LG-A120 Service Manual





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1. INTRODUCTION

1.1 Purpose

This manual provides information necessary to repair, 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 dose not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunications 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 expect as specifically noted in this manual.

Therefore, note that authorized 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 Devices(ESD), are indicated by the sign .

Following information is ESD handing:

- . 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 packages as described.

2. PERFORMANCE

2.1 H/W Features

Solution	6223D	MTK
Туре	Bar type	
Antenna Type	Internal (dual-Band)	
Main Display	1.77" 128 x 160 , TFT/65k	
Battery	950mAh Li-ion inner pack	950mAh: 55x34x5.7mm
Music player	Yes	Only for FM (AMR/WAV
Music player	165	file)
FM Receiver	Yes , US/Europe band support	(87.5~108MHz)
		Tension contact FPC
Embedded FM antenna	Yes	type FM Antenna on
		Battery cover.
Real time FM recording	Yes	
Loud Speaker	Yes	x 2, Φ 16 speaker
Music playerreal resuming	Yes	
Memory Size	64Mb+32Mb	User memory: 729KB
LAAT (Look Makilo Tuodrou)	Yes	LMT for: AMA
LMT (Lost Mobile Tracker)	res	M-DOG: China
Torch LED	Y	
In flight mode	Yes	

2.2 S/W Features

Feature	Detail Item	Description	
OS	OS	Operating System	Υ
Audio	Speech Code	FR,EFR,HR,AMR-NB	Υ
	AMR code	GSM Full Rate	Υ
		3GPP Adaptive Multi Rate (AMR-NB)	
	FM Radio		Υ
	MP3 Ring	MP3 decode	Υ
	Tone		
	Integrated hands	Speaker phone mode	Υ
	free		
	speaker		
	Key Tone	6 Level (Include Mute)	Υ
	Volume		
	Ring Tone	6 Level (Include Mute)	Υ
	Volume		
	Ring Tone	MP3 ring tone/Midi	Υ
	Call Alert	Ring, Vibrate, Ring & Vibrate, Ring after	Υ
	type	vibrate, Silent	
	Earpiece	6 Level (Include Mute)	Υ
	Volume		
	Mute		Υ
Frequency	GSM dual	Configuration is during software compile	Υ
Bands	band MS	time.	
	900-1800		
	PCS dual		N
	band MS		
	850-1900		
Date Service	Circuit		N
	Packet		N
Connectivity	Infrared		N
	(IrDA)		
	Bluetooth		N
	USB		N
	USB Mass		N
	storage		
	RS232(UAR	Only for manufacture tool	Y
	T)		

Voice	Voice		Υ
Function	Recording		
	Voice		N
	Command		
	Answering		N
	machine		
Camera	Capture Size	160x120, 320x240, 640x480	N
	Preview Size	Full Screen: 128x128	N
	Quality	Low, Normal, High	N
	EV	+4, +3, +2, +1, 0, -1, -2, -3, -4	N
	WB	Auto, Daylight, Tungsten,	N
		FLUORESCENT, Cloud,	
		INCANDESCENCE	
	Zoom	640x480 : 1x	N
		320x240 : 1x, 2x	
		160x120/128x128 : 1x, 2x, 4x	
	Effect	Normal, Sepia, Grayscale, Color invert	N
	Continuous	1 Shot, 3 shot, 6 shot	N
	Shot		
	Self Timer	3 seconds, 5 seconds, 10 seconds	N
	Shutter tone	Off, tone1, tone2, tone3	N
	Storage	Phone/SD card	N
	Reset Setting	Restore to default setting	N
Image Viewer	Browse detail		N
	image Info		
	Full Screen		N
	View		
File Manager	Browse file		Υ
(Sound folder)	tree		
	Сору,		Υ
	Rename,		
	Delete, Move		
	files		
	Rename,		Υ
	Delete,		
	Multi-Delete,		
	Create folder		
Display	RSSI	6 level (0~5 level)	Υ

	Battery level	4 level (0~3 level)	Υ
	RTC	Date & Time Display	Υ
	PLMN/Servic		Υ
	e Indicator		
	Quick Access		Υ
	Mode In Idle		
	Dimming		N
	Clock		
	Dual Clock		N
	Home	Display Shortcut icon in Idle(Quick	Y
	shortcut	Access)	
Call History	Last Dial	Max : 40 records	Y
	Number		
	Last	Max: 40 records	Y
	Received		
	Number		
	Last Missed	Max: 40 records	Y
	Number		
	Scratch Pad		N
	Memory		
	Call Duration	Last Call time, Total Call Time	Y
Call Cost	Last Call		Y
	Charge Units		
	Total Charge		Y
	Units		
Call	Call Waiting		Y
Management	Call Swap		Υ
	Call Retrieve		Y
	Auto Answer		N
	Auto Redial		Y
	Calling Line		N
	Full Call		Υ
	Divert		
	Speed		Υ
	Dialing		
	Last Number		Υ
	Redial		

	Multi Party		Υ
	Call		
	ECT	Explicit Call Transfer	Υ
Network	Automatic Network		Y
	Selection		
	Manual		Υ
	Network		
	Preferred	(User definition)	Y
	Network		
	Network		Υ
	Service		
	Status		
DTMF	DTMF		Y
	Signaling		
	DTMF		Y
	Enable &		
	Disable		
Cell Broadcast	Read Cell		Y
	Broadcast		
	On/Off	Receive On/Off	Y
	setting		
	Alert setting		N
	CB message		Y
	Language		
	setting		
	Channel		Y
	Setting		
Contacts(Pho	Entry	1000	Y
ne Book)	Field	Name, Mobile, Home, Office	Y
	Сору	ME <-> SIM	Y
	Move	ME <-> SIM	Υ
	FDN		Υ
	SDN		Υ
	Email Entry		N
	Picture ID		N
	Video Caller		N
	ID		
	vCard		N

	Business		N
	Card		
	Delete	Delete, Delete All(SIM or Phone), Multi	Υ
		Delete	
Supplementary	CFU	Call Forwarding Unconditional	Υ
Services	CFB	Call Forwarding on Mobile Subscriber	Υ
		Busy	
	CFNRy	Call Forwarding on No Reply	Υ
	CFNRc	Call Forwarding on Mobile Subscriber	Υ
		Not Reachable	
	BAOC	Barring of All Outgoing Calls	Υ
	BOIC	Barring of Outgoing International Calls	Υ
	BOICexHC	Barring of Outgoing International Calls	Υ
		except those directed to the Home	
		PLMN Country	
	BAIC	Barring of All Incoming Calls	Υ
	BICRoam	Barring of Incoming Calls when	Υ
		Roaming Outside the/Home PLMN	
		Country	
	Conference	Up to 5	Υ
	Call		
SIM	Plug in Type	3V & 1.8 V	Υ
	SIM Lock	Service Provider / Network Lock	N
	SIM Toolkit	Class 3	Υ
Short	Read		Υ
Message	Message		
	Write and		Υ
	Edit Message		
	Send and Receive		Υ
	Message		
	Reply to		Υ
	Message		
	Forward		Y
	Message		
	Extract Number		Υ
	from		
	Message		

	Message		Υ
	Status		
	Message		Υ
	Unread		
	Settable Message		Υ
	Center Number,		
	Reply Path		
	and Validity		
	Visible and Audible		Υ
	Message		
	Receive		
	Voice Mail		Υ
	Settable Voice Mail		Υ
	Center		
	Number		
	Message	Normal,	Υ
	Protocol		
	Message Overflow	Blinking Icon	Υ
	Indicator		
	Message		Υ
	Center		
	Number		
	Nokia Smart		N
	Message		
Miscellaneous	Development &		Υ
Function	Test		
	Facility		
	Field Test		Υ
	Facility		
	Display		Υ
	Software		
	Version		
	IMEI		Υ
	Restore		Υ
	Factory		
	Setting		

	Battery		Υ
	Charging		
	Mode		
Text Input	Language	Selectable Auto Language	Υ
	Predictive	Т9	Y
	word input		
Scheduler	Calendar	MAX: 100 records (35 chars)	Υ
	To Do	MAX: 50 records (35 chars)	Υ
	Memo	MAX: 10 records (80 chars)	N
World Time	Setting Local		Y
	Time		
	Display Two	Dual Clock	N
	Number of		
	Cities Time		
	Daylight		Y
	saving		
	NITZ		Υ
Unit converter		Length, Weight,	Υ
Stop Watch			N
Calculator		+-*/	Y
PC Sync	Phone Book	Only For manufacture	N
	Sync		
	Message		N
	Sync		
Game		2 C game	Y
Security	Emergency		Y
	Call		
	Handset		Υ
	Lock		
	Security	When Delete All	N
	Code		
	PIN Lock		Υ
	Keypad Lock		Y
Real Time	12/24 Hour		Y
Clock	Calendar		Y
	Time Zone		Y
	Daylight		N
	saving		

	Alarm	Once, Daily, Mon~Fri, hourly	Υ
	Manager		
	Dimming		N
	Clock		
	Power-off		Υ
	Alarm		
	On Alarm	Display & Ring	Υ
	Event		
Others	Mobile	For India, Asia	Υ
	Tracking		
	software		
	M-DOG	For China	Υ
Accessory	Charger		Υ
	Adapter		
	Normal		Υ
	earmic		
	(without hook		
	switch)		
User Memory		729 KB	Y

3.TECHNICAL BRIEF

3.1 Digital Main Processor

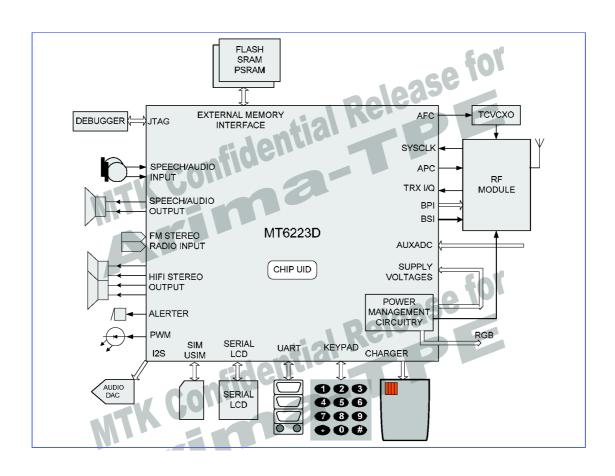


Figure.3-1-1 MT6223 FUNCTIONAL BLOCK DIAGRAM

3.1.1 System Overview

MT6223D is an entry level chipset solution with class 12 GPRS/GSM modem. It integrates not only analog baseband but also power management blocks into one chip and can greatly reduce the component count and make smaller PCB size. Besides, MT6223D is capable of SAIC (Single Antenna Interference Cancellation) and AMR speech.

Based on 32 bit ARM7EJ-STM RISC processor, MT6223D provides an unprecedented platform for high quality Modem performance.

Platform

MT6223D runs the ARM7EJ-STM RISC processor at up to 52Mhz, thus providing best trade-off between system performance and power consumption.

For large amount of data transfer, high performance DMA (Direct Memory Access) with hardware flow control is implemented, which greatly enhances the data movement speed while reducing MCU processing load.

Targeted as a modem-centric platform for mobile applications, MT6223D also provides hardware security digital rights management for copyright protection. For further safeguarding, and to protect manufacturer's development investment, hardware flash content protection is also provided to prevent unauthorized porting of software load.

Memory

MT6223D supports up to 2 external state-of-the-art devices through its 16-bit host interface. Devices such as burst/page mode Flash, page mode SRAM, and Pseudo SRAM are supported. To minimize power consumption and ensure low noise, this interface is designed for flexible I/O voltage and allows lowering of supply voltage down to 1.8V. The driving strength is configurable for signal integrity adjustment. The data bus also employs retention technology to prevent the bus from floating during turn over.

Multi-media

MT6223D utilize high resolution audio DAC, digital audio, and audio synthesis technology to provide superior audio features., e.g. MP3 ring tone.

Connectivity, and Storage

MT6223D supports UART as well as Bluetooth interface. Also, necessary peripheral blocks are embedded for a voice centric phone: Keypad Scanner with the capability to detect multiple key presses, SIM Controller, Alerter, Real Time Clock, PWM, Serial LCD Controller, and General Purpose Programmable I/Os.

Audio

Using a highly integrated mixed-signal Audio Front-End, architecture of MT6223D allows for easy audio interfacing with direct connection to the audio transducers. The audio interface integrates D/A and A/D Converters for Voice band, as well as high resolution Stereo D/A Converters for Audio band. In addition, MT6223D also provides Stereo Input and Analog Mux. MT6223D also supports AMR codec to adaptively optimize speech and audio quality.

Radio

MT6223D integrates a mixed-signal Baseband front-end in order to provide a well-organized radio interface with flexibility for efficient customization. It contains gain and offset calibration mechanisms, and filters with programmable coefficients for comprehensive compatibility control on RF modules. This approach also allows the usage of a high resolution D/A Converter for controlling VCXO or crystal, thus reducing the need for expensive TCVCXO. MT6223D achieve great MODEM performance by utilizing 14-bit high resolution A/D Converter in the RF downlink path. Furthermore, to reduce the need for extra external current-driving component, the driving strength of some BPI outputs is designed to be configurable.

Debug Function

The JTAG interface enables in-circuit debugging of software program with the ARM7EJ-S core. With this standardized debugging interface, MT6223D provides developers with a wide set of options in choosing ARM development kits from different third party vendors. Low Power Features MT6223D offers various low-power features to help reduce system power consumption. These features include Pause Mode of 32KHz clocking at Standby State, Power Down Mode for individual peripherals, and Processor Sleep Mode. In addition, MT6223D are also fabricated in advanced low leakage CMOS process, hence providing an overall ultra low leakage solution.

Power Management

MT6223D integrates all regulators that a voice-centric phone needs. Seven LDOs optimized for Specific GSM/GPRS baseband sub-systems are included, and a RF transceiver needed LDO is also built-in. Besides Li-Ion battery charge function, SIM card level shifter interface, two open-drain output switches to control the LED and vibrator are equipped. Other power management schemes such as thermal overload protection, Under Voltage Lock-out Protection (UVLO), over voltage protection and oower-on reset and start-up timer are also MT6223D features. Besides, 3 NMOS switches controlling the RGB LEDs are also embedded to reduce BOM coount.

Package

The MT6223D device is offered in 9mm×9mm, 224-ball, 0.5 mm pitch, TFBGA package.

3.1.2 Platform Feature

General

Integrated voice-band, audio-band and base-band analog front ends TFBGA 9mm×9mm, 224-ball, 0.5 mm pitch package

MCU Subsystem

ARM7EJ-S 32-bit RISC processor

High performance multi-layer AMBA bus

Java hardware acceleration for fast Java-based games and applets

Operating frequency: 26/52 MHz

Dedicated DMA bus

7 DMA channels

320K bits on-chip SRAM

On-chip boot ROM for Factory Flash Programming

Watchdog timer for system crash recovery

3 sets of General Purpose Timer

Circuit Switch Data coprocessor

Division coprocessor

External Memory Interface

Supports up to 2 external devices

Supports 16-bit memory components with maximum size of up to 128M Bytes each

Supports Flash and SRAM/PSRAM with Page Mode or Burst Mode

Industry standard serial LCD Interface

Supports multi-media companion chips with 8/16 bits data width

Flexible I/O voltage of 1.8V ~ 2.8V for memory interface

Configurable driving strength for memory interface

User Interfaces

5-row × 7-column keypad controller with hardware scanner

Supports multiple key presses for gaming

SIM/USIM Controller with hardware T=0/T=1 protocol control

Real Time Clock (RTC) operating with a separate power supply

General Purpose I/Os (GPIOs)

2 Sets of Pulse Width Modulation (PWM) Output

Alerter Output with Enhanced PWM or PDM

6 external interrupt lines

Security

Supports security key and 59 bit chip unique ID

Connectivity

3 UARTs with hardware flow control and speed up to 921600 bps

DAI/PCM and I2S interface for Audio application

Low Power Schemes

Power Down Mode for analog and digital circuits

Processor Sleep Mode

Pause Mode of 32KHz clocking at Standby State

3-channel Auxiliary 10-bit A/D Converter for application usage other than battery monitoring

Power and Supply Management

2.8V to 5.5V Input Range

Charger Input up to 8V

Seven LDOs Optimized for Specific GSM

Sub-systems

One LDO for RF transceiver

High Operation Efficiency and Low Stand-by Current

Li-Ion Battery Charge function

SIM Card Interface

Two Open-Drain Output Switches to Control the LED and Vibrator

Three NMOS switches to control RGB LEDs

Thermal Overload Protection

Under Voltage Lock-out Protection

Over Voltage Protection

Power-on Reset and Start-up Timer

Test and Debug

Built-in digital and analog loop back modes for both Audio and Baseband Front-End

DAI port complying with GSM Rec.11.10

JTAG port for debugging embedded MCU

3.1.3 MODEM Features

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

Dedicated Rx filter for FB acquisition

2 Channels Baseband Serial Interface (BSI) with 3-wire control

Bi-directional BSI interface. RF chip register read access with 3-wire or 4-wire interface.

10-Pin Baseband Parallel Interface (BPI) with programmable driving strength

Multi-band support

Voice and Modem CODEC

Dial 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

GSM Circuit Switch Data

GPRS Class 12

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 03.50

3.1.4 Multi-Media Features

LCD Interface

Dedicated Serial Interface supports 1 external Serial interface for LCM

LCD Controller

Supports LCM format: RGB332, RGB444, RGB565, RGB666, RGB888

Supports LCD module with maximum resolution up to 176x220 at 16bpp

2 layer blending

Supports hardware display rotation for each layer

Audio CODEC

Wavetable synthesis with up to 64 tones

Advanced wavetable synthesizer capable of generating simulated stereo

Wavetable including GM full set of 128 instruments and 47 sets of percussions

PCM Playback and Record

Digital Audio Playback

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

FM Radio Recording

Stereo to Mono Conversion

3.1.5 General Description

Figure3-1-2 details the block diagram of MT6223D. on a dual-processor architecture, MT6223D integrates both an ARM7EJ-S core and 2 digital signal processor cores. ARM7EJ-S is the main processor that is responsible for running 2G and 2.5G protocol software. Digital signal processors handle the MODEM algorithms as well as advanced audio functions.

Except for some mixed-signal circuitries, the other building blocks in MT6223D are connected to either the microcontroller or one of the digital signal processors.

