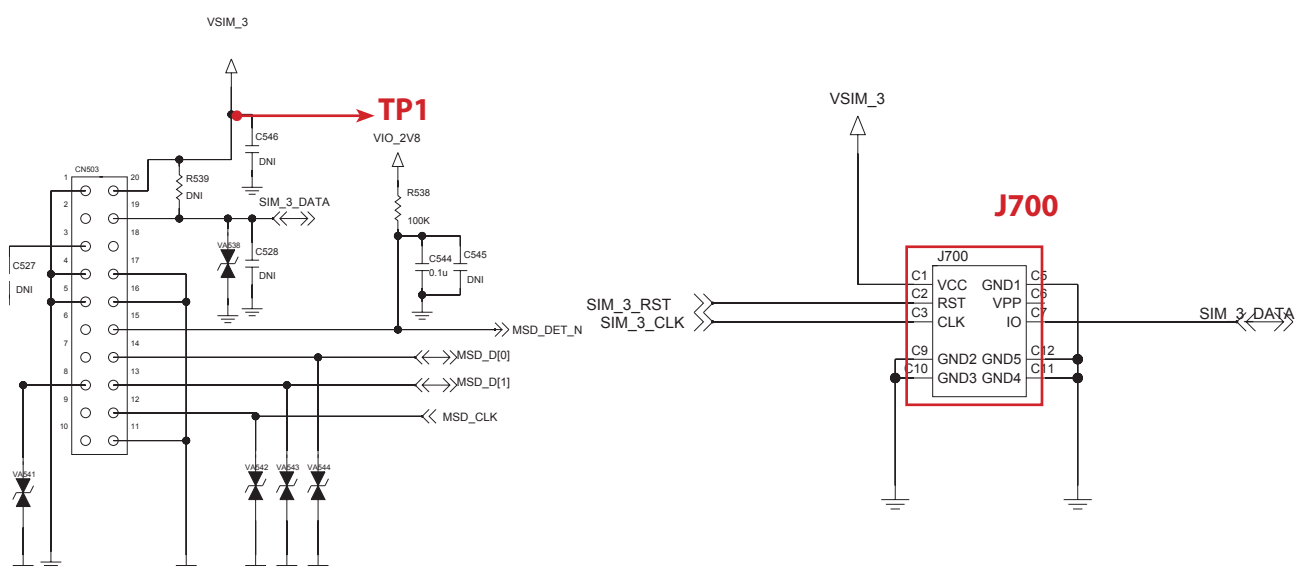


Figure 4.13.8 Sim Card Circuit

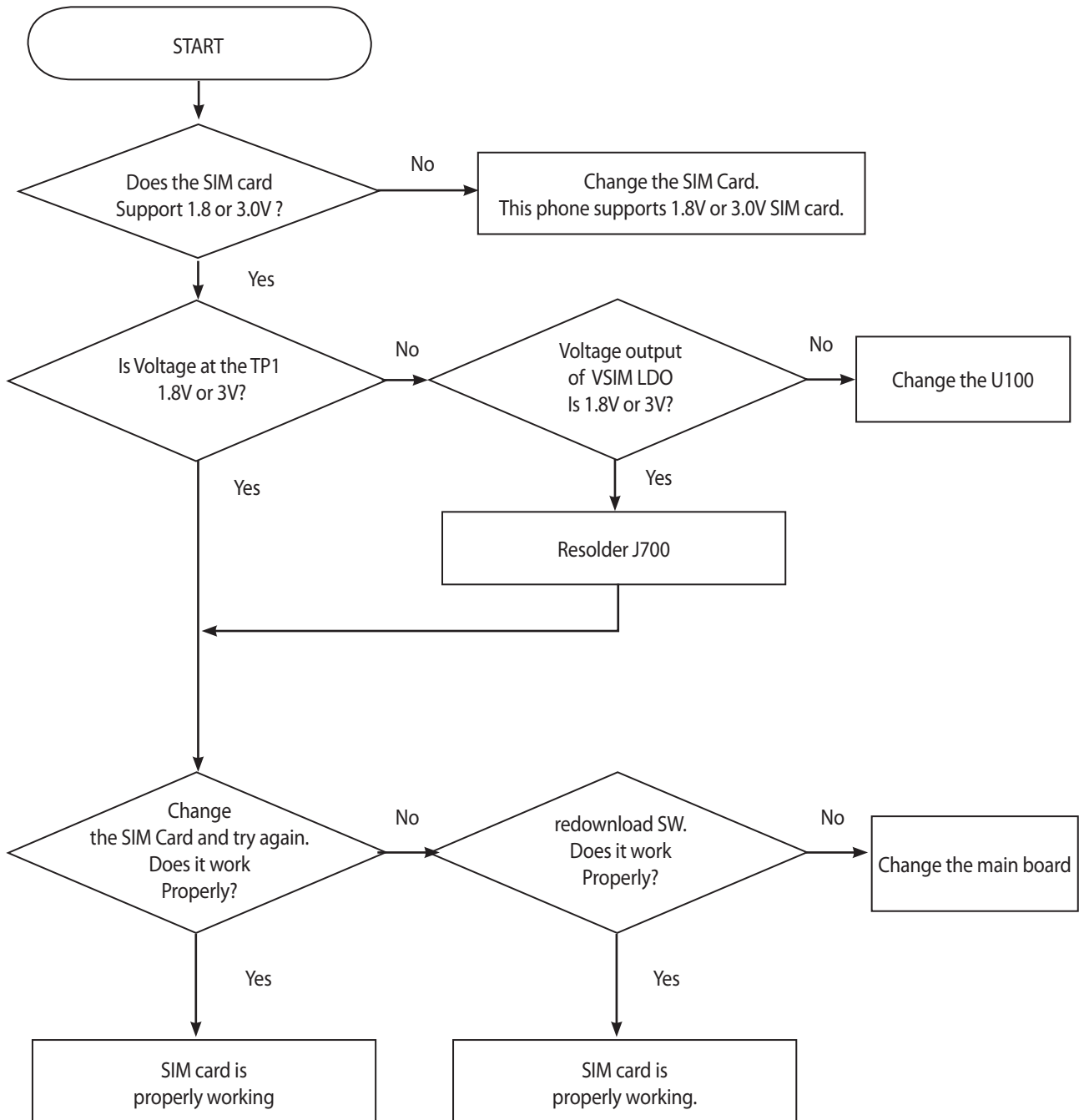


Figure 4.13.9 Sim Card Checking Flow

4.14 KEY backlight Trouble

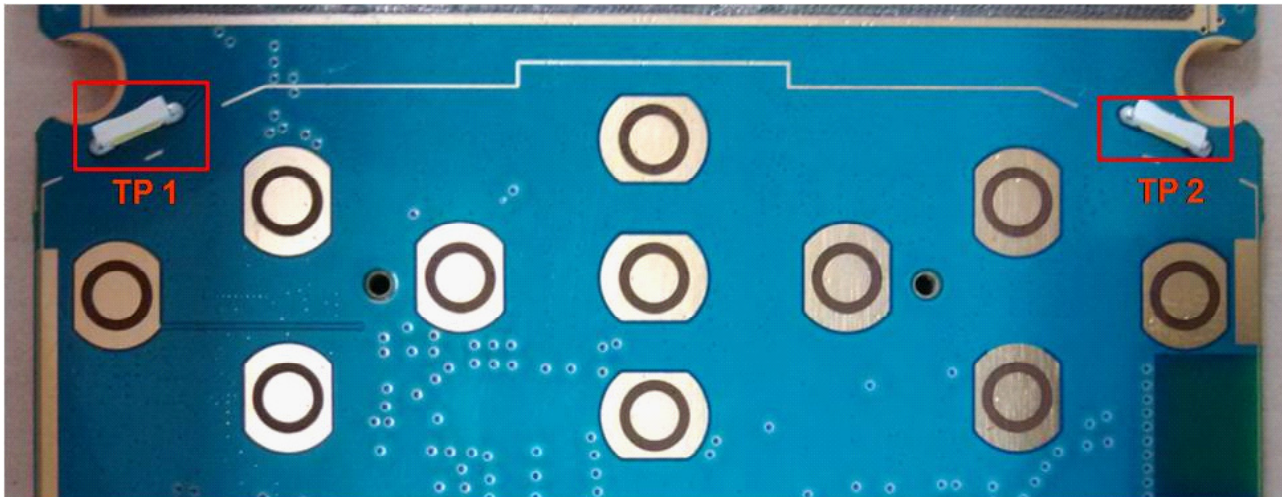


Figure 4.14.1 KEY backlight Test Point

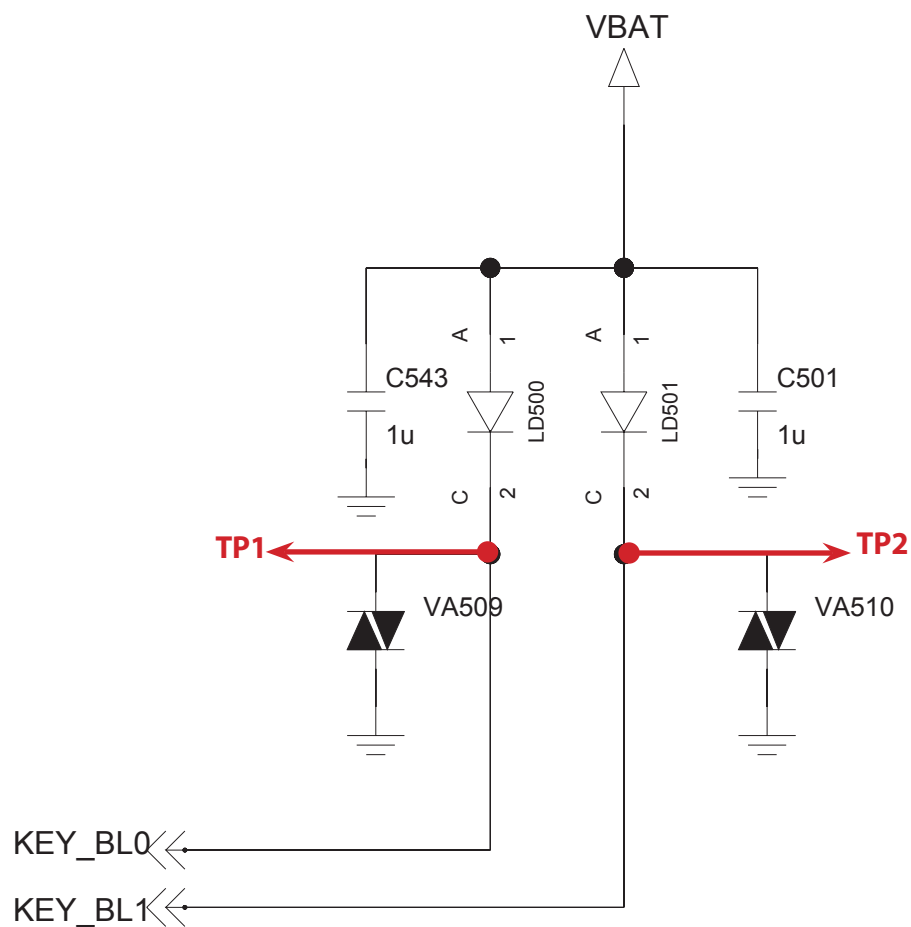


Figure 4.14.2 KEY backlight Circuit

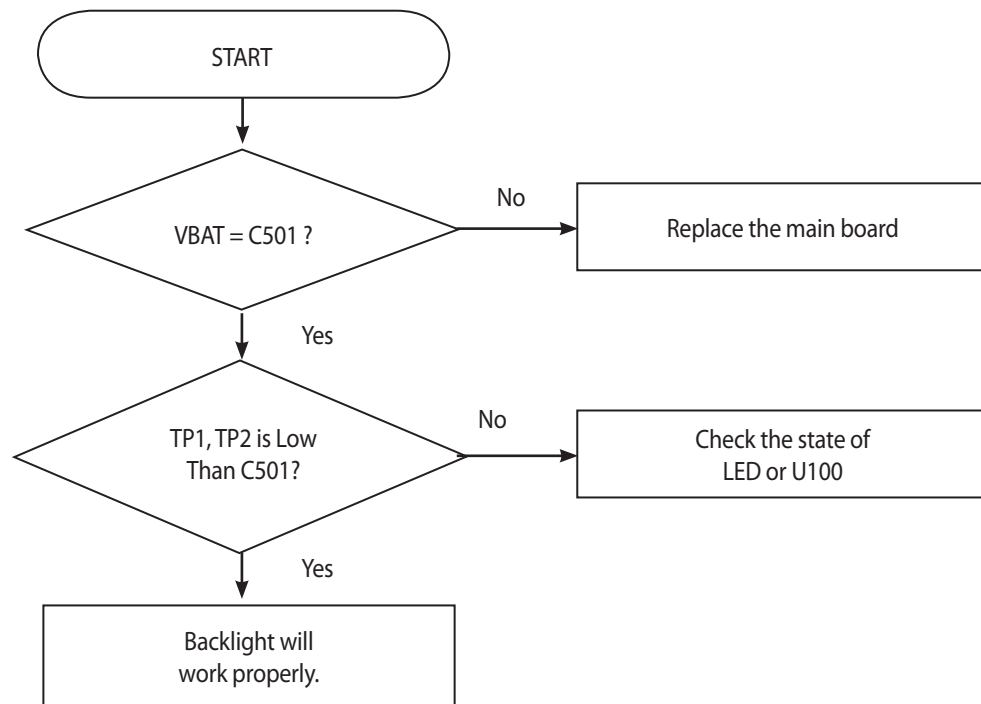


Figure 4.14.3 KEY backlight Checking Flow

4.15 Micro SD Trouble

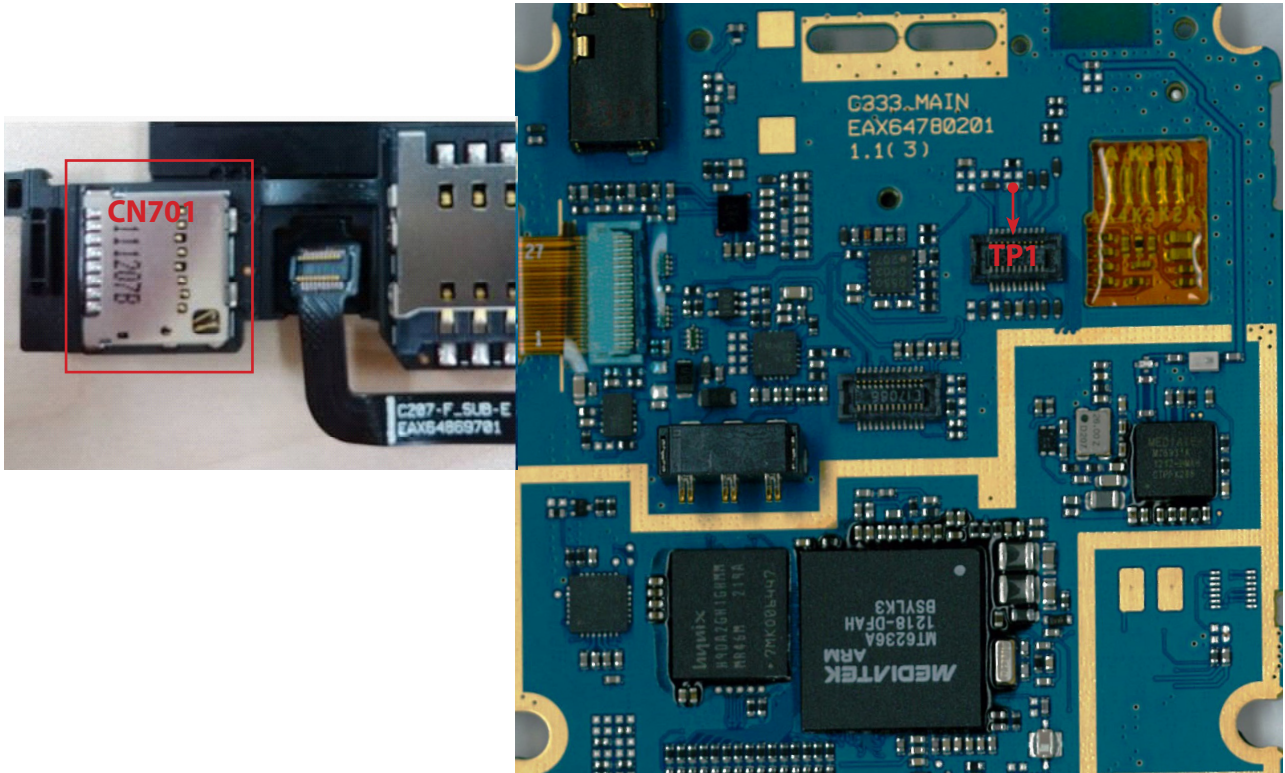


Figure 4.15.1 Micro SD Test Point

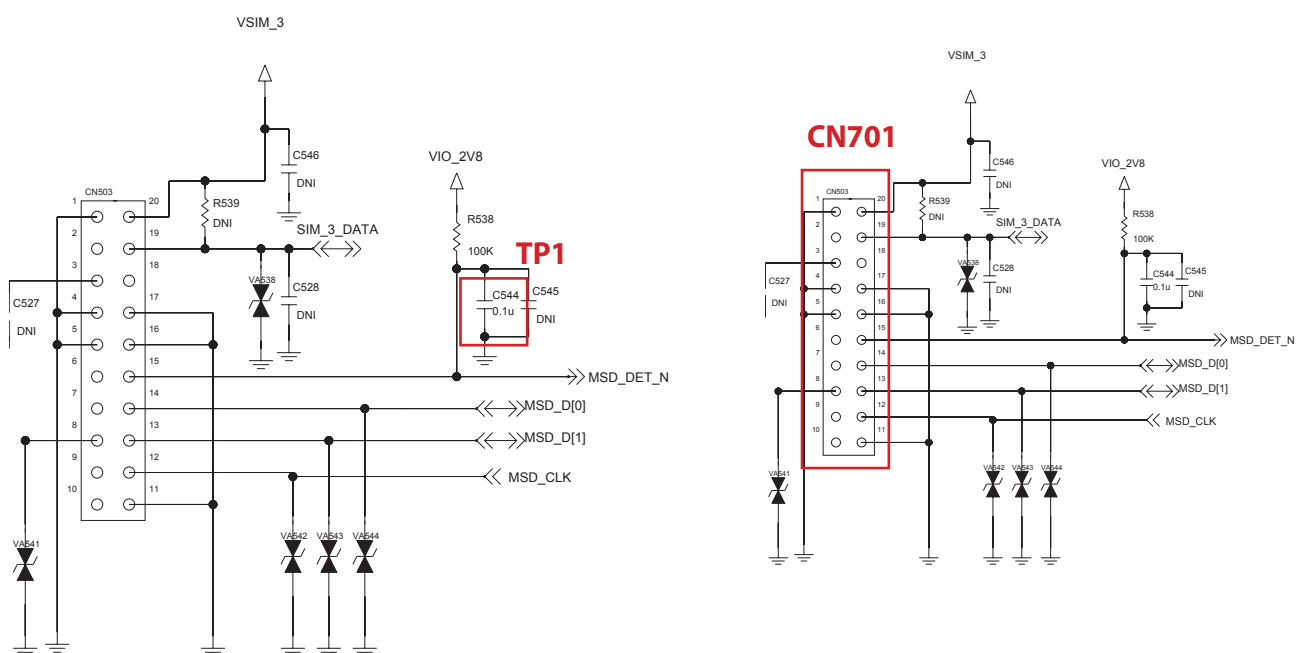


Figure 4.15.2 Micro SD Circuit

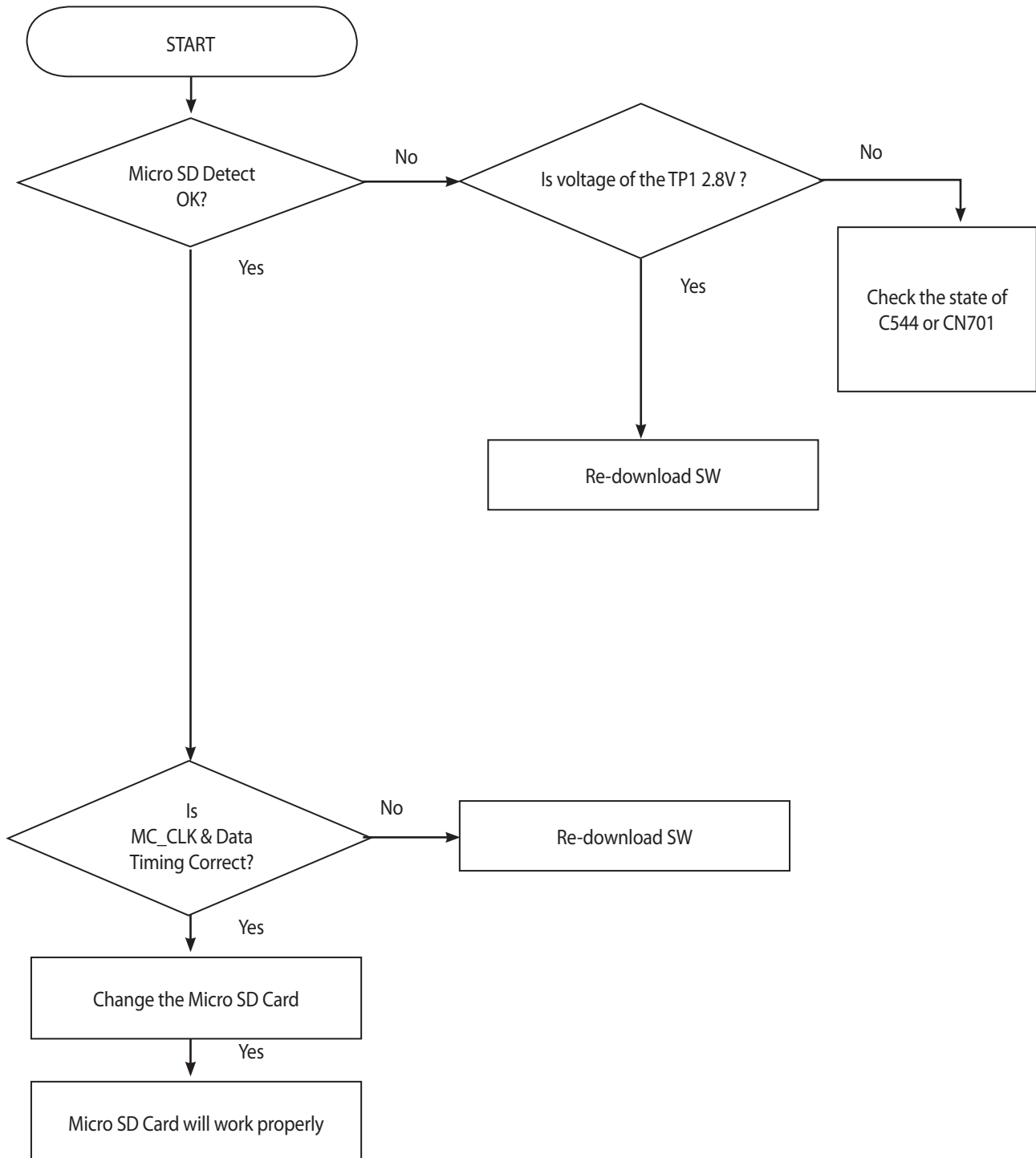


Figure 4.15.3 Micro SD Checking Flow

4.16 Bluetooth Trouble

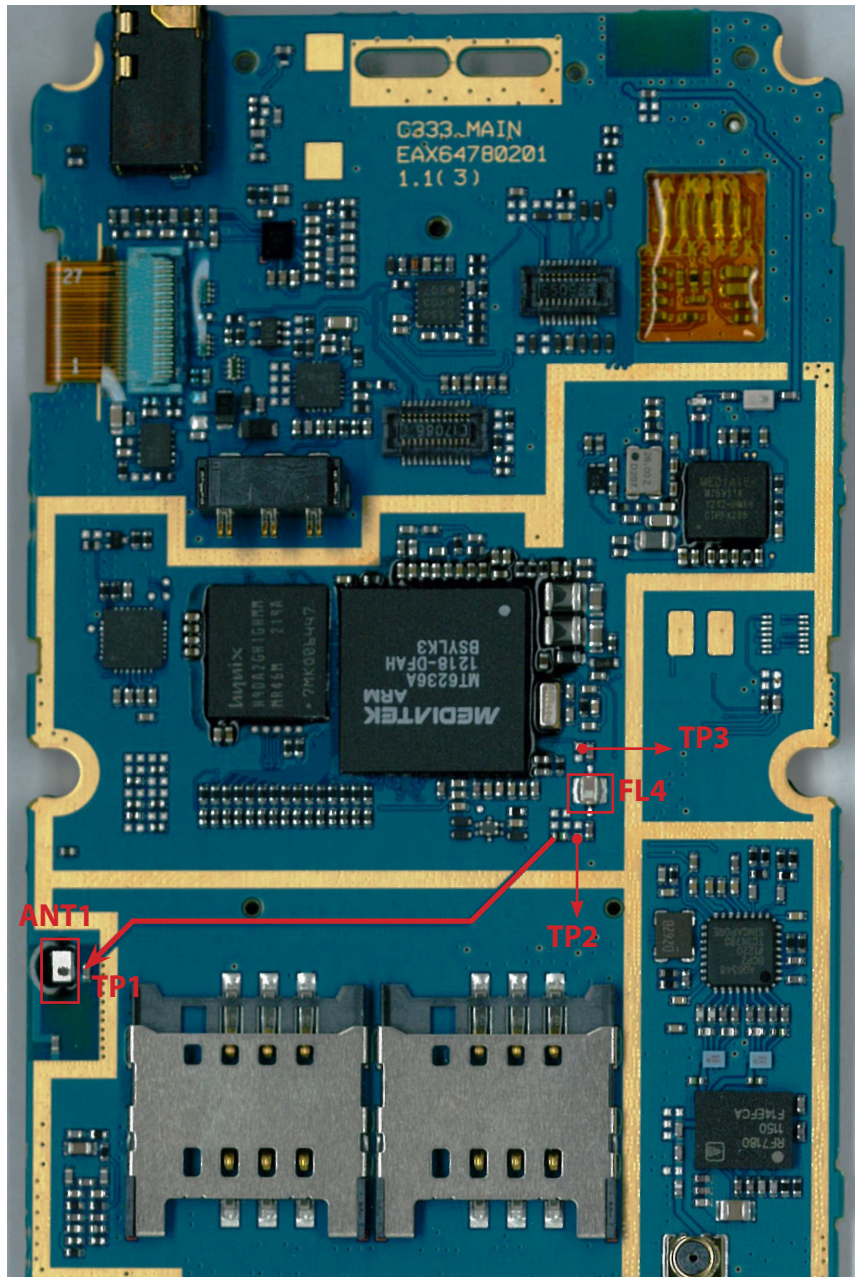


Figure 4.17.1 Bluetooth Components (bottom)

4. TROUBLE SHOOTING

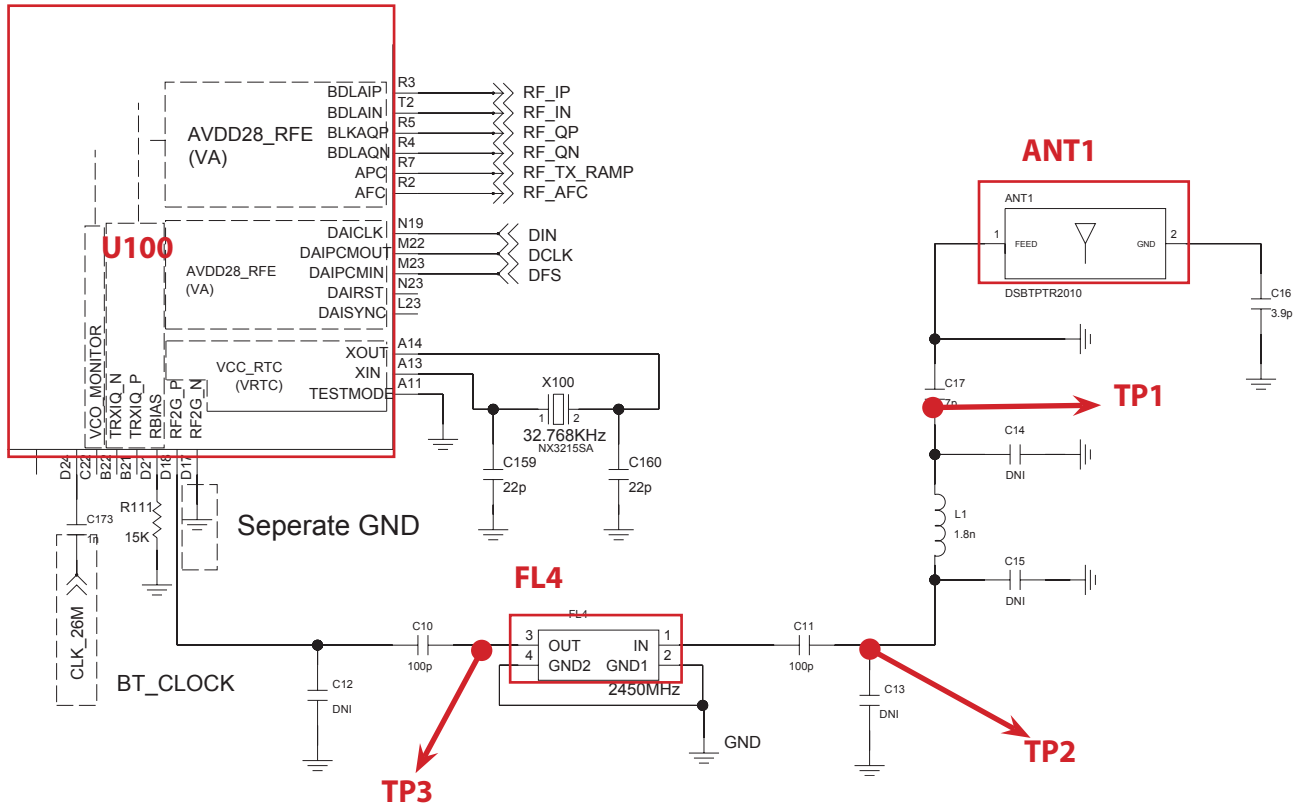


Figure 4.17.3 BT circuit diagram

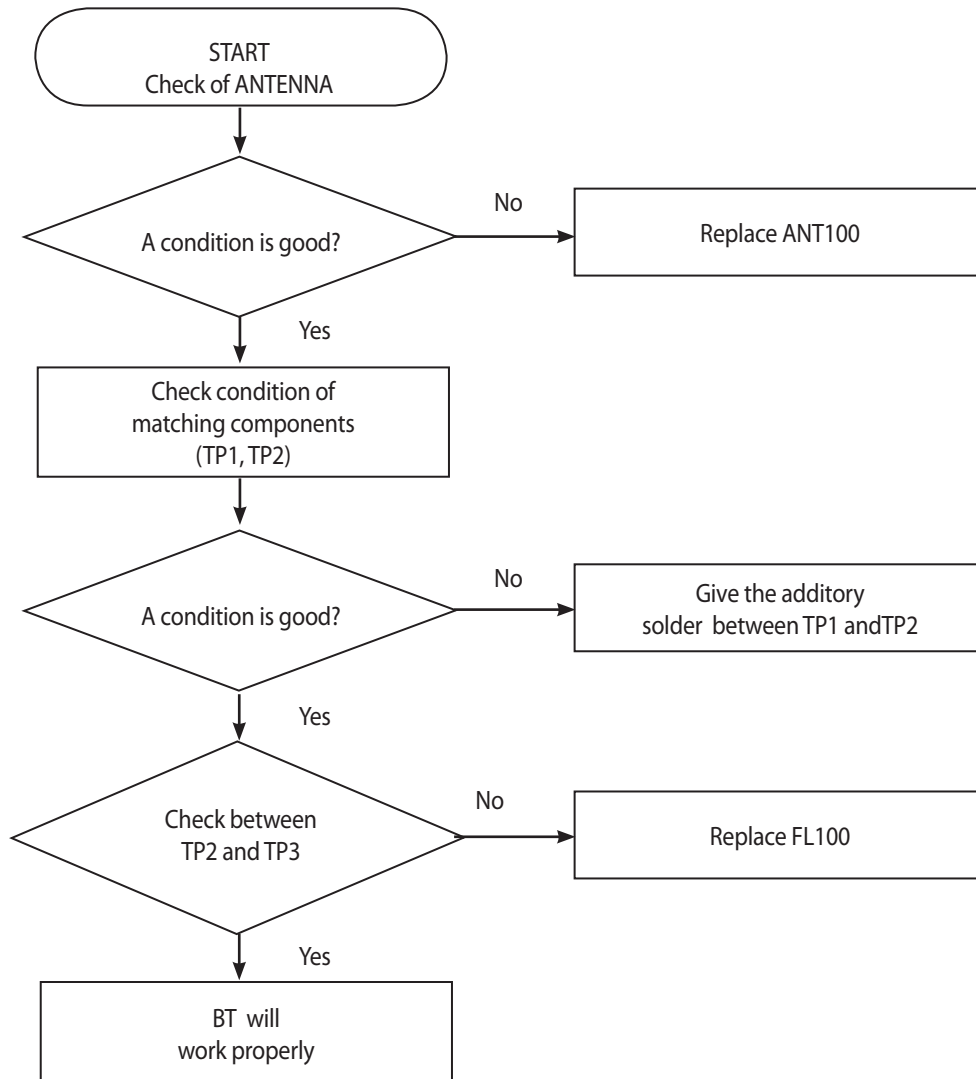


Figure 4.17.4 Checking flow (BLUE TOOTH)

4.17 FM Radio Trouble

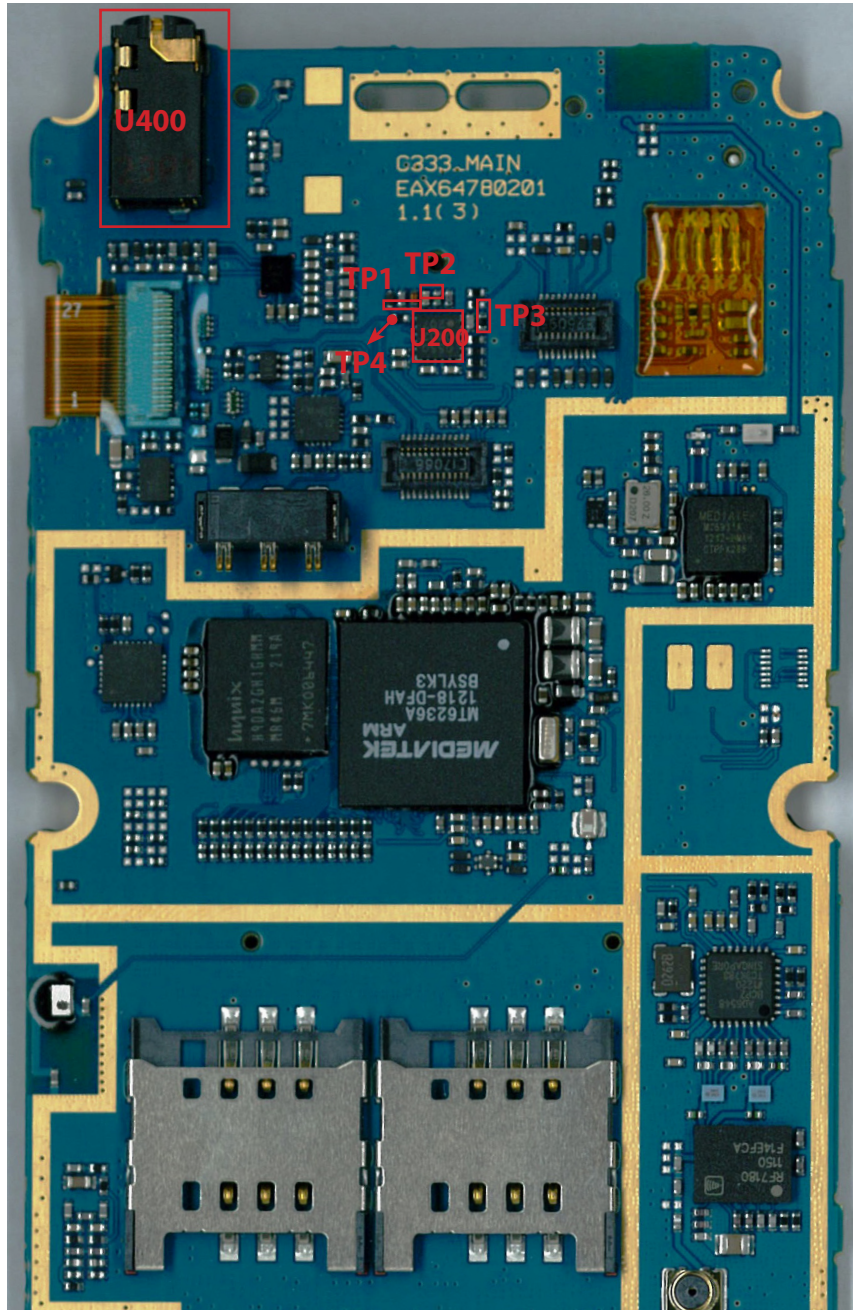


Figure 4.18.1 FM_RADIO Components Placements

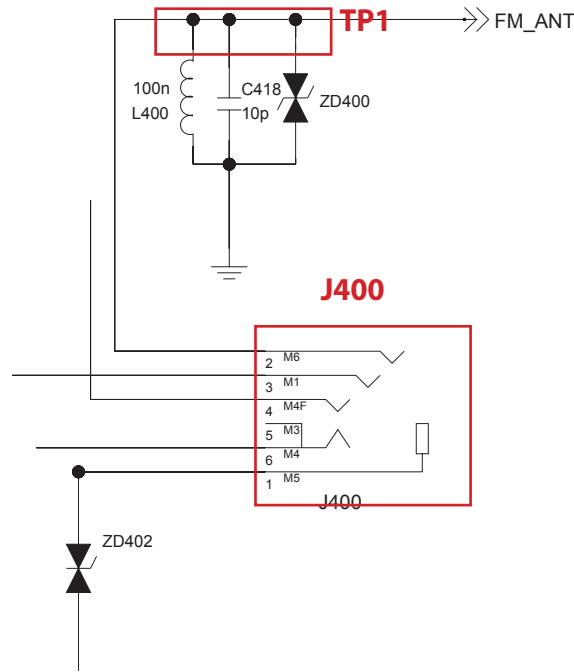


Figure 4.18.2 Circuit diagram(FM_RADIO 3.5phi conn't)

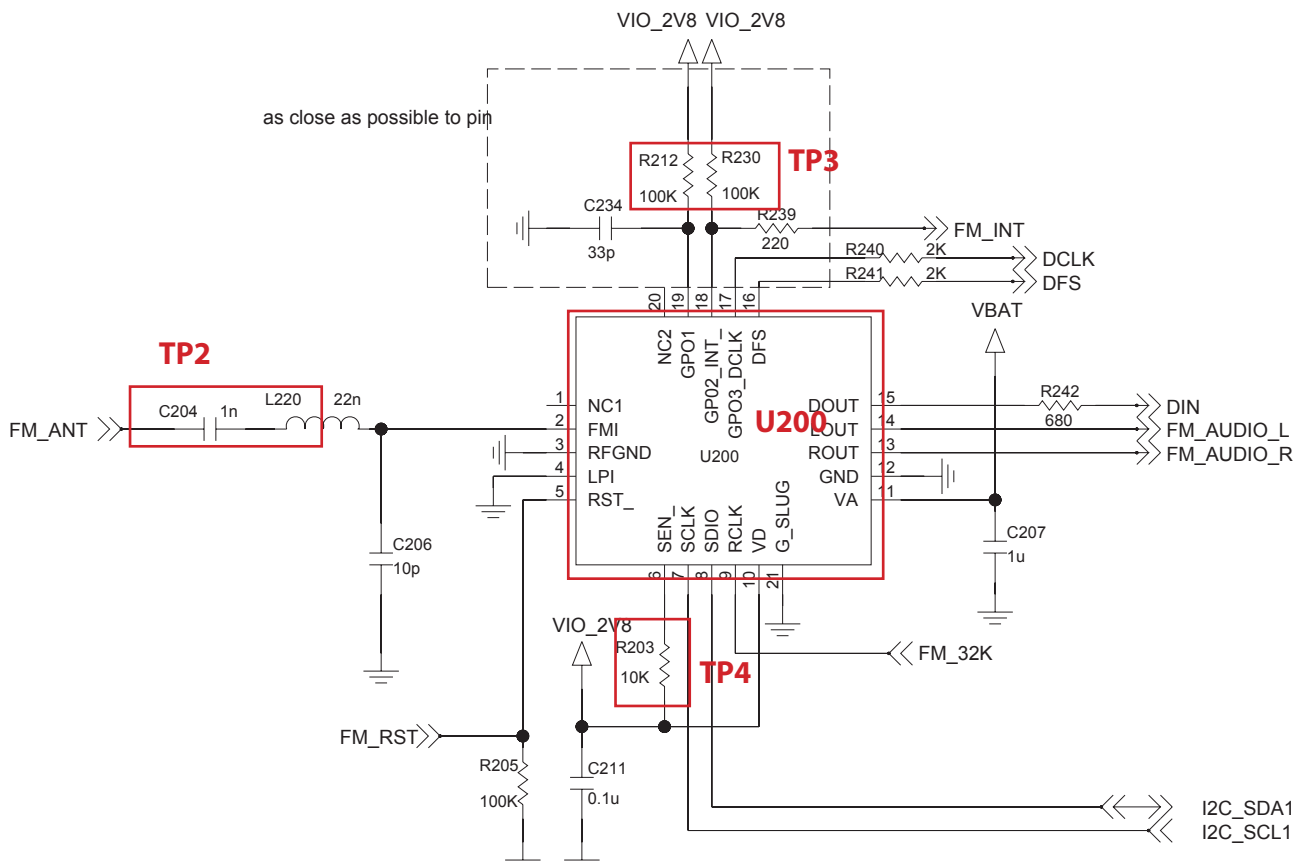


Figure 4.18.3 Circuit diagram(FM_Radio_Module)

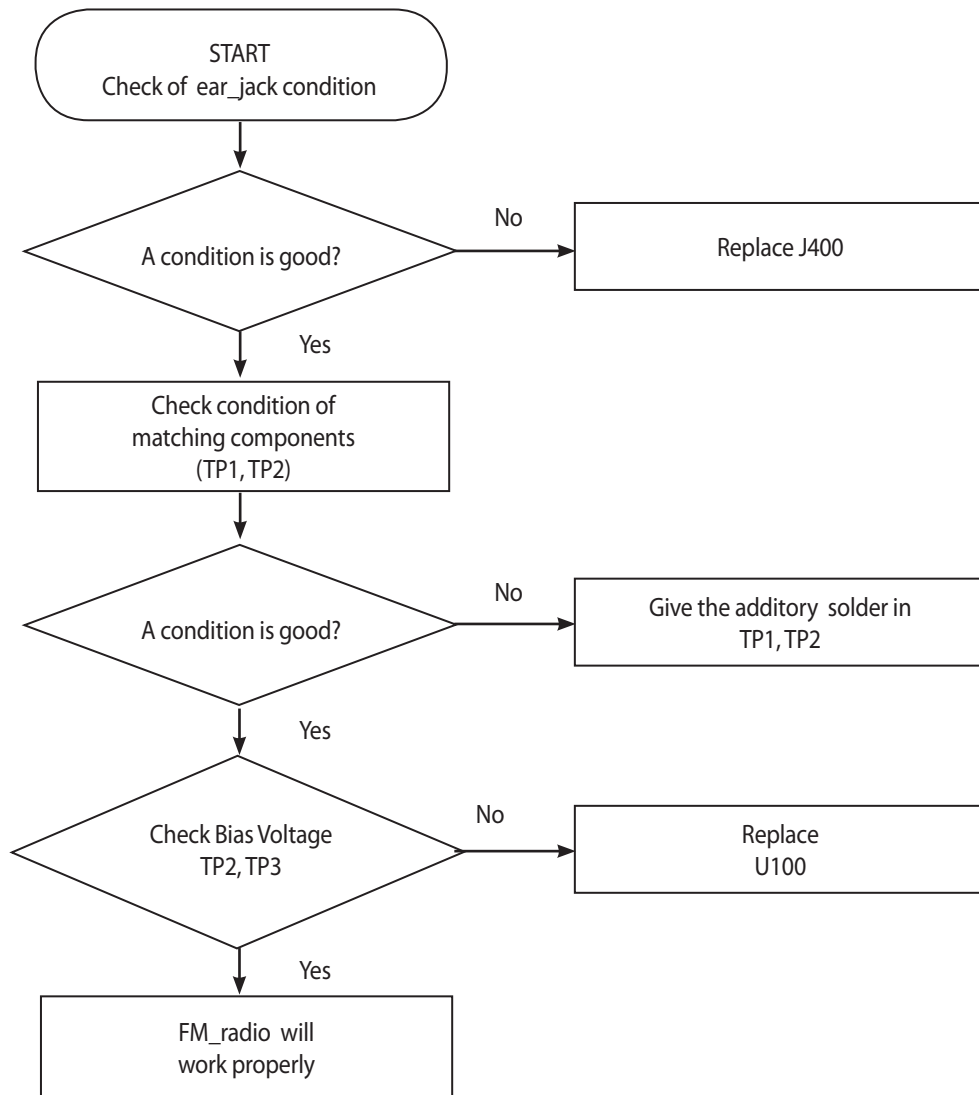


Figure 4.18.4 Checking flow (FM_RADIO)

4.18 WIFI Trouble

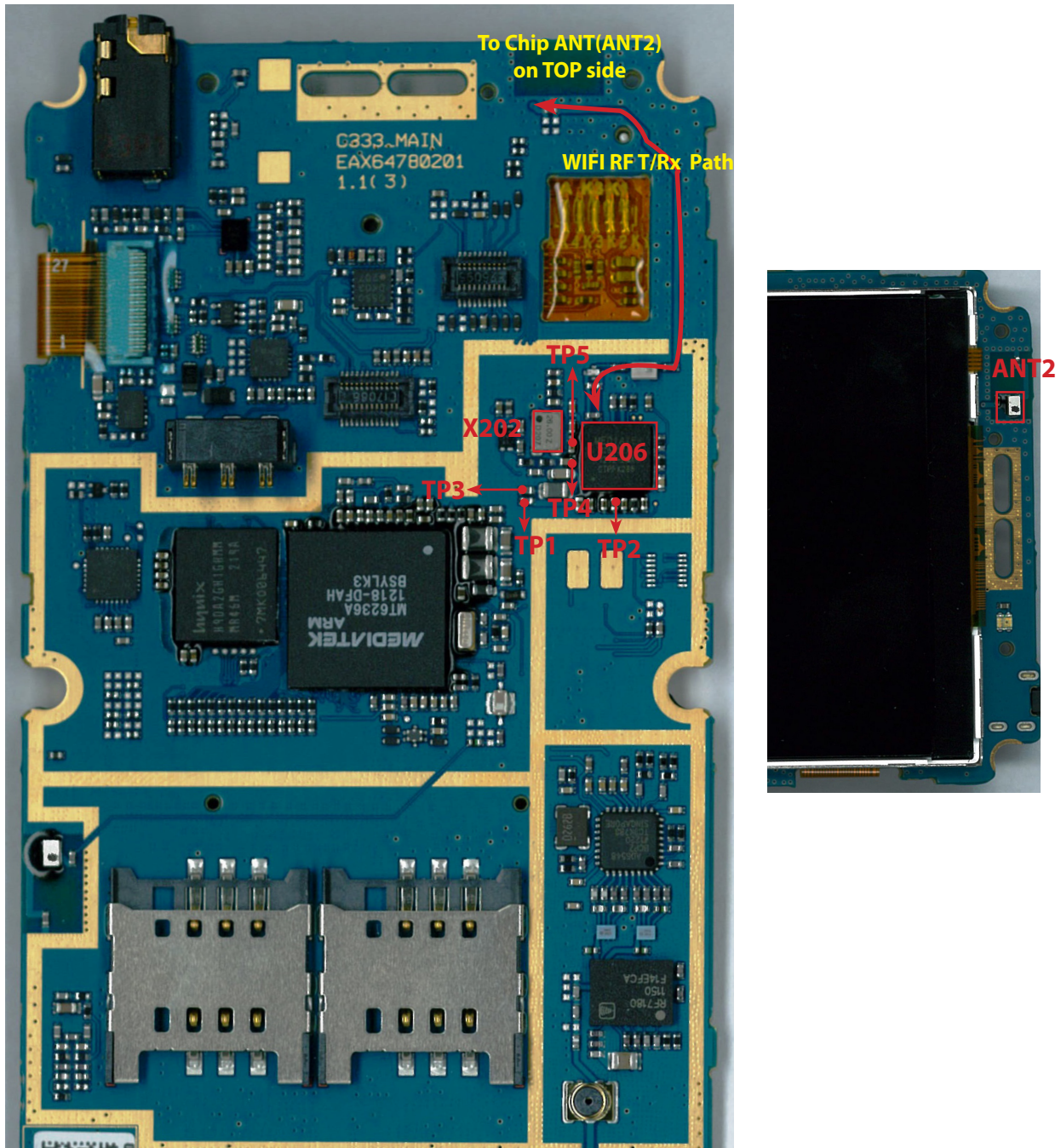


Figure 4.19.1 WIFI Components Placements(bottom/TOP)

Figure 4.19.2 WIFI circuit diagram

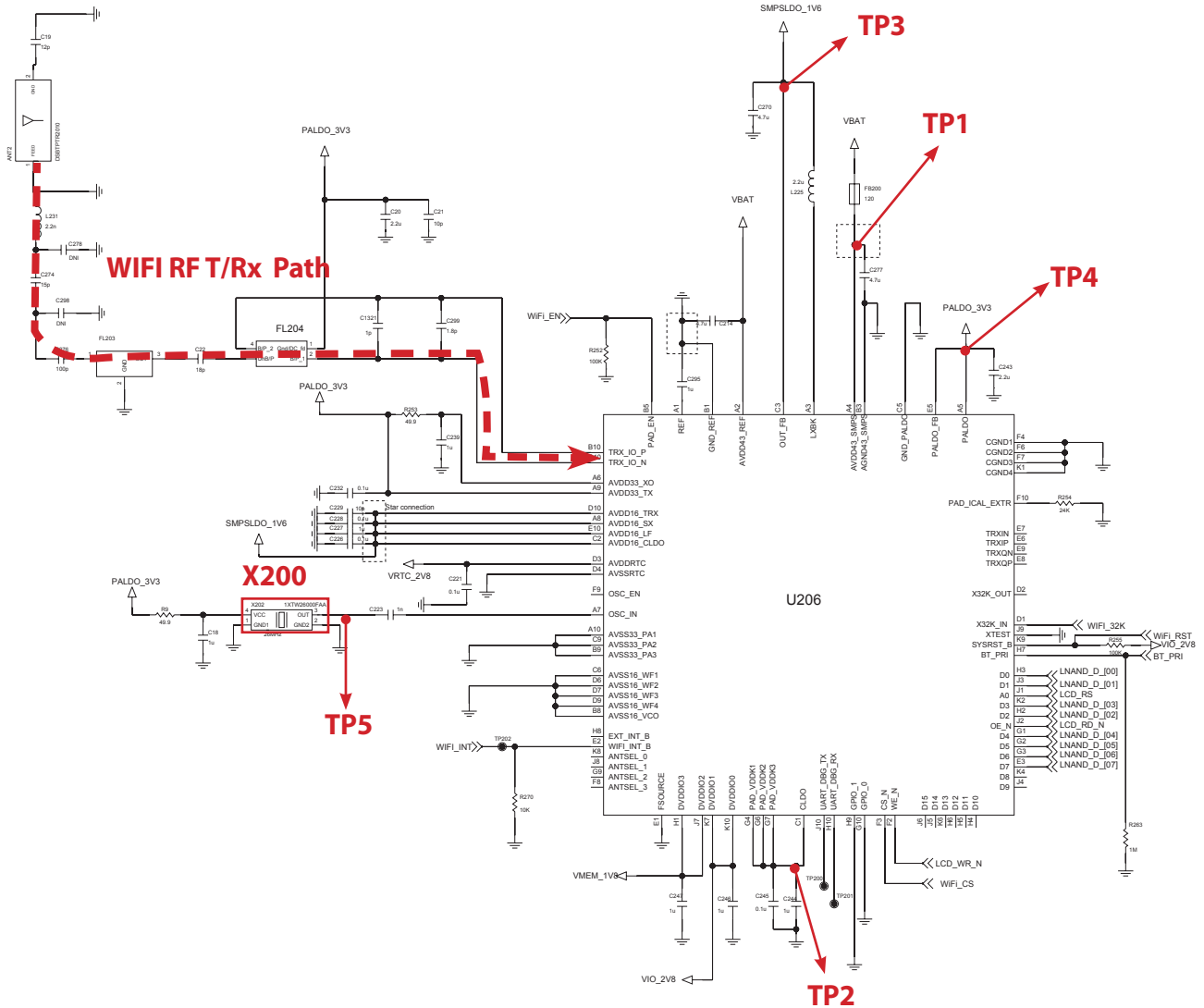


Figure 4.19.2 WIFI circuit diagram

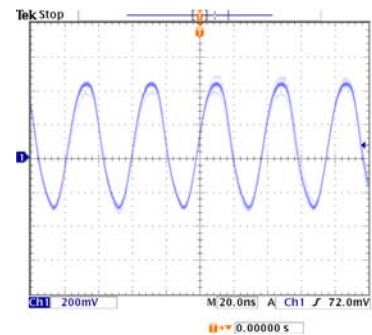
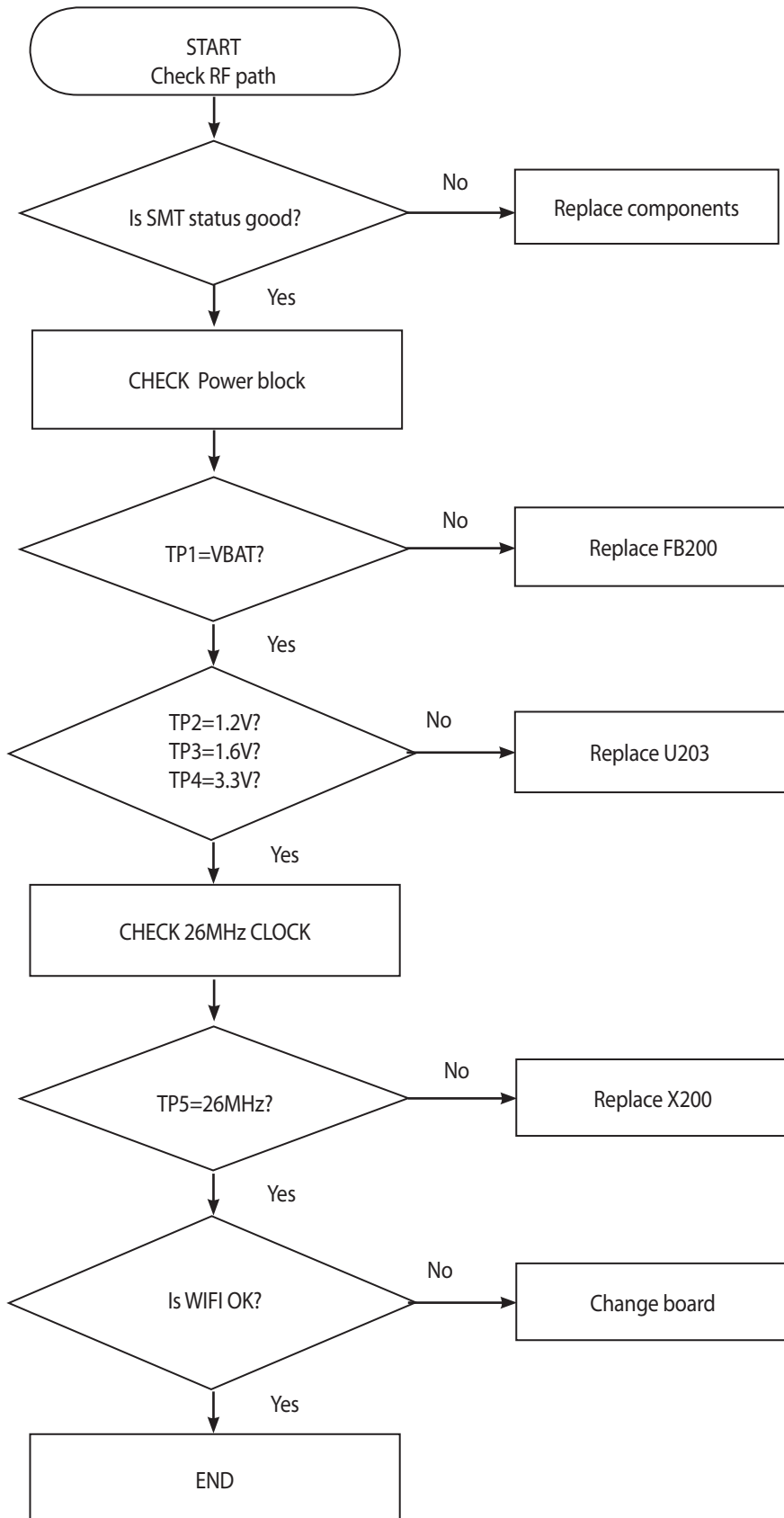
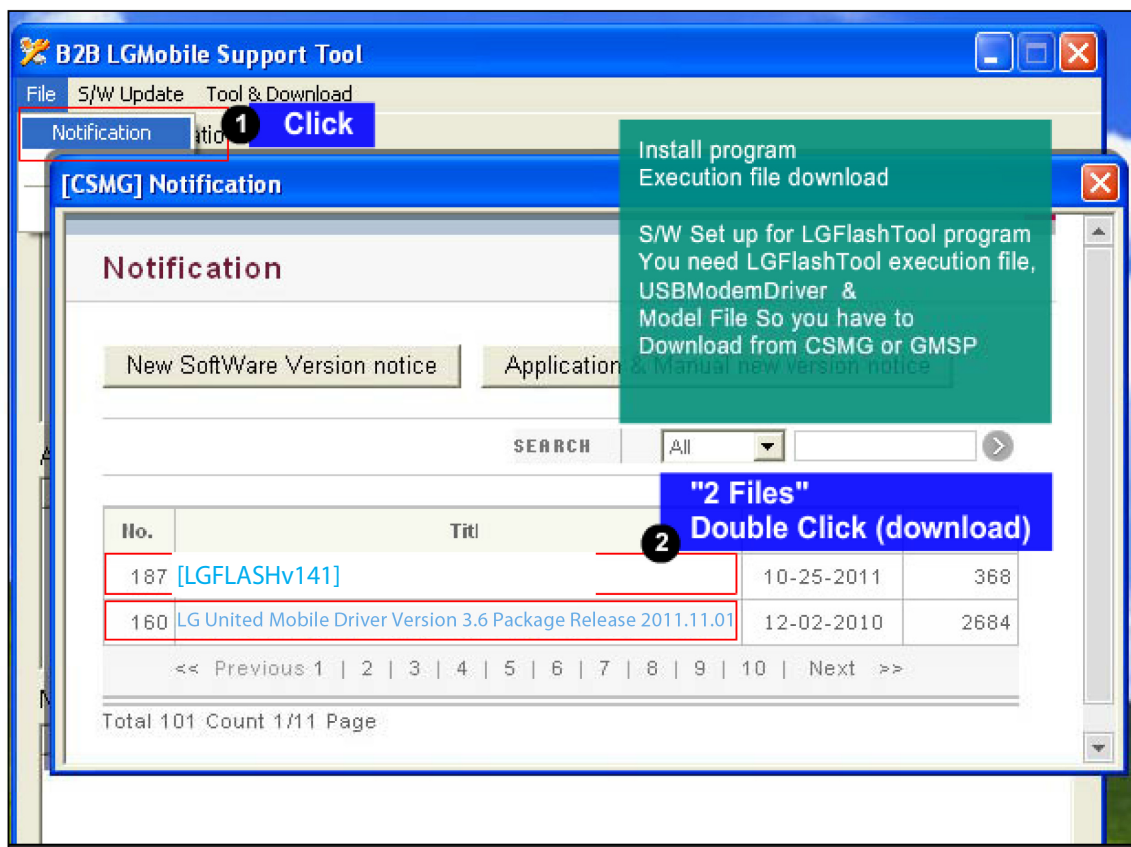
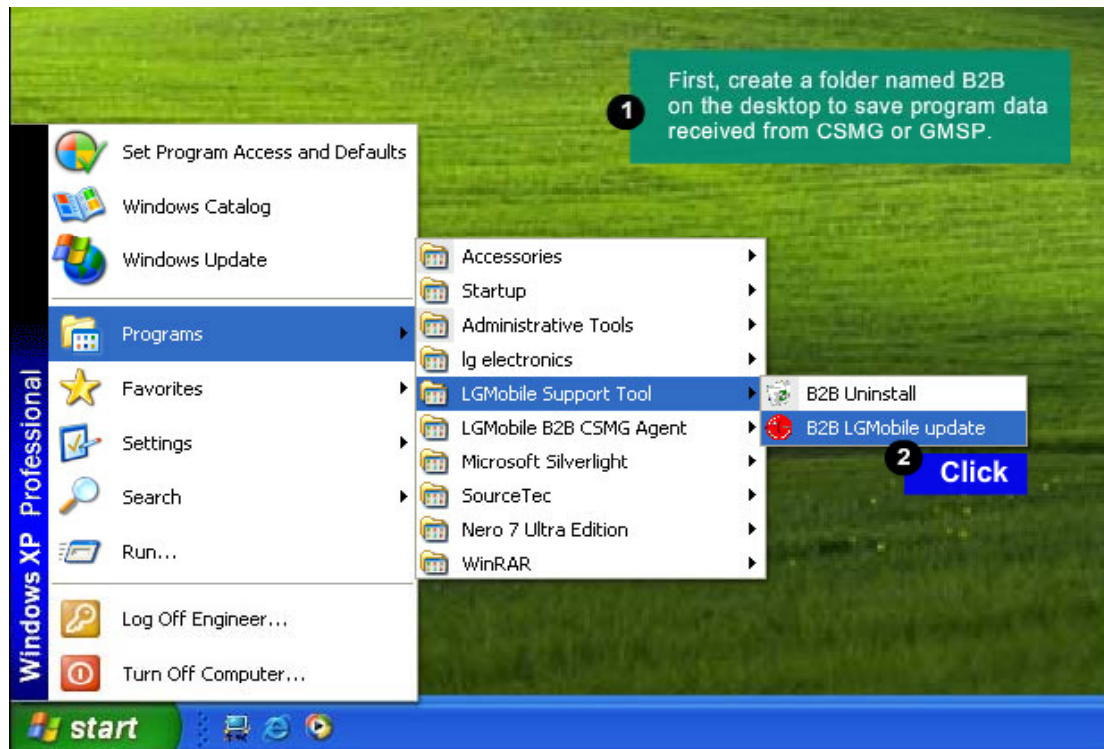
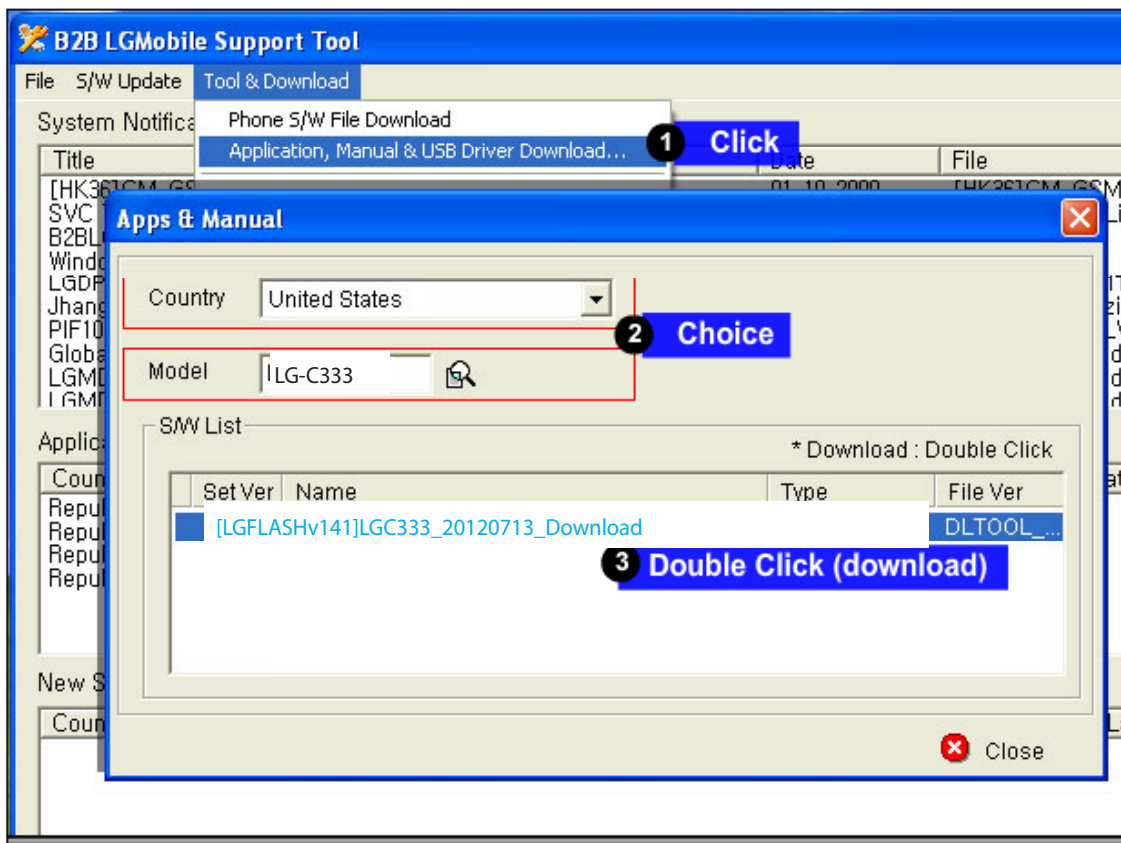
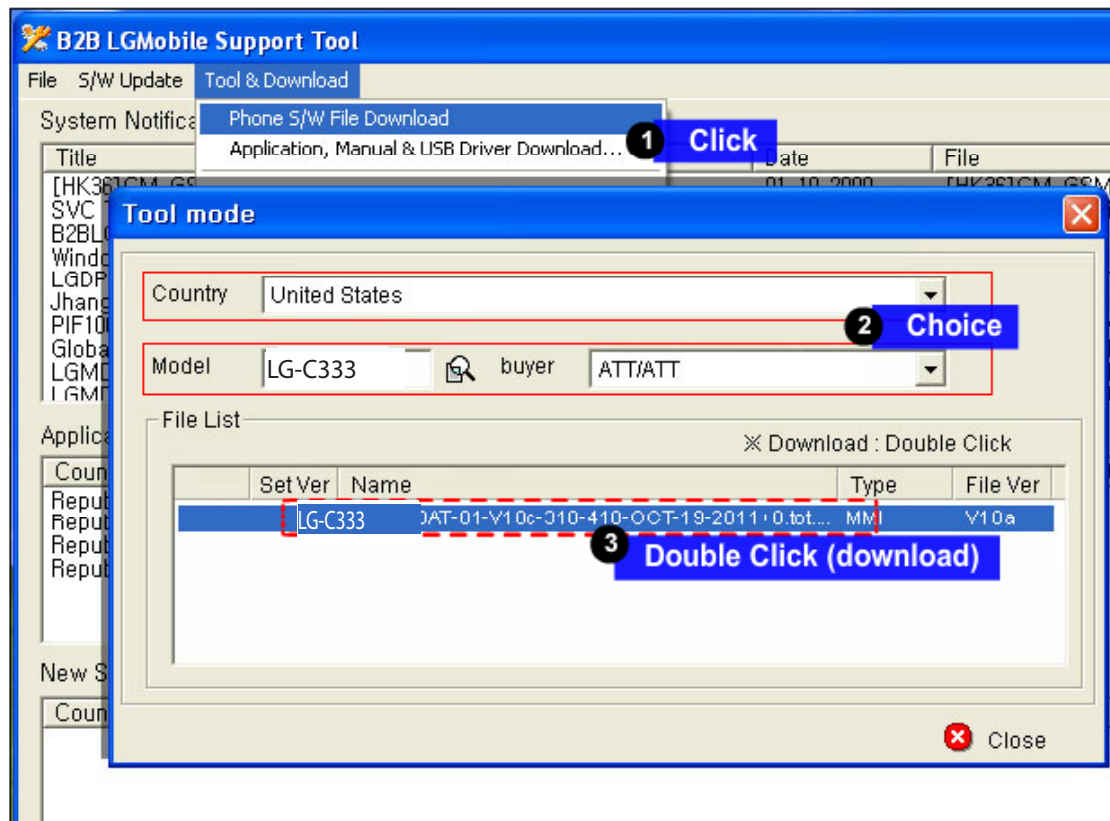