Specifically, MT6223D consist of the following subsystems:

- Microcontroller Unit (MCU) Subsystem includes an ARM7EJ-S RISC processor and its accompanying memory management and interrupt handling logics.
- ◆ Digital Signal Processor (DSP) Subsystem includes 2 DSP cores and their accompanying memory, memory controller, and interrupt controller.
- MCU/DSP Interface where the MCU and the DSPs exchange hardware and software information.
- Microcontroller Peripherals includes all user interface modules and RF control interface modules.
- Microcontroller Coprocessors runs computing-intensive processes in place of Microcontroller.
- ◆ DSP Peripherals hardware accelerators for GSM/GPRS/EGDE channel codec.
- Voice Front End the data path for converting analog speech from and to digital speech.
- Audio Front End the data path for converting stereo audio from stereo audio source
- Baseband Front End the data path for converting digital signal from and to analog signal of RF modules.
- Timing Generator generates the control signals related to the TDMA frame timing.
- Power, Reset and Clock subsystem manages the power, reset, and clock distribution inside MT6223D
- ◆ LDOs, Power-on sequences, swicthes and SIM level shifters.

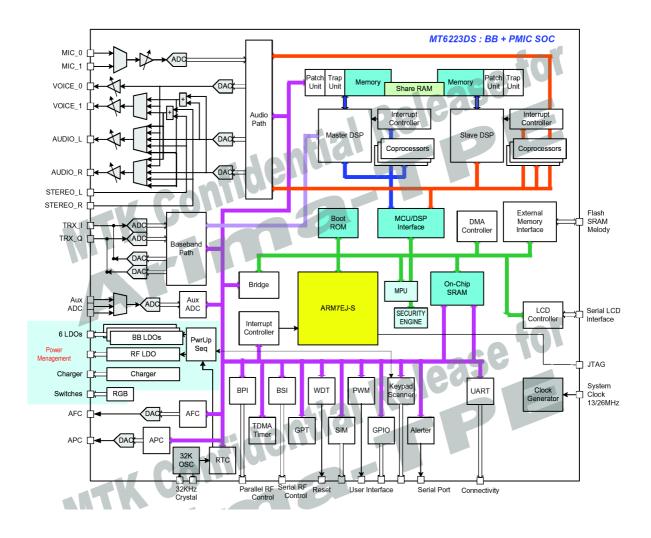


Figure.3-1-2 MT6223 BLOCK DIAGRAM

3.2 Power Amplifier Module (SKY77542)

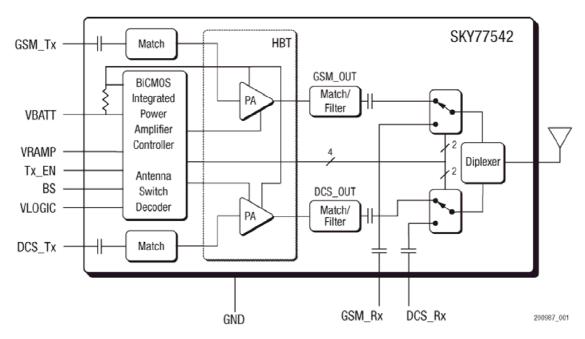


Figure.3-2-1 SKY77542 FUNCTIONAL BLOCK DIAGRAM

The SKY77542 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC.) for dual-band cellular handsets comprising GSM900 and DCS1800 operation. Designed in a low profile, compact form factor, the SKY77542 offers a complete Transmit VCO-to- Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM900 PA block and a DCS1800 PA block, impedance-matching circuitry for 50 $\,^{\Omega}$ input and output impedances, Tx harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor. A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM900 band and the other PA block supports the DCS1800 band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

Band selection and control of transmit and receive modes are performed using two external control pads. Refer to the functional block diagram in Figure 3-2-1 below. The band select pad (BS) selects between GSM and DCS modes of operation. The transmit enable (Tx_EN) pad controls receive or transmit mode of the respective RF switch (Tx = logic 1). Proper timing between transmit enable (Tx_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and Tx-VCO while the VCO is being tuned prior to the transmit burst.

The SKY77542 is compatible with logic levels from 1.2 V to VCC for BS and Tx_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

3.3 Transceiver Module (AD6548)

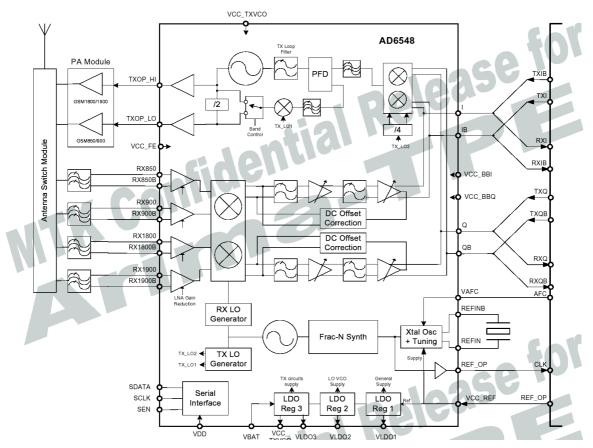


Figure.3-3-1 AD6548 FUNCTIONAL BLOCK DIAGRAM

3.3.1 General Descriptions

The AD6548/9 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, Switchplexer and a few passives enabling an extremely small cost effective GSM Radio solution.

The AD6548/9 uses the industry proven direct conversion receiver architecture of the OthelloTM 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 AD6548/9 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 class 12. 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 VCTCXO to be replaced with a low cost crystal. No other external components are required. The AD6549 uses the traditional VCTCXO reference source.

The AD6548/9 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 3.0V.

The AD6548/9 is packaged in a 5mm × 5mm, 32-lead LFCSP package.

ORDERING GUIDE	Model TemperatureRange	Package
AD6548BCPZ	-20℃ to +85℃	LFCSP-32
AD6549BCPZ	-20℃ to +85℃	LFCSP-32

3.3.2 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 (AD6548)

Power Management

Integrated LDOs allow direct battery supply connection

Small footprint

32-Lead 5 X 5 mm Chipscale Package

APPLICATIONS

Dual, Triple and Quad Band Radios

- GSM850, E-GSM 900, DCS1800 and PCS1900
- GPRS to Class 12- EDGE RX

3.3.3 Pin Descriptions

No	Name	Description	No	Name	Description
1	VCC_FE	Front end supply (IP) ³	17	VCC_REF	Reference Oscillator Supply (IP)
2	I	I baseband input/output	18	VAFC	AD6548 Crystal Freq control (IP)
			1 4 1		AD6549: Connect to VCC_REF
3	IB	I baseband input/output	19	REFINB	Crystal / VCTCXO Connection
4	VCC_BBI	Baseband I, TX path supply (IP) ³	20	REFIN	Crystal Connection
5	SDATA	Serial port data	21	REF_OP	Reference Frequency Output
6	SCLK	Serial port clock	22	QB	Q baseband input/output
7	SEN	Serial port enable	23	Q	Q baseband input/output
8	N/C	Not connected	24	VCC_BBQ	Baseband Q supply (IP) ³
9	VLDO3	TX LDO Output ¹	25	RX1900B	PCS 1900 LNA input
10	TXOP_LO	Transmit O/P (850/900MHz)	26	RX1900	PCS 1900 LNA input
11	TXOP_HI	Transmit O/P (1800/1900MHz)	27	RX1800B	DCS 1800 LNA input
12	VCC_TXVCO	TX VCO supply (1)	28	RX1800	DCS 1800 LNA input
13	VDD	Serial interface supply	29	RX900B	E-GSM 900 LNA input
14	VBAT	Battery I/P for LDO reg's	30	RX900	E-GSM 900 LNA input
15	VLDO1	LDO regulator Output ²	31	RX850B	GSM 850 LNA input
16	VLDO2	LO VCO Supply ¹	32	RX850	GSM 850 LNA input
					A410

3.4 Memory Module (K5L6443ABM-AD11)

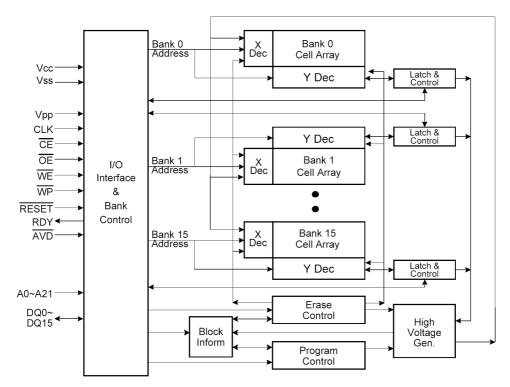


Figure.3-4-1 K5L6443ABM-AD11 FUNCTIONAL BLOCK DIAGRAM

GENERAL DESCRIPTION

The K5L6433ABM is a MultiChip Package Memory which combines 64Mbit NOR Flash Memory and 32M bit UtRAM2.

The 64Mb NOR Flash featuring single 1.8V power supply is a 64Mbit Synchronous Burst Multi Bank Flash Memory organized as 4Mx16. The memory architecture of the device is designed to divide its memory arrays into 135 blocks with independent hardware protection. This block architecture provides highly flexible erase and program capability. The 64Mb NOR Flash consists of sixteen banks. This device is capable of reading data from one bank while programming or erasing in the other bank. Regarding read access time, the device provides an 14.5ns burst access time and an 70ns initial access time at 54MHz. At 66MHz, the device provides an 11ns burst access time and 70ns initial access time. At 83MHz, the device provides an 9ns burst access time and 70ns initial access time. At 108MHz, the device provides an 7ns burst access time and 70ns initial access time. The device performs a program operation in units of 16 bits (Word) and an erase operation in units of a block. Single or multiple blocks can be erased. The block erase operation is completed within typically 0.7sec. The device requires 15mA as program/erase current in the extended temperature ranges.

SAMSUNG's UtRAM products are designed to meet the request from the customers who want to cope with the fast growing mobile applications that need high-speed random access memory. UtRAM is the solution for the mobile market with its low cost, high density and high performance feature. device is fabricated by SAMSUNG¢s advanced CMOS technology using one transistor memory cell. The device supports the traditional SRAM like asynchronous operation (asynchronous page read and asynchronous write), the NOR flash like synchronous operation (synchronous burst read and asynchronous write) and the fully synchronous operation (synchronous burst read and synchronous burst write). These operation modes are defined through the Confifuration Register Setting. It supports the special features for the standby power saving. Those are the PAR(Partial Array Refresh) mode. DPD(Deep Power Down) mode and

internal TCSR(Temperature Compensated Self Refresh). It also supports variable and fixed latency, driver strength settings, Burst sequence (wrap or No-wrap) options and a device ID register (DIDR).

The K5L6433ABM is suitable for use in data memory of mobile communication system to reduce not only mount area but also power consumption.

This device is available in 88-ball FBGA Type.

Features

- <Common>
- · Operating Temperature : -25°C ~ 85°C
- · Package: 88-ball FBGA Type 8mm x 10mm x 1.2mmt, 0.8mm pitch
- <NOR Flash>
- · This device has the Sync MRS option

(Extended Configuration Register)

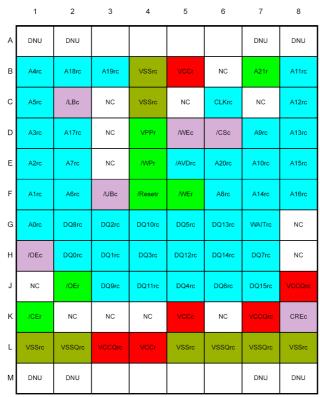
- Single Voltage, 1.7V to 1.95V for Read and Write operations
- Organization
 - 4,194,304 x 16 bit (Word Mode Only)
- Read While Program/Erase Operation
- Multiple Bank Architecture
 - 16 Banks (4Mb Partition)
- · OTP Block : Extra 256word block
- Read Access Time (@ CL=30pF)
 - Asynchronous Random Access Time: 70ns
 - Synchronous Random Access Time: 70ns
 - Burst Access Time: 7ns (108Mhz)
- · Page Mode Operation
- 8-Words Page access allows fast asychronous read Page Read Access Time: 20ns
- · Burst Length:
 - Continuous Linear Burst
 - Linear Burst: 8-word & 16-word with Wrap
- · Block Architecture
 - Eight 4Kword blocks and one hundred twenty seven 32Kword blocks
 - Bank 0 contains eight 4 Kword blocks and seven 32Kword blocks
 - Bank 1~Bank 15 contain one hundred twenty 32Kword blocks
- · Reduce program time using the VPP
- · Support Single & Quad word accelerate program
- Power Consumption (Typical value, CL=30pF)
 - Async/Sync burst Access Current: 24mA
 - Program/Erase Current: 15mA
 - Read While Program/Erase Current: 40mA
 - Standby Mode/Auto Sleep Mode :15uA
- · Block Protection/Unprotection

- Using the software command sequence
- Last two boot blocks are protected by WP=VIL
- All blocks are protected by VPP=VIL
- · Handshaking Feature
 - Provides host system with minimum latency by monitoring RDY
- · Erase Suspend/Resume
- · Program Suspend/Resume
- Unlock Bypass Program/Erase
- Hardware Reset (RESET)
- Data Polling and Toggle Bits
- Provides a software method of detecting the status of program or erase completion
- · Endurance: 100,000 Program/Erase Cycles
- · Support Common Flash Memory Interface
- · Low Vcc Write Inhibit

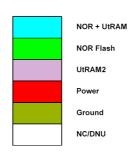
<UtRAM2>

- Process technology: CMOS
- Organization: 2M x 16 bit
- Power supply voltage: 1.7V~1.95V
- Three state outputs
- Supports Configuration Register Set
 - CRE pin set up
 - Software set up
- Supports power saving modes
 - PAR (Partial Array Refresh)
 - DPD (Deep Power Down)
 - Internal TCSR (Temperature Compensated Self Refresh)
- Supports driver strength optimization
- Support 2 operation modes
 - Asynchronous mode (4-Page)
 - Synchronous mode
- Random access time:70ns
- Page access time:20ns
- Synchronous burst operation
 - Max. clock frequency: 104MHz
 - Fixed and Variable read latency
 - 4 / 8 / 16 / 32 and Continuous burst
 - Wrap / No-wrap
 - Latency: 3(Variable) @ 104MHz
 - Burst stop
 - Burst read suspend
 - Burst write data masking

Pin DESCRIPTION



88 FBGA: Top View (Ball Down)



Pin Name	Pin Function(Common)	
DQ0rc ~ DQ15rc	Data Input/Output	
A0rc ~ A20rc	Address Input	
CLKrc	Clock	
/AVDrc	Address Valid Input	
F-RDY	Ready Out(NOR)	
R-WAIT	Data Availability (UtRAM)	
VCCQrc	Data Input/Output Power	
VSSrc	Ground	
VSSQrc	Ground	

Pin Function(UtRAM2)	
Lower Byte Enable, Upper Byte Enable	
Control Register Enable	
Power Supply	
Output Enable	
Write Enable	
Chip Enable	

Pin Name	Pin Function
NC	Not Connected

Pin Name	Pin Function(NOR Flash)	
A21r	Address Input	
/CEr	Chip Enable	
/WPr	Write Protection	
/OEc	Output Enable	
/WEc	Write Enable	
/Resetr	Hardware Reset	
VCCr	Power Supply	
VPPr	Accelerates Programming	

3.5 FM Radio Module (AR1200/1210)

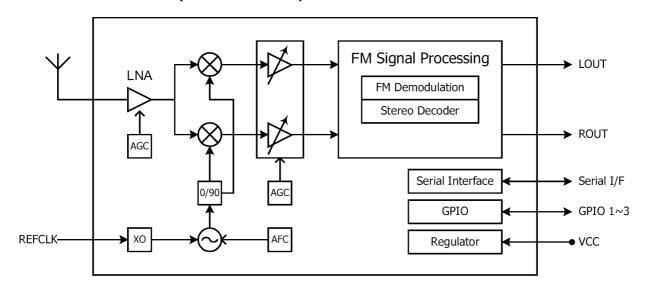
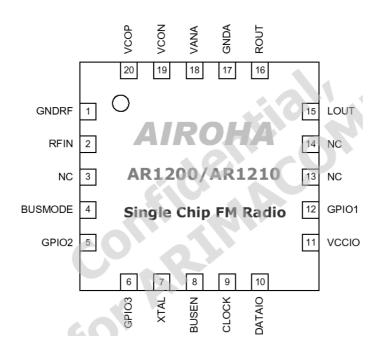


Figure. 3-5-1 AR1200/1210 FM Receiver Block Diagram

AR1200 /AR1210 is a highly integrated single chip stereo FM radio receiver for all kinds of applications. AR1200 /AR1210 supports worldwide FM bands from 76 to 108MHz. It integrates LNA, Mixer, Oscillator and LDO regulator to minimize the external BOM cost.

The built-in FM signal processing unit with noise reduction mechanism provides optimum sound quality. A simple 2-wire/3-wire interface allows easy control from the host. For AR1200,Radio Data System(RDS) and Radio Broadcast Data System(RBDS) demodulator and decoder are also supported.

AR1200 and AR1210 are pin-to-pin compatible and are the same in all FM radio receiver functions, specs and packages except the RDS/RBDS function. AR1200 supports RDS/ RBDS receiver function, while AR1210 do not.



PIN	SIGANL	TYPE	DESCRIPTION
1	GNDRF	GND	RF Ground
2	RFIN	Input, Analog	RF Input
3	NC		Not Connected
4	BUSMODE	Input, Digital Control	2-wire/3-wire Bus Mode Selection
5	GPIO2	Input/Output, Digital	General I/O Port 2
6	GPIO3	Input/Output, Digital	General I/O Port 3
7	XTAL	Analog	XTAL Oscillator Input
8	BUSEN	Input, Digital Control	Serial Interface
9	CLOCK	Input, Digital Control	Serial Interface
10	DATAIO	Input/Output, Digital	Serial Interface
11	VCCIO	VCC Supply	Supply Voltage for I/O Ports
12	GPIO1	Input/Output, Digital	General I/O Port 1
13	NC		Not Connected
14	NC		Not Connected
15	LOUT	Output, Analog	Left Audio Output
16	ROUT	Output, Analog	Right Audio Output
17	GNDA	GND	Analog Ground
18	VANA	VCC Supply	Supply Voltage for Analog Circuits
19	VCON	Input, Analog	VCO Tank Input
20	VCOP	Input, Analog	VCO Tank Input

3.6 LCD Interface

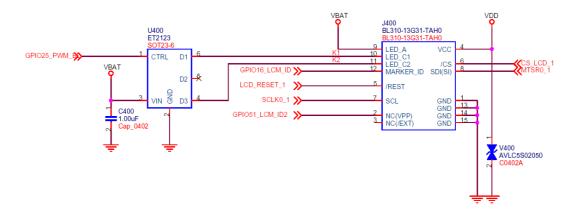


Figure.3-6-1 LCD Interface

General Description

The Arima 1.77" model is a Color TFT (Main) LCD supplied by LG Innotek.

This main LCD has a 1.77inch diagonally measured active display area with 128(RGB)x160 resolution. Each pixel is divided into Red, Green and Blue sub-pixels and dots which are arranged in vertical stripes.

Main color is determined with colors signal for each pixel.

The **Arima 1.77**" has been designed to apply the interface method that enables low power, high speed, and high contrast.

The **Arima 1.77**" is intended to support applications where thin thickness, wide viewing angle and low power consumption are critical factors and graphic displays are important.

Pin Description

Pin No. **Symbol** Description Remark **GND** Ground 1 **OPEN** NC **OPEN** 3 OPEN V45 **OPEN** 4 VCC Power supply for driver 5 /RESET Reset Pin. Initialize the LSI at the low level 6 /CS I Chip Select. Active low 7 Serial clock input in SPI mode SCL Ι 8 SDI ١ Serial input in SPI mode 9 LED_A I LED anode connection 10 0 LED cathode connection LED_C1 11 LED C2 0 LED cathode connection 12 0 Distinction of LCD maker MAKER_ID 13 **GND** Ground

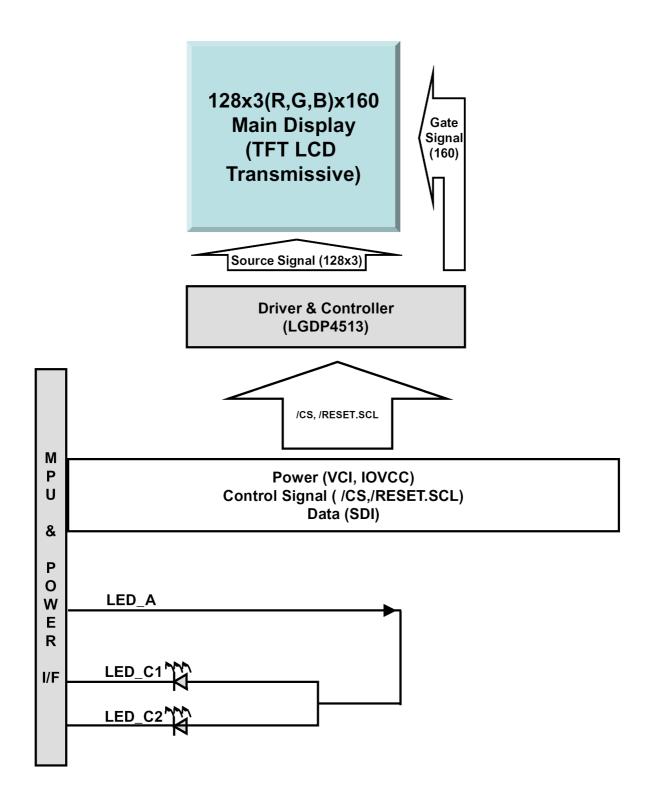


Figure. 3-6-2 DM17-BSM02 Block Diagram

3.7 SIM Card Interface

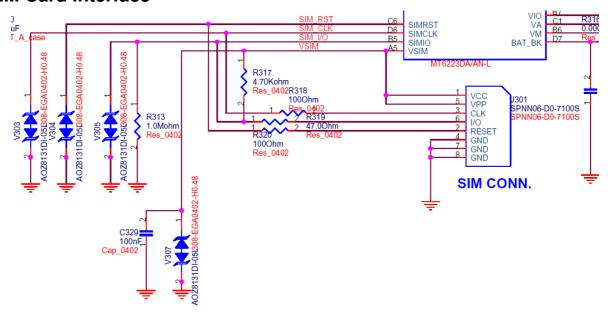


Figure.3-7-1 SIM CARD Interface

The MT6223 contains a dedicated smart card interface to allow the MCU access to the SIM card. It can operate via 4terminals, using SIMVCC, SIMI/O, SIMRST, SIMCLK

The SIMVCC is used to control the external voltage supply to the SIM card. SIMRST is used as the SIM card reset signal. SIMI/O and SIMCLK are used for data exchange purpose.

The SIM interface acts as a half duplex asynchronous communication port and its data format is composed of ten consecutive bits: a start bit in state Low, eight information bits, and a tenth bit used for parity checking.

3.8 KEYPAD Interface

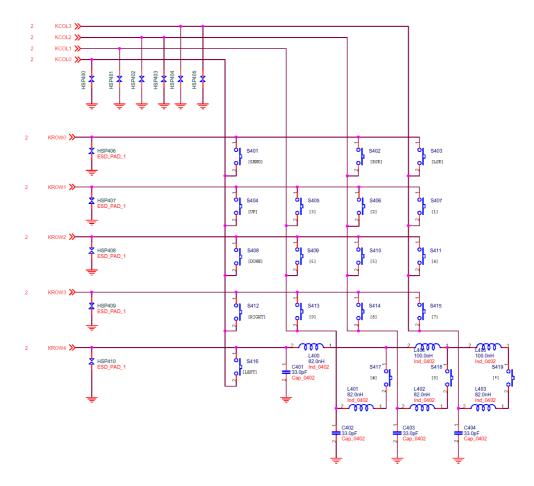


Figure.3-8-1. KEYPAD Interface

The keypad can be divided into two parts: one is the keypad interface including 4 columns and 5 rows; 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 4 x 5 matrix, 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 MT6223 can then read the key(s) pressed directly in KP_HI_KEY, KP_MID_KEY and KP_LOW_KEY 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.

3.9 Battery Charging Block Interface

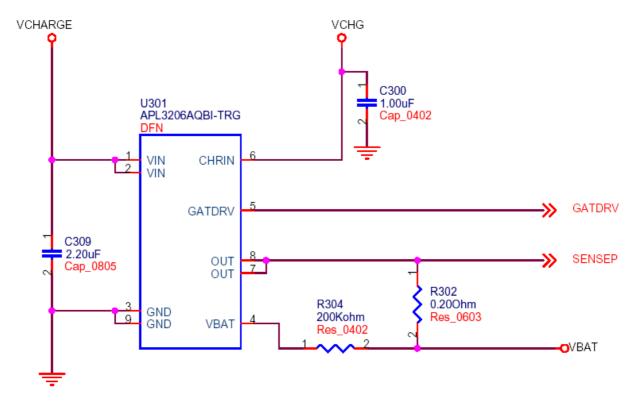


Figure.3-9-1 Charging IC Interface

The APL3206AQBI-TRG is controlled by MT6223.

3.10 Audio Interface

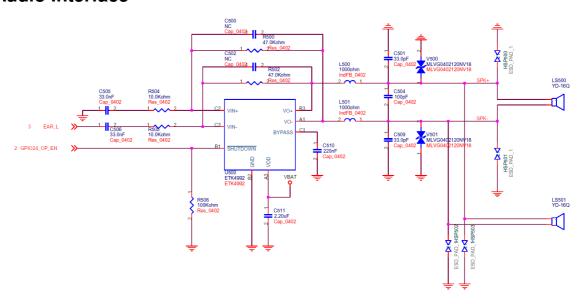


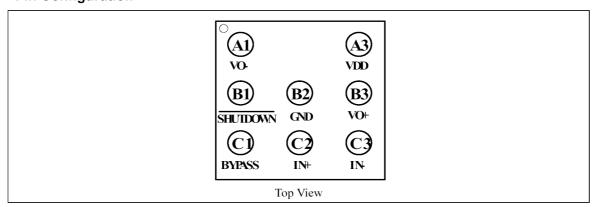
Figure.3-10-1 Audio Interface

The ETK4992 is a fully differential audio power amplifier designed for portable communication device applications. It is capable of delivering 1.25 watt of continuous average power to an 8. BTL load with less than 1% distortion (THD+N) from a 5V battery voltage. It operates from 2.2 to 5.5V.

Features like 90dB PSRR at 217Hz, improved RF-rectification immunity, the space-saving 8-bump WLCSP package, the advanced pop & click circuitry, a minimal count of external components and low-power shutdown mode make ETK4992 ideal for wireless handsets.

The ETK4992 is unity-gain stable, and the gain can be configured by external resistors.

Pin Configuration



Pin Function

Pin No.	Name	I/O	Function
A1	VO-	О	Negative differential output.
B1	SHUTDOWN	I	Shutdown Pin,active low.
C1	BYPASS	I	Common mode voltage. Connect a bypass capacitor to GND for common mode voltage filtering. The bypass capacitor is optional.
B2	GND	POWER	Ground.
C2	IN+	I	Positive differential input.
A3	VDD	POWER	Power supply.
В3	VO+	О	Positive differential output.
C3	IN-	I	Negative differential input.

3.11 Vibrator Interface

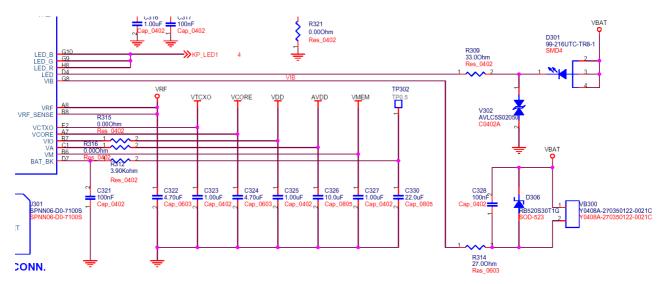
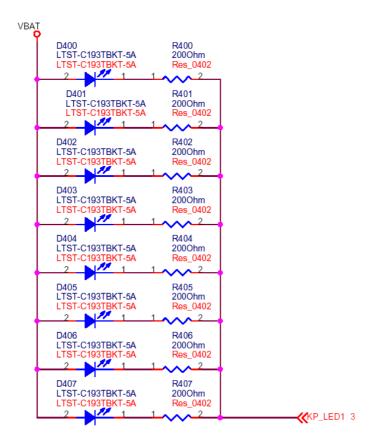


Figure.3-11-1Vibrator Interface

This handset has Vibrator operation. Control signal is controlled by MT6223.

3.12 Key LED Interface



This handset has 8 LEDs that illuminates blue color.

Control signal is controlled by MT6223 and handset has 3 methods, ON, OFF, Dimming

4. Trouble Shooting

A120 Base Band Trouble shooting

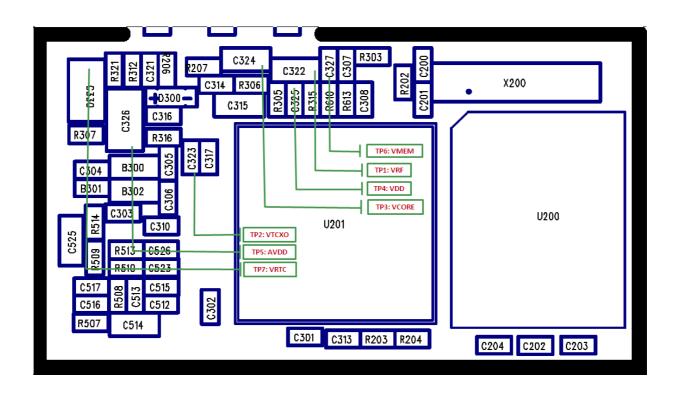
4.1 Power On Trouble

4.1.1 Test Point

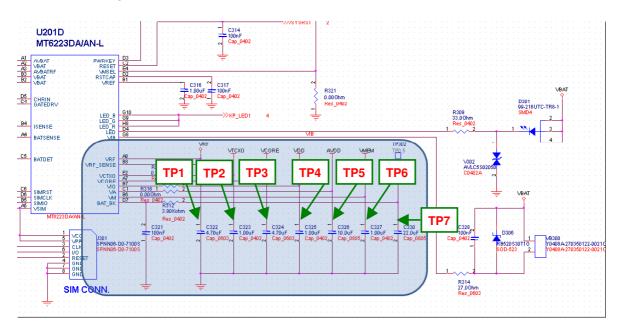
Check Points:

- Battery Voltage(Need to over 3.35V)
- Power-On key detection(PWRON signal)

	Voltage	Measure pin	PART
VRF	2.8V	C322 Pin1	TP1
VTCXO	2.8V	C323 Pin1	TP2
VCORE	1.8V	C324 Pin1	TP3
VDD	2.8V	C325 Pin1	TP4
AVDD	2.8V	C326 Pin1	TP5
VMEM	1.8V	C327 Pin1	TP6
VRTC	2.7V	C330 Pin1	TP7



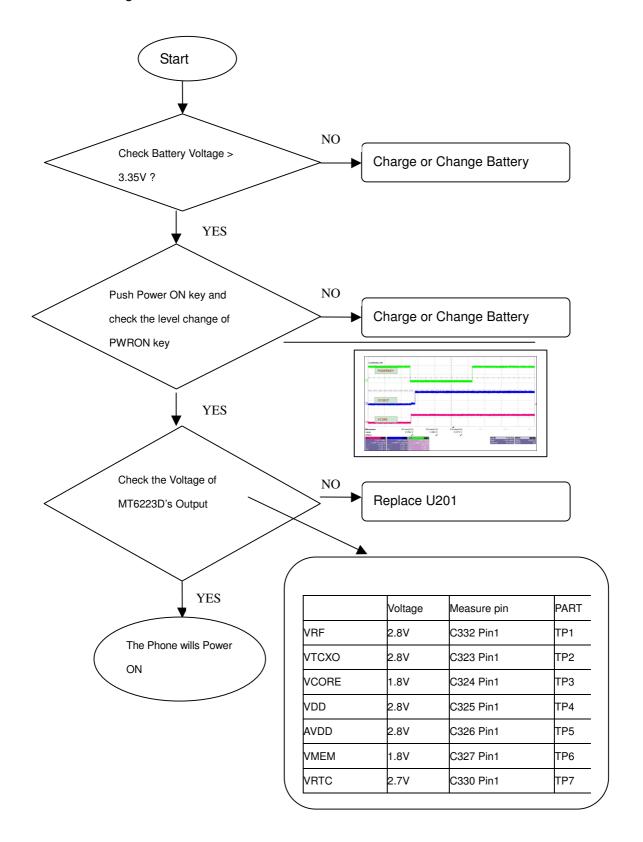
4.1.2 Circuit Diagram



References voltage:

VSIM	1.8V/3.3V
VRF	2.8V
VCORE	1.8V/1.5V
vio :	2.8V
VMEM	1.8V/2.8V
VA	2.8V
VCTXO	2.8V
VMSEL	VMEM
: : H: : : :	2.8V
:: L::::	i i i i i i i i i i i i i i i i i i i

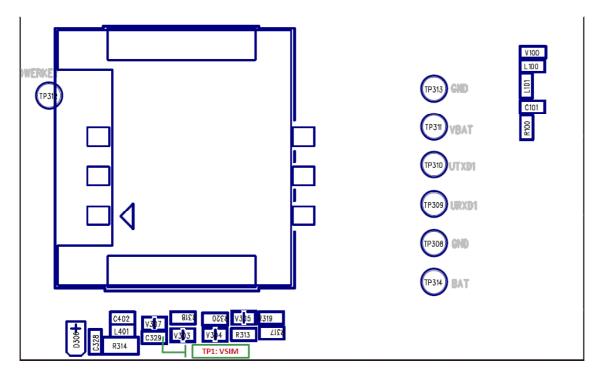
4.1.3 Checking Flow



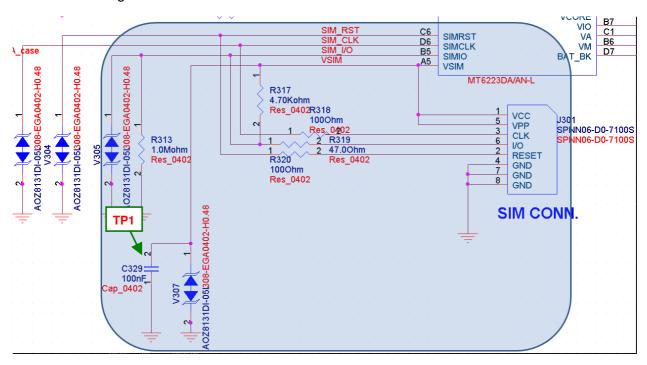
4.2 SIM Card Trouble

4.2.1 Test Point

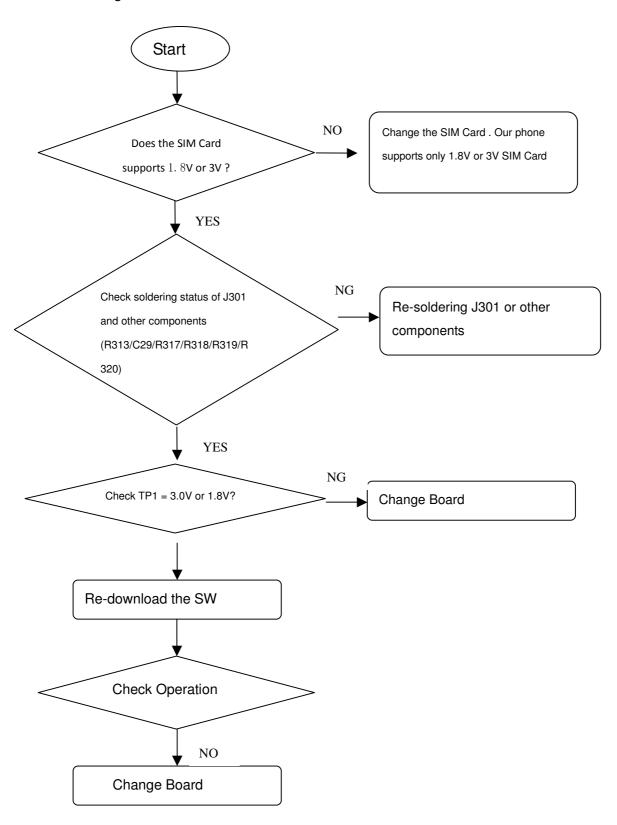
	Measure pin	PART
VSIM	C 329 Pin2	TP1



4.2.2 Circuit Diagram



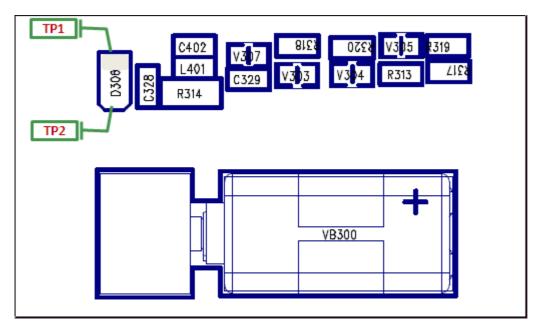
4.2.3 Checking Flow



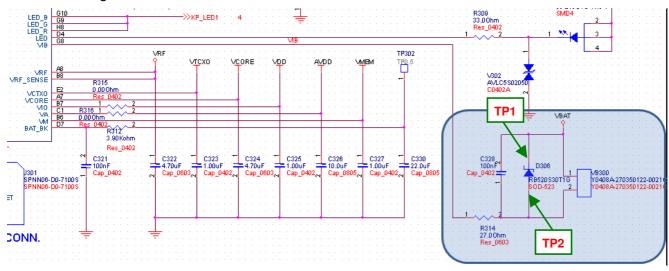
4.3 Vibrator Trouble

4.3.1 Test Point

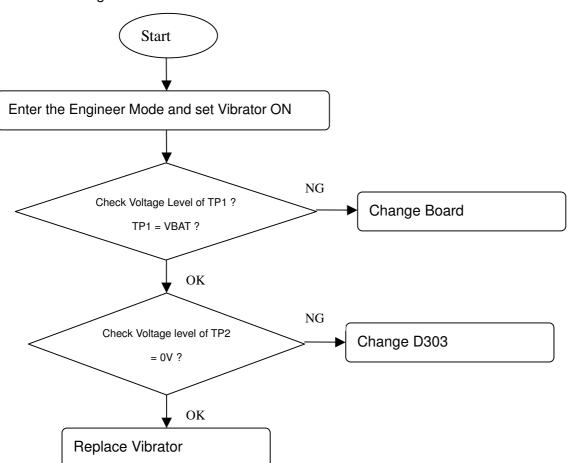
	М	Measure pin		PART
VBAT	D:	D306 Pin2		TP1
	D:	306	Pin1	TP2