Figure 4.19.4 26M CLOCK

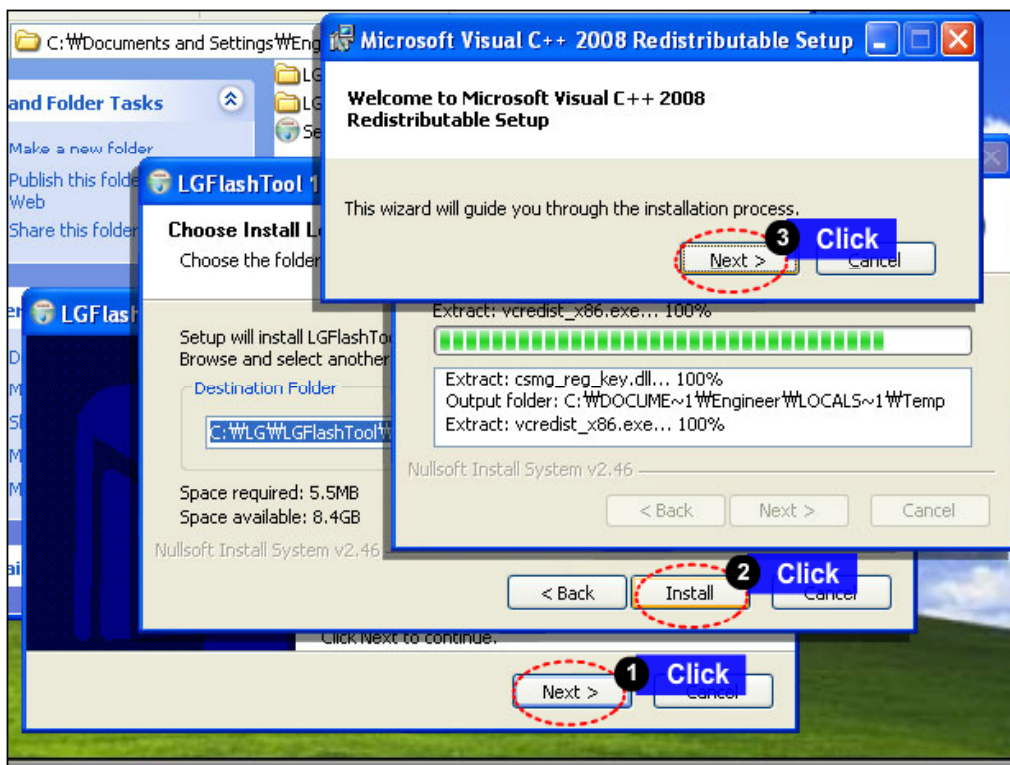
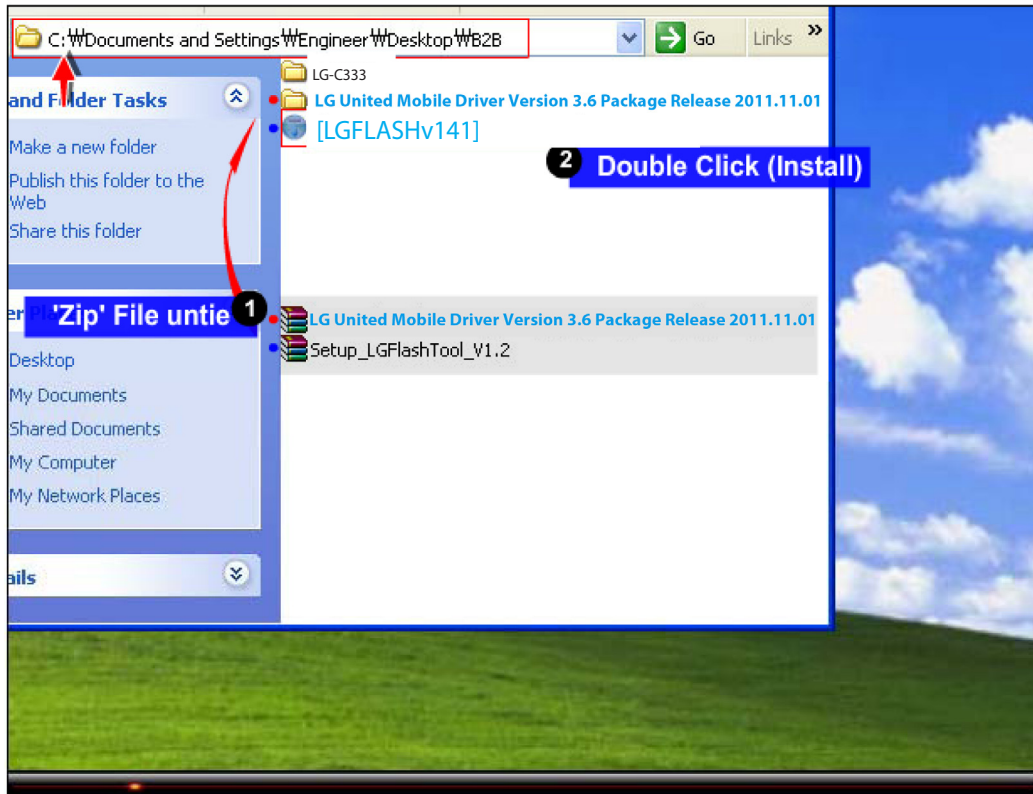
5. DOWNLOAD

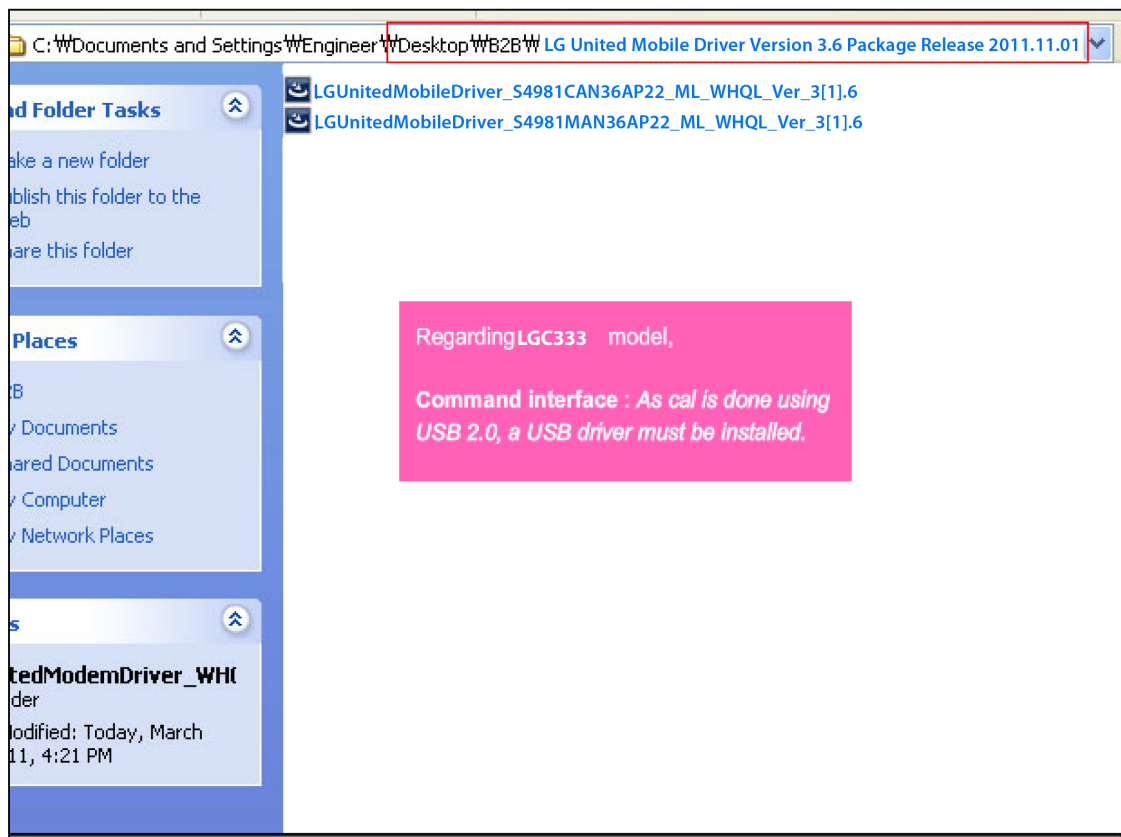


5. DOWNLOAD

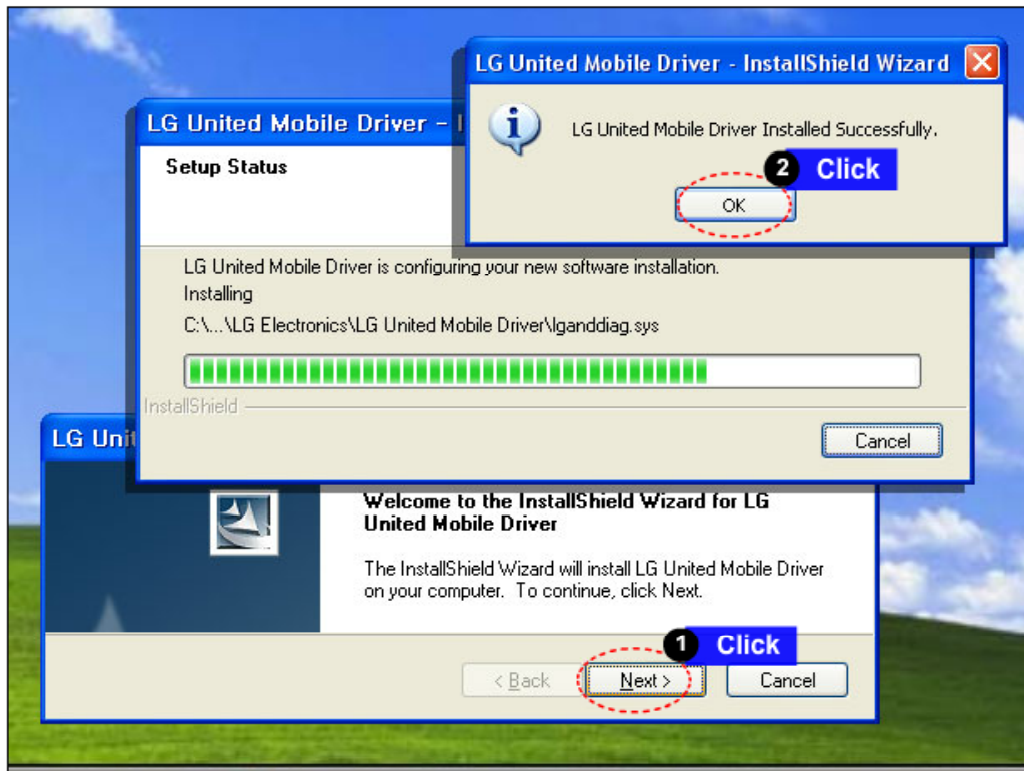
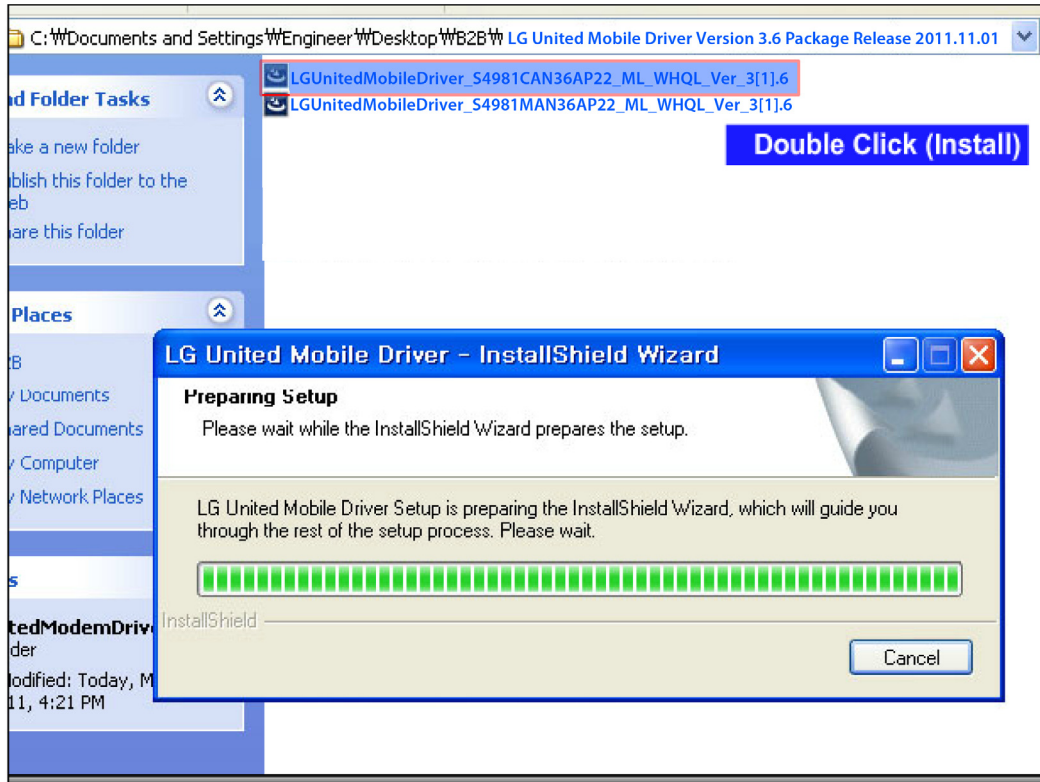


5. DOWNLOAD

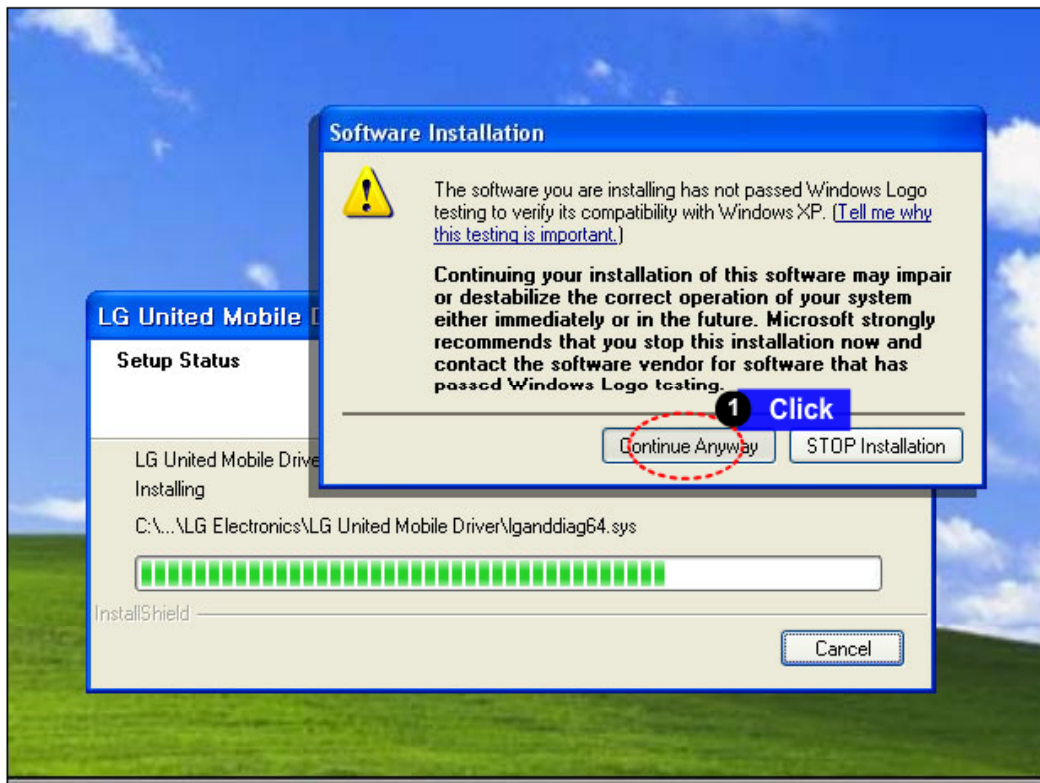
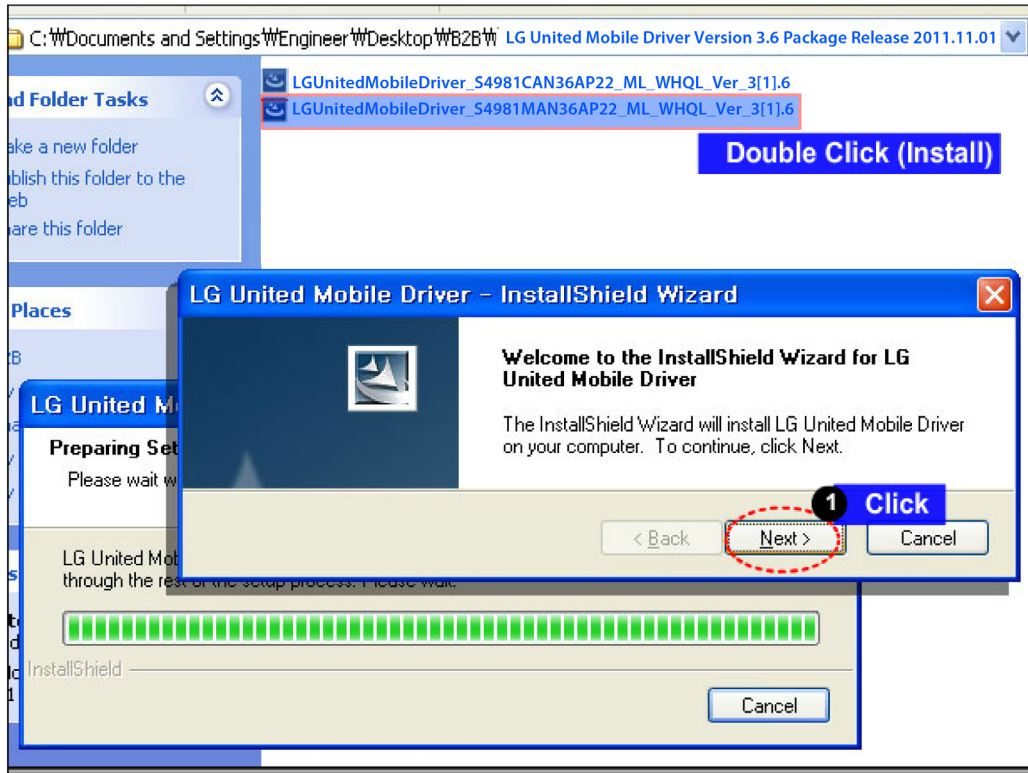




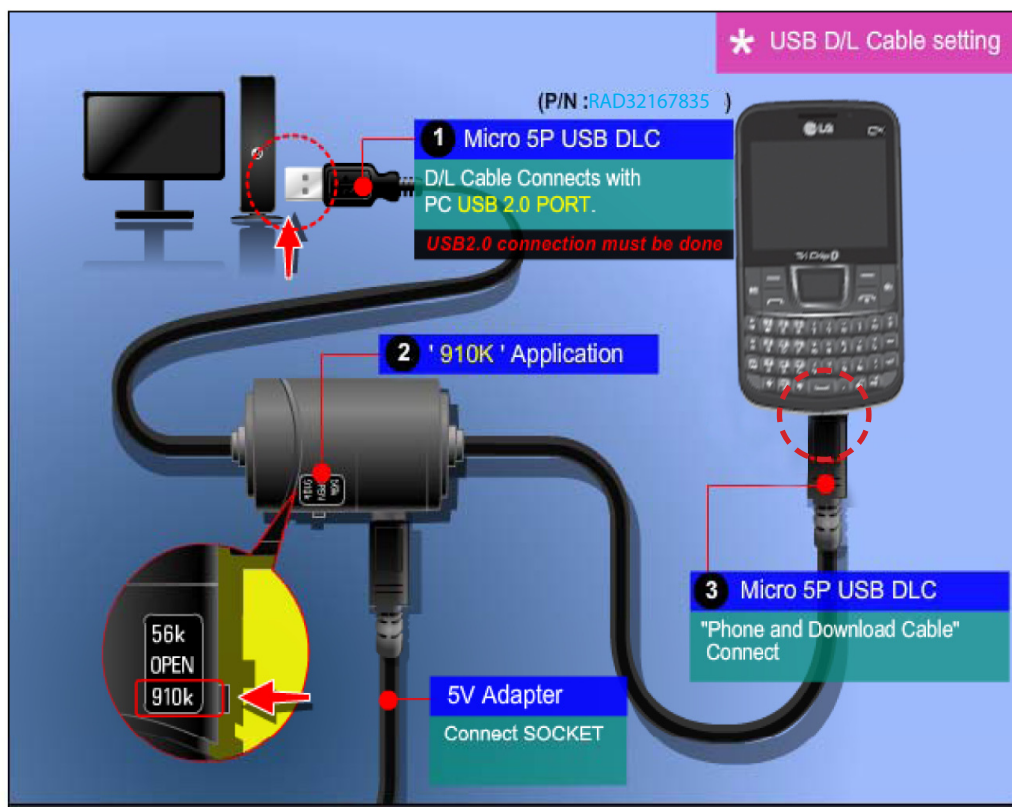
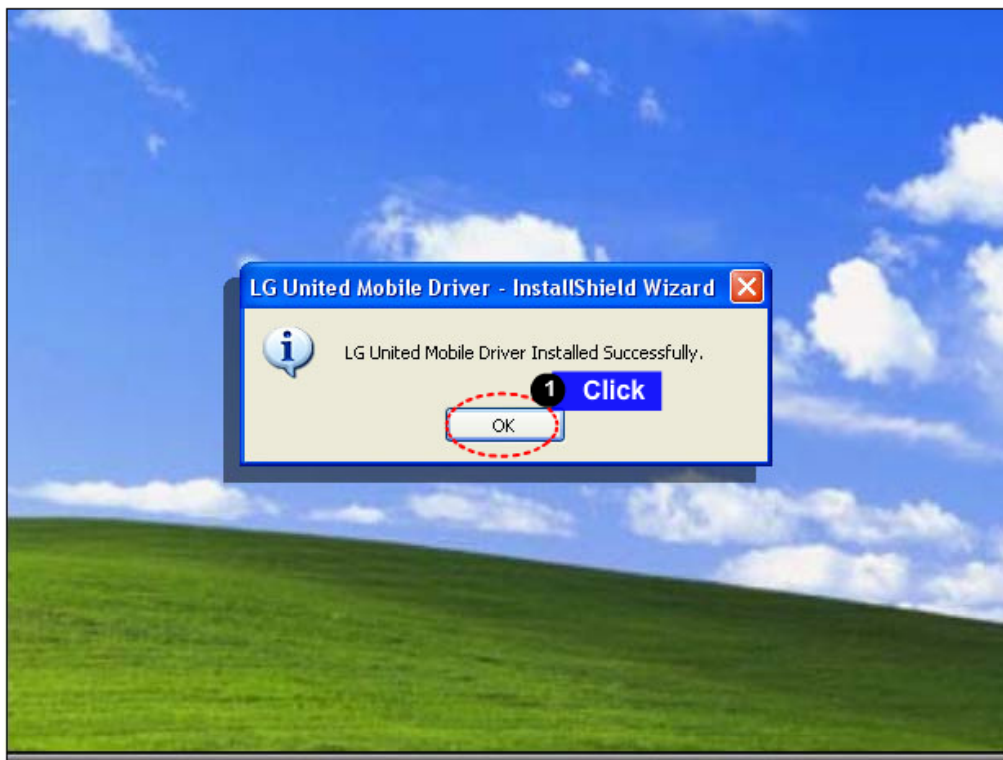
5. DOWNLOAD

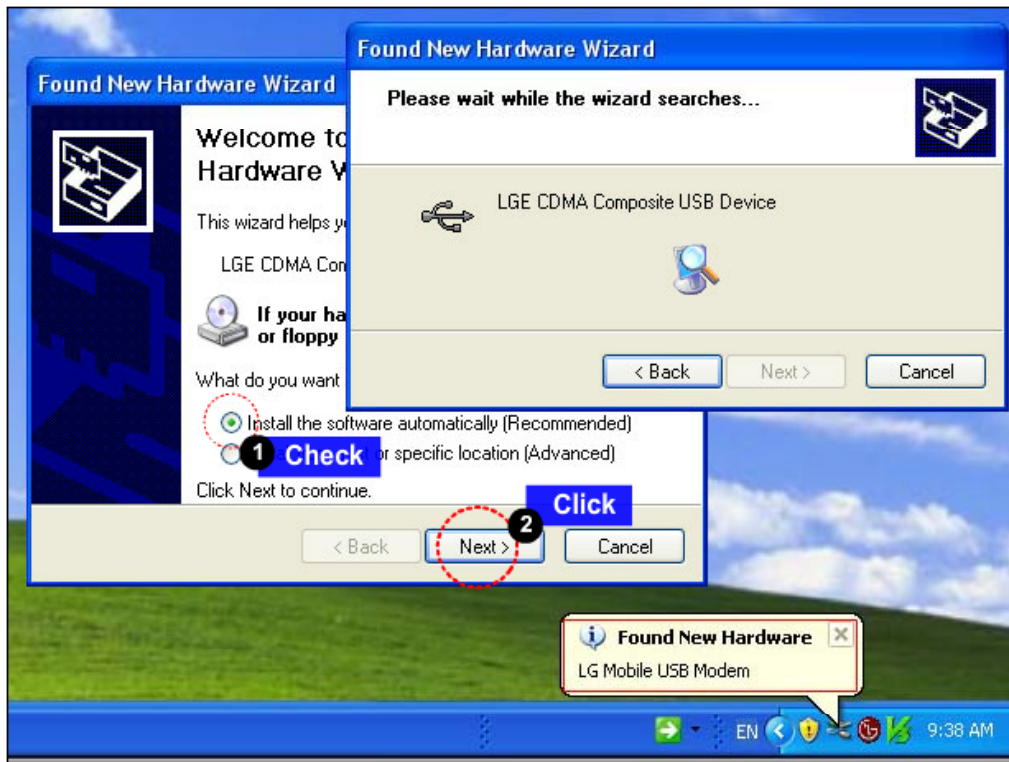
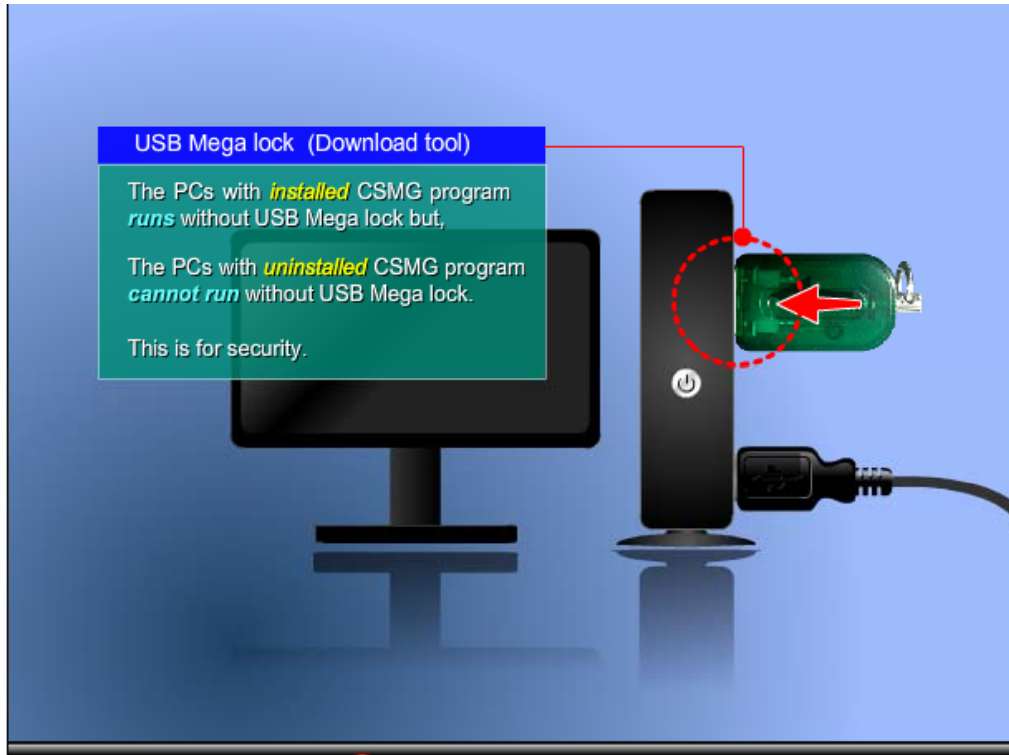


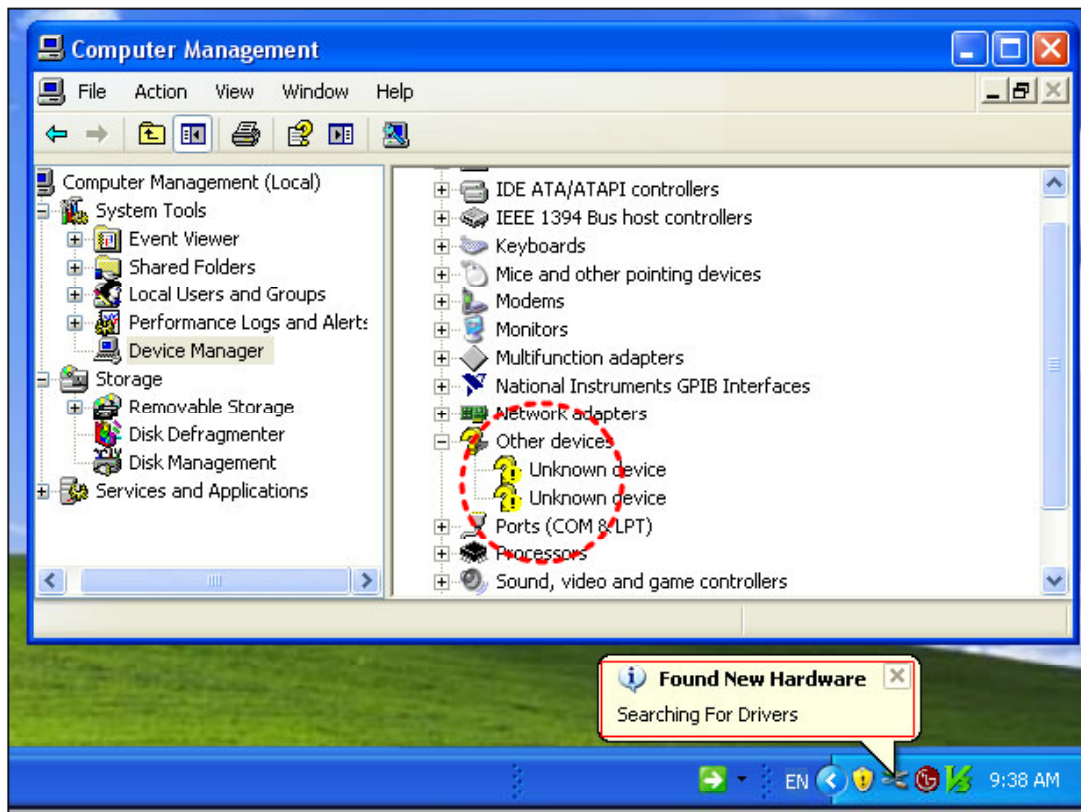
5. DOWNLOAD

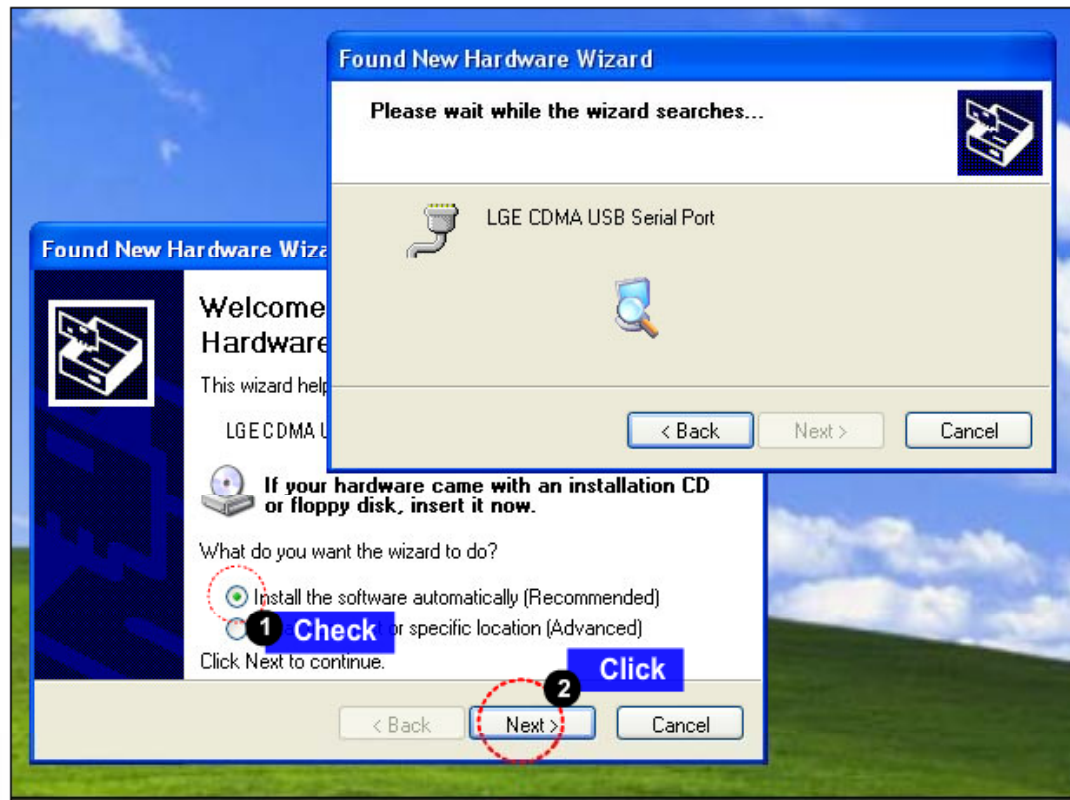
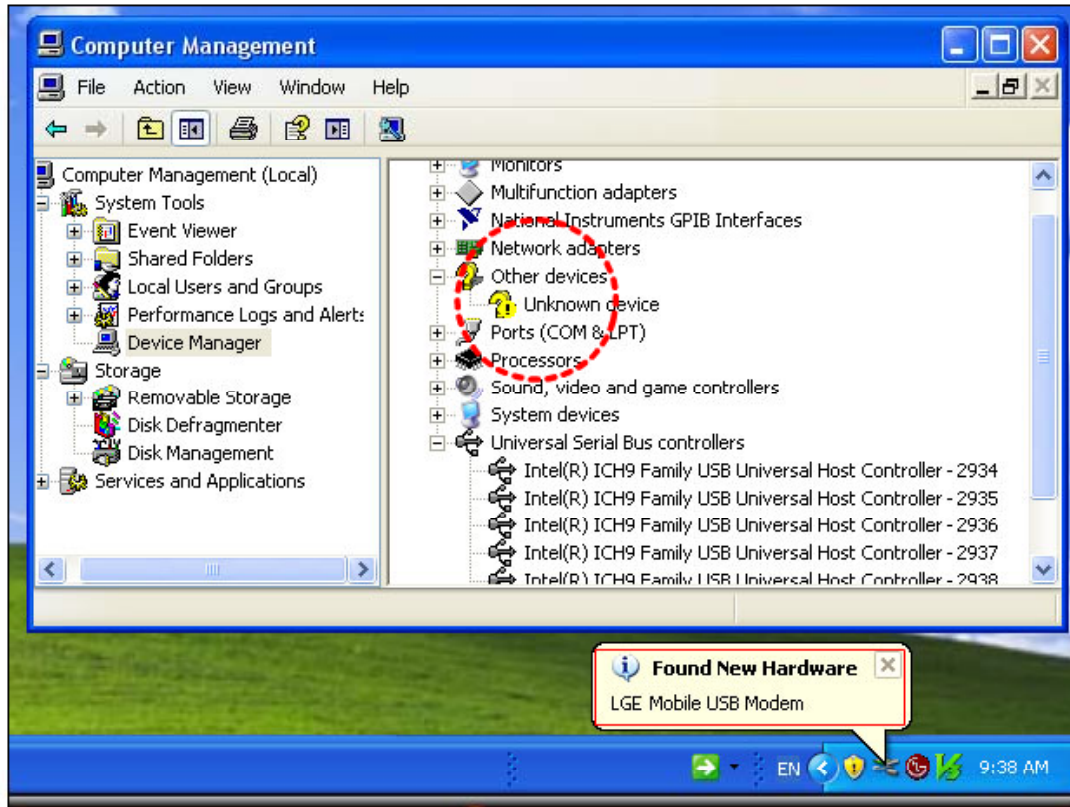


5. DOWNLOAD

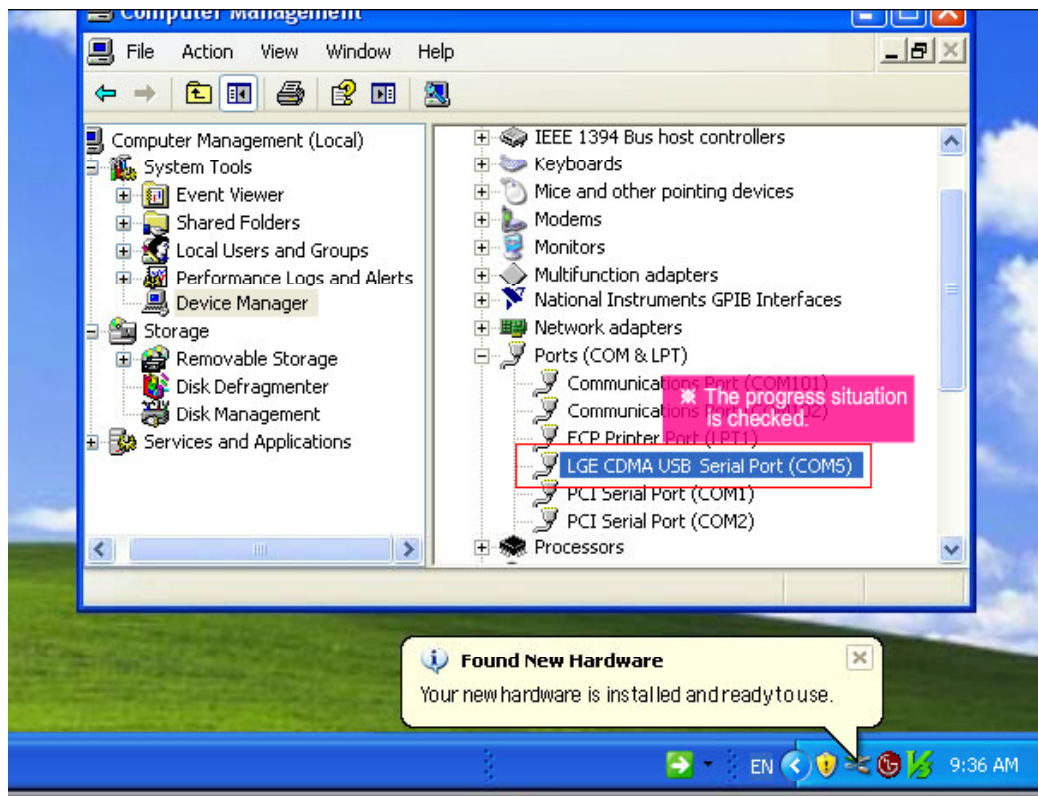
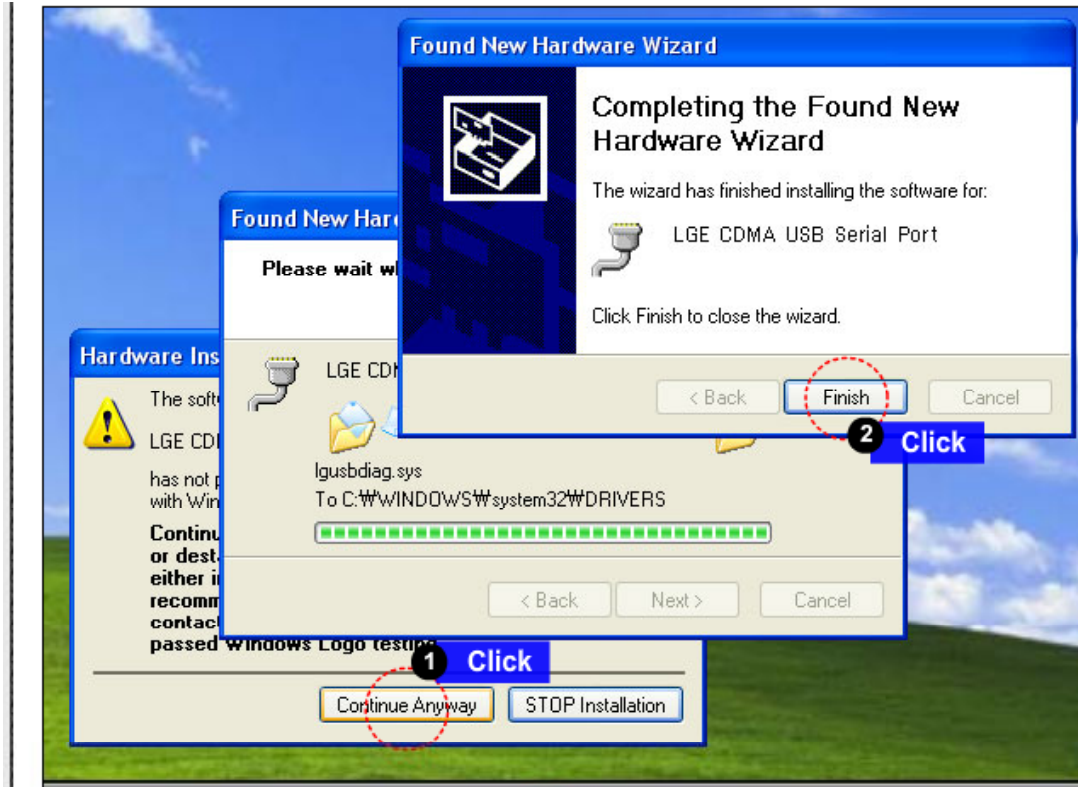


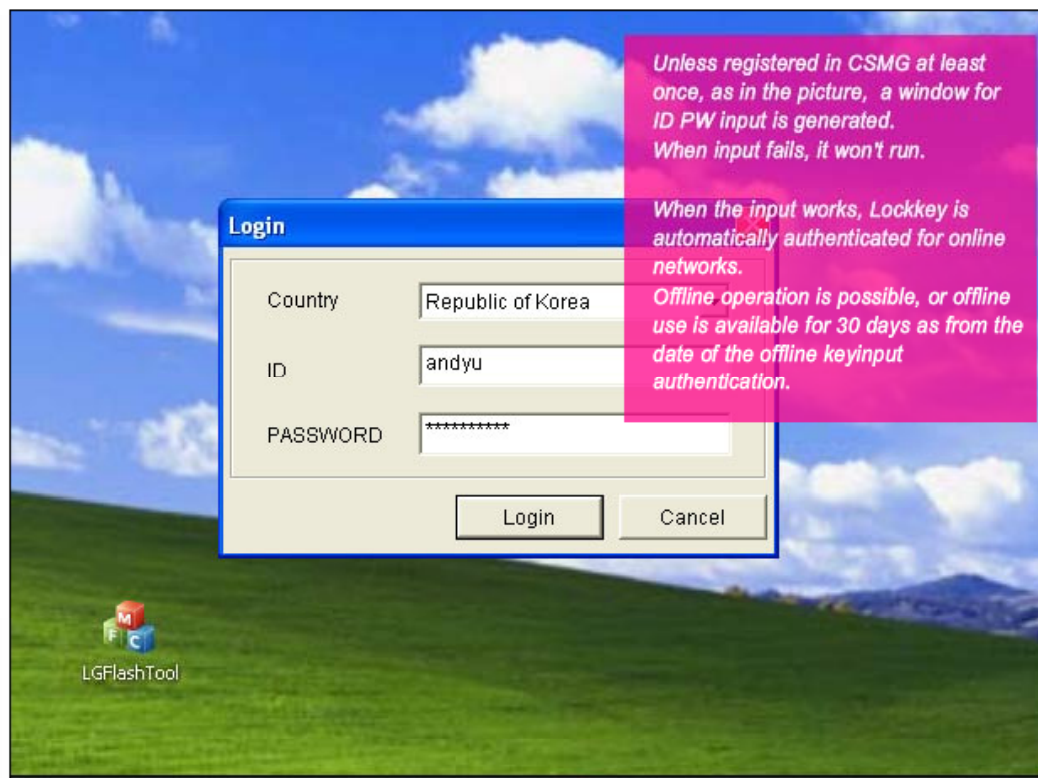
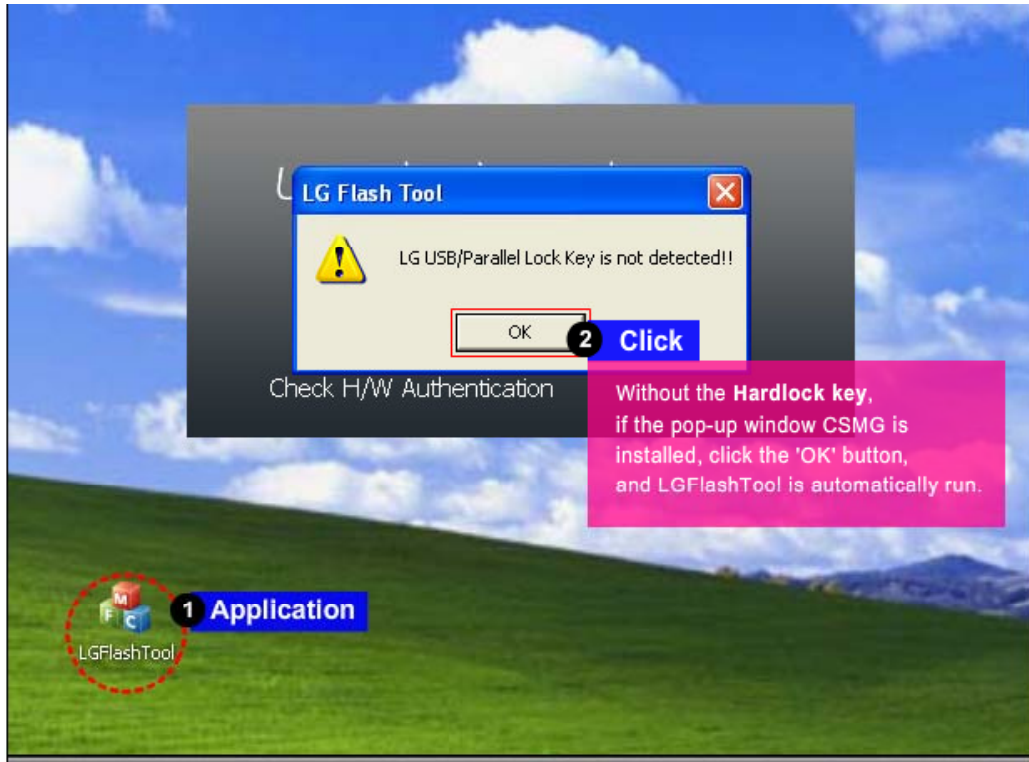




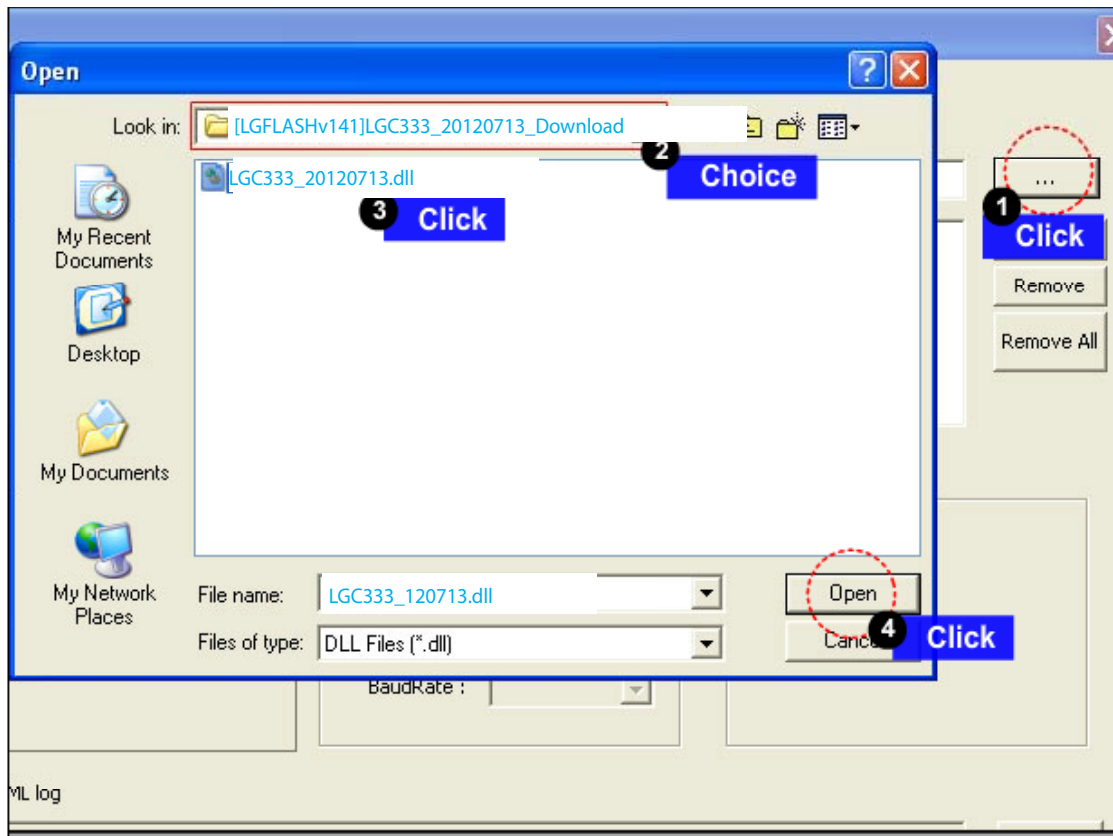
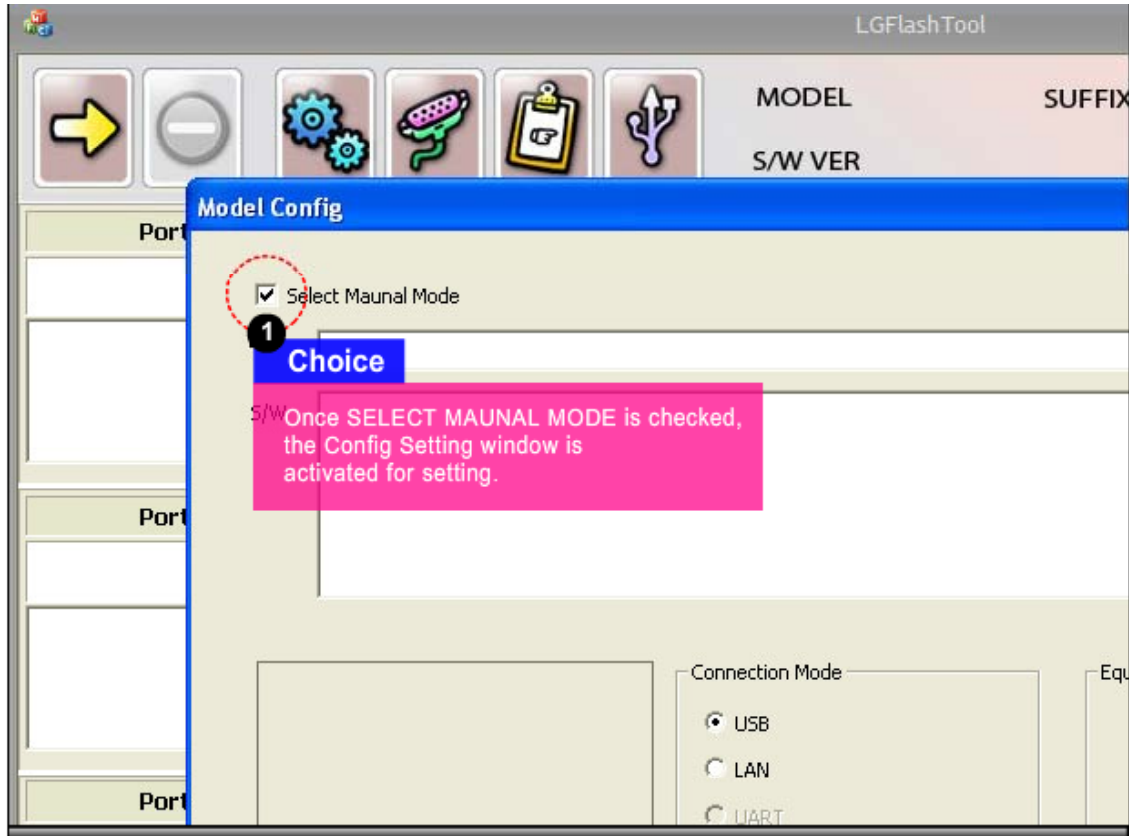


5. DOWNLOAD

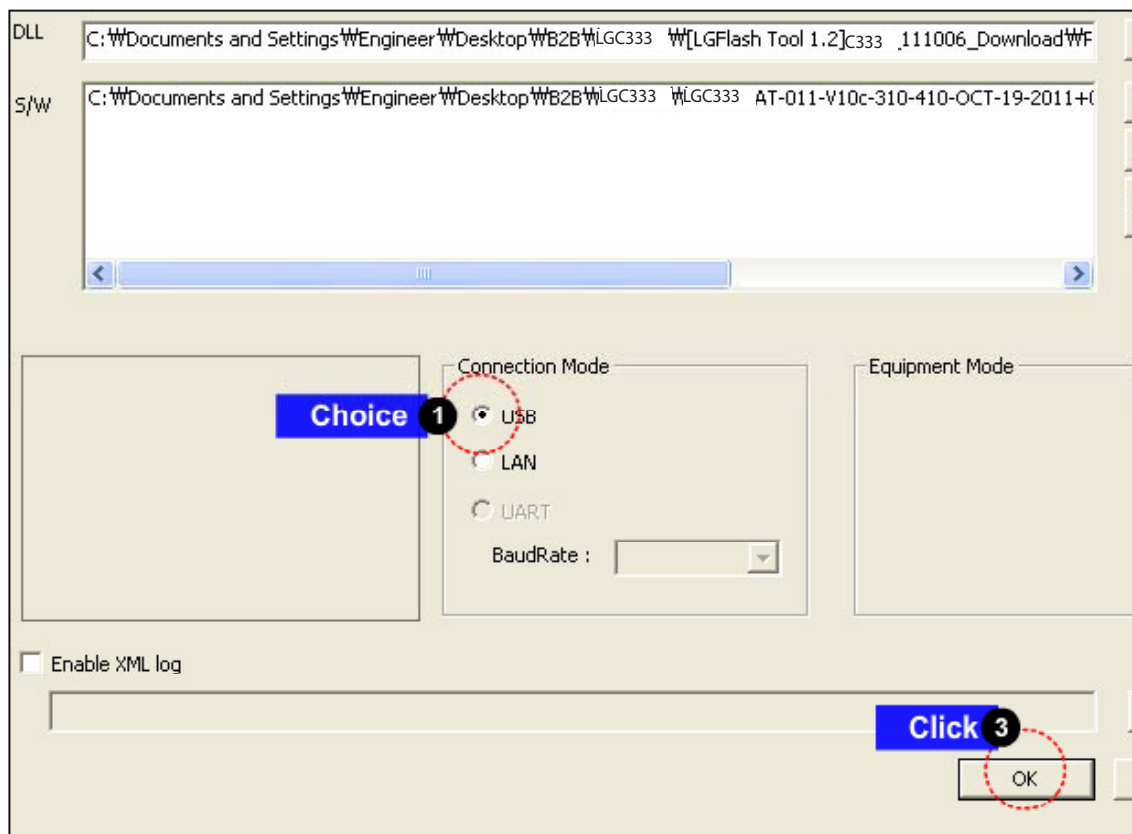
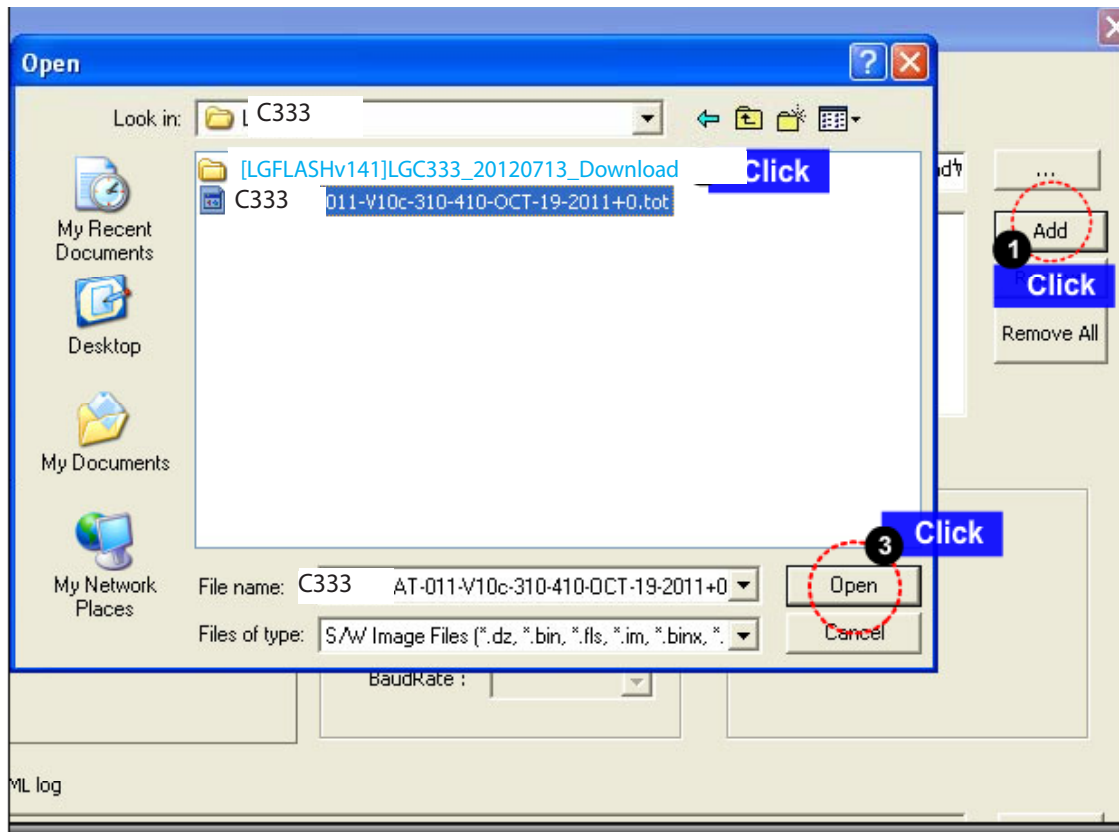




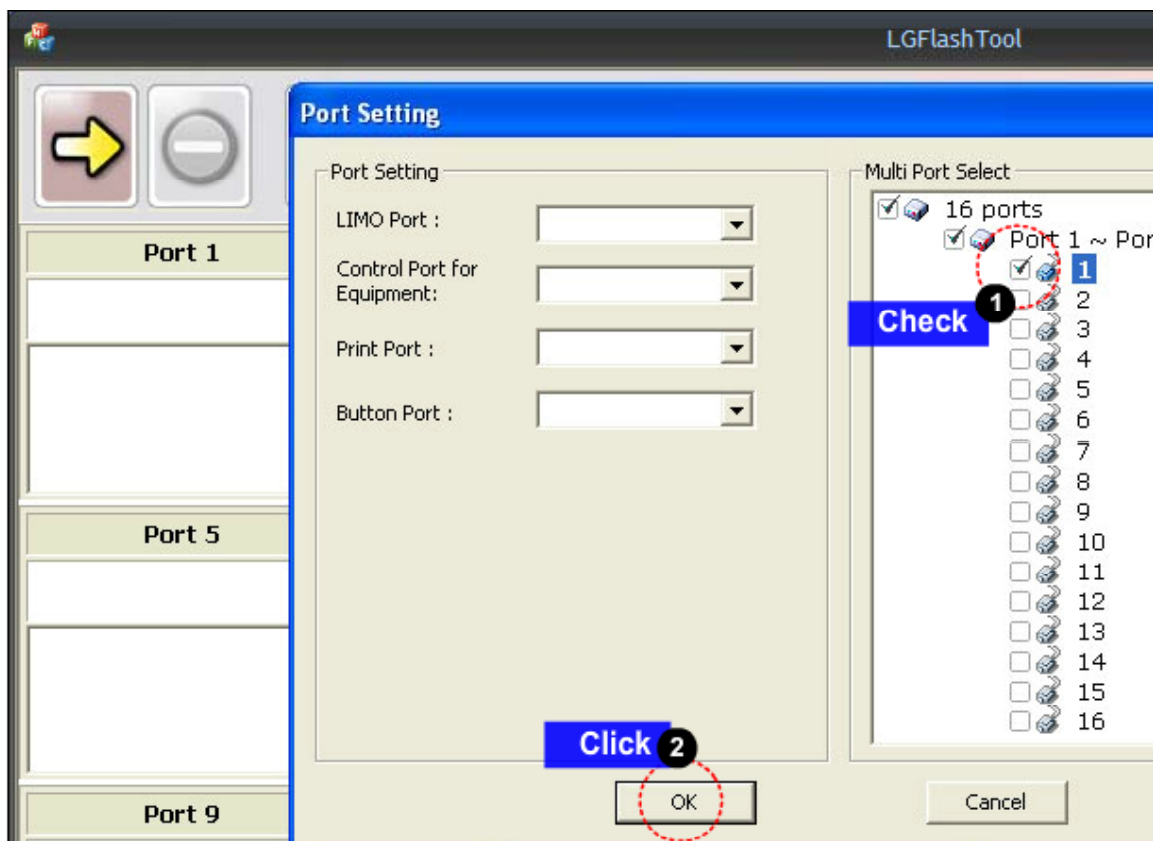
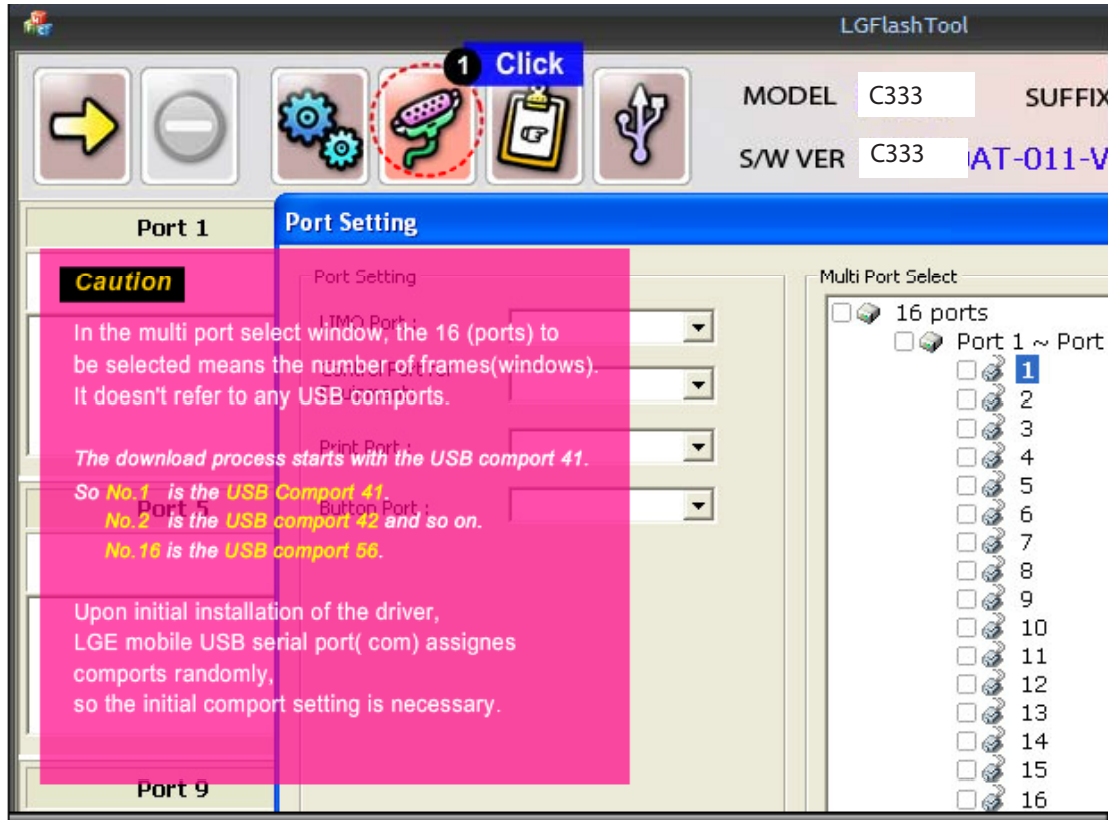
5. DOWNLOAD

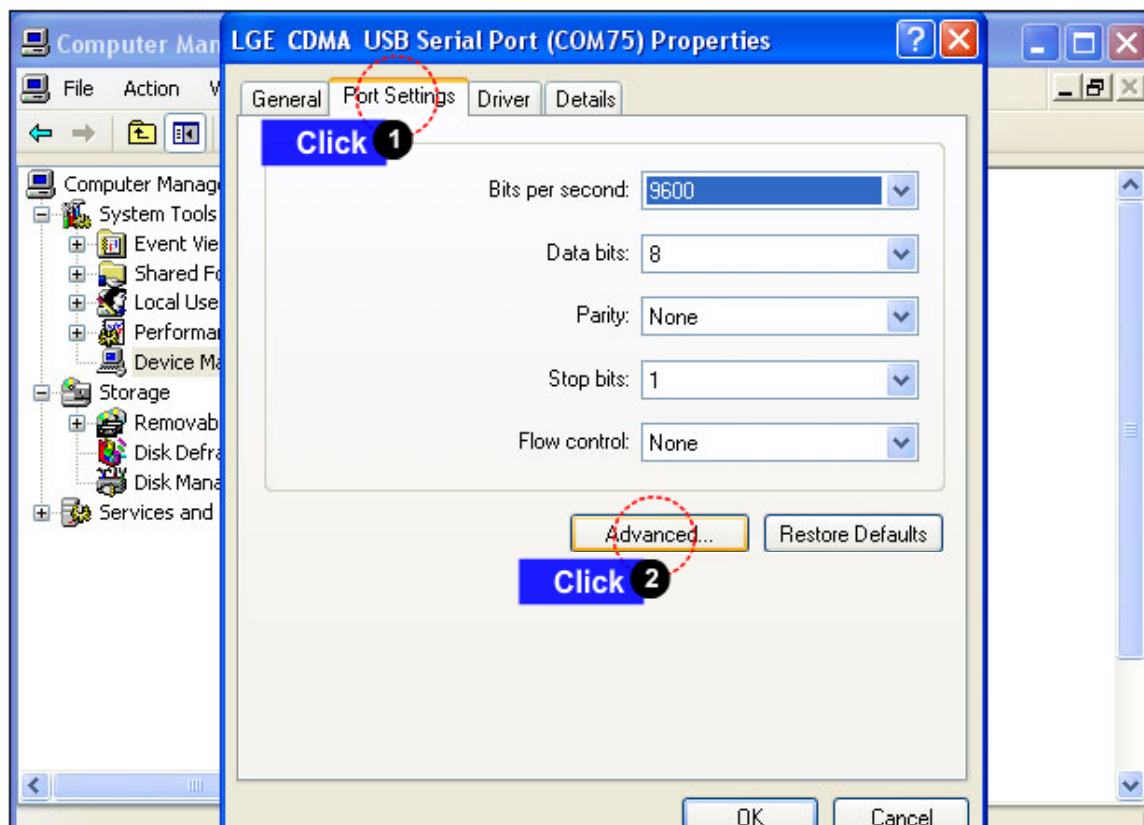
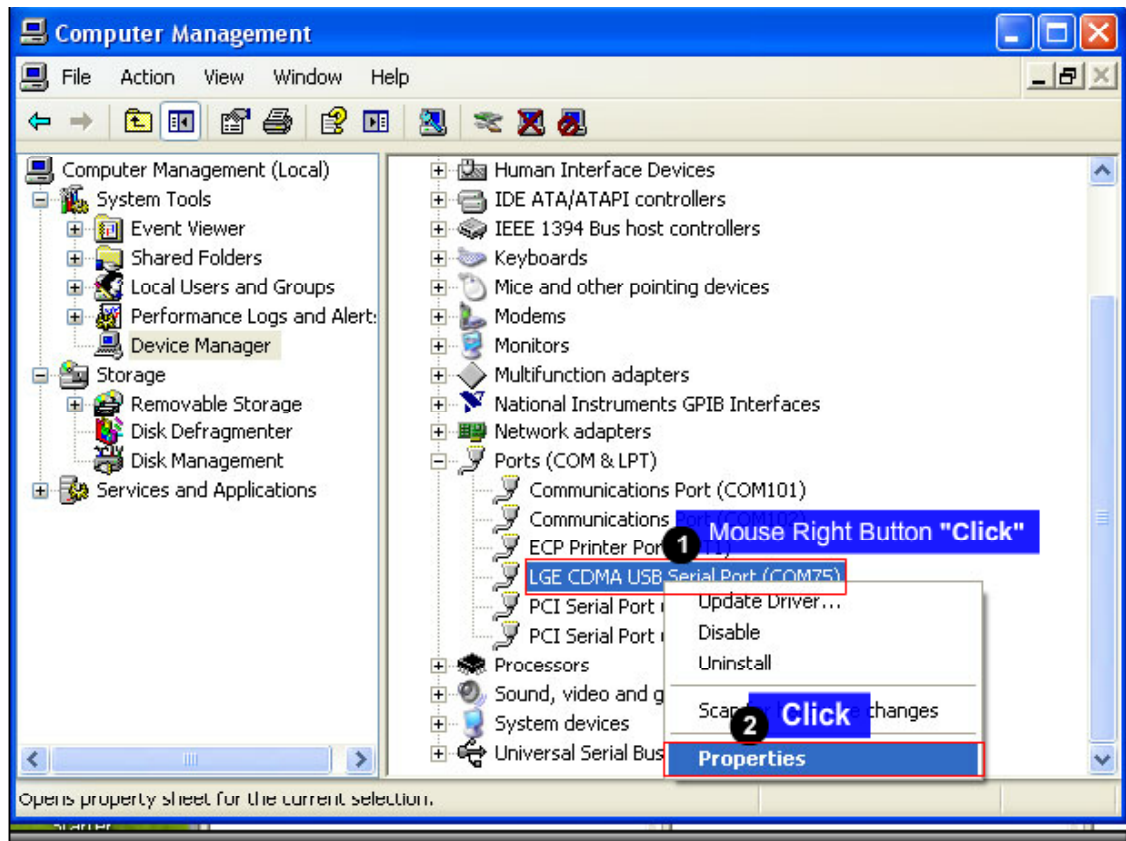