4.3.2 Circuit Diagram

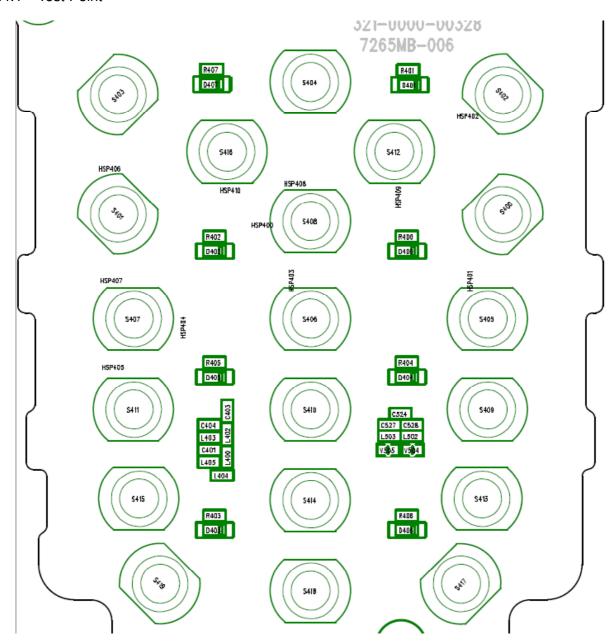


4.3.3 Checking Flow

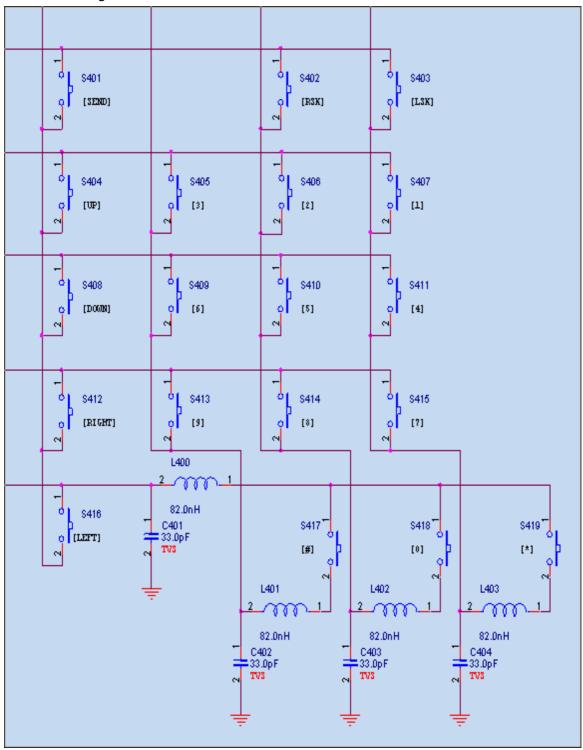


4.4 Keypad Trouble

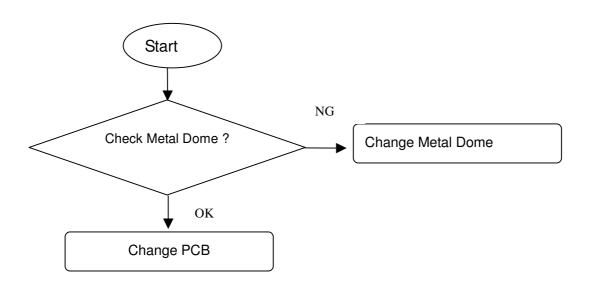
4.4.1 Test Point



4.4.2 Circuit Diagram

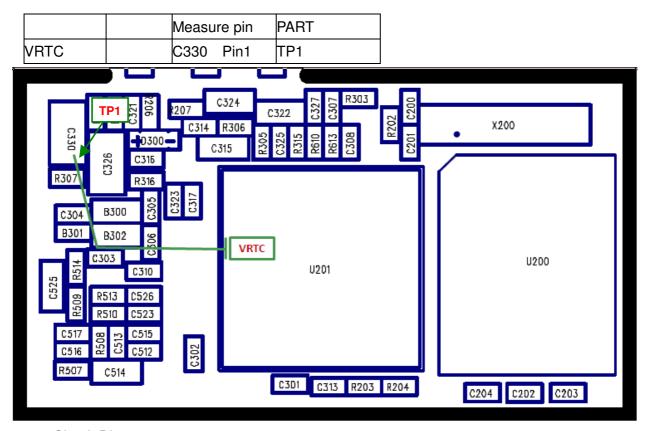


4.4.3 Checking Flow

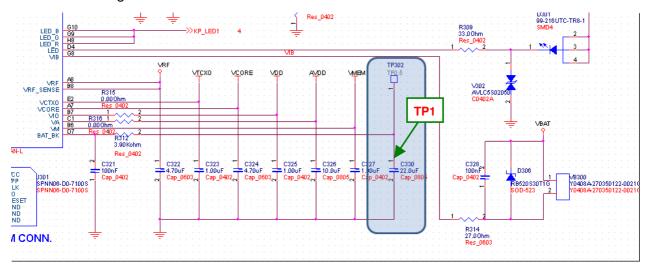


4.5 RTC Trouble

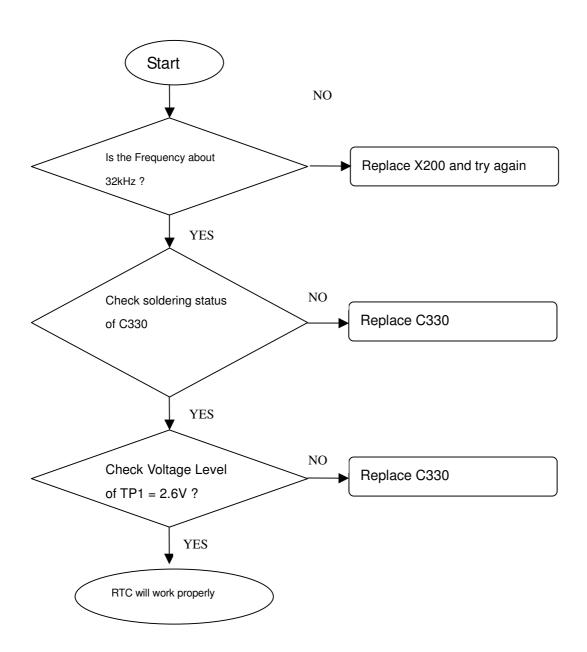
4.5.1 Test Point



4.5.2 Circuit Diagram



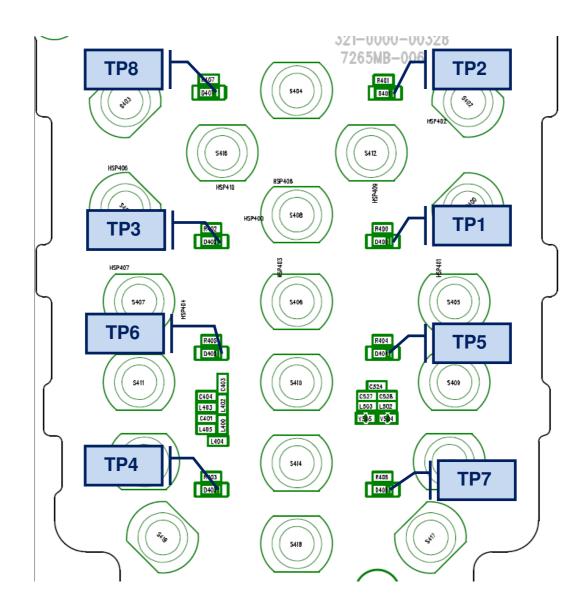
4.5.3 Checking Flow



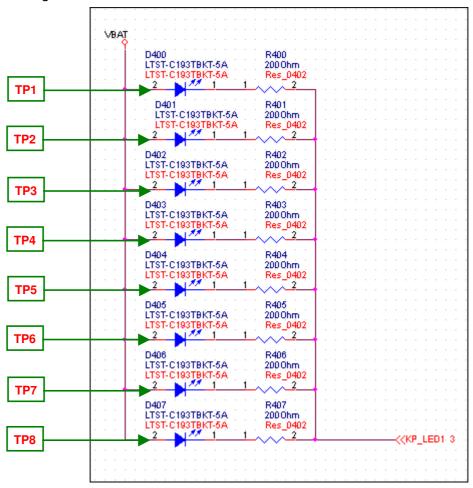
4.6 Key Backlight Trouble

4.6.1 Test Point

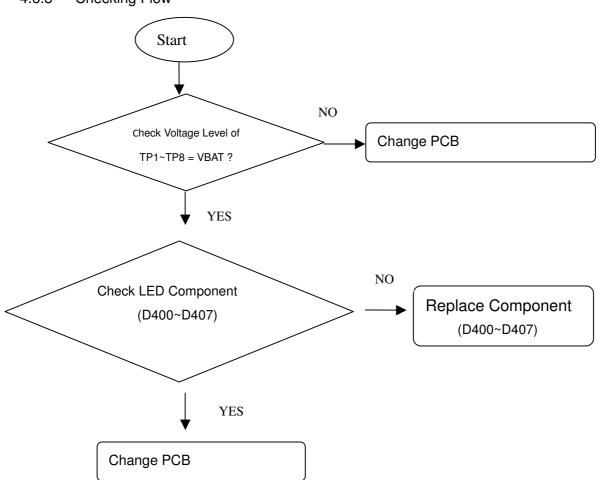
	Measure pin	PART
VBAT	D400 Pin2	TP1
VBAT	D401 Pin2	TP2
VBAT	D402 Pin2	TP3
VBAT	D403 Pin2	TP4
VBAT	D404 Pin2	TP5
VBAT	D405 Pin2	TP6
VBAT	D406 Pin2	TP7
VBAT	D407 Pin2	TP8



4.6.2 Circuit Diagram



4.6.3 Checking Flow



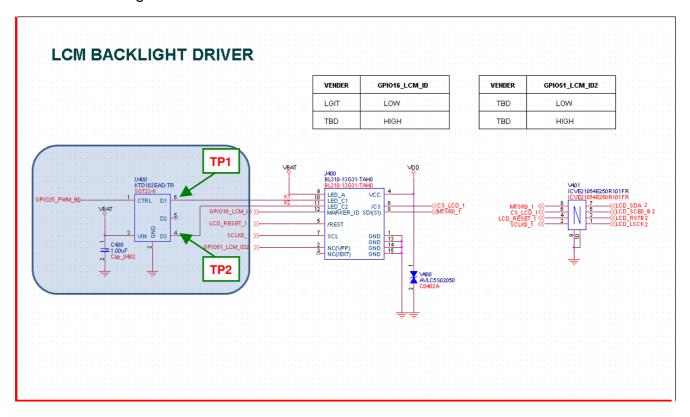
4.7 LCM Backlight Trouble

4.7.1 Test Point

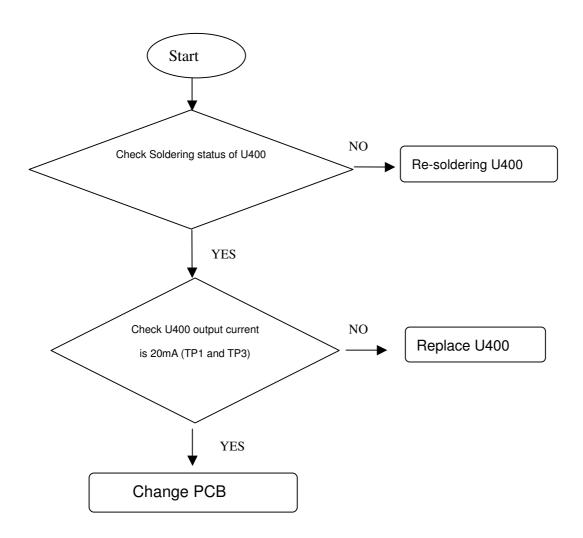
Net	Measure pin	PART
D1	U400 Pin 6	TP1
D3	U400 Pin 4	TP2



4.7.2 Circuit Diagram



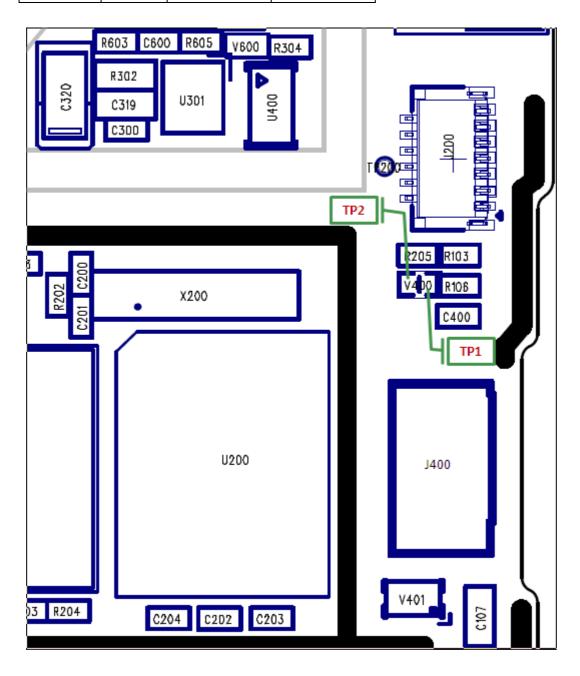
4.7.3 Checking Flow



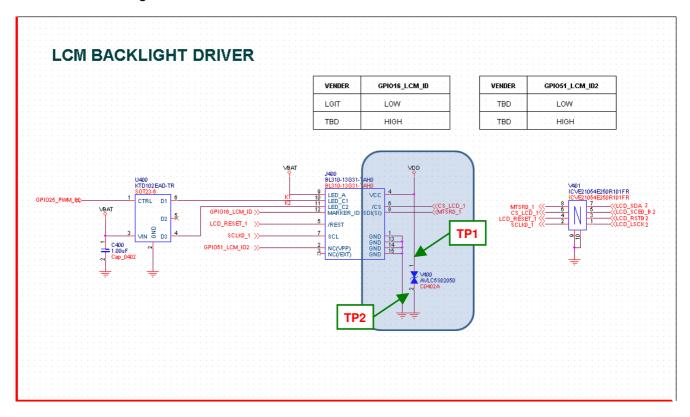
4.8 LCM Trouble

4.8.1 Test Point

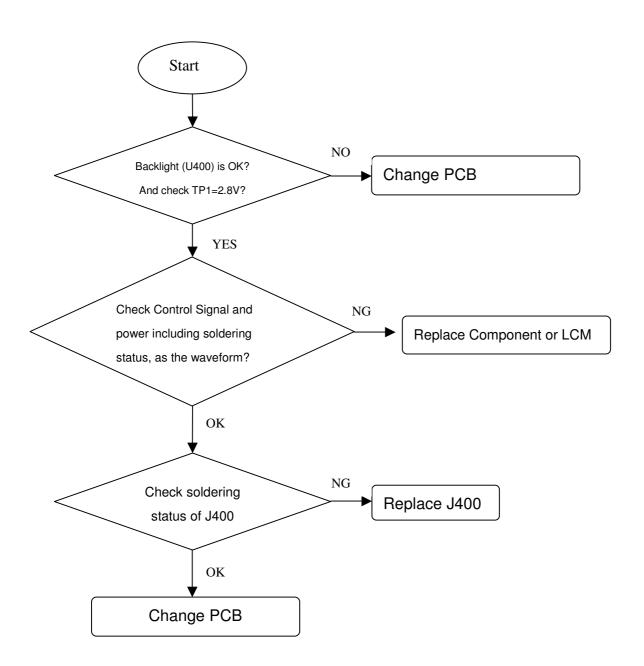
Net	Measure	e pin	PART
VDD	V400 I	Pin1	TP1
GND	V400 I	Pin2	TP2