5. DOWNLOAD

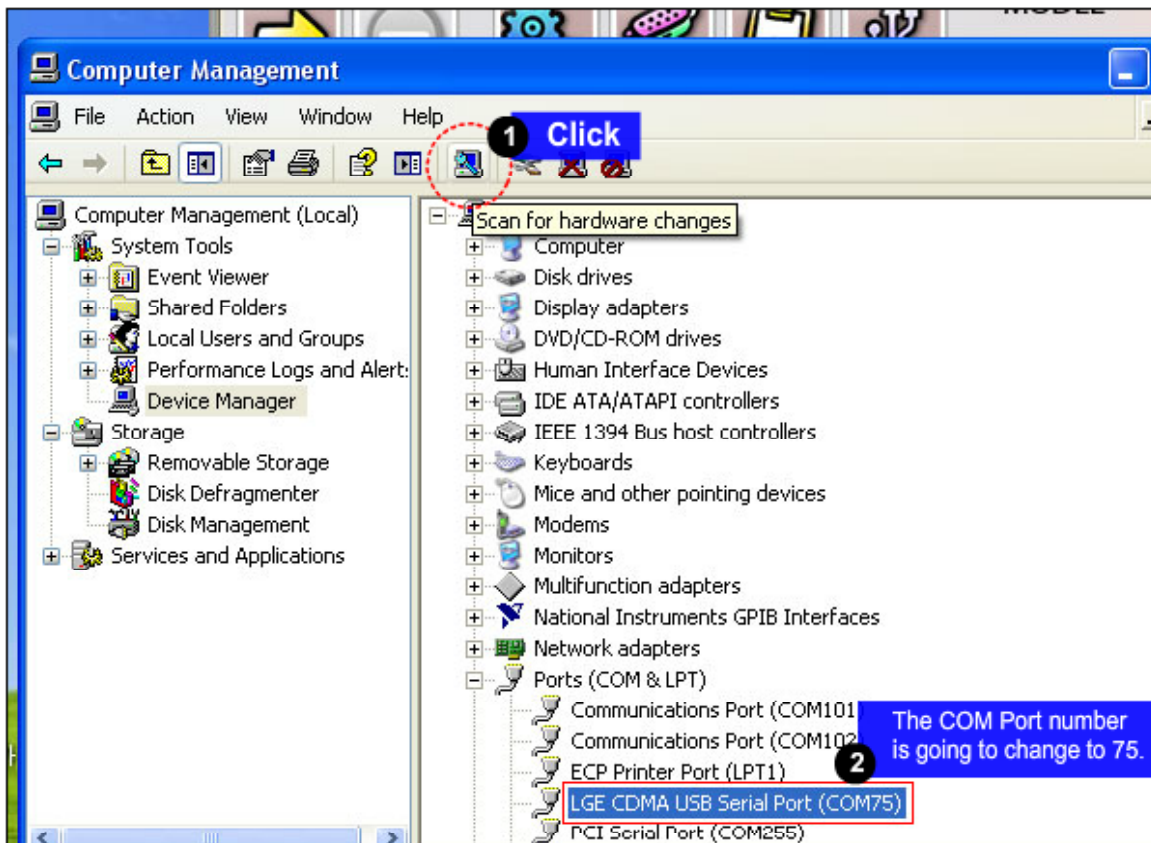
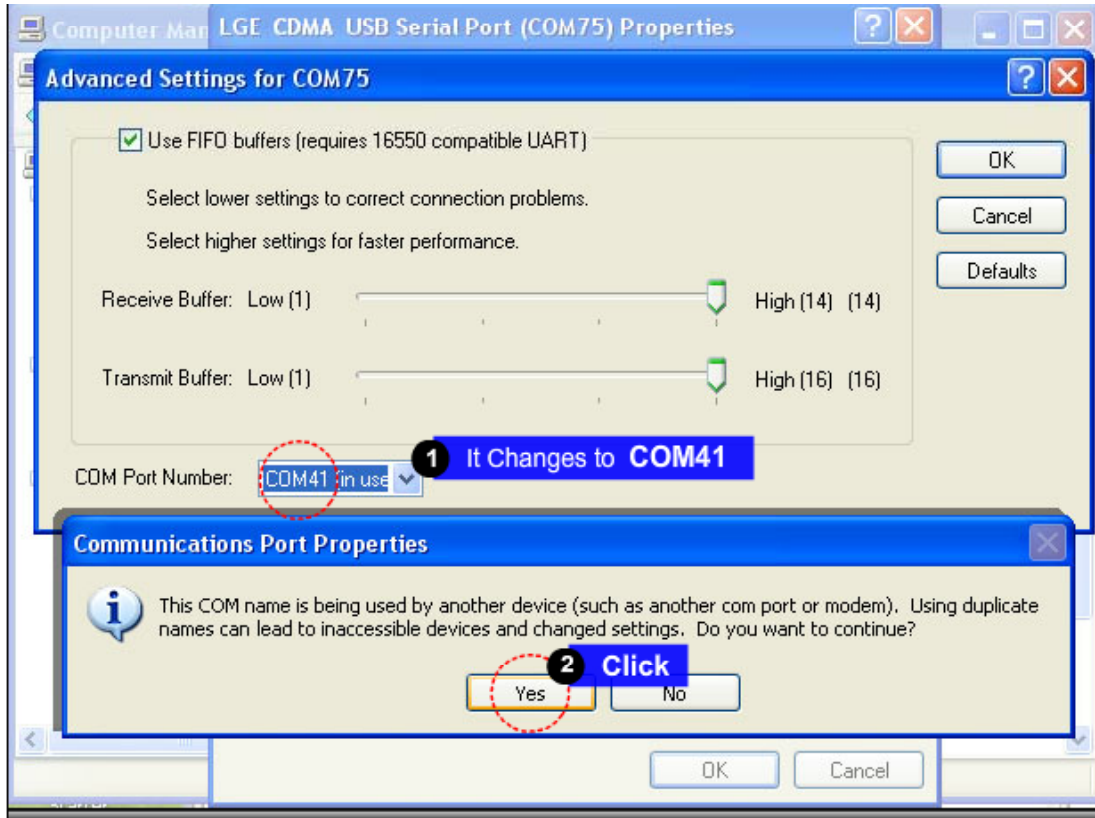


5. DOWNLOAD

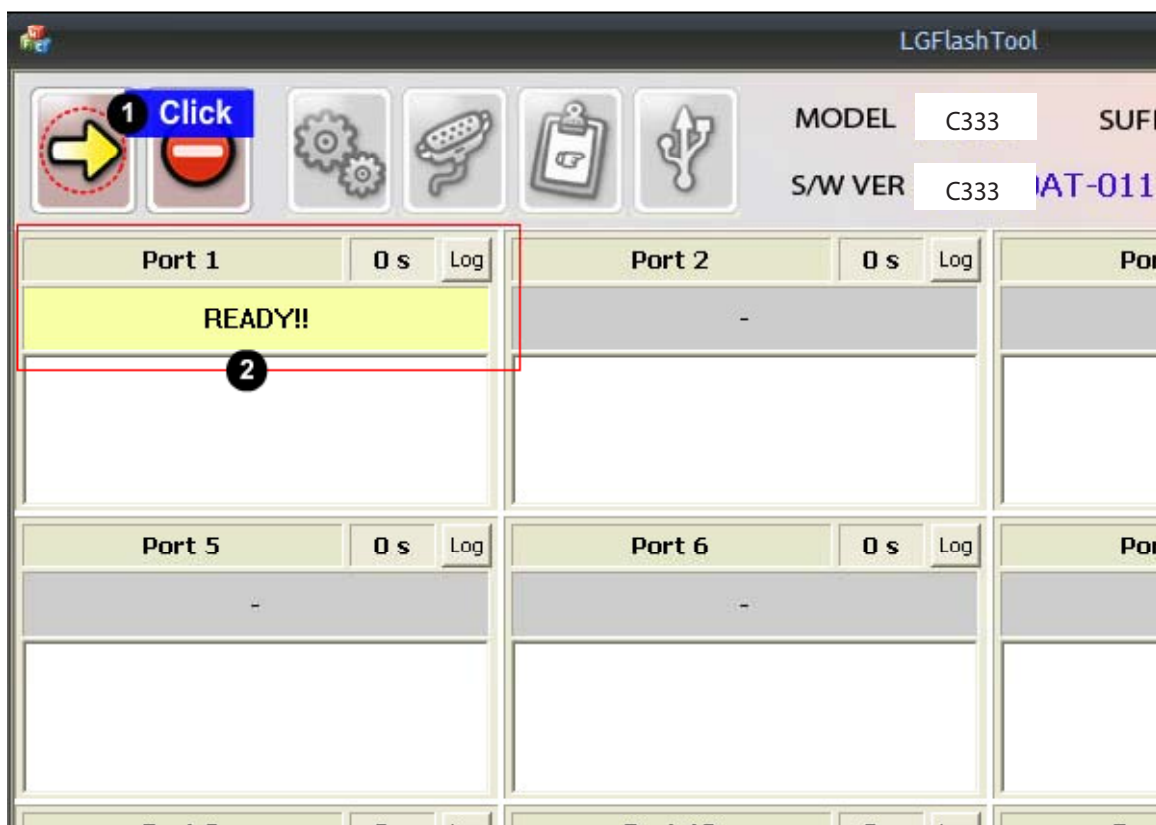
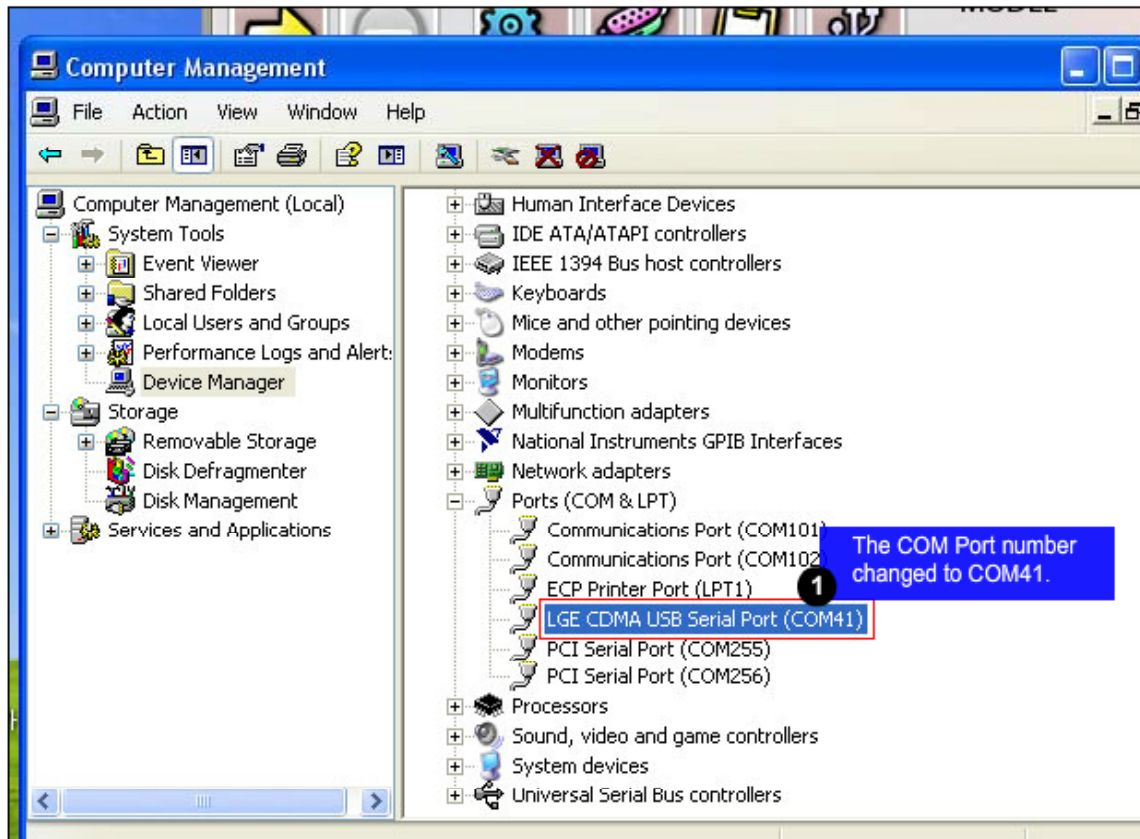




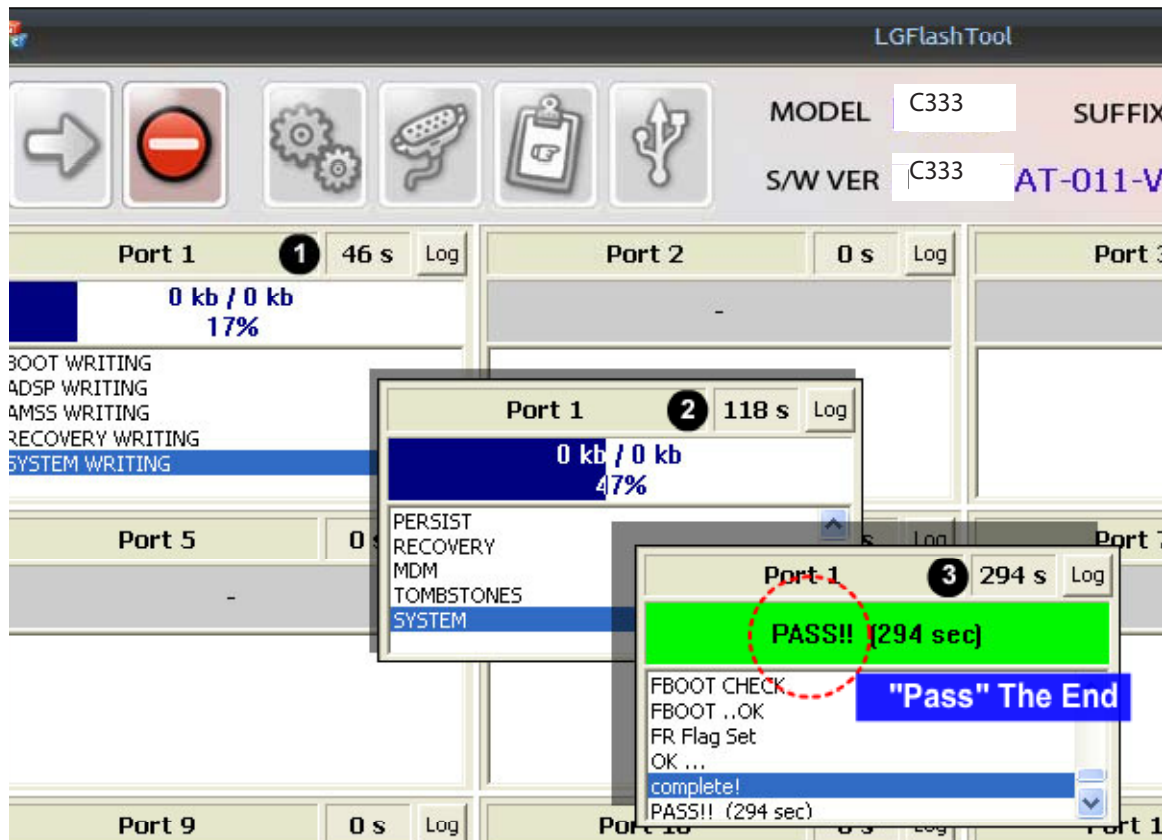
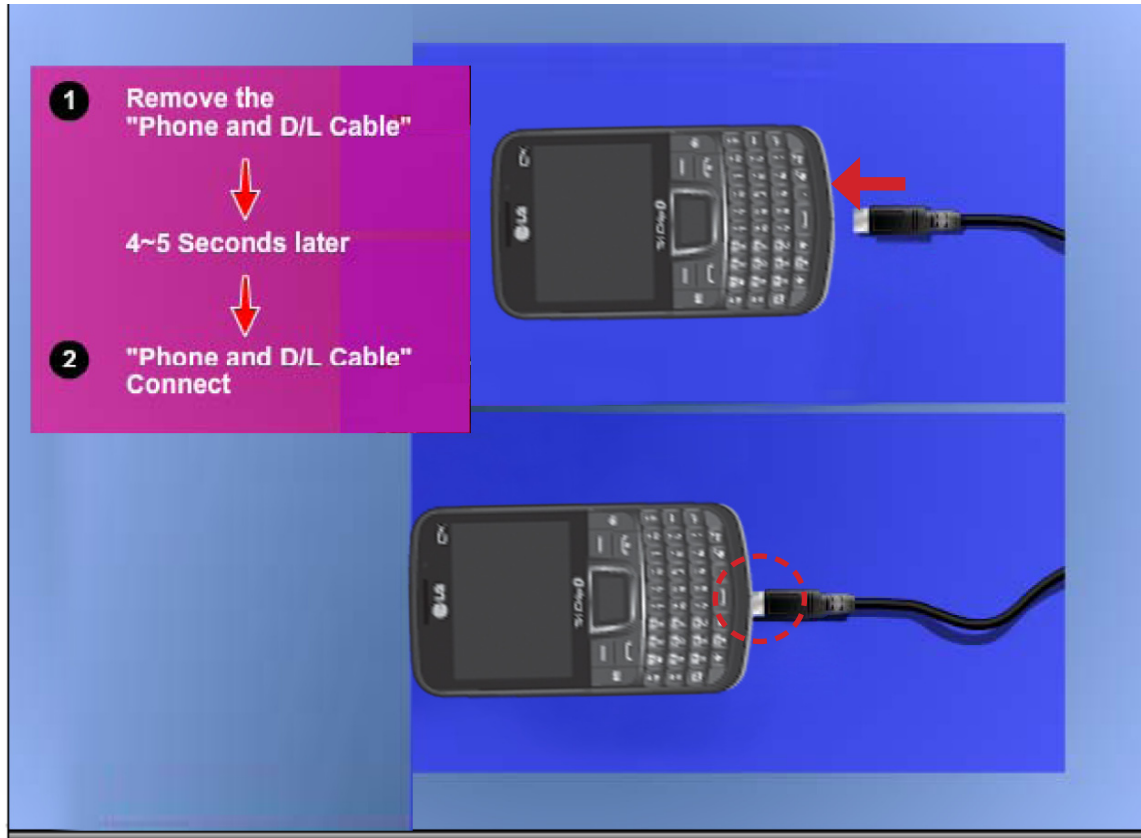
5. DOWNLOAD



5. DOWNLOAD

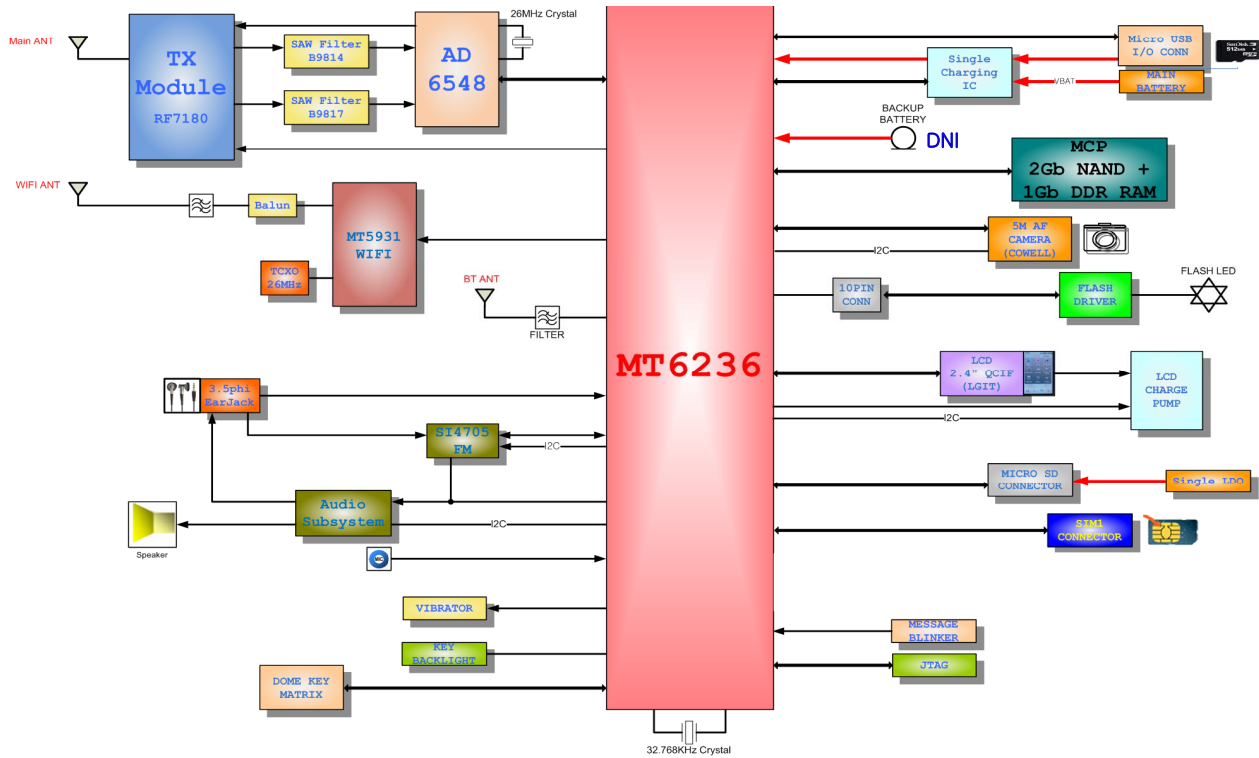


5. DOWNLOAD



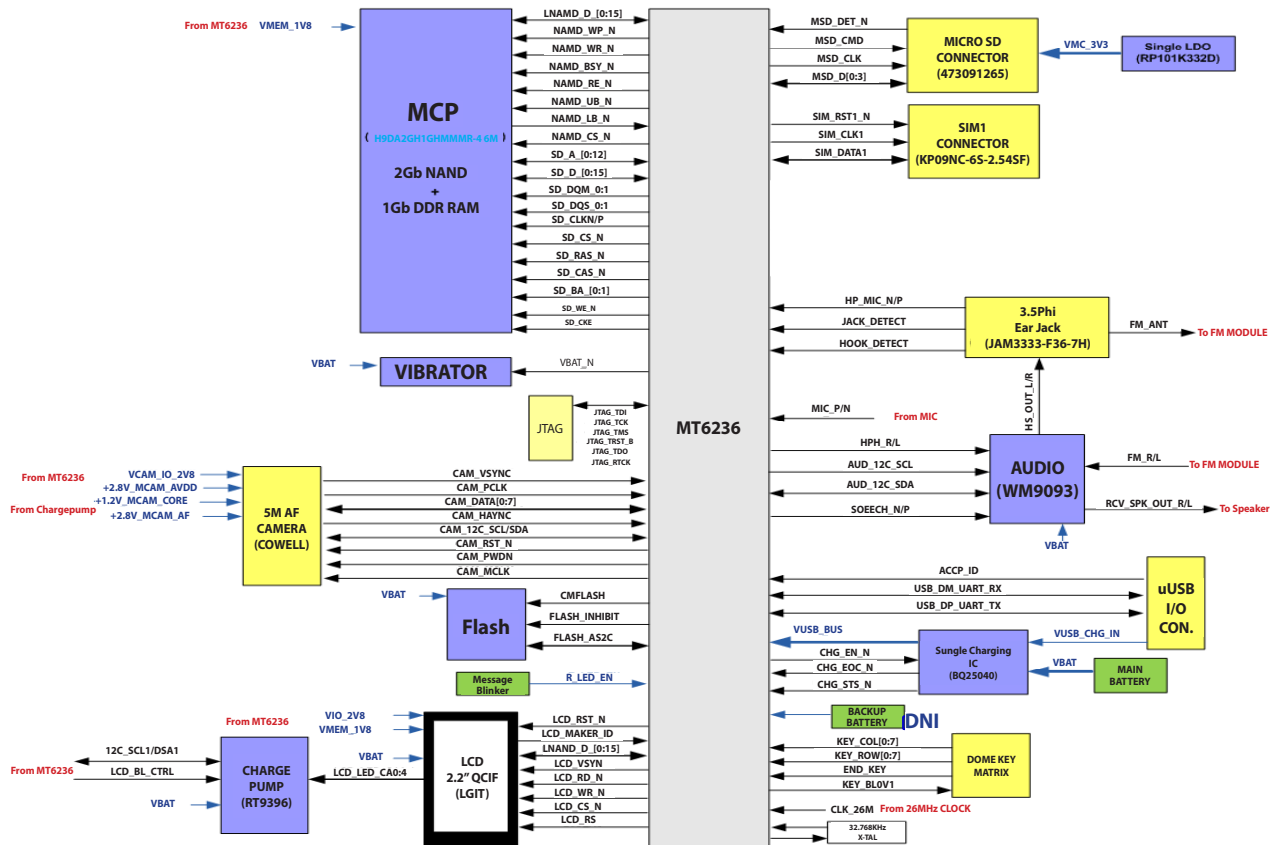
6. Block diagram

System HW Block Diagram : C333 Total Block Diagram

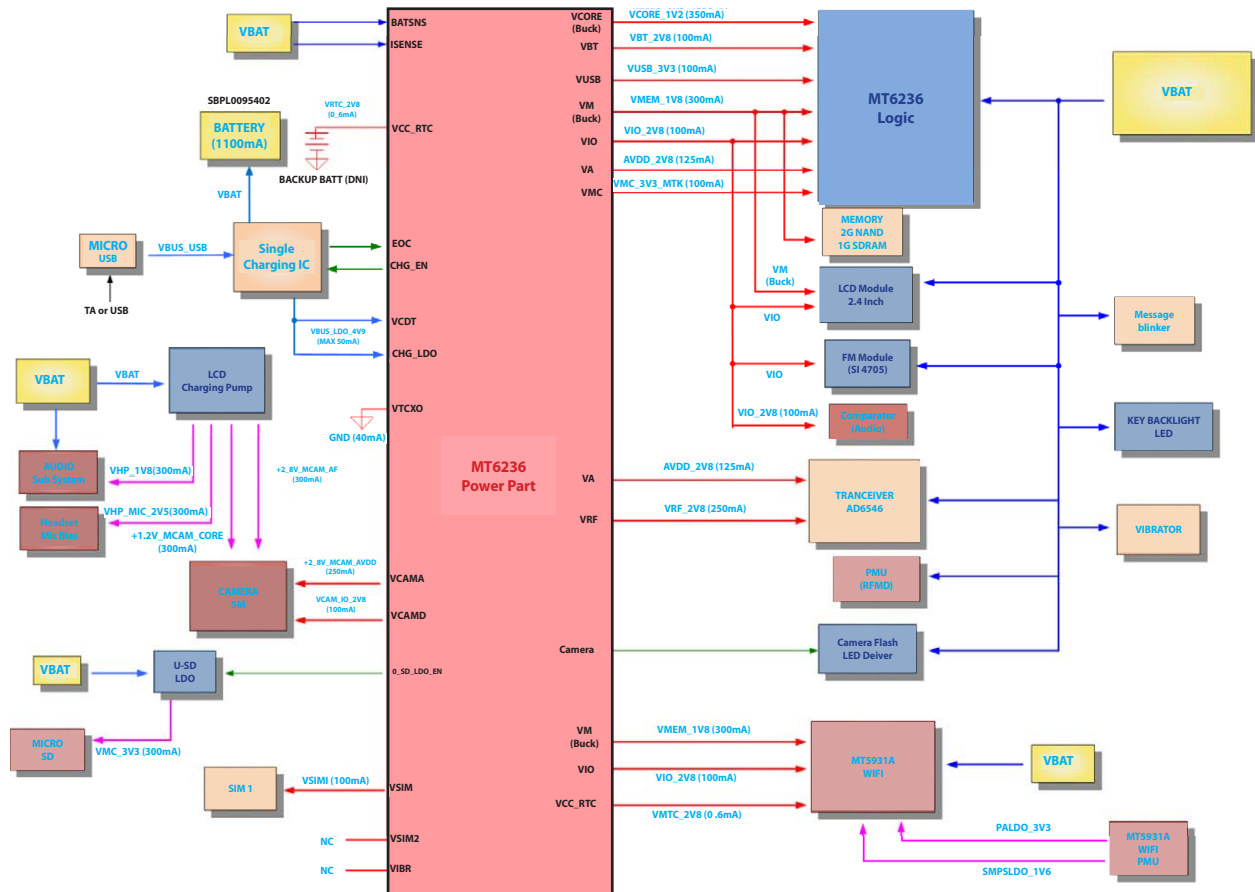


6. BLOCK DIAGRAM

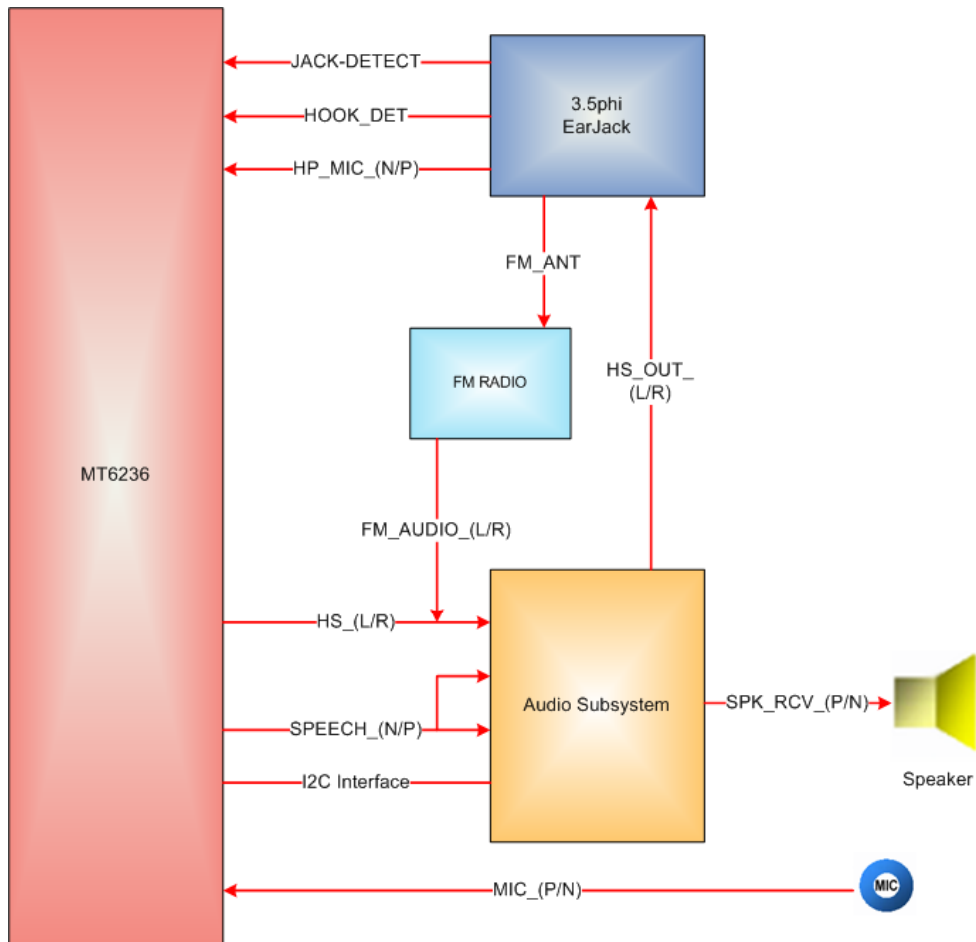
System HW Block Diagram : BB Block



System HW Block Diagram (Detail) : POWER

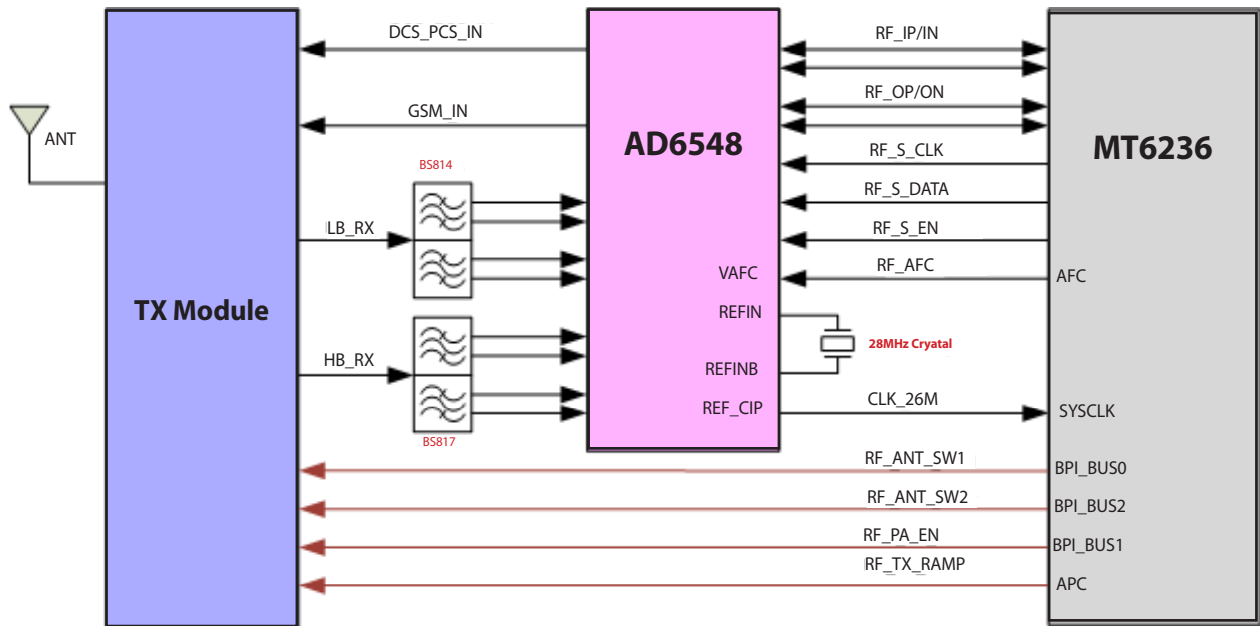


System HW Block Diagram (Detail) : AUDIO



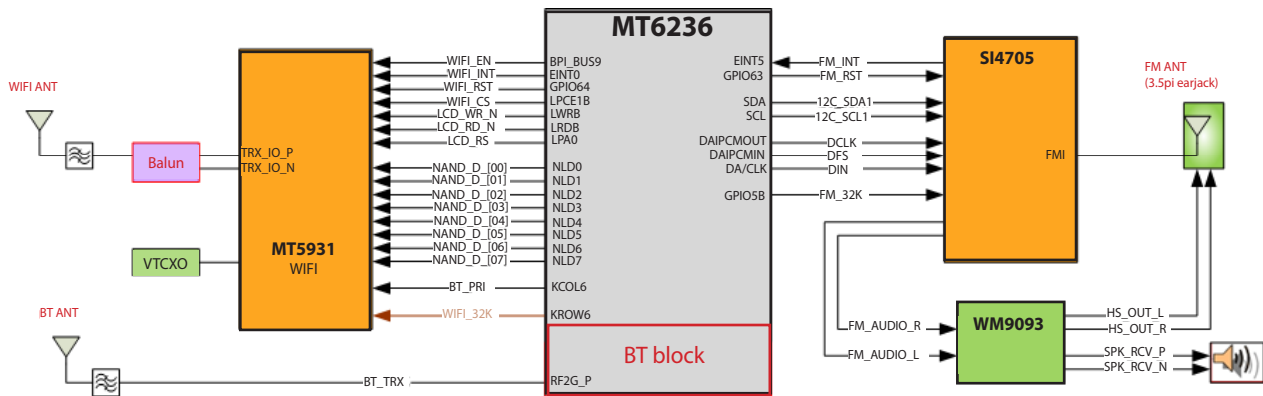
6. BLOCK DIAGRAM

System HW Block Diagram : RF Block

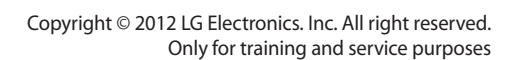


6. BLOCK DIAGRAM

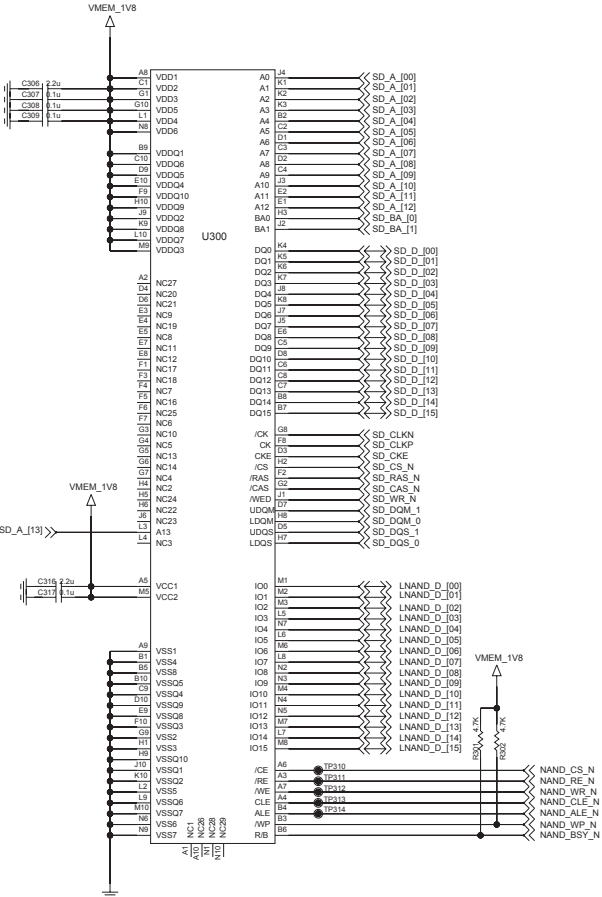
System HW Block Diagram : WIFI & BT & FM Block