4.8.2 Circuit Diagram

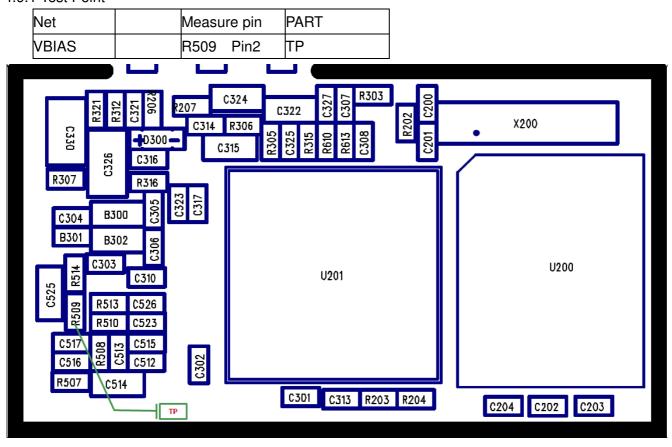


4.8.3 Checking Flow

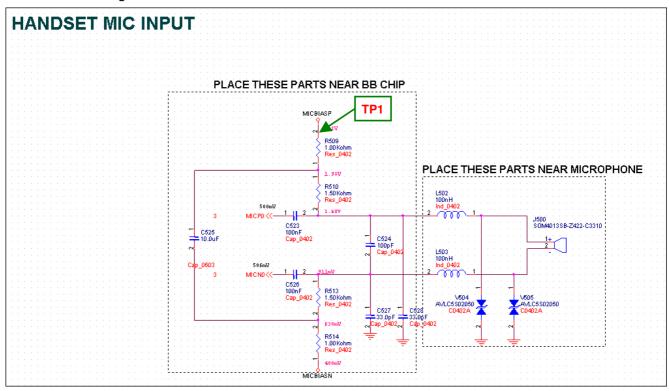


4.9 Microphone Trouble

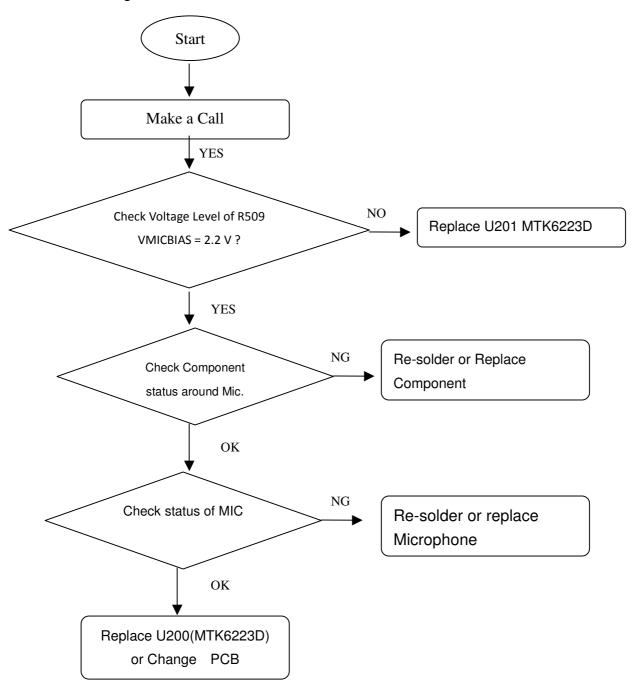
4.9.1 Test Point



4.9.2 Circuit Diagram



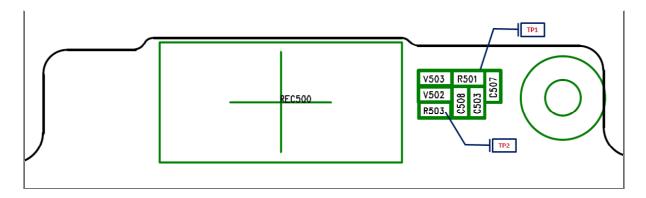
4.9.3 Checking Flow



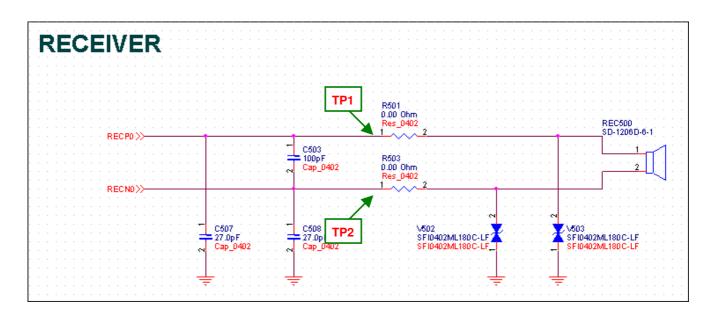
4.10 Receiver Trouble

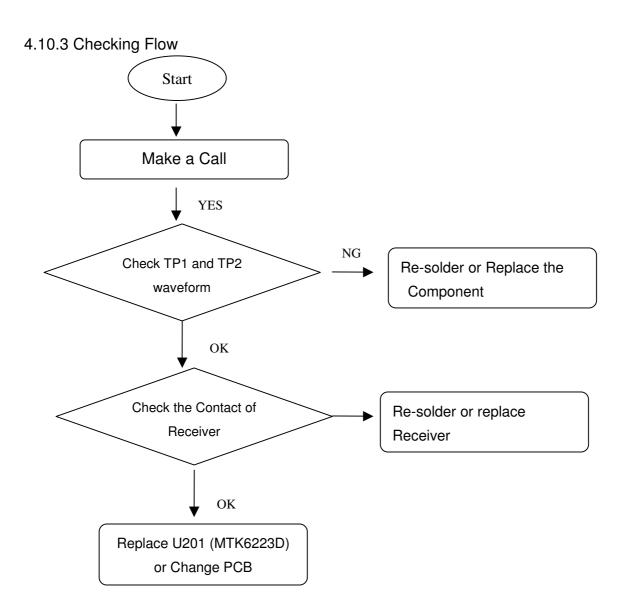
4.10.1 Test Point

Net	Measure pin		PART
RECP0	R501 Pin1		TP1
RECN0	R503	Pin1	TP2



4.10.2 Circuit Diagram

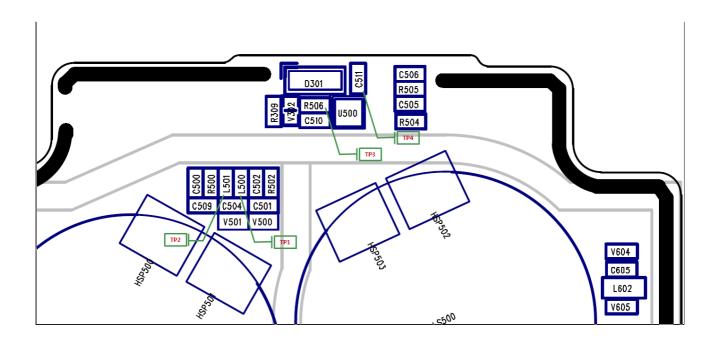




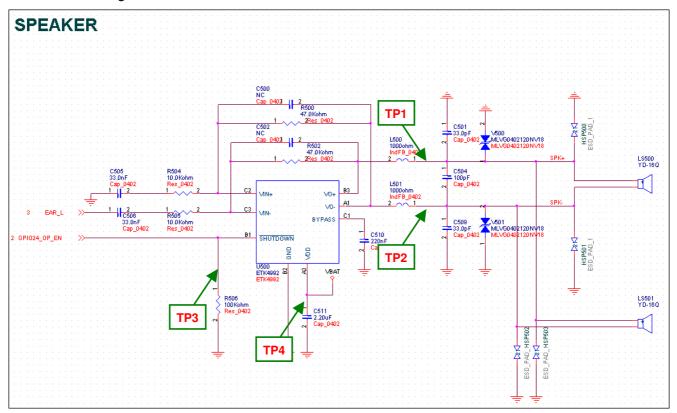
4.11 Speaker Trouble

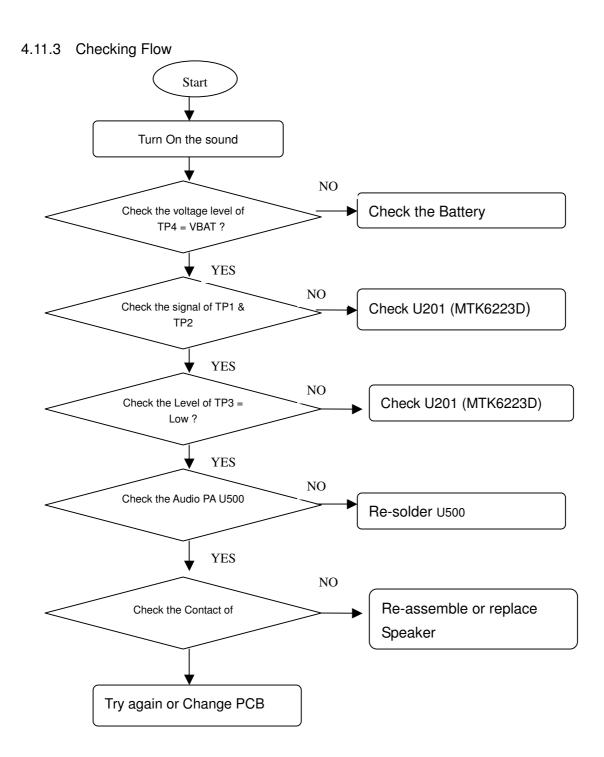
4.11.1 Test Point

Net	Measure pin	PART
SPK-	L500 Pin1	TP1
SPK+	L501 Pin1	TP2
U500.B1	R506 Pin1	TP3
VBAT	C511 Pin1	TP4



4.11.2 Circuit Diagram





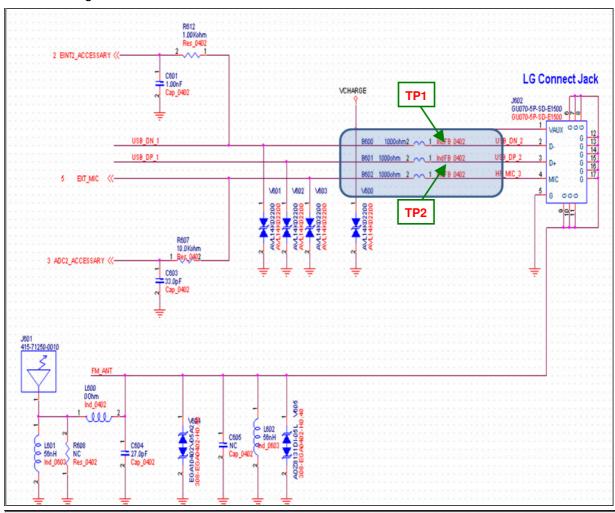
4.12 Headphone Trouble

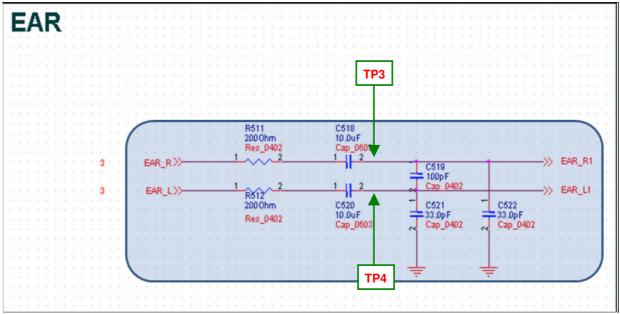
4.12.1 Test Point

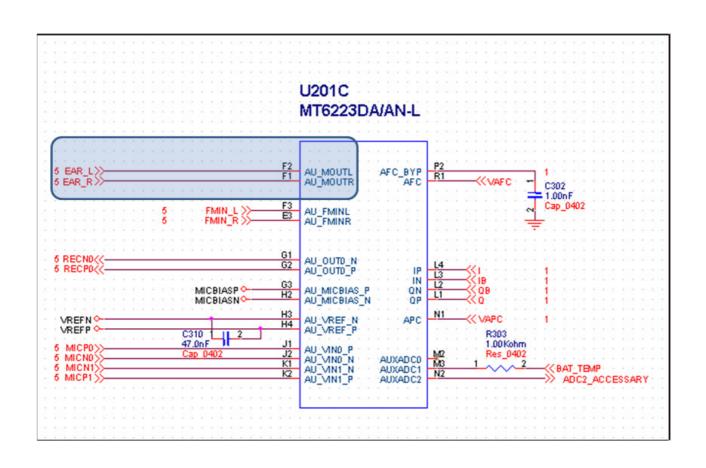
Net	Measure pin		PART
USB_DN_2	B600	Pin1	TP1
USB_DP_2	B601	Pin1	TP2
EAR_R1	C518	Pin2	TP3
EAR_L1	C520	Pin2	TP4



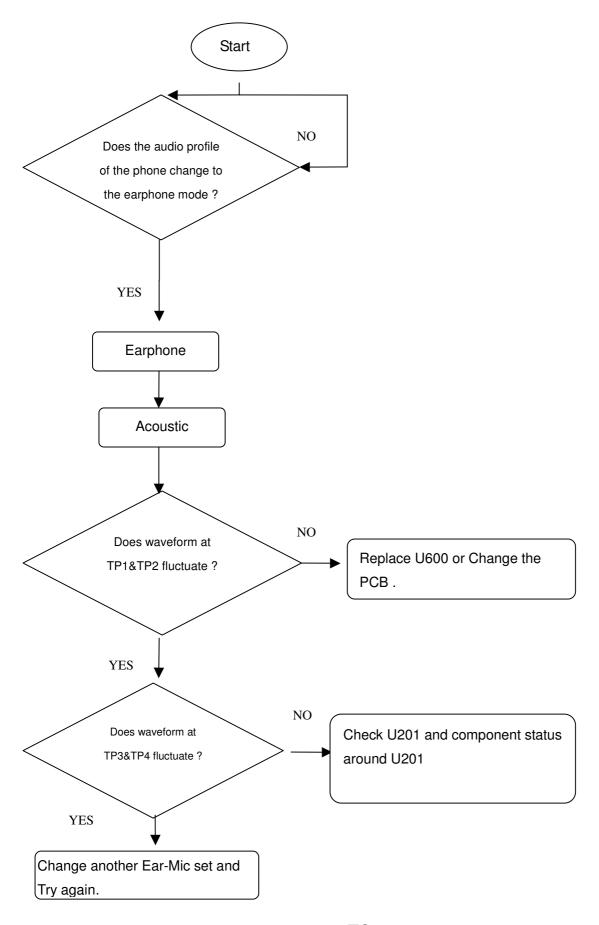
4.12.2 Circuit Diagram







4.12.3 Checking Flow

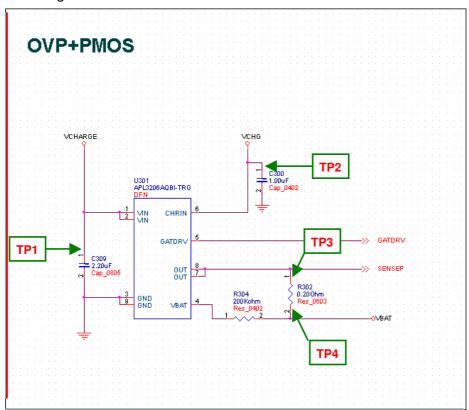


4.13 Charging Trouble

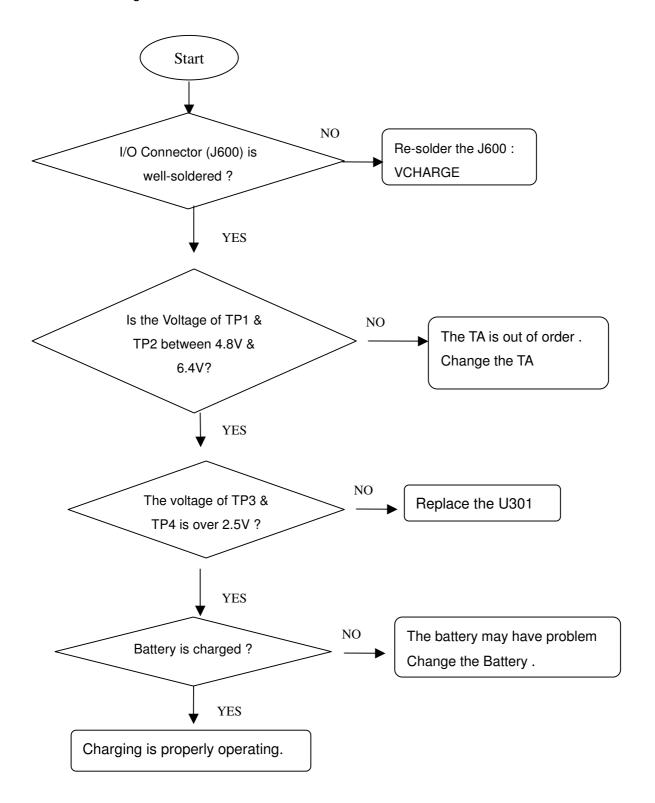
4.13.1 Test Point

Net	Measure p	oin PART		
	C309 Pir	11 TP1		
	C300 Pir	11 TP2		
SENSEP	R302.1 F	Pin1 TP3		
VBAT	R302.2 F	Pin2 TP4		
	C608 C609	C612 9092	C527 C52	1000

4.13.2 Circuit Diagram



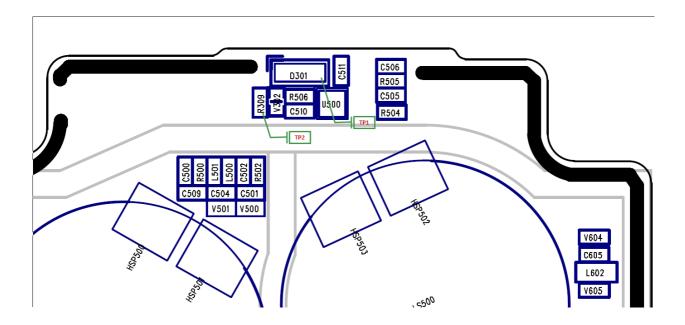
4.13.3 Checking Flow



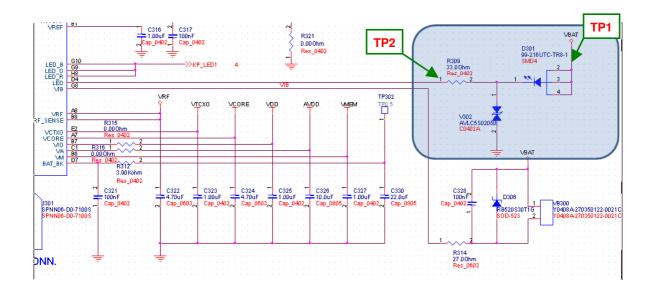
4.14 Torch LED Trouble

4.14.1 Test point

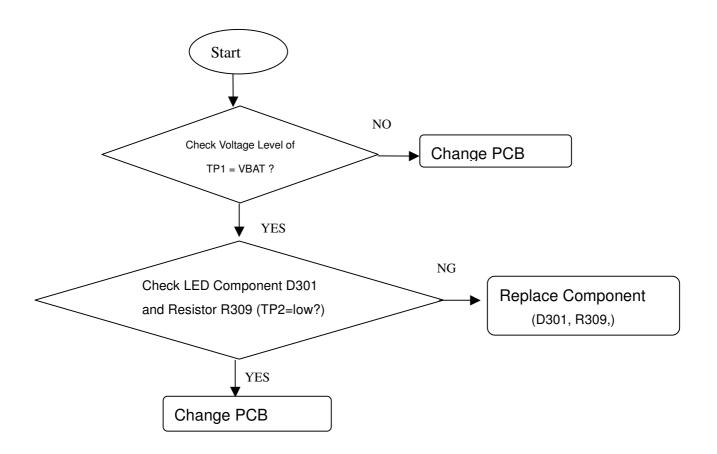
Net	Meası	ure pin	PART
VBAT	D301	Pin2,3,4	TP1
	R309	Pin1	TP2



4.14.2 Circuit Diagram

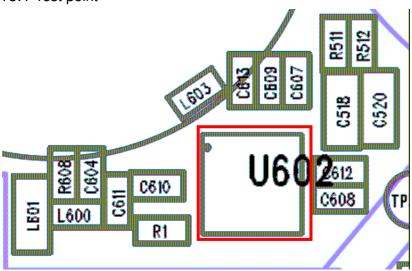


4.14.3 Checking Flow

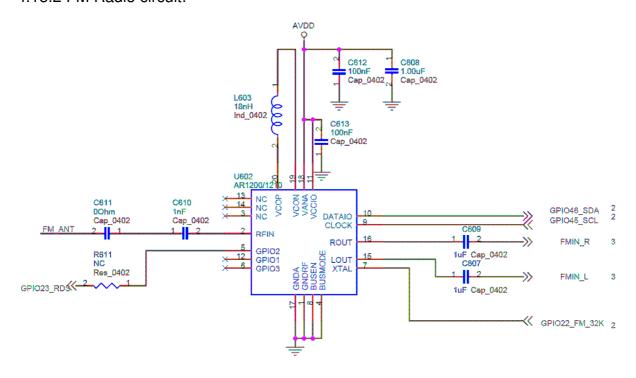


4.15 FM Radio Trouble

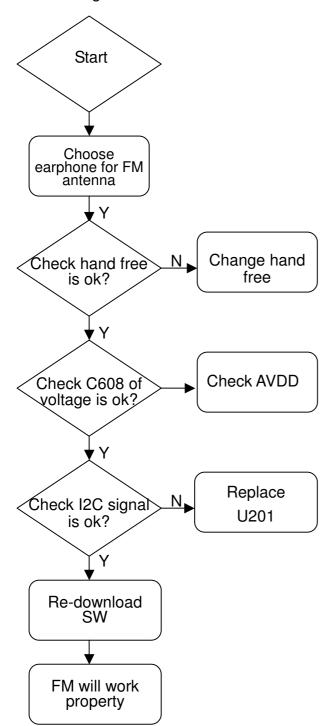
4.15.1 Test point



4.15.2 FM Radio circuit:

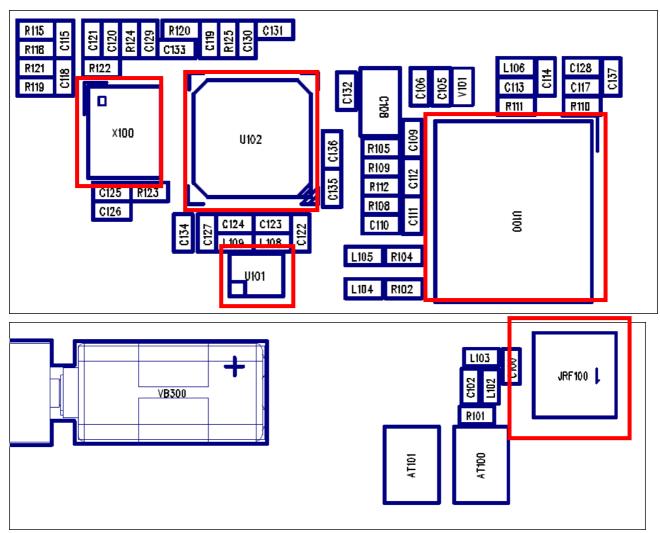


4.15.3 Checking Flow



RF TROUBLE SHOOTING

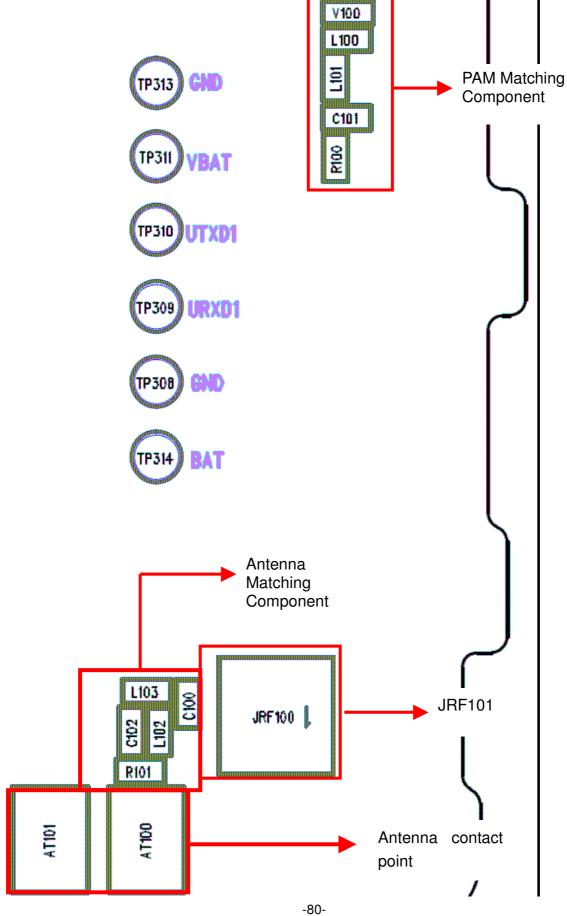
RF Module



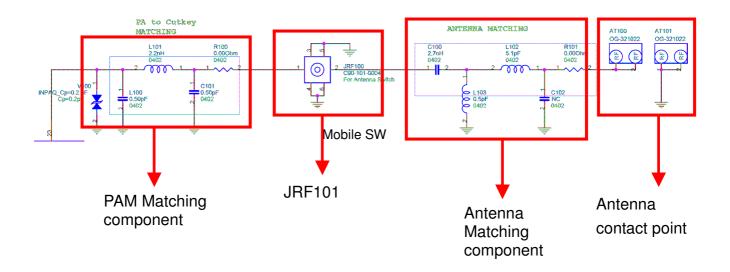
REFERENCE	PART Description
U100	PAM (Power Amp. Module+ASM)
X100	DCXO (26MHz)
JRF100	Mobile Switch
U101	RX SAW Filter
U102	Transceiver

4.16 No Connection Trouble

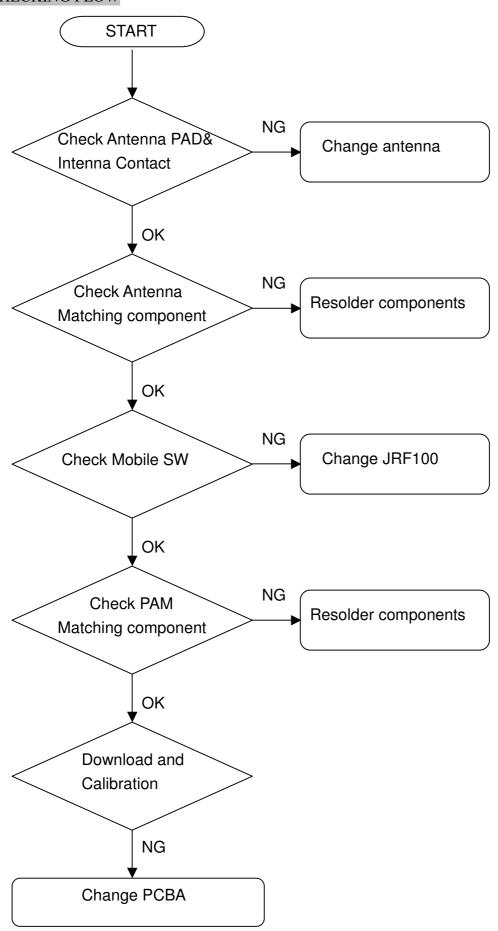
TEST POINT



CIRCUIT



CHECKING FLOW

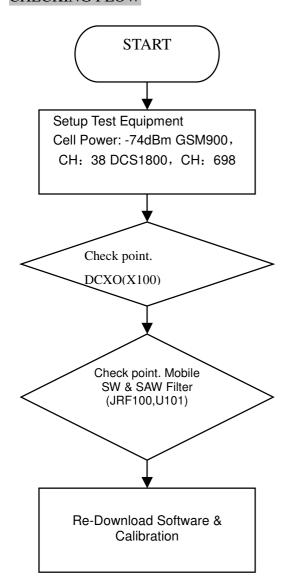


4.17 RX Trouble

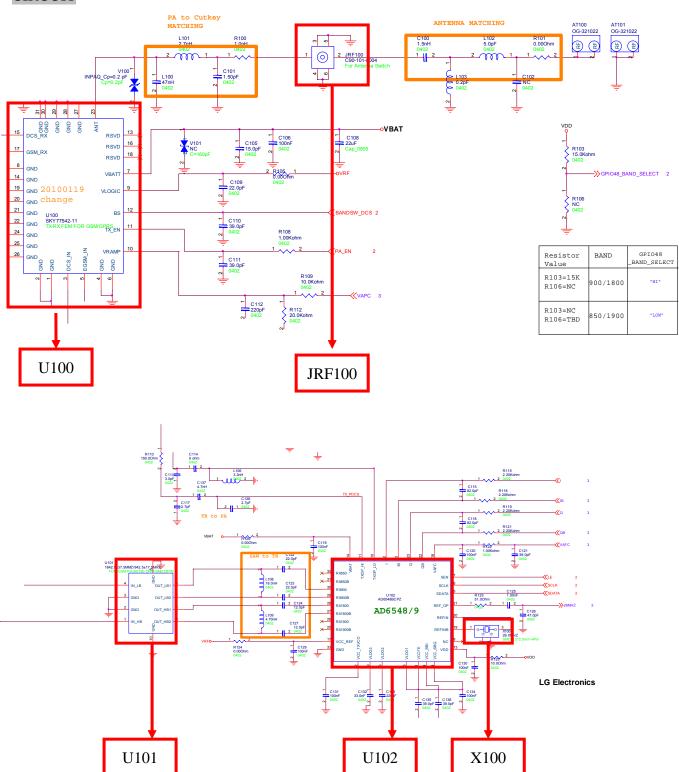
TEST POINT



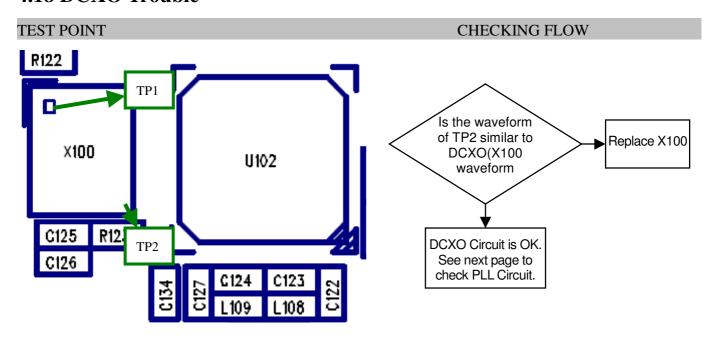
CHECKING FLOW

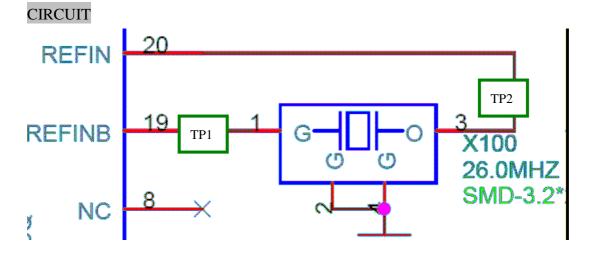


CIRCUIT

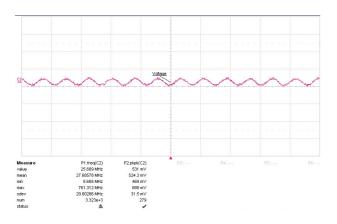


4.18 DCXO Trouble

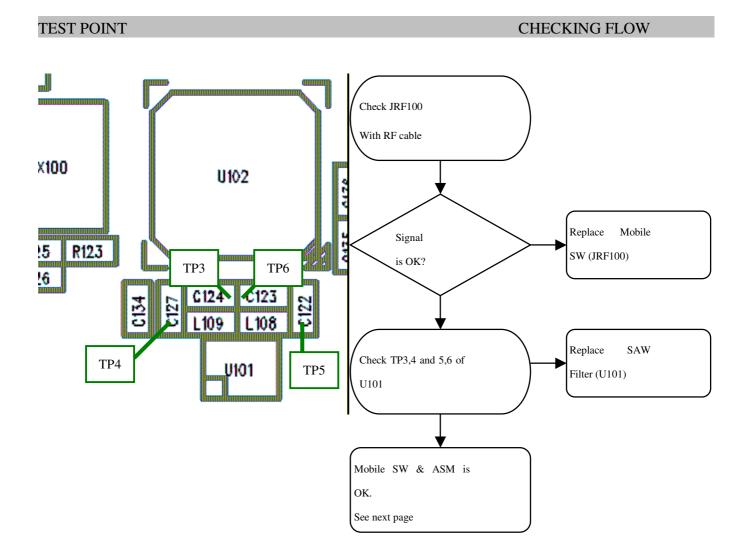




TP2 WAVE FORM

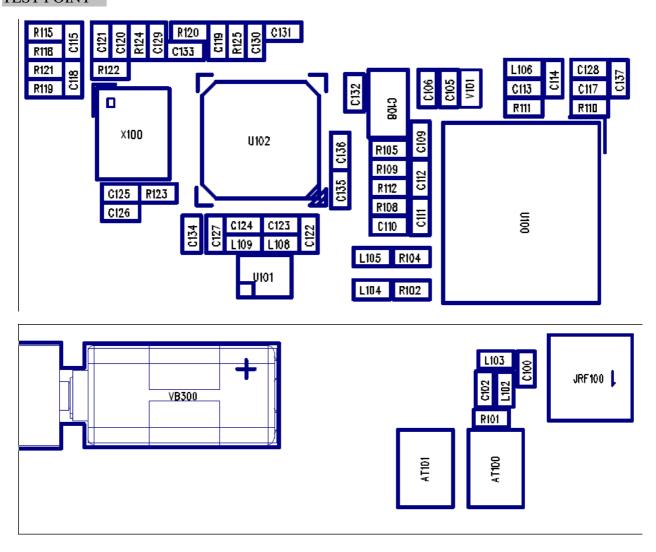


4.19 SAW Filter Trouble



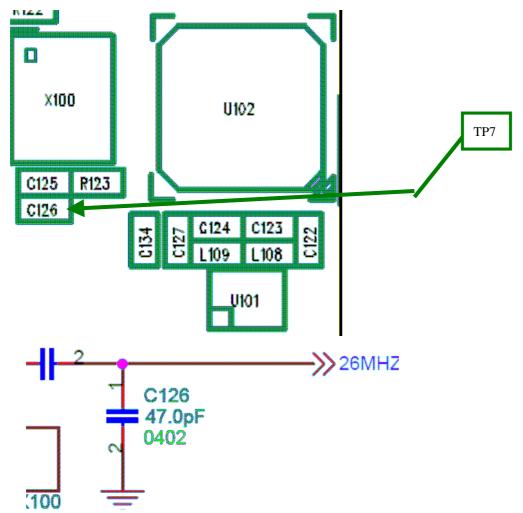
4.20 TX Trouble

TEST POINT

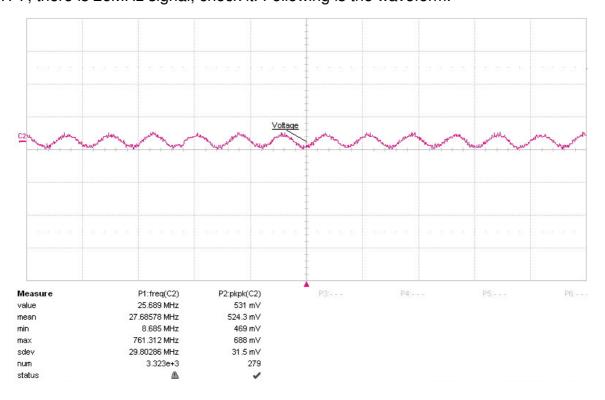


CHECKING FLOW Setup Test Equipment Cell Power: -74dBm GSM900 CH38 DCS CH698 CHECK POINT (U102) CHECK POINT PAM CONTROL POINT CHECK ASM & MOBILE SW & SAW (JRF100,U101) Re-Download S/W & Calibration

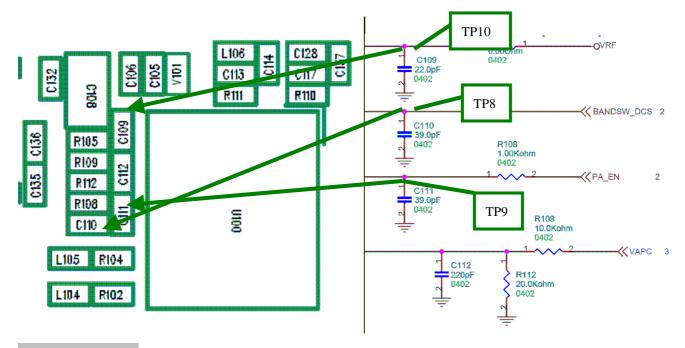
4.21 Transceiver trouble



TP7, there is 26MHz signal, check it. Following is the waveform.