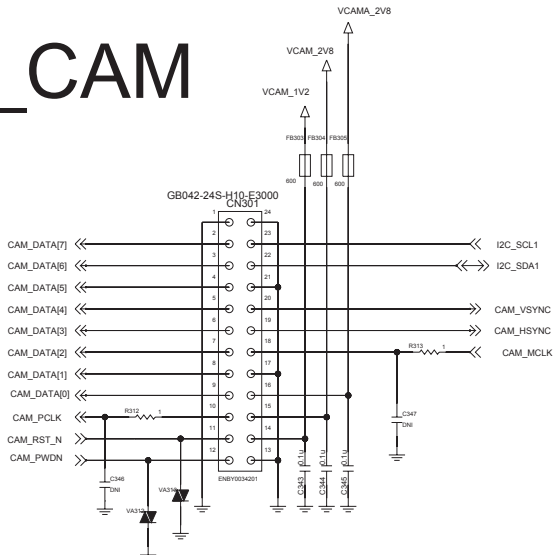
7. CIRCUIT DIAGRAM



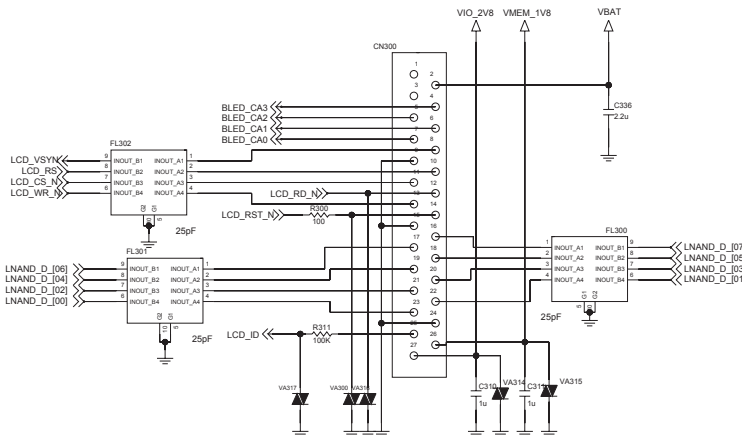
hynix 2G/1G DDR



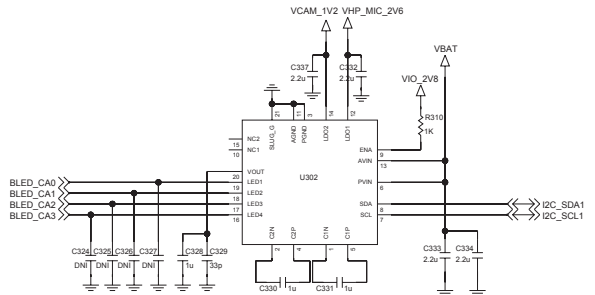
3M CAM



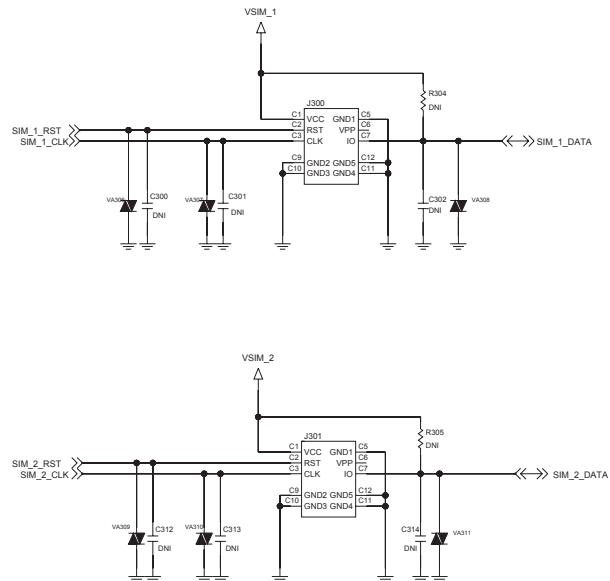
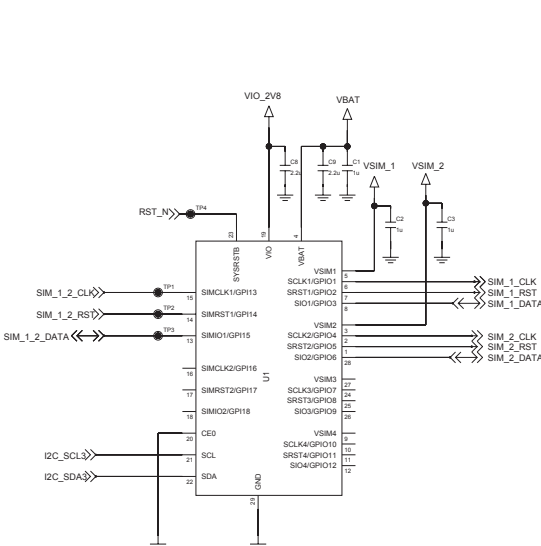
LCD INTERFACE



LCD Charge Pump



SIM Mux 1 2



[illegible]

The schematic diagram illustrates the internal circuitry of a receiver module, divided into two main sections: the BB side place and the MIC side place.

BB side place: This section includes the input matching network. It features two input ports, MIC_P and MIC_N, each with a 0.1uF capacitor (C427 and C432 respectively) connected to ground. The signals pass through 47pF capacitors (C429 and C431) and 100 ohm resistors (R420 and R421) to a central node. This node is connected to a 1nH capacitor (C423) and a 2.2K resistor (R417) leading to the VMIC_BIAS_P supply. A 2K resistor (R422) is connected to ground from the central node. The central node is also connected to the MIC side place.

MIC side place: This section includes the microphone input and the output filter. It starts with a 100nH inductor (L401) connected to the central node. This is followed by a 100nH inductor (L402) and a 100nF capacitor (C433) connected to ground. The signal then passes through a 47pF capacitor (C434) to the output filter. The output filter consists of two diodes (V409 and V408) connected in series to ground, with a 100nF capacitor (C434) connected to ground from the output node. The output is connected to the MIC400 microphone.

RCV Circuit

The diagram illustrates the RCV (Receiver) circuit. It consists of two input lines, SPK_P and SPK_N, each with a 0 Ohm resistor (R407, R408) and a 39pF capacitor (C404, C405) to ground. The SPK_P line is connected to the non-inverting input of an op-amp (CN400). The SPK_N line is connected to the inverting input of the op-amp. The op-amp's output is connected to a speaker. The op-amp is powered by a 5V supply (V400) and a 5V supply (V401). The op-amp is labeled CN400.

The schematic diagram illustrates the BB side place of the BBIC. It includes a truth table for the HOOK_DET signal, a detailed circuit diagram with various components, and a label for the BB side place.

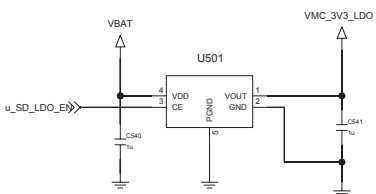
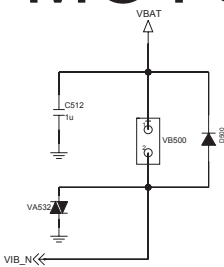
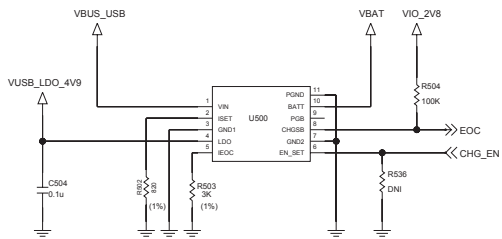
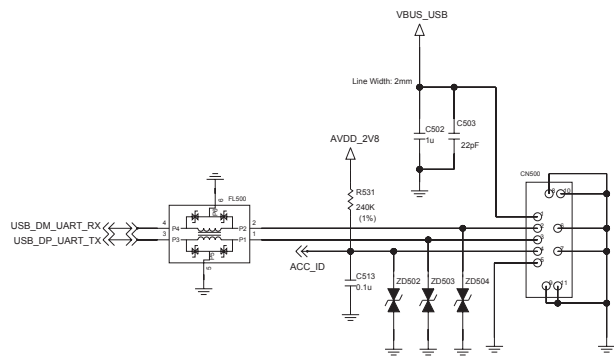
	HOOK_DET	IN-
ON	High	0 V
OFF	Low	2.8V

The circuit diagram shows the following components and connections:

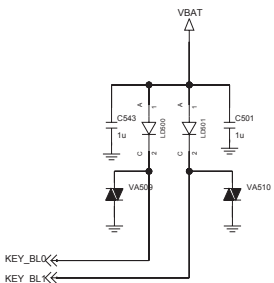
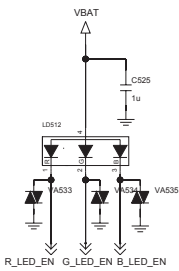
- Resistors:** R402 (100k), R403 (100k), R405 (10), R406 (100k), R407 (100k), R408 (100k), R409 (100k), R410 (100k), R411 (100k), R412 (100k), R413 (100k), R414 (100k), R415 (100k), R416 (100k), R417 (100k), R418 (100k), R419 (100k), R420 (100k), R421 (100k), R422 (100k), R423 (100k), R424 (100k), R425 (100k), R426 (100k), R427 (100k), R428 (100k), R429 (100k), R430 (100k), R431 (100k), R432 (100k), R433 (100k), R434 (100k), R435 (100k), R436 (100k), R437 (100k), R438 (100k), R439 (100k), R440 (100k), R441 (100k), R442 (100k), R443 (100k), R444 (100k), R445 (100k), R446 (100k), R447 (100k), R448 (100k), R449 (100k), R450 (100k), R451 (100k), R452 (100k), R453 (100k), R454 (100k), R455 (100k), R456 (100k), R457 (100k), R458 (100k), R459 (100k), R460 (100k), R461 (100k), R462 (100k), R463 (100k), R464 (100k), R465 (100k), R466 (100k), R467 (100k), R468 (100k), R469 (100k), R470 (100k), R471 (100k), R472 (100k), R473 (100k), R474 (100k), R475 (100k), R476 (100k), R477 (100k), R478 (100k), R479 (100k), R480 (100k), R481 (100k), R482 (100k), R483 (100k), R484 (100k), R485 (100k), R486 (100k), R487 (100k), R488 (100k), R489 (100k), R490 (100k), R491 (100k), R492 (100k), R493 (100k), R494 (100k), R495 (100k), R496 (100k), R497 (100k), R498 (100k), R499 (100k), R500 (100k).
- Capacitors:** C401 (100p), C402 (100p), C403 (100p), C404 (100p), C405 (100p), C406 (100p), C407 (100p), C408 (100p), C409 (100p), C410 (100p), C411 (100p), C412 (100p), C413 (100p), C414 (100p), C415 (100p), C416 (100p), C417 (100p), C418 (100p), C419 (100p), C420 (100p), C421 (100p), C422 (100p), C423 (100p), C424 (100p), C425 (100p), C426 (100p), C427 (100p), C428 (100p), C429 (100p), C430 (100p), C431 (100p), C432 (100p), C433 (100p), C434 (100p), C435 (100p), C436 (100p), C437 (100p), C438 (100p), C439 (100p), C440 (100p), C441 (100p), C442 (100p), C443 (100p), C444 (100p), C445 (100p), C446 (100p), C447 (100p), C448 (100p), C449 (100p), C450 (100p), C451 (100p), C452 (100p), C453 (100p), C454 (100p), C455 (100p), C456 (100p), C457 (100p), C458 (100p), C459 (100p), C460 (100p), C461 (100p), C462 (100p), C463 (100p), C464 (100p), C465 (100p), C466 (100p), C467 (100p), C468 (100p), C469 (100p), C470 (100p), C471 (100p), C472 (100p), C473 (100p), C474 (100p), C475 (100p), C476 (100p), C477 (100p), C478 (100p), C479 (100p), C480 (100p), C481 (100p), C482 (100p), C483 (100p), C484 (100p), C485 (100p), C486 (100p), C487 (100p), C488 (100p), C489 (100p), C490 (100p), C491 (100p), C492 (100p), C493 (100p), C494 (100p), C495 (100p), C496 (100p), C497 (100p), C498 (100p), C499 (100p), C500 (100p).
- Diodes:** ZD401, ZD402, ZD403, ZD404, ZD405, ZD406, ZD407, ZD408, ZD409, ZD410, ZD411, ZD412, ZD413, ZD414, ZD415, ZD416, ZD417, ZD418, ZD419, ZD420, ZD421, ZD422, ZD423, ZD424, ZD425, ZD426, ZD427, ZD428, ZD429, ZD430, ZD431, ZD432, ZD433, ZD434, ZD435, ZD436, ZD437, ZD438, ZD439, ZD440, ZD441, ZD442, ZD443, ZD444, ZD445, ZD446, ZD447, ZD448, ZD449, ZD450, ZD451, ZD452, ZD453, ZD454, ZD455, ZD456, ZD457, ZD458, ZD459, ZD460, ZD461, ZD462, ZD463, ZD464, ZD465, ZD466, ZD467, ZD468, ZD469, ZD470, ZD471, ZD472, ZD473, ZD474, ZD475, ZD476, ZD477, ZD478, ZD479, ZD480, ZD481, ZD482, ZD483, ZD484, ZD485, ZD486, ZD487, ZD488, ZD489, ZD490, ZD491, ZD492, ZD493, ZD494, ZD495, ZD496, ZD497, ZD498, ZD499, ZD500.
- Transistors:** Q401, Q402, Q403, Q404, Q405, Q406, Q407, Q408, Q409, Q410, Q411, Q412, Q413, Q414, Q415, Q416, Q417, Q418, Q419, Q420, Q421, Q422, Q423, Q424, Q425, Q426, Q427, Q428, Q429, Q430, Q431, Q432, Q433, Q434, Q435, Q436, Q437, Q438, Q439, Q440, Q441, Q442, Q443, Q444, Q445, Q446, Q447, Q448, Q449, Q450, Q451, Q452, Q453, Q454, Q455, Q456, Q457, Q458, Q459, Q460, Q461, Q462, Q463, Q464, Q465, Q466, Q467, Q468, Q469, Q470, Q471, Q472, Q473, Q474, Q475, Q476, Q477, Q478, Q479, Q480, Q481, Q482, Q483, Q484, Q485, Q486, Q487, Q488, Q489, Q490, Q491, Q492, Q493, Q494, Q495, Q496, Q497, Q498, Q499, Q500.
- Other components:** FB401, FB402, FB403, FB404, FB405, FB406, FB407, FB408, FB409, FB410, FB411, FB412, FB413, FB414, FB415, FB416, FB417, FB418, FB419, FB420, FB421, FB422, FB423, FB424, FB425, FB426, FB427, FB428, FB429, FB430, FB431, FB432, FB433, FB434, FB435, FB436, FB437, FB438, FB439, FB440, FB441, FB442, FB443, FB444, FB445, FB446, FB447, FB448, FB449, FB450, FB451, FB452, FB453, FB454, FB455, FB456, FB457, FB458, FB459, FB460, FB461, FB462, FB463, FB464, FB465, FB466, FB467, FB468, FB469, FB470, FB471, FB472, FB473, FB474, FB475, FB476, FB477, FB478, FB479, FB480, FB481, FB482, FB483, FB484, FB485, FB486, FB487, FB488, FB489, FB490, FB491, FB492, FB493, FB494, FB495, FB496, FB497, FB498, FB499, FB500.

The BB side place is labeled at the bottom of the diagram.

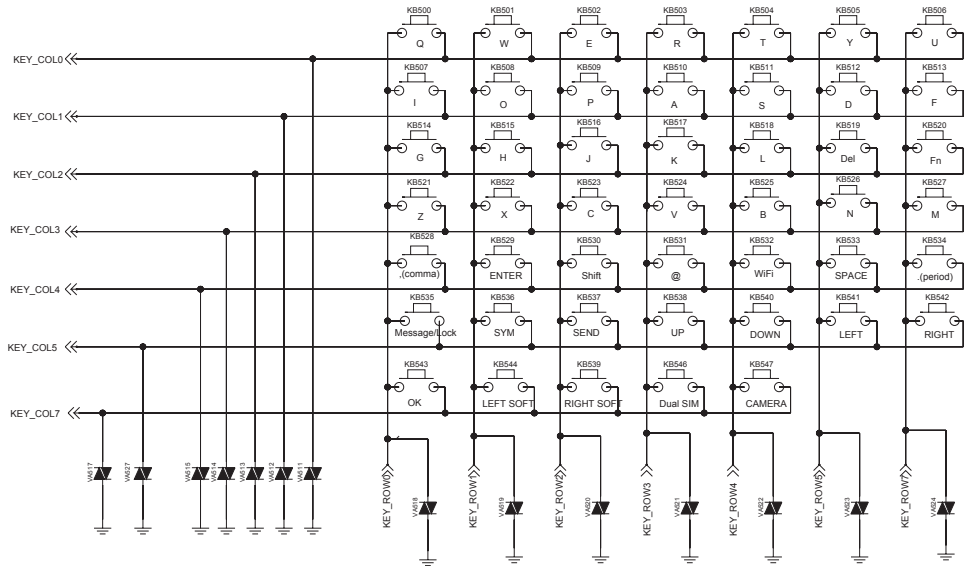
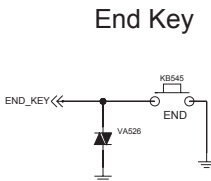
u-USB CONN. SINGLE CHARGER MOTOR MSD LDO



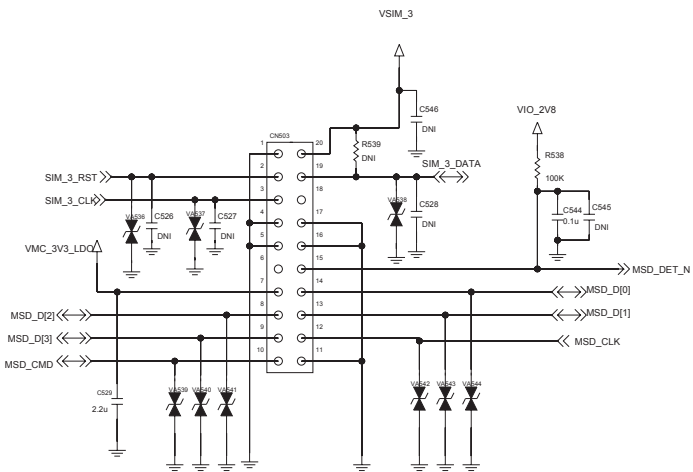
3-SIM INDICATOR KEY BACKLIGHT



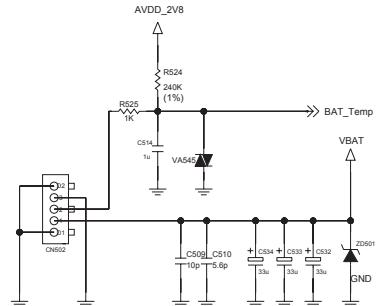
KEY MATRIX



MAIN TO FPCB CONN.

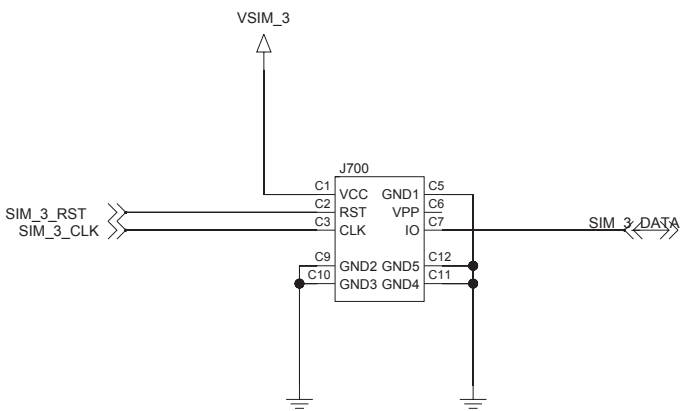
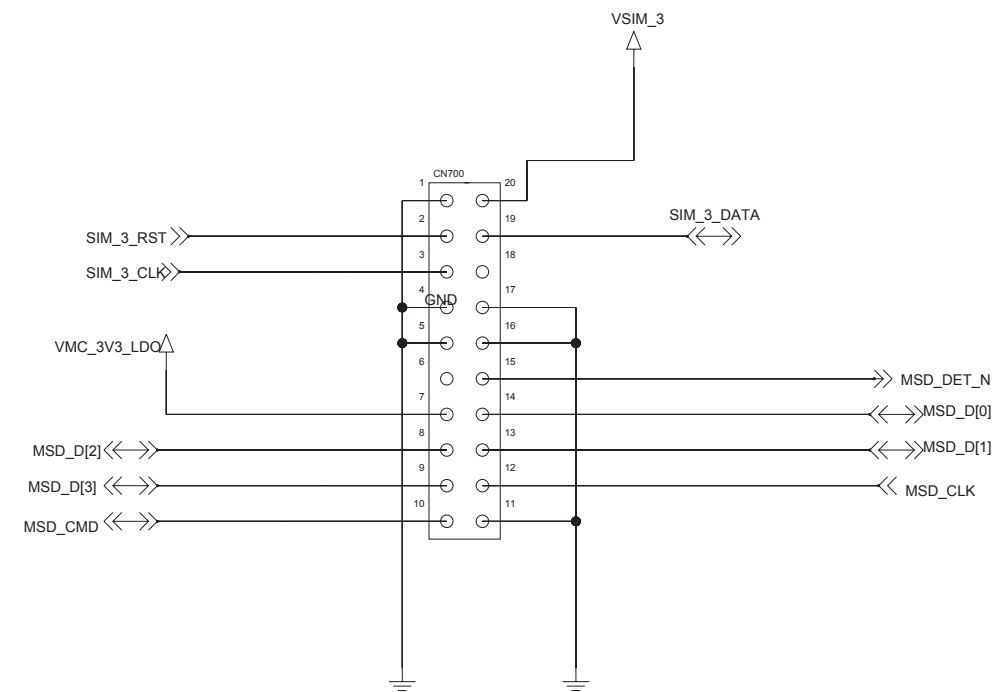


BAT CONN.

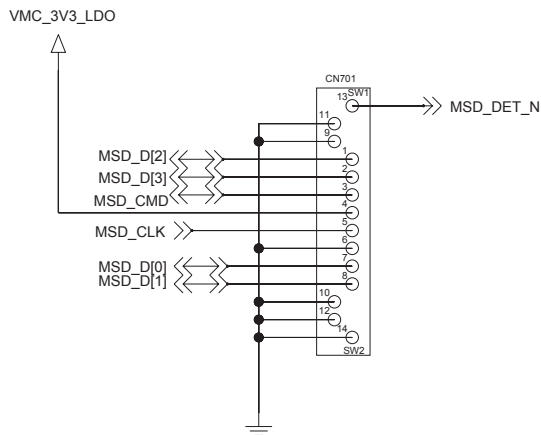


#3 SIM CARD

FPCB TO MAIN CONN.



u-SD CARD



8. BGA PIN MAP

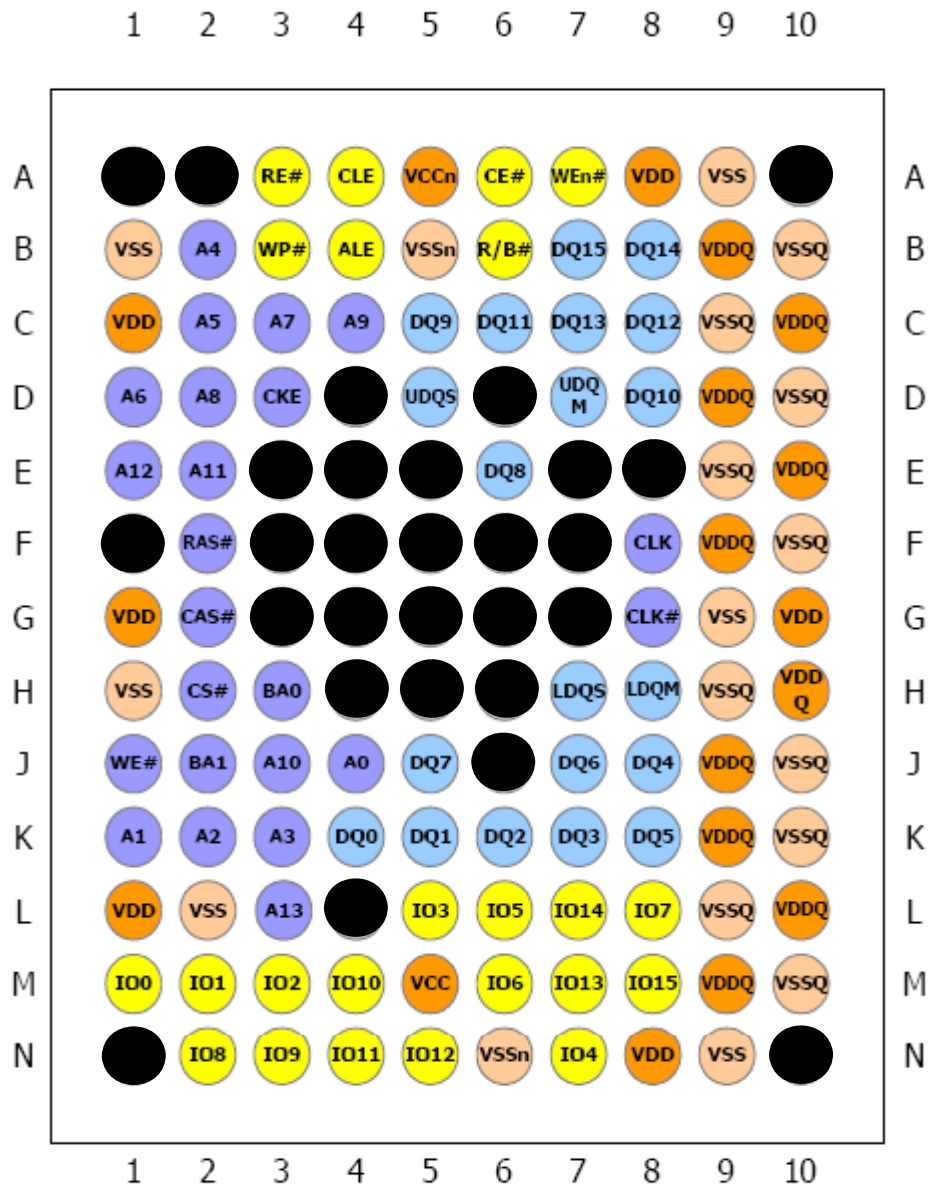
BGA IC pin check (U100)

MT6236 TFBGA 12.5mm x 12.5mm, 382ball

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
A		SIO2	VSIM		AVDD4_3_VD2		VCORE	VM	AVSS43_VCOR		TESTM_OCK	SEN	XOUT	SECUP_N	VCC28_PA		VSS_BT_RF	VSS_BT_RF	VCC28_LDO_R_KRF	VSS_BT_RF	VSS_BT_RF			A		
B	CHRLDO	VDRV	PWRKEY	AVDD4_3_VD1	VDD	AVSS43_VCOR		AVDD4_3_VD1	AVSS43_VCOR		SEN	VCC_R_TIC		TRICK	VSS_BT_RF		VSS_BT_RF		TRICK_P	TRICK_N	VSS_BT_RF	VSS_BT_SF	VCC28_SX	B		
C	VCDT	RESET_B	ISENSE	AVSS43_LDOS	SCLK2	VCAM2		AVSS43_VM	VM_FB	AVSS43_VCOR	SEN	GND_R_TIC	DVDD_LMC2	ITCK	VSS_BT_RF		VSS_BT_RF		VCOLM_ONTO_R			VSS_BT_RF		C		
D		BAISON_S			VSSM2	VSSB		VCORE_FB		AP_LDO		ITDI	ITMS			RFXG_N	RFXG_P			RBIAS	VSS_BT_RF	VSS_BT_RF	OSC_IN	D		
E	AVSS43_VRF	VREF					VNC	VFB		PLM2	PLM2	ITDO	ITRST_B			VSS_BT_RF		VSS_BT_RF				VSS_BT_RF	VCC28_OSC	E		
F	VRF		AVDD4_3_VA	AVDD4_3_VRF	SIO		SRST1	SRST2	SEN	SEN	SPLM5_O	SPLM5_SI					VSS_BT_RF		VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	F		
G	SPK_P		VA	VCAMA_S	VRF_S		PMLT_ESTIMO	BAISON		SCLK			SPL_SC_K	SPL_CS_N		DVDD2_8	VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	VSS_BT_RF	VCC28_BBLO	G		
H	SPK_N	DVDD4_3_SPK			VCAMA		DVSS43_SPK	VSS					XBOOT	VDDK					GPI063	SYSRST_B	SRCLK_ENA	GPI064	IRDA_T_XD	EINT3	H	
I	AU_MO_UTL			AVDD2_8_MBU_F	VTCXO	AU_JMI_NL	AU_JMI_NL	DVSS43_SPK		VSS					VDDK				PWM4	PWM5			GPI058	IRDA_P_DN	J	
K	AU_MO_UTR	AVDD2_8_AFE	AVSS28_AFE	AVSS28_AFE			VDDK		VDDK		VDDK	VSS		VSS					PWM3	PWM6	IRDA_R_XD	EINT6	UTXD2	EINT5	EINT1	K
L			AU_MI_CBIAS_P			AU_VIN_O_P		VSS		VSS				VSS		DVDD2_8	DVDD2_8	VDDK	VDDK	EINT2	EINT4	UTXD3	DAISYN_C	EINT0	L	
M	AU_OU_T0_N	AU_OU_T0_P	AUX_Y_5	AUX_IN_5									VSS	VSS	VSS			URXD2	URXD3			DAIPC_MOUT	DAIPC_MIN		M	
N	AUX_X_M	AUX_X_P	AUX_Y_7			AU_VIN_I_N	AU_VIN_I_P	AVSS	VSS		VDDK	VSS	VSS	VSS	VSS			DVDD2_8	DAICLK	NLD1	NAL1	NCEB	DAIRST	NREB	N	
P		AUX_IN_6	AUX_IN_4								DVDD2_8					DVDD2_8			VDDK	NLD5	NLD11	NRNB	NLD3	NWEB	NCL1	P
R	AVDD2_8_PLL	APC	BDLAI_P	BDLAQ_N	BDLAQ_P	AVSS28_RFE	APC		VSS									VDDK	VDDK	NLD7	NLD9		NLD4	NLD0		R
T		BDLAI_N		AVDD2_8_RFE		AVSS28_RFE				ED_CL_K_B	DVDD2_EMI	DVDD2_EMI	DVDD2_EMI	DVDD2_EMI	DVDD2_EMI		VDDK	VDDK	DVDD2_NFI	NLD15	NLD13	NLD8	NLD6	NLD2	T	
U	SVSCL_K	AVSS28_PLL	USB_D_M			FSOURCE			ED_CL_K	ED10		ED6		ED8	CMRST	CMPLK	DVSS28_MPI	LPC10B	LRSTB	LPAD	NLD14	NLD12	NLD10		U	
V	AVDD1_2_PLL	USB_DP		AVDD2_8_USB	MCCK		FA6			DVDD2_EMI	DVDD2_EMI							CMDAT7	TEST28_N			LPTE	NLD17		V	
W	AVSS12_PLL	AVSS12_USB	AVSS12_USB	MCODA_2	MCODA_0	BISLATA	FA3	FRAS_B		DOM1	DQ50	ED0	ED7	ED3	KROW5	KROW1		CMVRE	CMPLA_SH	LSDA	AVDD2_8_MPI	LPC1B	NLD16	LRDB	W	
Y	USB_V_P	AVDD1_2_USB			BPLBU_S0	BPLBU_S1	FA12	FA4		ED8	ED14		KCOL1	KROW3			CMMLK	DVDD2_CAM	DVSS28_MPI	AVSS28_MPI	LSA0	LACK	LWRB		Y	
AA		MCODM_0	BPLBU_S0	BPLBU_S1	BPLBU_S4	FA13	FA9	FA5		ED12	DOM0		ED15	KROW7			CMDAT9	SCL			DVDD2_8_MPI	(VBI)	RDPI		AA	
AB	MCODA_1		BPLBU_S0	BPLBU_S1	BPLBU_S7	FA0	EC30_B	FWR_B	FWAIT	ADV_B	DQ51	ED9	ED4	ED13	WATCHDOG	KCOL0	DVDD2_KF	CMVRE	CMDAT8	SDA	DVSS28_MPI	DVDD2_8_MPI	RDPI		AB	
AC	DVDD2_MC	MCODA_3		BPLBU_S5	FA1	FA10	FA14	ECAS_B	FA11	HCK3	FRD_B	HCS1_B	EA8	ED0	KCOL7	KCOL5	KCOL3	KROW6	KROW4	CMPLN	CMDAT6		RCN	RCB	AC	
AD		BPLBU_S1	BPLBU_S9		FA2	FA15		HCK3	HCK3	HCK3	FRD_B	HCS1_B	EA7	ED11	ED1	KCOL6		KCOL4	KCOL2	KROW2	KROW0	RCN	RCB		AD	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		

BGA IC pin check (U300)

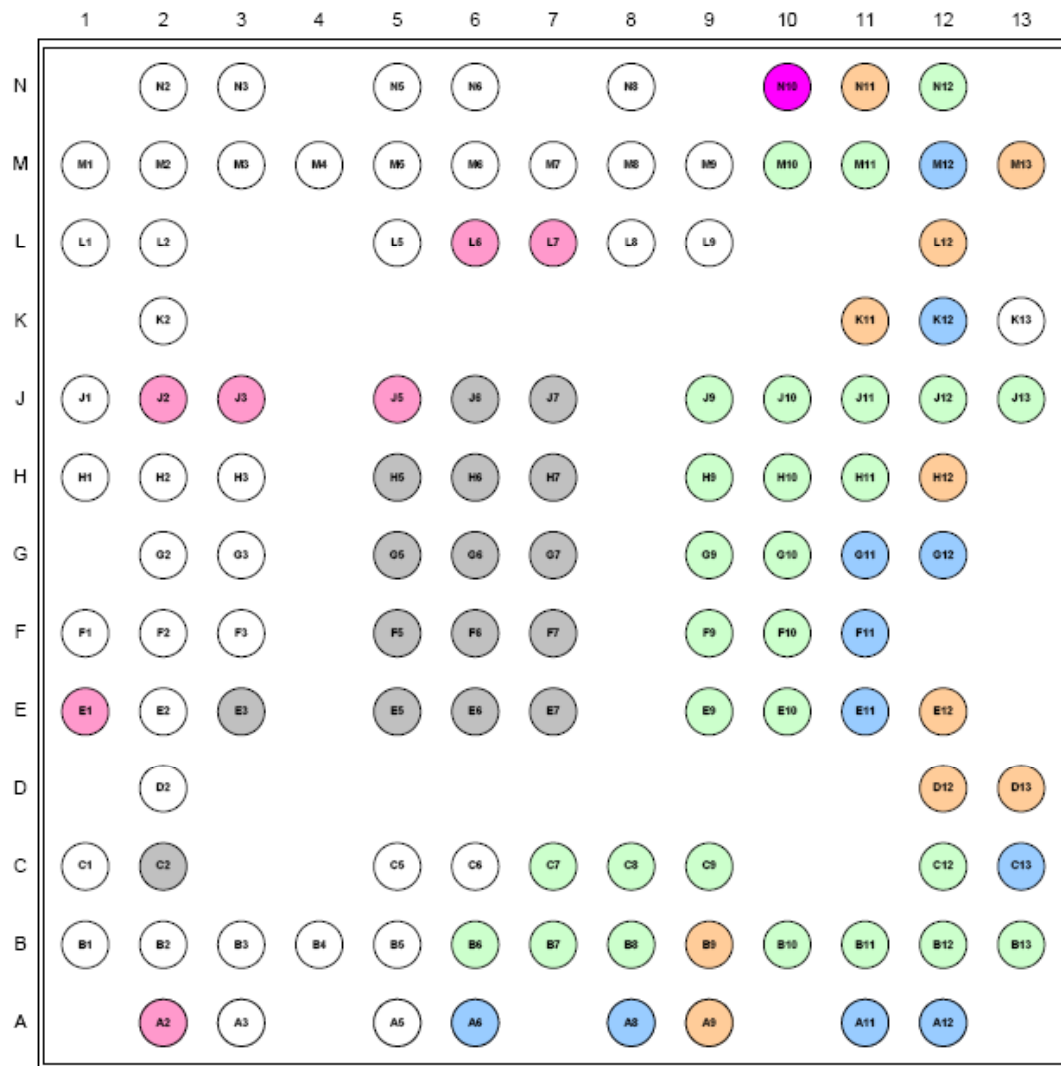
130bal 8.0X9.0 MCP(x16 SLC NAND + x16 LPDDR)



: not in use

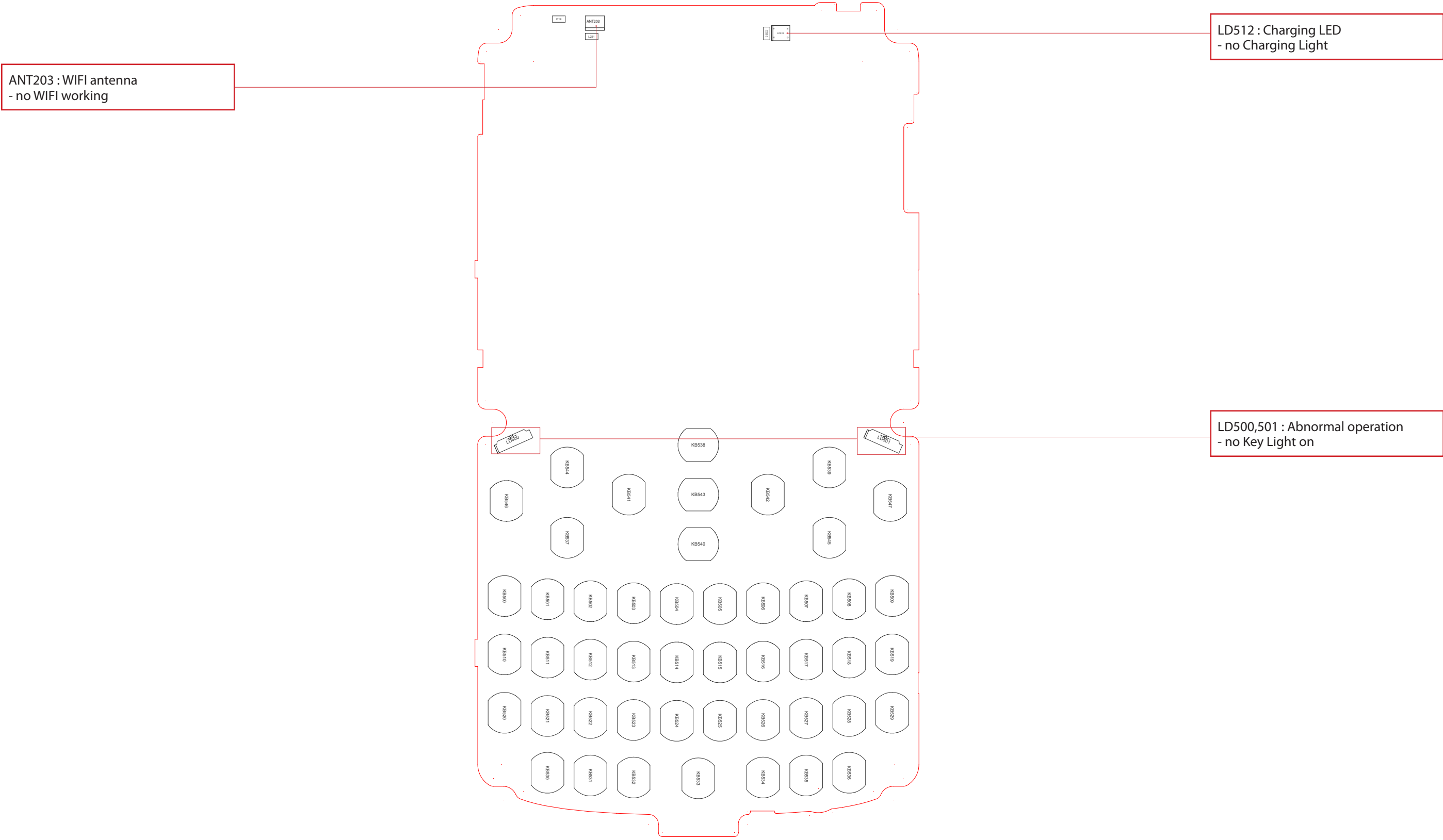
BGA IC pin check (U203)

TFBGA ball Type

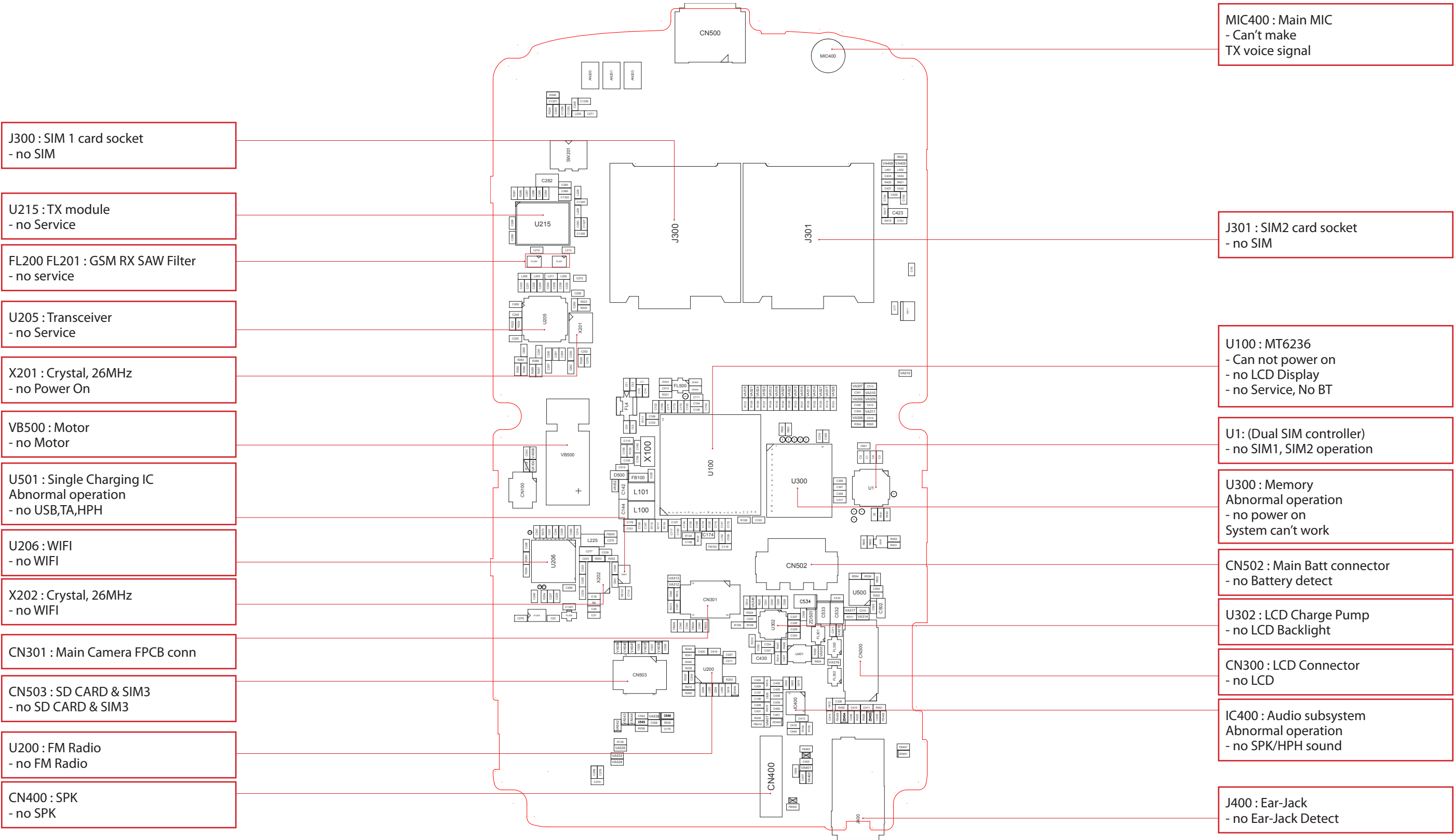


ALL USED PIN

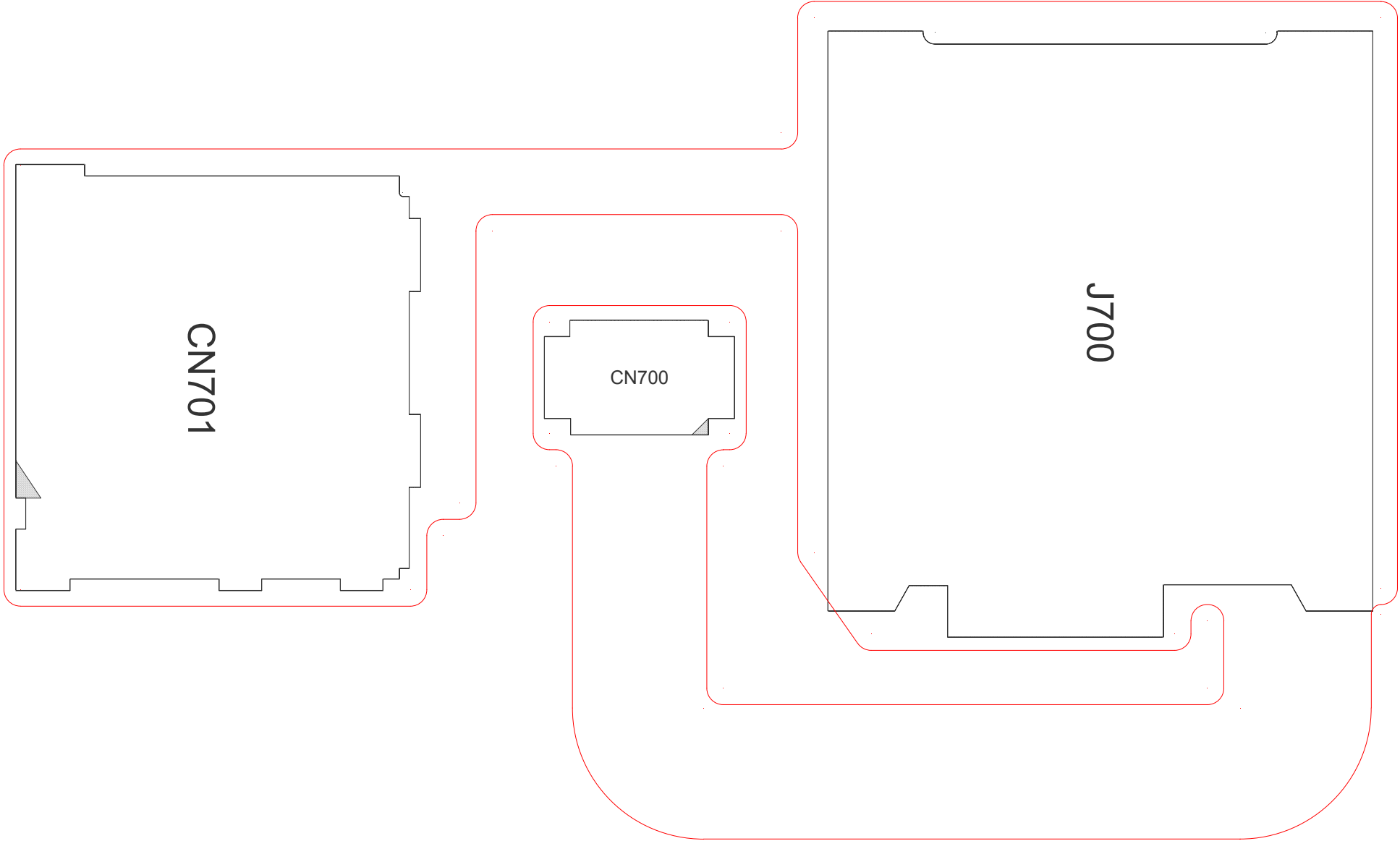
9. PCBLAYOUT



LG-C333_MAIN_EAX64780201_1.1_TOP



LG-C333_MAIN_EAX64780201_1.1_BOT



_TOP

10. ENGINEERING MODE

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset. The key sequence for switching the engineering mode on is "3845#*333# "Select. Pressing END will switch back to non-engineering mode operation. Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing 'back key will switch back to the original test menu.

[1] Device Test

- [1-1]ALL Auto Test
- [1-2]All Auto Test Result
- [1-3]Auto Detecting test
- [1-4]Charging LED Test
- [1-5]Key Press Test
- [1-6]Camera Test
- [1-7]LCD Display Test
- [1-8]Sound Test
- [1-9]Vibrator Test
- [1-10]WIFI Test
- [1-11]Loopback Test
- [1-12]FM Radio Test
- [1-13]Main LCD

- [1-13-1]White
- [1-13-2]Red
- [1-13-3]Green
- [1-13-4]Blue11
- [1-13-5]Black
- [1-13-6]Gray

- [1-13-6-1]Gray0
- [1-13-6-2]Gray1
- [1-13-6-3]Gray2
- [1-13-6-4]Gray3
- [1-13-6-5]Gray4
- [1-13-6-6]Gray5
- [1-13-6-7]Gray6
- [1-13-6-8]Gray7
- [1-13-6-9]Gray8
- [1-13-6-10]Gray9
- [1-13-6-11]Gray10
- [1-13-6-12]Gray11
- [1-13-6-13]Gray12
- [1-13-6-14]Gray13
- [1-13-6-15]Gray14
- [1-13-6-16]Gray15
- [1-13-6-17]Gray16

[1-14]Sub LCD

- [1-15]LCD Backlight
- [1-16]KEY Backlight
- [1-17]Speaker
- [1-18]Vibrator
- [1-19]Sub Camera
- [1-20]Speaker VibTest

- [1-20-1]Speaker&VIB
- [1-20-2]Speaker ONLY
- [1-20-3]VIBRATOR ONLY

[1-21]Vibrator Duration

- [1-21-1]Call Alert
- [1-21-2]Message Alert
- [1-21-3]Alarm

[2]ELT TEST

[2-1]automatic

- [2-1-1]1 Time
- [2-1-2]2 Times
- [2-1-3]3 Times
- [2-1-4]4 Times
- [2-1-5]5 Times
- [2-1-6]100 Times
- [2-1-7]Infinite

[2-2]Manual

- [2-2-1]LCD Backlight
- [2-2-2]Ringtones
- [2-2-3]Vibrator
- [2-2-4]Camera
- [2-2-5]Audio Loopback

[3]SW sanity Test

[3-1]FPRITest

[3-2]DB Check

- [3-1-1]Copy DB to UserDisk
- [3-1-2]Copy DB file to ExtMem
- [3-1-3]Copy CRC

[3-3]E Serial no

[3-4]UA,String

[3-5]Unlock

[4]Factory Reset

[5]Version

[5-1]SW Version Info

[6]Usage info

[7]ERS

[7-1]Client Status

[7-1-1]Active

[7-1-2]Active + File Save

[7-1-3]Inactive

[7-1-4]Inactive + File Save

[7-2]Ers Test

[7-2-1]QM test

[7-3]Carrier Setting

[8]Engineer mode

[8-1]PS

[8-1-1] Band selection

[8-2]DRM

[8-2-1] DRM Cert Check

[8-2-2] DRM Cert Info

[8-3]RF(BER)

[8-3-1] preview

[8-3-2] LCD

[8-3-3] Vibrator

[8-4]BaseBand

[8-4-1]Battery Log

[8-4-2]Battery Info

[8-4-3]LCD(MAIN)

[8-4-4]LCD(SUB)

[8-4-5]BackLight(Key)

[8-4-6]RF CAL Info

[8-5]Audio Tunning

[8-5-1]Handset

[8-5-2]Headset

[8-5-3]Speaker Phone

[8-5-4]Bluetooth Headset

[8-5-5]Info

[8-6]Bluetooth

[8-6-1]Set BT Address

[8-6-2]BT Audio/RF Test

[8-6-3]BT Test Menu

[8-7]aging Test

[8-8]JAVA

[8-9]User Pattern Test

[8-10]NetWork Info

[8-10-1] SIM1

[8-10-2] SIM2

[8-11]WIFI Eng MENU

[8-11-1]Net Info

[8-11-2]FTM mode

[8-11-3]OTA Test

[8-11-4]wlCmd

[8-11-5]open

[8-11-6]close

[8-11-7]Available net

[8-11-8]disconnect

[8-11-9]IP_configuration

[8-11-10]PS_Mode

[8-11-11]WPS

[8-11-12]WPSE

[8-11-13]Test Page

[8-11-14]Threshold Setting

[8-11-15]GAN Mode

[8-11-16]Certs Info

[8-11-17]Cert Set Up

[8-11-18]Wi-fi UI

[8-12]Packet data connection

[8-12-1]SIM1

[8-12-2]SIM2

[8-13]FMRadio

[8-14]WebEngMode

[8-14-1]UA String Editor

[8-14-2]UA String Selector

[8-14-3]UA profile Editor

[8-14-4]Set MCC MNC

[8-14-5]Enable page Dump

[8-14-6]Trace Mode

[9]WISE Debug

[9-1]Variable Watch

[9-2]heap Freesize

[9-3]heap Leakage

[9-4]heap Assert

[9-5]QM heap Freesize

[9-6]Deceloper Debug

[9-6-1]Debug_None

[9-6-2]Debug_LOW

[9-6-3]DebugMIDDLE

[9-6-4]HIGH

[10]MTK Debug

[10-1]Catcher

[10-2]SleepMode

[10-3]DCM

[10-4]Memory Dump

[10-5]Buffer Monitor

[10-5-1]Disable

[10-5-2]ALL

[10-5-3]8 Byte

[10-5-4]32 Byte

[10-5-5]64 Byte

[10-5-6]128 Byte

[10-5-7]256 Byte

[10-5-8]512 Byte

[10-5-9]1024 Byte

[10-5-10]2048 Byte

[10-6]FS Trace Mode

[10-6-1]Disable

[10-6-2]Error

[10-6-3]API + Error

[10-7]Watch Dog

[10-8]VM setting

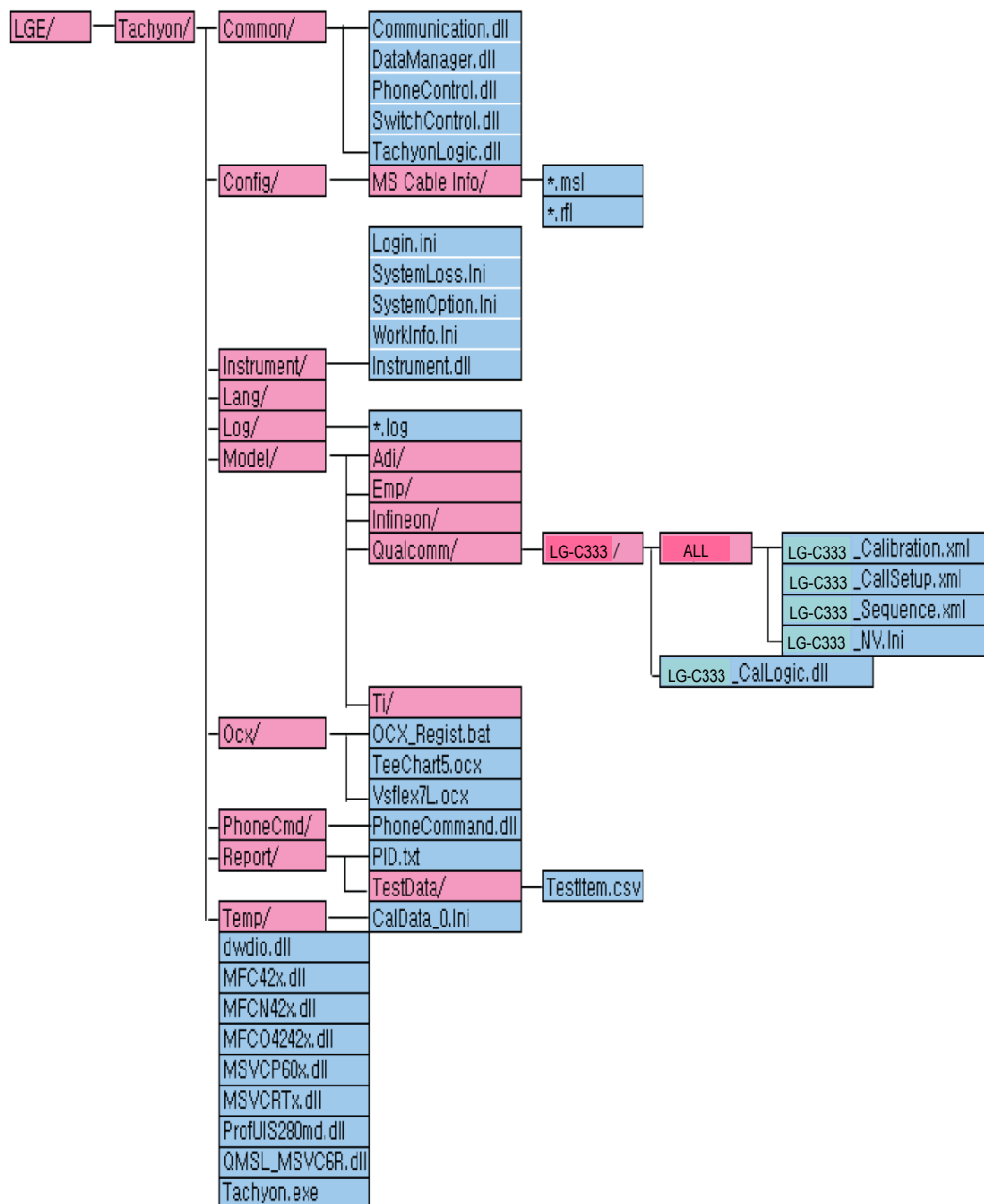
[10-9]VM Common Param

11.RF CALIBRATION

11.1 RF CALIBRATION

11.1 Configuration of Tachyon

11.1.1 Configuration of directory



11.1.2 Description of basic folders

Folder	Description
Tachyon	Exe file and MFC dll, UI dll is present.
Common	Common dll files. (XML Data I/O , Auto Test Logic, Tachyon Logic Control, Communication)
Config	Envirement files. (Port configuration, Loss adjust)
Instrument	Tester control dll.
Model	Model files is present. (Model -> Solution (Qualcomm, EMP, ADI, INFINEON) -> MODEL NAME(LGGM630, LGSH470, ..) -> BUYER NAME(SKT, TEL, V, ...)
OCX	Conponent files.
PhoneCmd	Phone communication file
Report	Report Files is present. (Cal data, test data)

11.1.3 Description of configuration files

Folder	Description
'MODEL NAME'_Calibration.XML	There are imformations to calibrate. It consist of calibration items.
'MODEL NAME'_CallSetup.XML	There are imformations to call.
'MODEL NAME'_NV.INI	It consists of default values. It is written when 'cal&auto' is begun.
'MODEL NAME'_Sequence.XML	It is described a testing procedures.

11.2 How to use Tachyon

11.2.1 Model selection

Follow the procedure before start calibration & auto test

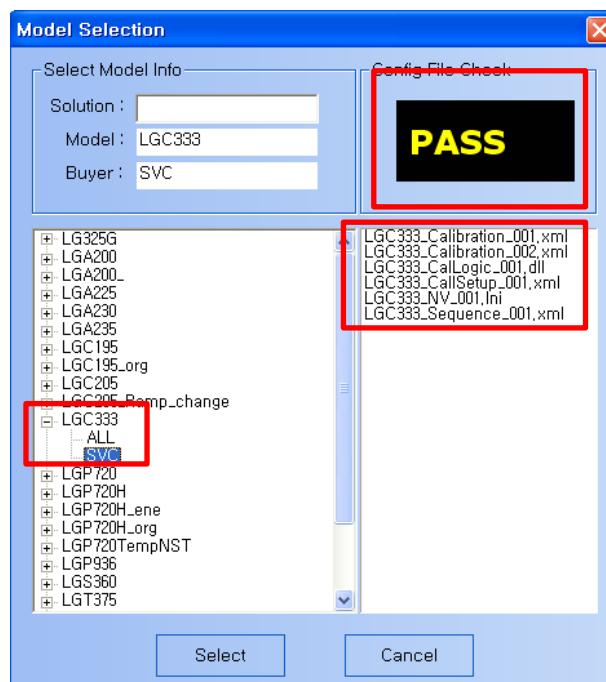


a. Click the icon,  in tool bar.

Then, You can make a choice of LG-C333 for loading cfg files before run.

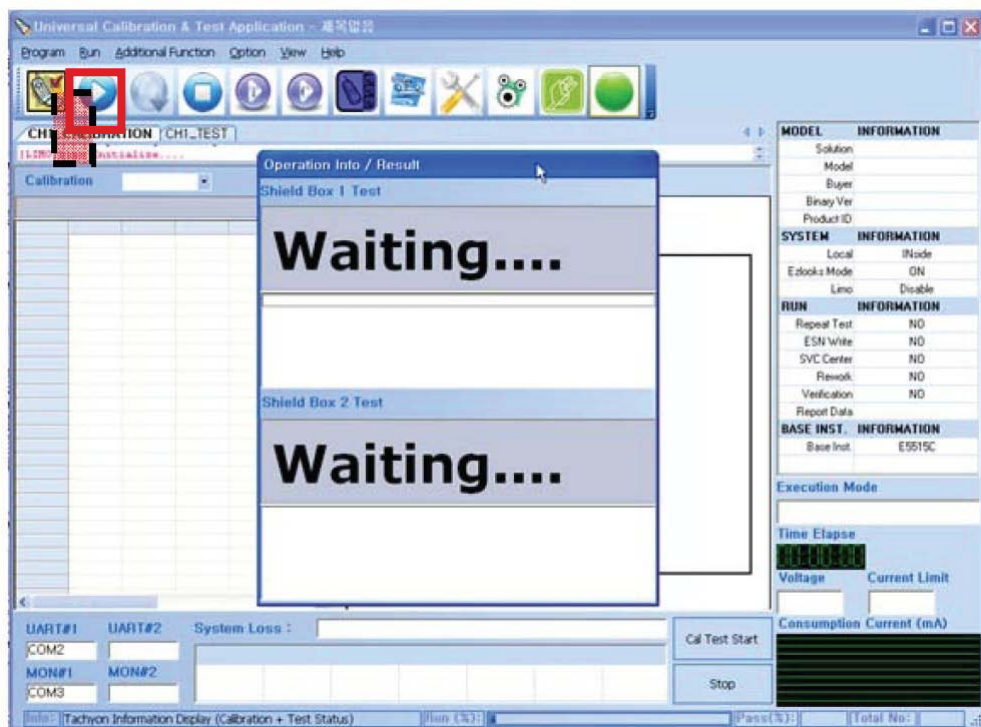
b. Select model name and then do double-click the buyer name.

You will see configuration files loaded in the right window with PASS information above



11.2.2 Start cal & auto

a. Click calibration & autotest button,  in Tool bar

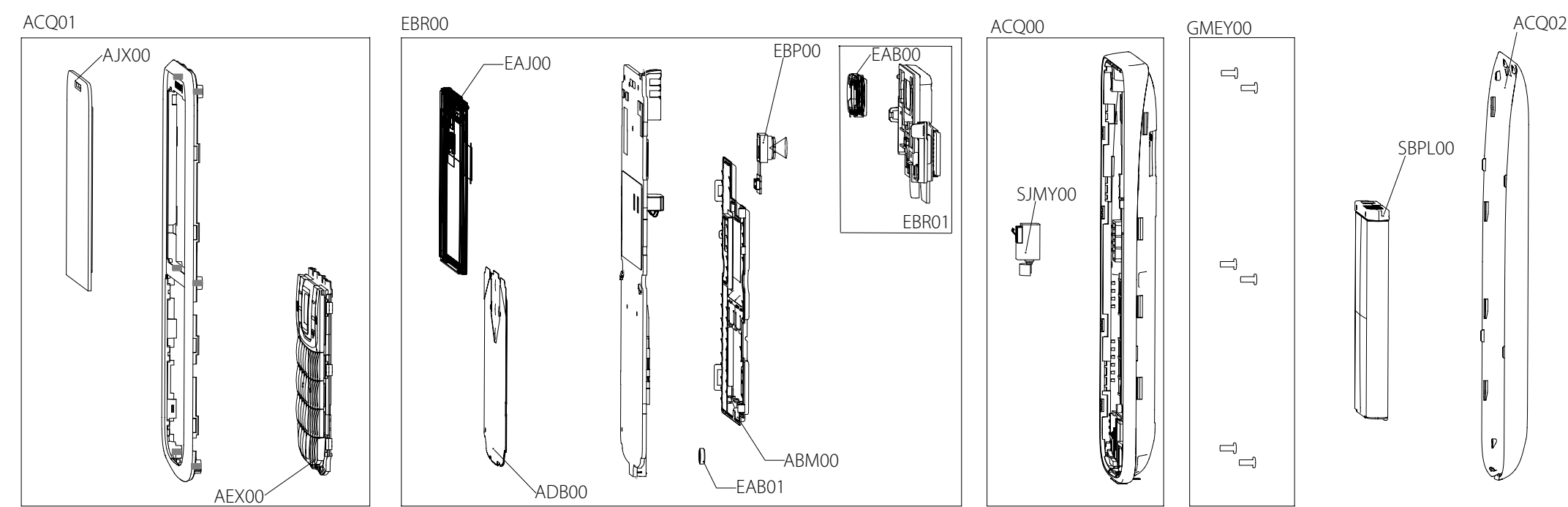


b. Calibration & autotest will be executed in order.