4.22 PAM Trouble

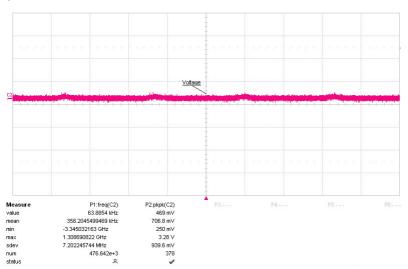


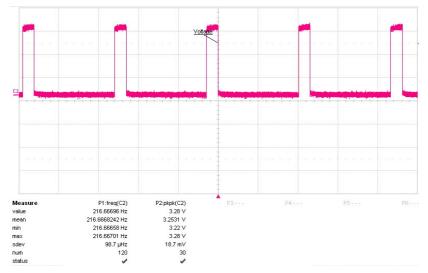
Signal configuration

Mode	GSM900 TX	DCS 1800 TX	GSM900 RX	DCS 1800 RX
BS (TP8)	L	Н	L	Н
TXON_PA (TP9)	Н	Н	L	L
VLOGIC (TP10)	Н	Н	Н	Н

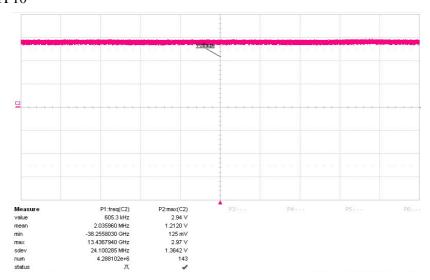
Wave form

GSM900 TX

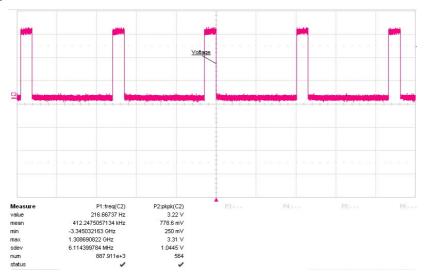


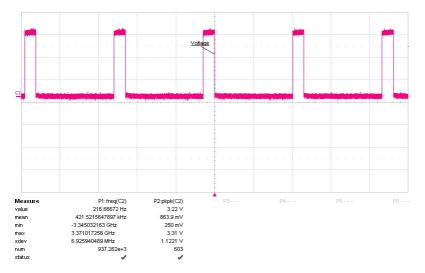


TP10

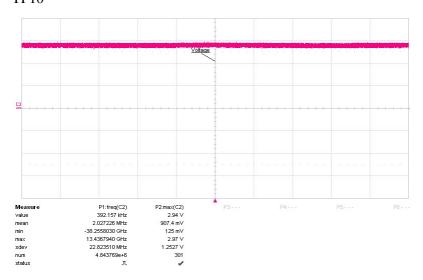


DCS1800 TX

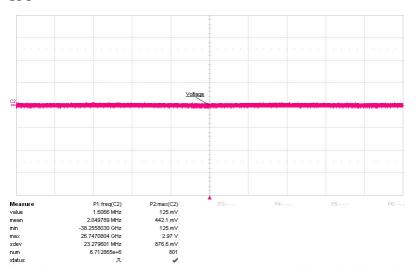


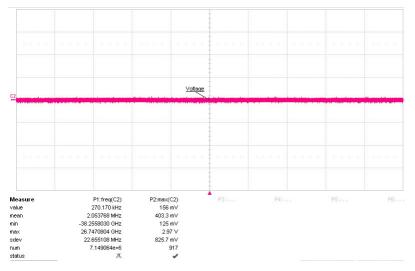


TP10

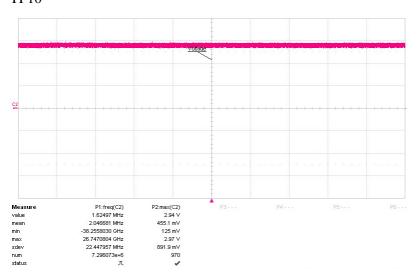


GSM900 RX

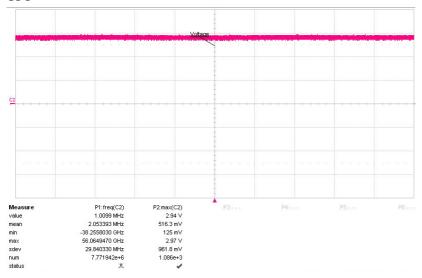


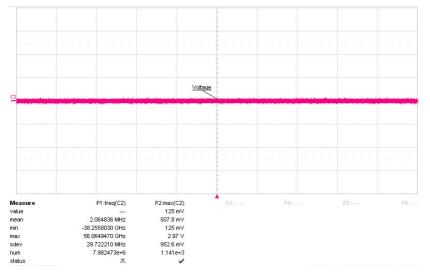


TP10

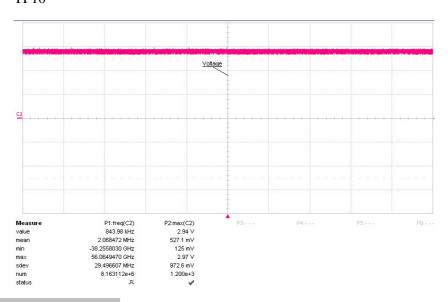


DCS1800 RX

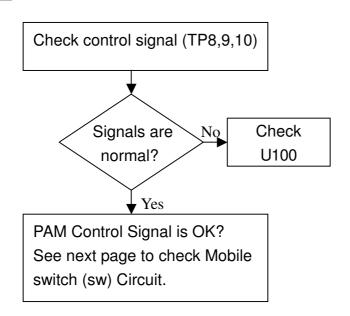




TP10

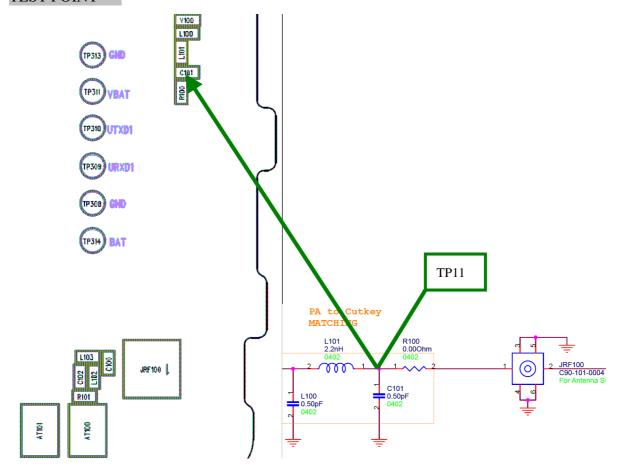


CHECKING FLOW

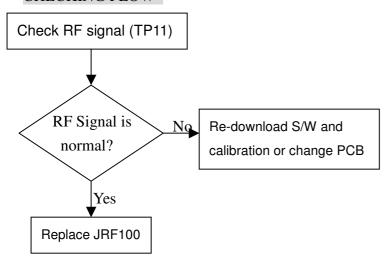


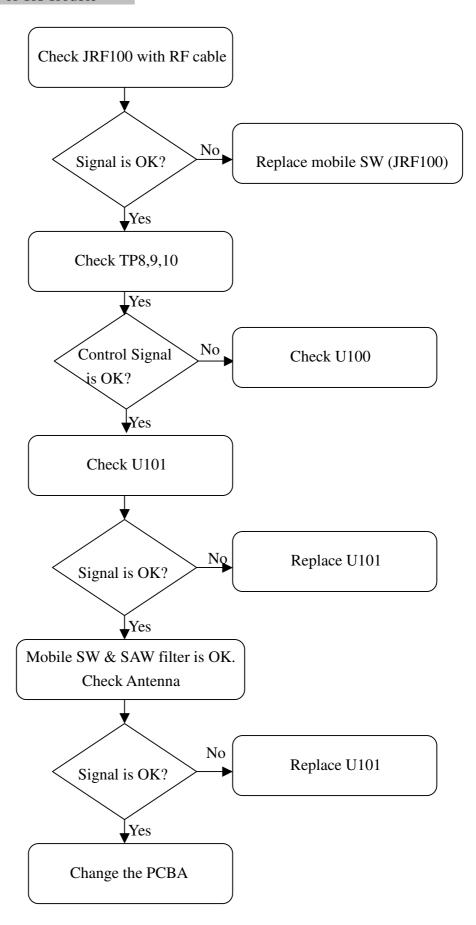
4.23 Mobile Switch Trouble

TEST POINT



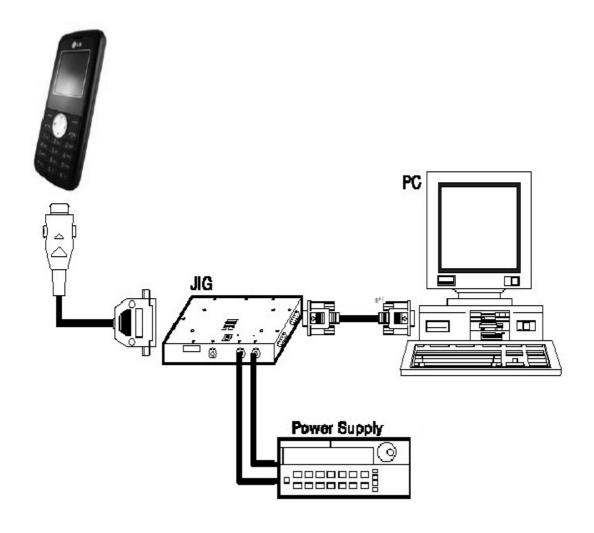
CHECKING FLOW





5.DOWNLOAD

5.1 Download setup



5.2 Download Process

LEO Download Tool

■ Tools

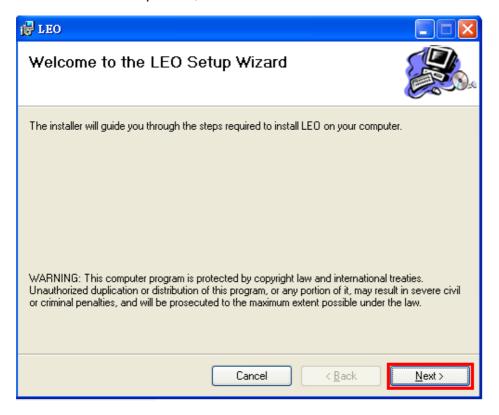
- 1. Download cable(Prolific USB-to-Serial)
- 2. PC
- 3. Battery (3.8 V Li-ion Battery)

■ How to install Leo download tool

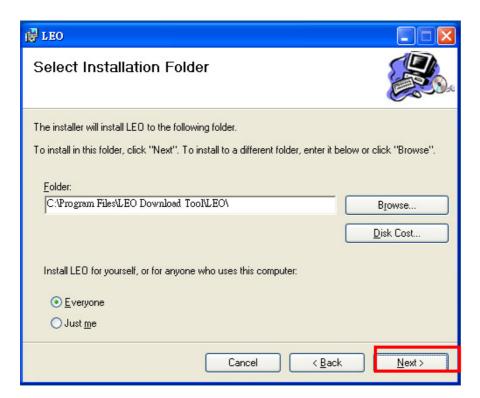
1. You must install "Prolific USB-to-Serial Comm Port" driver first before installing this program, and then double click the "Setup.msi" start installation.



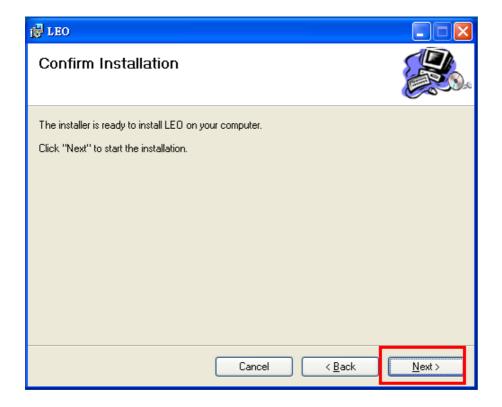
2. You can see the below picture, and then click the "Next" button.



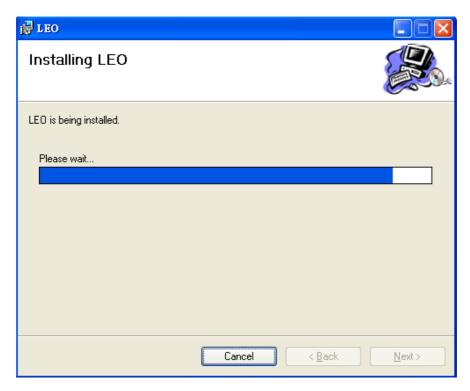
3. You can see the below picture, and then click the "Next" button.

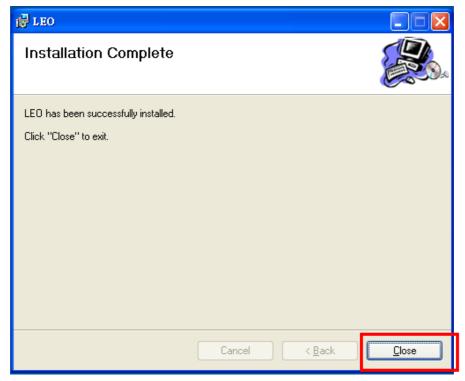


4. You can see the below picture, and then click the "Next" button.



5. You can see the below Installing picture, and then click the "Close" button installation complete.





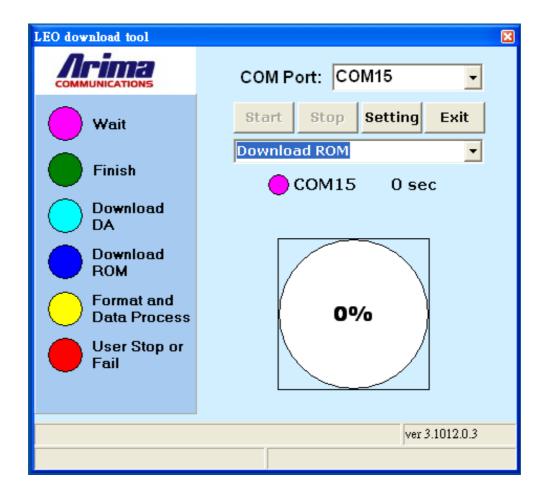
How to use Leo download tool

For example: A120-00-V10a-404-XX-JUN-10-2010

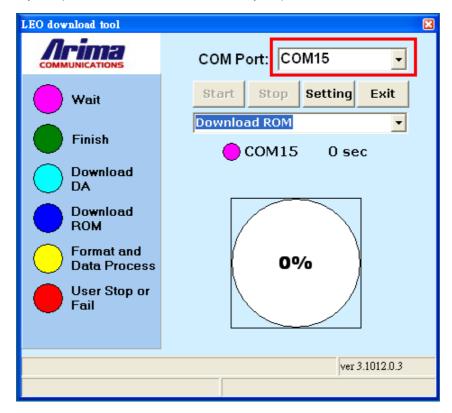
1. Connect Download cable with computer, and then double click the" LEO Download Tool".



2.you can see the below picture.



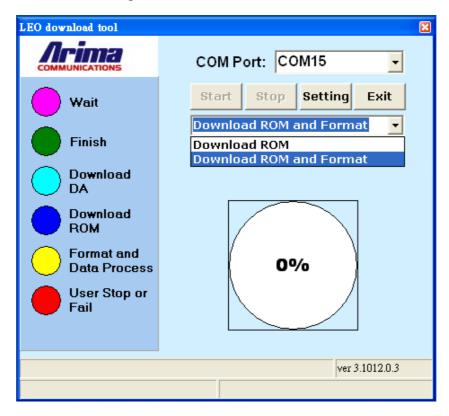
3. Select COM port (LEO will auto detect COM port)



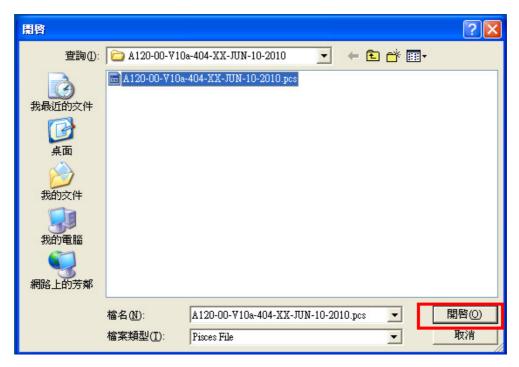
4. Select Download mode.

Note: 1 If you select "Download ROM", it will download software only.

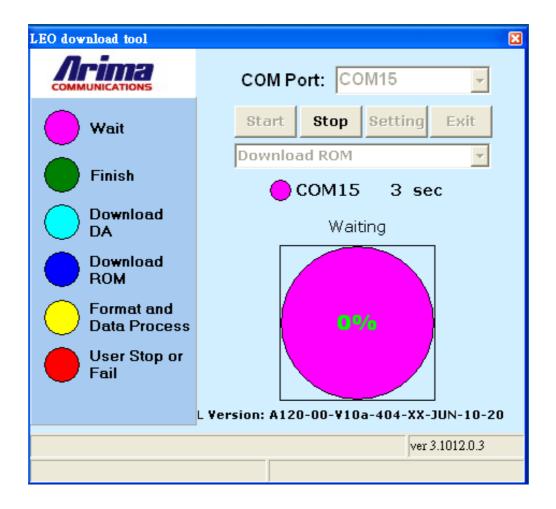
② If you select "**Download ROM and Format**", it will download software and delete NVRAM all data except calibration data and IMEI number, and delete user disk data include contact information · message etc, also it still will reset META_NVRAM to factory default.



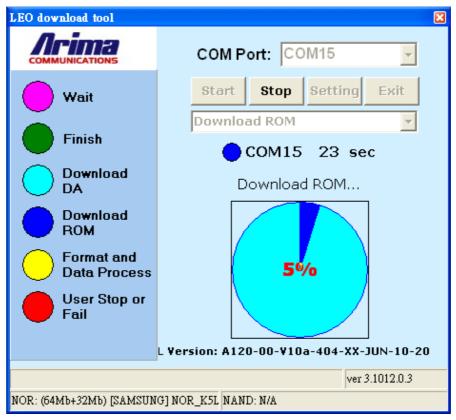
5.Click the "Setting" button and select a valid file. The file always be end of ".PCS", reference below picture.



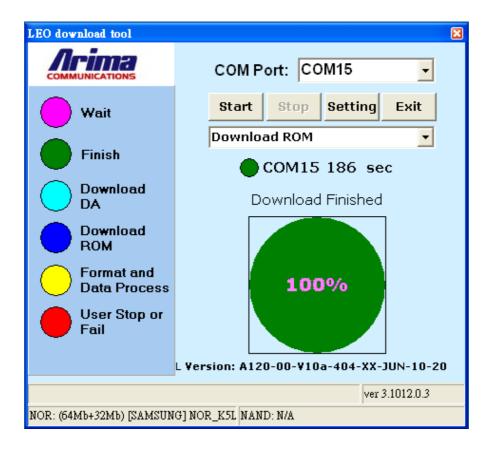
6. Select the ". PCS "file and press open, you can see following picture.



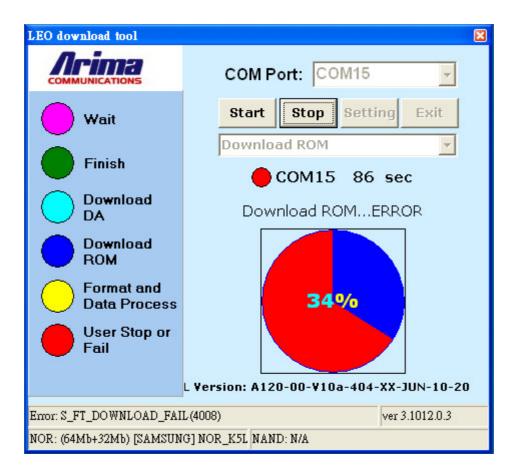
7. After you see the pink cycle, connect download cable with handset, and then press the power key, you will see below picture.



8. After reach to 100%, SW download finish.



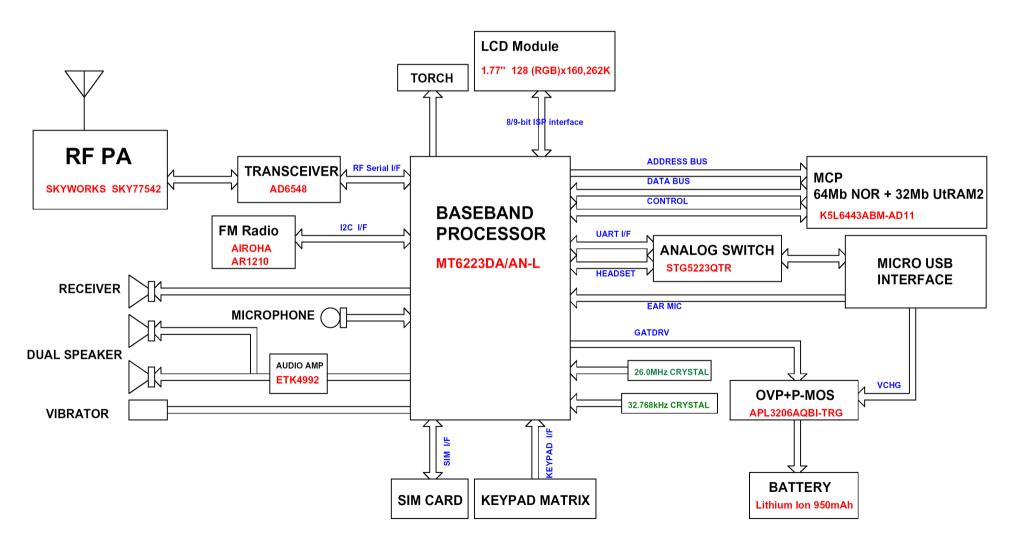
9.If download failed, you will see the below picture.