- 1) Precede Action.
 - NV write
 - Test command send.
- 2) RF Calibration
- 3) RF Auto test
- 4) After action
 - Phone reset
 - Change UE to AMSS

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW(SBOM)



Location	Description
GMEY00	Screw,Machine
ACQ00	Cover Assembly,Rear
SJMY00	Motor,DC
ACQ01	Cover Assembly,Front
AEX00	Keypad Assembly,Main
AJX00	Window Assembly,LCD
EBR00	PCB Assembly,Main
EBR01	PCB Assembly,Flexible
EAB00	Speaker,Dual Mode
ABM00	Can Assembly,Shield
ADB00	Dome Assembly,Metal
EAJ00	LCD Module
EBP00	Camera Module
EAB01	Microphone,Condenser
SBPL00	Rechargeable Battery,Lithium Ion
ACQ02	Cover Assembly,Battery

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.2 ReplacementParts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
1	AGQ000000	Phone Assembly	AGQ86789701	LGC333.ABRABK BK:BLACK BLACK -	
2	MEZ002100	Label,Approval	MEZ64403301	COMPLEX LGA290.ABRASV ZZ:Without Color -	
2	ACQ100400	Cover Assembly,EMS	ACQ86090801	LGC333.ABRABK BK:BLACK BLACK -	
3	GMEY00	Screw,Machine	GMEY0009201	GMEY0009201 BH + 2.7mM 3.5mM MSWR3 FZB N N LG ELECTRONICS INC.	
3	MJN061100	Tape,Protect	MJN68310701	COMPLEX LGC333.ABRABK ZZ:Without Color -	
3	ACQ00	Cover Assembly,Rear	ACQ86075201	LGC333.ABRABK BK:Black -	
4	MBL000000	Cap	MBL65357101	COMPLEX LGC333.ABRABK BK:Black -	
4	ACQ105800	Cover Assembly Rear(SVC)	ACQ86253401	LGC333.ABRABK CKD BK:BLACK BLACK -	
5	MJN061100	Tape,Protect	MJN68333001	COMPLEX LGC333.ABRABK ZZ:Without Color -	
5	MCK063300	Cover,Rear	MCK67289401	MOLD PC LGC333.ABRABK BK:Black -	
5	MCQ009400	Damper,Camera	MCQ67033401	COMPLEX LGC333.ABRABK BK:Black -	
5	MCQ000000	Damper	MCQ67033501	COMPLEX LGC333.ABRABK BK:Black Damper (Mic)	
5	MCQ000001	Damper	MCQ67228801	COMPLEX LGC333.ABRABK ZZ:Without Color -	
5	MEZ000900	Label,After Service	MEZ64319901	COMPLEX LGF120L.ALGTWA ZZ:Without Color F120I AS Label	
5	MKC009400	Window,Camera	MKC64438901	CUTTING ACRYL LGC333.ABRABK ZZ:Without Color -	
5	MJN089300	Tape,Window	MJN68157101	COMPLEX LGC333.ABRABK ZZ:Without Color Tape,Window(Camera)	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
3	MJN061101	Tape,Protect	MJN68314801	COMPLEX LGC333.ABRABK ZZ:Without Color -	
3	ACQ01	Cover Assembly,Front	ACQ86075101	LGC207.ABRABK BK:Black -	
4	AEX00	Keypad Assembly,Main	AEX74017601	LGC333.ABRABK ZZ:Without Color -	
4	MCQ074200	Damper,Speaker	MCQ67072201	COMPLEX LGC333.ABRABK BK:Black Damper, Speaker (Front)	
4	MHK000000	Sheet	MHK63968301	COMPLEX LGC333.ABRABK ZZ:Without Color -	
4	MDJ000000	Filter	MDJ63448501	COMPLEX LGC333.ABRABK BK:Black Filter(Speaker)	
4	MJN061100	Tape,Protect	MJN68163401	COMPLEX LGC333.ABRABK ZZ:Without Color -	
4	MJN089300	Tape,Window	MJN68171601	COMPLEX LGC333.ABRABK ZZ:Without Color -	
4	ACQ033200	Cover Assembly Front(Sub)	ACQ86113401	LGC333.ABRABK SI:SILVER VIOLET -	
5	MCK032700	Cover,Front	MCK67256501	MOLD PC LGC333.ABRABK BK:Black -	
5	MET099500	INSERT,NUT	MICE0016904	MECH_COMMON ZY,ZZ,PRESS, STS, , , , ,	
4	AJX00	Window Assembly,LCD	AJX73504901	LGC333.ABRABK ZZ:Without Color -	
5	MKC043300	Window,LCD	MKC64363501	CUTTING ACRYL LGC207.ABRABK ZZ:Without Color -	
5	MCQ043300	Damper,LCD	MCQ67126801	COMPLEX LGC333.ABRABK BK:Black -	
7	ABA000000	Bracket Assembly	ABA74368501	LGC333.ABRABK BK:Black -	
8	MJN000001	Tape	MJN68171701	COMPLEX LGC333.ABRABK ZZ:Without Color Tape (Speaker)	
8	MCQ074200	Damper,Speaker	MCQ67072301	COMPLEX LGC333.ABRABK BK:Black -	
8	MAZ000000	Bracket	MAZ63509801	MOLD PC LGC333.ABRABK BK:Black -	
8	MJN000000	Tape	MJN68171801	COMPLEX LGC333.ABRABK ZZ:Without Color Tape (Bracket)	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
5	MJN000000	Tape	MJN68329301	COMPLEX LGC333.ABRABK ZZ:Without Color -	
5	MEV000000	Insulator	MEV63758701	COMPLEX LGC375.AINDBK ZZ:Without Color C375 INSULATOR, LCD CON	
5	ABM00	Can Assembly,Shield	ABM73856201	LGC333.ABRABK ZZ:Without Color -	
6	MKU101700	Absorber,Electrom agnetic Wave	MKU30483201	COMPLEX LGC333.ABRABK ZZ:Without Color -	
6	MBK070300	Can,Shield	MBK63332701	CUTTING STS LGC333.ABRABK ZZ:Without Color -	
6	MEV000000	Insulator	MEV64212301	COMPLEX LGC333.ABRABK ZZ:Without Color -	
5	ADB00	Dome Assembly,Metal	ADB73918101	LGC333.ABRABK ZZ:Without Color -	
5	MDS000000	Gasket	MDS64015101	COMPLEX LGC333.ABRABK ZZ:Without Color Gasket(LCD)	
5	MEZ000000	Label	MLAZ0038301	COMPLEX LG-VX6000 ZZ:Without Color PID Label 4 Array PRINTING,	
2	ACQ02	Cover Assembly,Battery	ACQ86253301	LGC333.ABRABK BK:BLACK BLACK -	
3	MEZ000900	Label,After Service	MEZ64503701	COMPLEX LGE400F.AVIVBK ZZ:Without Color E400F BRAZIL SAC LABEL	
3	MCK004100	Cover,Battery	MCK67256601	MOLD PC LGC333.ABRABK BK:Black -	

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.2 ReplacementParts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
3	EAN060000	Memory Card Assembly	EAN62630001	-	
4	EAN011400	IC,Memory Card,MICRO SD	EAN62416001	SD-C02G2CYB(PYBKP) 2GBYTE 2.7VTO3.6V MICRO SD CARD 15.0x11.0x1.0MM TR 8P 2GB MicroSD Card (24nm 16Gb MLC x 1) TOSHIBA ELECTRONICS KOREA CORPORATION	
4	SAD010100	Software Application	SAD33434101	- - BRAZIL PC SYNC -	
4	EAA030100	PIFA Antenna,Multiple	EAA62792801	LS01-I-12016-A0 MULTI -5DB 5:1 Metal Stamping Type - - - LS Mtron Ltd.	
4	SJMY00	Motor,DC	SJMY0007905	DM-YK407-6F2 3V 80mA 0A 11KRPM 0RPM 0SEC 0GF.CM 0OHM DONGYANG CHENGJI CO.	
3	EBR00	PCB Assembly,Main	EBR75738701	LGC333.ABRABK 1.0 Main	
4	EBR071500	PCB Assembly Main,Insert	EBR76169801	LGC333.ABRABK 1.0 Main	
5	EBR01	PCB Assembly Flexible	EBR75741001	LGC333.ABRABK 1.0 Flexible	
6	EBR070400	PCB Assembly Flexible,SMT	EBR75741101	LGC333.ABRABK 1.0 Flexible	
7	EAX010700	PCB,Flexible	EAX64869701	LGC333.ABRABK 1.0 POLYI Multi 2 0.2 Flexible	
7	EBR070300	PCB Assembly Flexible,SMT Top	EBR75704901	LGC333.ABRABK 1.0 Flexible	
8	CN701	Socket,Card	EAG62830201	104031-0811 SD 8P ANGLE SMD R/TP 11.95x11.40x1.42t, Push-pull type MOLEX	
8	CN700	Connector,BtoB	ENBY0039501	GB042-20P-H10-E3000 20P 0.40MM STRAIGHT PLUG SMD R/TP 1M - LS Mtron Ltd.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
8	J700	Socket DIMM/SIMM	EAG63193601	SIMF006G2K55-00R 6P STRAIGHT STANDARD SMD T/REEL - SHENZHEN EVERWIN PRECISION TECHNOLOGY CO.,LTD.	
7	EBR070200	PCB Assembly Flexible,SMT Bottom	EBR75741201	LGC333.ABRABK 1.0 Flexible	
6	EBR070100	PCB Assembly Flexible,Insert	EBR76187601	LGC333.ABRABK 1.0 Flexible	
8	EAB00	Speaker,Dual Mode	EAB62688401	BRS-181031P08-P Nd-Fe-B 700mW 8OHM 92DB 850HZ 1810 3t spring, front side SPRING BUJEON ELECTRONICS CO., LTD	
5	RAA050100	Resin,PC	BRAH0001301	UF2040 or 3075BHF . . NONE	
5	EAJ00	LCD Module	EAJ61929201	TM023KDH60 QVGA 2.3INCH 320X240 400CD COLOR 50% 4/3 450 60Hz Inverter N - - - Shanghai Tianma Micro-Electronics Co., Ltd.	
5	EBP00	Camera Module	EBP61422001	CW3030 CW3030_A99CC 3M FF Hynix 1/5" FPC 90deg COWELL ELECTRONICS CO.,LTD	
4	EBR071800	PCB Assembly Main,SMT	EBR75738801	LGC333.ABRABK 1.0 Main	
5	SAD010000	Software,Mobile	SAD33446701	Base V09h - BRAZIL MTK -	
5	EBR071700	PCB Assembly Main,SMT Top	EBR75739001	LGC333.ABRABK 1.0 Main	
6	L231	Inductor Multilayer,Chip	ELCH0005001	HK1005 2N2S 2.2NH 0.3NH - 300mA 0.13OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	ANT2	Chip Antenna Bluetooth	EAA62809101	DSBTPTR2010 DUAL -2DB 3:1 Planar Inverted F Type - - - PARTRON	
6	C525	Capacitor Ceramic,Chip	ECZH0001215	C1005X5R1A105KT000F 1uF 10% 10V X5R - 55TO+85C 1005 R/TP - TDK KOREA COOPERATION	
6	LD500 LD501	LED,Chip	EDLH0013401	SWAA07 WHITE 3.0~3.2 20mA 1200~1400mcd 0.285~0.31 120mW 1005 R/TP 2P - SEOUL SEMICONDUCTOR CO.,LTD	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	LD512	Numeric Displays	EDLS0002001	19-237/R6GBB6C-B01/2T RED/GREEN/BLUE 3 3.3V 25A 360mCD 95mW COMMON ANODE R/TP 4P EVERLIGHT ELECTRONICS CO., LTD.	
6	C19	Capacitor Ceramic,Chip	ECZH0000816	C1005C0G1H120JT000F 12pF 5% 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	EAX010000	PCB,Main	EAX64780201	LGC207.ABRABK 1.0 FR-4 SBL 6 1.0 Main	
5	EBR071600	PCB Assembly Main,SMT Bottom	EBR75738901	LGC333.ABRABK 1.0 Main	
6	C103 C106 C111 C121 C166 C211 C221 C226 C228 C232 C245 C252 C254 C255 C256 C258 C261 C307 C308 C309 C317 C343 C344 C345 C401 C410 C411 C425 C427 C428 C432 C440 C504 C513 C544	Capacitor Ceramic,Chip	ECZH0003103	GRM36X7R104K10PT 100nF 10% 10V X7R - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	VA536 VA537 VA538 VA539 VA540 VA541 VA542 VA543 VA544 ZD400 ZD401 ZD402 ZD404 ZD405	Diode,TVS	EDTY0009401	VMNZ6.8CST2R 5.78V 0 10V 0A 100mW VMN2 R/TP 2P 1 ROHM.	
6	R133 R252 R255	Resistor,Chip	ERHZ0000204	MCR01MZP5F1003 100KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R134	Resistor,Chip	ERHZ0000217	MCR01MZP5F1303 130KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R407	Resistor,Chip	ERHZ0000423	MCR01MZP5J154 150KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	VA300 VA306 VA307 VA308 VA309 VA310 VA311 VA312 VA313 VA316 VA317 VA407 VA408 VA409	Varistor	SEVY0005101	ICVL0518050FR 18V 0% 5F 1.0*0.5*0.55 NONE SMD R/TP INNOCHIPS TECHNOLOGY	
6	C22 C225 C230 C231 C233	Capacitor Ceramic,Chip	ECCH0000113	MCH155A180J 18pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C299	Capacitor Ceramic,Chip	ECCH0000183	GRM1555C1H1R8C 1.8pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C277	Capacitor Ceramic,Chip	ECCH0007802	CL10A475KP8NNNC 4.7uF 10% 10V X5R - 55TO+85C 1608 R/TP - - SAMSUNG ELECTRO- MECHANICS CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C430	Capacitor Ceramic,Chip	ECCH0007803	CL10A106MP8NNNC 10uF 20% 10V X5R - 55TO+85C 1608 R/TP 0.8MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C174 C270	Capacitor Ceramic,Chip	ECCH0017601	CL05A475MQ5NRNC 4.7uF 20% 6.3V X5R - 55TO+85C 1005 R/TP 0.5MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C1321	Capacitor Ceramic,Chip	ECZH0000802	C1005C0G1H010CT 1pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	L209 L211	Inductor Multilayer,Chip	ELCH0001054	1005GC2T5N6SLF 5.6NH 0.3NH - 300mA 0.27OHM 3.2GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	U500	IC,Charger	EUSY0410801	RT9524 DFN,10,R/TP,DFN Cal Test Mode Single Charger IC for Micro USB,IC,ChargerIC,Charger RICHTEK TECHNOLOGY CORP.	
6	C128 C214	Capacitor Ceramic,Chip	EAE62506501	CL05A475MP5NRNC 4.7uF 20% 10V X5R - 55TO+85C 1005 R/TP - - SAMSUNG ELECTRO- MECHANICS CO., LTD.	
6	L102	Inductor Multilayer,Chip	ELCH0001048	1005GC2T10NJLF 10NH 5% - 250mA 0.42OHM 2.5GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	L203	Inductor Multilayer,Chip	ELCH0001052	1005GC2T18NJLF 18NH 5% - 200mA 0.65OHM 1.6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP PILKOR ELECTRONICS LTD.	
6	L400	Inductor Multilayer,Chip	ELCH0001444	0402AF-101XJEW 100NH 5% - 900mA 0.16OHM 1.4GHZ 8 NON SHIELD NONE 1.12X0.66X0.66MM R/TP COILCRAFT SINGAPORE PTE LTD.	
6	L212	Inductor Multilayer,Chip	ELCH0003818	LQG15HS9N1J02D 9.1NH 5% - 300mA 0.26OHM 3.4GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	L213	Inductor Multilayer,Chip	ELCH0003820	LQG15HS3N0S02D 3NH 0.3NH - 300mA 0.17OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	L206 L220	Inductor Multilayer,Chip	ELCH0003839	LQG15HS22NJ02D 22NH 5% - 300mA 0.42OHM 1.9GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	FL200	Filter,Saw,Dual	EAM62470601	B9814 881.5/942.5MHz 1.5*1.1*0.4 SMD R/TP 10P EPCOS PTE LTD.	
6	FL204	Filter,Balun	EAM62490001	LDM152G4505HC012 2400-2500 950mDB BPF SMD R/TP 4P - MURATA MANUFACTURING CO.,LTD.	
6	U100	IC,Digital Baseband Processor,GSM	EAN61828501	MT6236 1.8VTO2.7V 1W 382P - BGA R/TP 382P MEDIATEK INC.	
6	U300	IC,MCP,NAND	EAN61927501	H9DA2GH1GHMMMR-46M NAND/2G SDRAM/1G 1.7VTO1.95V 8.0x9.0x0.9 TR 130P NAND+DDR SDRAM FBGA 2Gb NAND(LB/128Mx16)+1Gb DRAM(DDR/200MHz/16Mx4x16) HYNIX SEMICONDUCTOR INC.	
6	U200	IC,FM	EAN61956201	Si4705-D50-GMR FM Rx with RDS, Internal Antenna, I2S, 130nm QFN R/TP 21P SILICON LABORATORIES	
6	U205	IC,RF Transceiver,GSM	EAN62095601	AD6548BCPZ-RL3 GSM & EDGE RF Transceiver LFCSP-32 R/TP 32P MEDIATEK SINGAPORE PTE.LTD.	
6	U1	IC,Multiplexer	EAN62228101	MT6306 3.2~4.3V 999 ANALOG SWITCH/MULTIPLEXER QFN R/TP 28P SIM Controller MEDIATEK INC.	
6	U206	IC,WiFi	EAN62306101	MT5931A WiFi Single, 2.4GHz 11b/g/n, 5.1x5.3x1.2, 0.5pitch TFBGA R/TP 84P MEDIATEK INC.	
6	Q400	FET	EBK61952101	KTJ6131V P-CHANNEL MOSFET -30V +-20 -0.05A 400HM 100mW VSM R/TP 3P KEC CORPORATION	
6	C280	Capacitor Ceramic,Chip	ECCH0000107	MCH155A060DK 6pF 0.5PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C206 C21 C229 C238 C240 C418 C509	Capacitor Ceramic,Chip	ECCH0000110	MCH155A100D 10pF 0.5PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C257	Capacitor Ceramic,Chip	ECCH0000117	CL05C270JB5NNNC 27pF 5% 50V NP0 -55TO+125C 1005 R/TP 0.5 SAMSUNG ELECTRO-MECHANICS CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C151 C154 C155 C156 C157 C275 C404 C405 C424 C426 C431 C435 C436	Capacitor Ceramic,Chip	ECCH0000120	MCH155A390J 39pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C260 C429 C433 C434	Capacitor Ceramic,Chip	ECCH0000122	MCH155A470JK 47pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C249 C250	Capacitor Ceramic,Chip	ECCH0000127	MCH155A820J 82pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C172 C173 C204 C223 C272	Capacitor Ceramic,Chip	ECCH0000143	MCH155CN102KK 1nF 10% 50V X7R -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	L401 L402	Inductor Multilayer,Chip	ELCH0005009	HK1005 R10J 100NH 5% - 150mA 1.5OHM 600MHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	L225	Inductor,Wire Wound,Chip	ELCP0008017	CIG21L2R2MNE 2.2UH 20% - 500mA 0.5 0.95 0.16OHM - - SHIELD 2X1.25X1MM NONE R/TP SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	L100 L101	Inductor,Wire Wound,Chip	ELCP0009409	LQM2HPN2R2MG0L 2.2UH 20% - 600mA 0.6 1.3 0.08OHM - - SHIELD 2.5X2X1MM NONE R/TP MURATA MANUFACTURING CO.,LTD.	
6	CN301	Connector,BtoB	ENBY0034201	GB042-24S-H10-E3000 24P 0.40MM STRAIGHT SOCKET SMD R/TP 1M - LS Mtron Ltd.	
6	CN503	Connector,BtoB	ENBY0039601	GB042-20S-H10-E3000 20P 0.4MM STRAIGHT SOCKET SMD R/TP 1M - LS Mtron Ltd.	
6	J400	Jack,Phone	ENJE0008001	JAM3333-F32-7F 1P 4P ANGLE R/TP 4mM BLACK 6P - HON HAI PRECISION INDUSTRY CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	CN300	Connector FFC/FPC/PIC	ENQY0014201	04-6293-627-005-829+ 27P 0.30MM FPC STRAIGHT BOTH SMD R/TP LOCKING - KYOCERA ELCO KOREA SALES CO.,LTD.	
6	R253 R9	Resistor,Chip	ERHY0000104	MCR01MZP5F49R9 49.9OHM 1% 1/16W 1005 R/TP - ROHM.	
6	R110	Resistor,Chip	ERHY0000124	MCR01MZP5F7501 7.5KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R502	Resistor,Chip	ERHY0000185	RC1005F821CS 820OHM 1% 1/16W 1005 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	R301 R302	Resistor,Chip	ERHY0000254	MCR01MZP5J472 4.7KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R300 R414 R420 R421	Resistor,Chip	ERHY0003301	MCR01MZP5J101 100OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R239	Resistor,Chip	ERHY0003501	RC1005J221CS 220OHM 5% 1/16W 1005 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	R270	Resistor,Chip	ERHZ0000203	MCR01MZP5F1002 10KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R100	Resistor,Chip	ERHZ0000205	MCR01MZP5F1004 1MOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R111	Resistor,Chip	ERHZ0000221	MCR01MZP5F1502 15KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R285 R287	Resistor,Chip	ERHZ0000242	MCR01MZP5F2200 220OHM 1% 1/16W 1005 R/TP - ROHM.	
6	R286	Resistor,Chip	ERHZ0000522	MCR01MZP5J240 24OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R135 R418	Resistor,Chip	ERHZ0000529	MCR01MZP5J152 1.5KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R117	Resistor,Chip	ERHZ0000538	MCR01MZP5F3303 330KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	U302	IC,Charge Pump	EUSY0344402	RT9367C QFN,20,R/TP,4CH,2LDO,3X3,IC,Sub PMICIC,Sub PMIC RICHTEK TECHNOLOGY CORP.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	U501	IC,LDO Voltage Regulator	EUSY0367001	RP101K332D RP101K332D RP101K332D,DFN1612-4B ,4 ,R/TP ,300mA 3.3V LDO RICOH COMPANY, LTD. RICOH COMPANY, LTD.	
6	IC400	IC,Audio Sub System	EUSY0403901	WM9093ECS/R 1.71~5.5V 0W WLCSP R/TP 20P - WOLFSON MICROELECTRONICS PLC	
6	U401	IC,Comparator	EUSY0407701	LMV331 2.7~5.5V - COMPARATOR SC70 R/TP 5P - TEXAS INSTRUMENTS KOREA LTD, HONGKONG BRANCH.	
6	X202	Oscillator,TCXO	EXST0002401	1XTW26000FAA 26MHZ 1.5PPM 2.8V 0.0x0.0x0.0MM NONE SMD R/TP DAISHINKU CORPORATION.	
6	X201	Crystal	EXXY0025201	DSX321G-26M - 10PPM - - - SMD P/TP DAISHINKU CORPORATION.	
6	X100	Crystal	EXXY0026801	NX3215SA 32.768KHZ 20PPM 0F NONE SMD R/TP NIHON DEMPA KOGYO CO.,LTD.	
6	VA400 VA401 VA509 VA510 VA511 VA512 VA513 VA514 VA515 VA517 VA518 VA519 VA520 VA521 VA522 VA523 VA524 VA526 VA527 VA532 VA533 VA534 VA535 VA545	Varistor	SEVY0005402	ICVS0505500FR 5.6V 0% 50F 1.0*0.5*0.55 - SMD R/TP INNOCHIPS TECHNOLOGY	
6	FB200	Filter,Bead	SFBH0007101	BLM15AG121SN1D 120 ohm 1.0X0.5X0.5 25% 0.25 ohm 0.5A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	FB407 FB408 FB409 FB410	Filter,Bead	SFBH0008105	BLM15BD182SN1D 1800 ohm 1.0X0.5X0.5 25% 1.4 ohm 0.1A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	
6	FL4	Filter,Dielectric	SFDY0003001	DEA202450BT-1275A1 DEA202450BT- 1275A1,2450 MHz,2.0*1.25*1.05,SMD,2400M~2500M,IL 1.6,4pin,U-U,50-50,BT BPF TDK CORPORATION	
6	FL300 FL301 FL302	Filter,EMI/Power	SFEY0012501	ICVE10054E250R201FR ESD/EMI 0HZ 25pF 0H SMD R/TP INNOCHIPS TECHNOLOGY	
6	FL500	Filter,EMI/Power	SFEY0016301	ICMEF112P900M COMMON MODE NOISE FILTER 0HZ 0F 0H SMD R/TP INNOCHIPS TECHNOLOGY	
6	ANT2	Chip Antenna Bluetooth	EAA62809101	DSBTPTR2010 DUAL -2DB 3:1 Planar Inverted F Type - - - PARTRON	
6	EAB01	Microphone Condenser	EAB62291401	SOB410S44VRC 44DB 2.2KOHM OMNI 1.5TO4V 4pi 1.2t SMD BSE CO., LTD.	
6	C502	Capacitor Ceramic,Chip	EAE62505701	CL10A105KB8NNNC 1uF 10% 50V X5R - 55TO+85C 1608 R/TP 0.9T max. - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C282	Capacitor Ceramic,Chip	EAE62542701	CL21A226MPCLRNC 22uF 20% 10V X5R - 55TO+85C 2012 R/TP 0.95T max. SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	CN500	Connector,I/O	EAG63090001	04-5161-005-100-868 7P 0.90MM ANGLE RECEPTACLE DIP R/TP Normal New IO Connector KYOCERA ELCO KOREA SALES CO.,LTD.	
6	J700	Socket DIMM/SIMM	EAG63193601	SIMF006G2K55-00R 6P STRAIGHT STANDARD SMD T/REEL - SHENZHEN EVERWIN PRECISION TECHNOLOGY CO.,LTD.	
6	CN502	Connector,Terminal Block	EAG63193701	BATF003G6K95-00R 3P 3.00MM STRAIGHT DIP T/REEL - SHENZHEN EVERWIN PRECISION TECHNOLOGY CO.,LTD.	
6	FB100	Filter,Bead	EAM62071001	BLM18KG221SN1D 220 ohm 1.6X0.8X0.8 25% 0.05 ohm 2.2A SMD R/TP 2P 0 MURATA MANUFACTURING CO.,LTD.	
6	FL203	Filter,Ceramic	EAM62250401	LFB212G45CG7D227 BPF 2.45KHZ 100Hz SMD R/TP 3P MURATA MANUFACTURING CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	FL201	Filter,Saw,Dual	EAM62450901	B9817 1960/1842.5MHz 1.5*1.1*0.4 SMD R/TP 10P EPCOS PTE LTD.	
6	C235 C236	Capacitor Ceramic,Chip	ECCH0001001	C1005C0G1H6R8CT000F 6.8pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C142 C144 C423	Capacitor Ceramic,Chip	ECCH0005604	GRM188R60J106M 10000000 pF,6.3V,M,X5R,TC,1608,R/TP,0.8 mm MURATA MANUFACTURING CO.,LTD.	
6	C20 C332 C333 C334 C336 C337 C400 C8 C9	Capacitor Ceramic,Chip	ECCH0007804	CL05A225MP5NSNC 2.2uF 20% 10V X5R - 55TO+85C 1005 R/TP 0.5MM SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C125	Capacitor Ceramic,Chip	ECZH0000806	C1005C0G1H050CT000F 5pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C234 C290 C293 C329	Capacitor Ceramic,Chip	ECZH0000830	C1005C0G1H330JT000F 33pF 5% 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C1322	Capacitor Ceramic,Chip	ECZH0000839	C1005C0G1H4R7CT000F 4.7pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C259	Capacitor Ceramic,Chip	ECZH0001216	C1005X5R1A224KT000E 220nF 10% 10V X5R - 55TO+85C 1005 R/TP - TDK KOREA COOPERATION	
6	C169 C170 C171	Capacitor Ceramic,Chip	ECZH0004402	CL05F104ZO5NNNC 0.1uF -20TO+80% 16V Y5V - 30TO+85C 1005 R/TP - SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	ZD501	Diode,Zener	EDNY0013602	EDZTE615.1B 4.98V 4.98TO5.2V 80OHM 150mW EMD2 R/TP 2P 1 ROHM Semiconductor KOREA CORPORATION	
6	D500	Diode,Switching	EDSY0011901	SDB310Q 340mV 30V 200mA 1A 0SEC 150mW EMD2 R/TP 2P 1 AUK CORP	
6	ZD502 ZD503 ZD504	Diode,TVS	EDTY0010501	RCLAMP1521P.TCT 15V 16.7 28V 4A 0W SLP1006P2 R/TP 2P 1 SEMTECH CORPORATION	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R524 R531	Resistor,Chip	ERHZ0000252	MCR01MZP5F2403 240KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R503	Resistor,Chip	ERHZ0000264	MCR01MZP5F3001 3KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R402	Resistor,Chip	ERHZ0000287	MCR01MZP5F4702 47KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R116	Resistor,Chip	ERHZ0000295	MCR01MZP5F5102 51KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R254	Resistor,Chip	ERHZ0000328	MCR01MZP5F2402 24KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	R405	Resistor,Chip	ERHZ0000402	MCR01MZP5J100 10OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R101 R228 R310 R415 R525	Resistor,Chip	ERHZ0000404	MCR01MZP5J102 1KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R203 R281	Resistor,Chip	ERHZ0000405	MCR01MZP5J103 10KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R205 R212 R230 R311 R403 R404 R504 R538	Resistor,Chip	ERHZ0000406	MCR01MZP5J104 100KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R263 R406	Resistor,Chip	ERHZ0000407	MCR01MZP5J105 1MOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R282 R284	Resistor,Chip	ERHZ0000429	MCR01MZP5J181 180OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R312 R313 R429 R430	Resistor,Chip	ERHZ0000434	MCR01MZP5J1R0 1OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R400 R401	Resistor,Chip	ERHZ0000435	MCR01MZP5J200 20OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R240 R241	Resistor,Chip	ERHZ0000437	MCR01MZP5J202 2KOHM 5% 1/16W 1005 R/TP - ROHM.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	R288	Resistor,Chip	ERHZ0000449	MCR01MZP5J243 24KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R283	Resistor,Chip	ERHZ0000457	MCR01MZP5J300 30OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R434	Resistor,Chip	ERHZ0000484	MCR01MZP5J471 470OHM 5% 1/16W 1005 R/TP - ROHM.	
6	R119 R120 R121 R122 R123 R124 R125 R126 R127 R128 R129 R130 R131 R132 R242	Resistor,Chip	ERHZ0000505	MCR01MZP5J681 680OHM 5% 1/16W 1005 R/TP - ROHM.	
6	SW201	Connector,RF	EAG63012601	RF-800N 0.40MM STRAIGHT SOCKET SMD R/TP AU 50OHM 500mDB DONG EUN	
6	U215	Module,Tx Module	EAT61473901	RF7180 36DBM,36DBM,33DBM,33DBM 0DB 42%,40%,36%,37% 0A 0A 0DB 0DBM 0DBM 23P 6.63x5.24x0.975MM RF7171 low cost ver, GPRS QUAD TX DUAL RX MODULE RF MICRO DEVICES INC	
6	C17	Capacitor Ceramic,Chip	ECCH0000108	C1005NP0709DGT 7pF 0.5PF 50V NP0 - 55TO+125C 1005 R/TP - NEOTECH CO., LTD	
6	C274	Capacitor Ceramic,Chip	ECCH0000112	MCH155C150J 15pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C510	Capacitor Ceramic,Chip	ECCH0000185	GRM1555C1H5R6C 5.6pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C16	Capacitor Ceramic,Chip	ECCH0000195	GRM1555C1H3R9C 3.9pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - MURATA MANUFACTURING CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	C101 C134 C167 C176 C243 C306 C316 C402 C403 C412 C413 C414 C415 C416 C529	Capacitor Ceramic,Chip	ECCH0000198	CL05A225MQ5NSNC 2.2uF 20% 6.3V X5R - 55TO+85C 1005 R/TP . SAMSUNG ELECTRO- MECHANICS CO., LTD.	
6	C10 C11 C1333 C1336 C200 C271 C276 C284 C285 C288 C289	Capacitor Ceramic,Chip	ECZH0000813	C1005C0G1H101JT 100pF 5% 50V C0G - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C123 C1338	Capacitor Ceramic,Chip	ECZH0001002	C1005CH1H0R5BT000F 0.5pF 0.1PF 50V NP0 - 55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C525	Capacitor Ceramic,Chip	ECZH0001215	C1005X5R1A105KT000F 1uF 10% 10V X5R - 55TO+85C 1005 R/TP - TDK KOREA COOPERATION	
6	L1	Inductor Multilayer,Chip	ELCH0003847	LQG15HS1N8S02D 1.8NH 0.3NH - 300mA 0.1OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP MURATA MANUFACTURING CO.,LTD.	
6	L230	Inductor Multilayer,Chip	ELCH0005003	HK1005 12NJ 12NH 5% - 300mA 0.4OHM 2.7GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	R106	Resistor,Chip	ERHZ0000294	MCR01MZIP5F5101 5.1KOHM 1% 1/16W 1005 R/TP - ROHM.	
6	VA314 VA315	Varistor	SEVY0005202	EVLC5S02100 5.5V 0% 100F 1.0*0.5*0.6 UL SMD R/TP AMOTECH CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
6	FB101 FB103 FB303 FB304 FB305 FB402 FB403	Filter,Bead	SFBH0006806	CIM05J601NC 600 ohm 1.0X0.5X0.5 25% 0.6 ohm 0.3A SMD R/TP 2P 0 SAMSUNG ELECTRO- MECHANICS CO., LTD.	
6	C159 C160 C283 C286 C291 C503 L229	Capacitor Ceramic,Chip	ECCH0000115	MCH155A220JK 22pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C287	Capacitor Ceramic,Chip	ECCH0000129	MCH155A121JK 120pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C168	Capacitor Ceramic,Chip	ECCH0000701	C1005C0G1H1R2CT000F 1.2pF 0.25PF 50V NP0 - 55TO+125C 1005 R/TP - TDK CORPORATION	
6	C533 C534	Capacitor TA,Conformal	ECTH0002002	F981A336MSA 33uF 20% 10V 3.3UA -55TO+125C 6OHM 2.0X1.25X0.8MM NONE SMD R/TP 0.9T max. NICHICON CORPORATION, EAST JAPAN SALES OFFICE	
6	L231	Inductor Multilayer,Chip	ELCH0005001	HK1005 2N2S 2.2NH 0.3NH - 300mA 0.13OHM 6GHZ 8 SHIELD NONE 1.0X0.5X0.5MM R/TP TAIYO YUDEN CO.,LTD	
6	R104 R105 R108 R109 R140 R141 R222 R223 R224 R225 R417 R419 R422	Resistor,Chip	ERHZ0000443	MCR01MZP5J222 2.2KOHM 5% 1/16W 1005 R/TP - ROHM.	
6	R118	Wire Pad,Open	SAFO0000501	AX3100 ATL SV_SHIPBACK,MAIN,A,0OHM_1005_DNI	
6	R427 R428	PCB ASSY,MAIN PAD SHORT	SAFP0000401	LG-LU3000 LGTBK,MAIN,A,	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	LocationNo.	Description	PartNumber	Spec	Remark
1	AGF000000	Package Assembly	AGF76679301	LGC333.ABRABK ZZ:Without Color LG-C333(Q3t) BRA, Brazil Package	
1	AAD000000	Addition Assembly	AAD86170601	LGC333.ABRABK BK:BLACK BLACK -	

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.3 Accessory

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	LocationNo.	Description	PartNumber	Spec	Remark
2	SBPL00	Rechargeable Battery Lithium Ion	SBPL0095402	LGIP-530A PRISMATIC 3.7V 1.1AH 220mAh 50x34x5.5 50x34x5.5 BLACK Mold none TOCAD DONGHWA	
2	EBX000000	Accessory Data Cable	SGDY0016701	KCA-ET-8-0020 KCA-ET-8-0020 Micro USB, 1.2M KSD CO., LTD	
2	EAB010200	Earphone, Stereo	SGEY0003219	EMB-LGE001STKE ,BLACK, 4 POLE PLUG, 3.5 4, Earphone, Stereo CRESYN CO., LTD	
2	EAY060000	Adapters	SSAD0036001	STA-U12BR 90Vac~264Vac 5.1V 700mA 5060 GOST NONE NONE - SUNLIN ELECTRONICS CO., LTD	
2	AFN053800	Manual Assembly Operation	AFN75893101	LGC333.ABRABK ZZ: Without Color Manual assy for LGC333 BRA	
3	MFL053800	Manual, Operation	MFL67681601	PRINTING LGC333.ABRABK ZZ: Without Color Brazil PORTUGUESE Manual for LGC333 BRA	