Attention: If appear failed image, Please try close LEO and try open again.

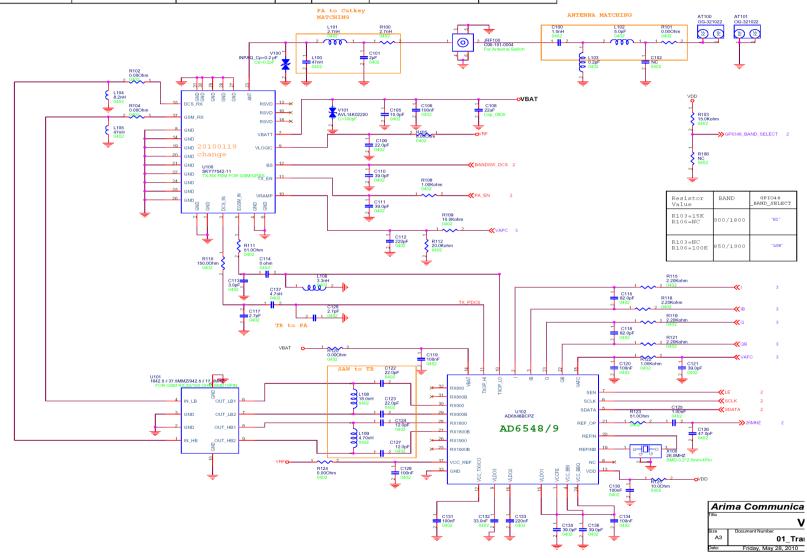
6. BLOCK DIAGRAM

V30-7265 BLOCK DIAGRAM

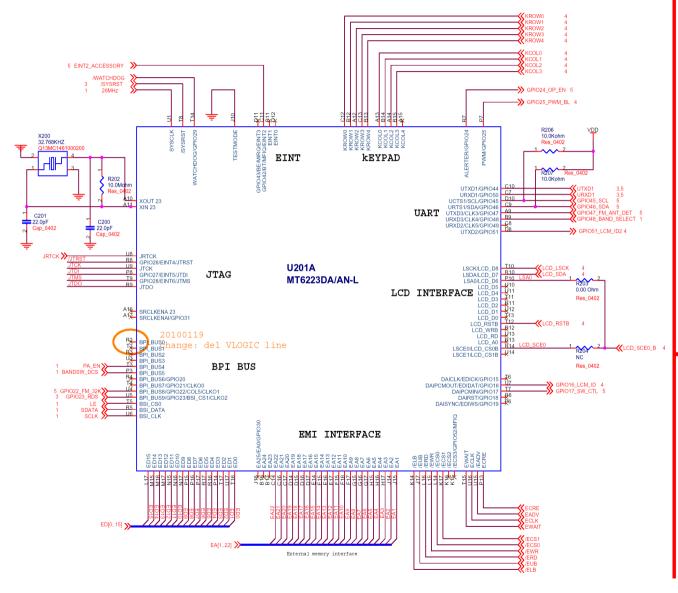


7. CIRCUIT DIAGRMA

	PA to Cutkey MATCHING	ANTENNA MATCHING	PA	SAW	TR to PA	SAW to TR
EU(900/1800)	L102=2.7nH	L100=3.9nH L103=6.8nH C101=3.9pF R100=0 ohm C102=0.5pF	U100= 77542	U101= B9500_EPCOS	R111=56 ohm , L111=3.3nH , C116=33 pF C113=NC , L3.3nH , C114=2.2pF R100=56 ohm , L112=1.8nH , C137=18 pF C128=NC , L107=1.5nH , C117=1.0pF	L104=NC
US(850/1900)	L101=2.7nH	L100=3.9nH L103=6.8nH C101=3.9pF R100=0 ohm C102=0.5pF	U100= 77543	B9506_EPCOS	R111=56 ohm , L111=3.3nH , C116=33 pF C113=NC , L3.3nH , C114=2.2pF R100=56 ohm , L112=1.8nH , C137=18 pF C128=NC , L107=1.5nH , C117=1.0pF	L104=NC

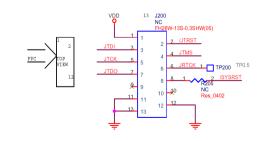


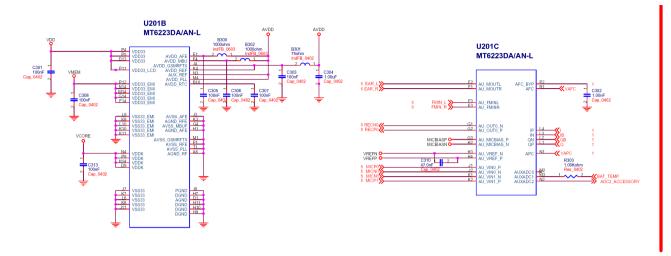
BB CHIP_LOGIC



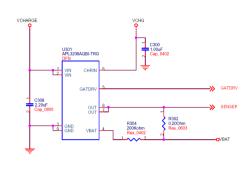
MCP U200 K5L6443ABM-AD11 K5L6443ABM-AD11 VMEM EA[1..22] >> G1 A0 F1 A1 E1 A2 D1 A3 B1 A4 C1 A5 F2 A6 F2 A7 F6 A8 C203 100nF Cap_0402 D7 A9 E7 A10 B8 A11 C8 A12 D8 A12 D8 A13 E7 A14 E8 A15 E8 A16 D2 A17 B2 A17 B2 A18 B3 A19 E6 A20 A21 F4 J2 F5 B5 VMEM C202 100nF Cap_0402 VSSQ VSSQ VSSQ VSS VSSQ 16 VSSQ 12 VSSQ 12 VSS 12 VSS 18 O VSS 18 15 O MNT VSS 15 O MATT C6 AVD JB VCCQ VSCQ K7 ED[0..15] >> EDU H2 ED1 H3 DQ0 ED2 G3 DQ1 ED3 H4 DQ3 ED5 G5 DQ4 ED6 J6 DQ6 ED7 H7 7 H7 DQ7 VMEM D8 G2 DQ8 DQ9 ED10 G4 DQ10 ED11 J4 DQ11 ED12 H5 DQ12 C204 100nF Cap_0402 D13 G6

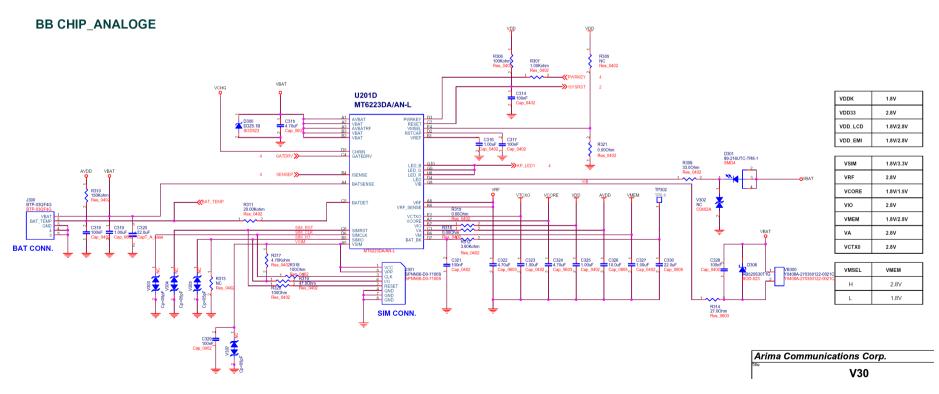
JTAG



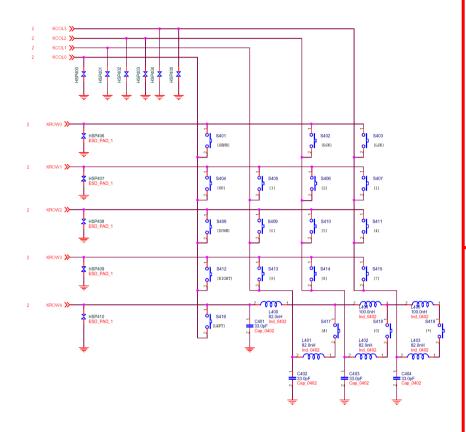


OVP+PMOS

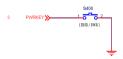




KEYPAD



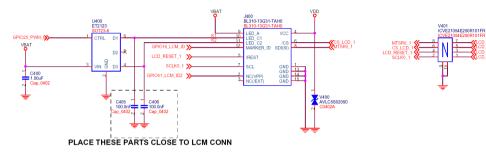
PWRKEY



LCM BACKLIGHT DRIVER

VENDER	GPIO16_LCM_ID	
LGIT	LOW	
TBD	HIGH	

VENDER	GPIO51_LCM_ID2
TBD	LOW
TBD	HIGH

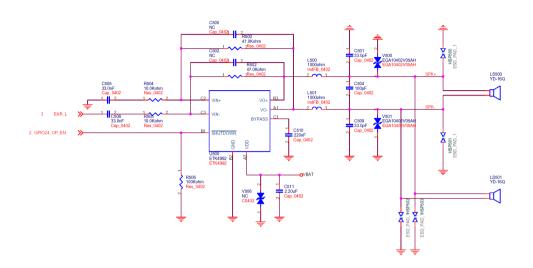


KEYPAD BACKLIGHT LED

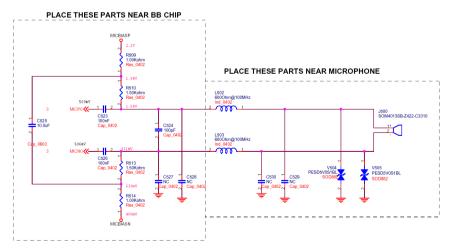


Arima Communications Corp.

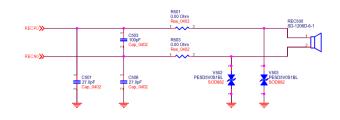
SPEAKER



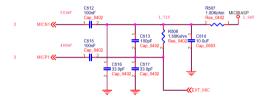
HANDSET MIC INPUT



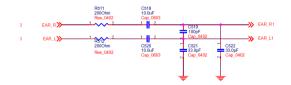
RECEIVER



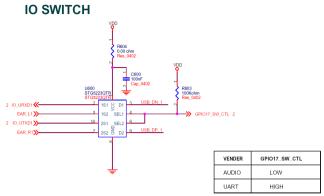
HEADSET MIC INPUT

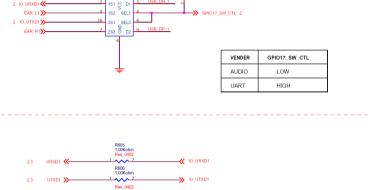


EAR

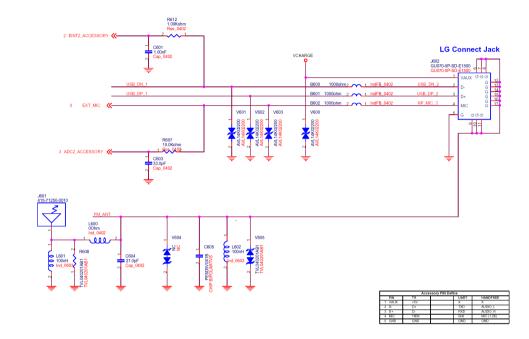


Arima Communications Corp.

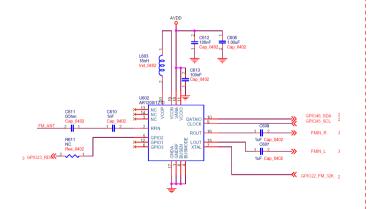


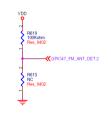


IO INTERFACE



FM RADIO





Resistor Value	FM_ANT	GPIO47_FM_ANT_DET
R541=100K R542=NC	EXT+INTER	HIGH
R541= NC R542=10K	ONLY EXT	LOW

TEST POINT FOR DOWNLOAD

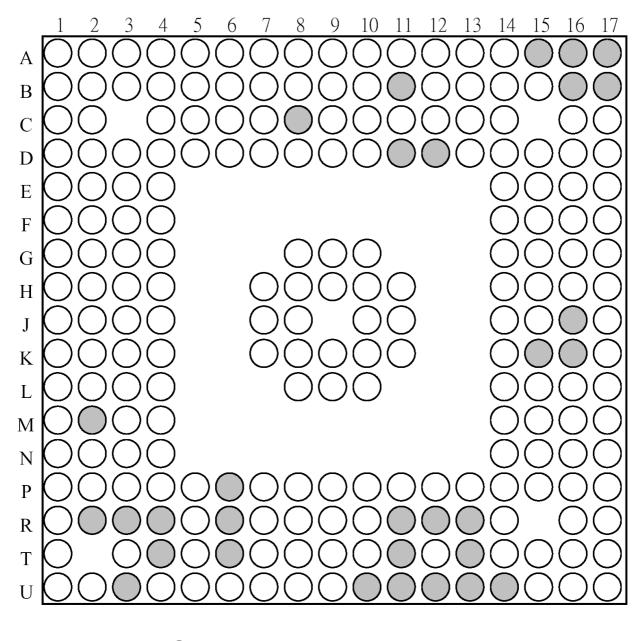


Arima Communications Corp.

8. BGA IC PIN Check

8.1 BGA PIN Check of main chip (MT6223)

BB_MT6223 (U201)

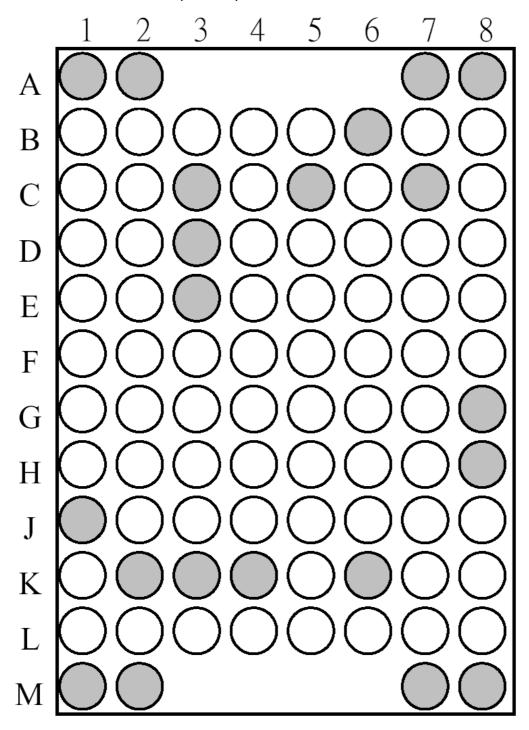


O BGA use

BGA non-us

8.2 BGA PIN Check of Memory (K5L6443ABM-AD11)

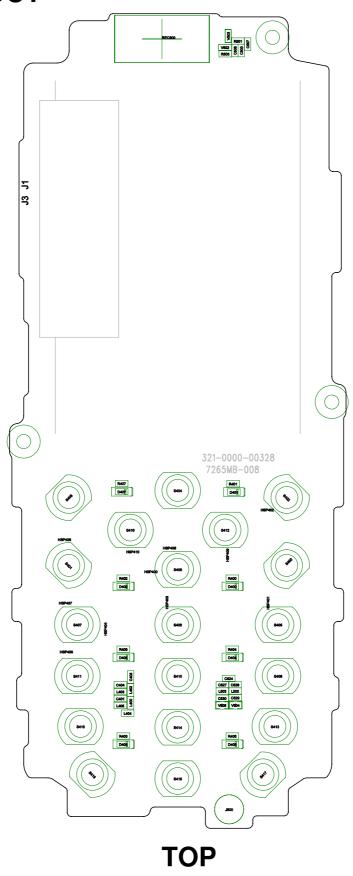
K5L6443ABM-AD11 (U200)

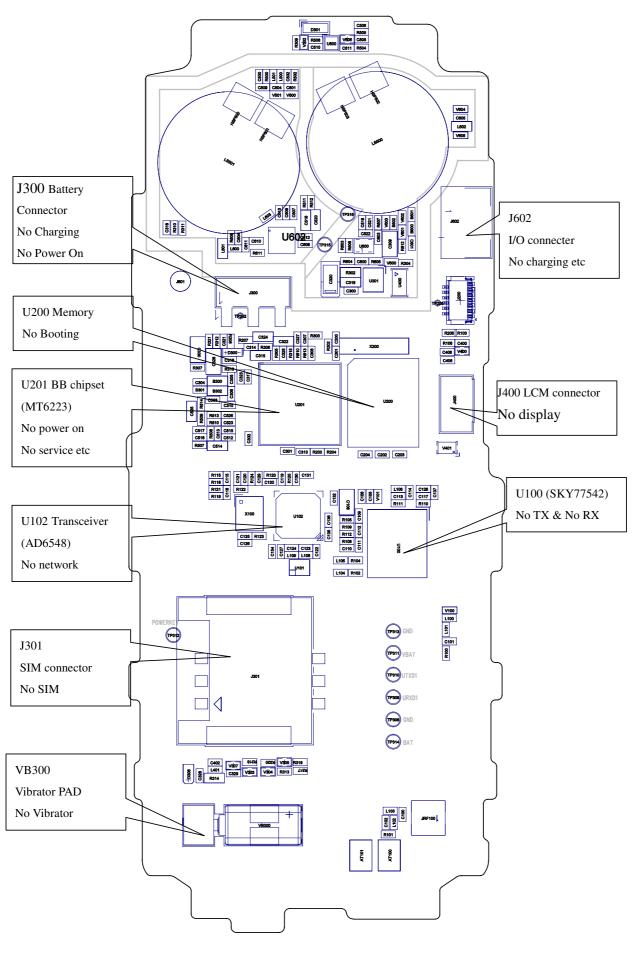


O BGA use

BGA non-use

9. PCB LAYOUT





Bottom

10. Engineering Mode

1. Test purpose

- a) To verify Appearance by visual check
- b) To verify recognition of SIM card
- c) To verify Function Test in the table shown as below
- d) To verify power down phone

2. Test System

- 1. Power Supply Unit (PSU)+Dummy Battery or Battery
- 2. Test SIM Card (Spec: GSM Phase 2+ Test SIM Standard 1(3.1))
- 3. Sample Hands free Kit (SHF, Stereo)

3. Test Procedure

3.1 Appearance Test

Verify appearance by visual check

3.2 SIM Test

Verify recognition of SIM card

If "Insert SIM" indicated on Display, it is NG.

3.3 Enter Service Mode

- 3.1.1 No SIM Card installed
 - a. Power on Phone
 - b. Press 878 to enter service mode.
- 3.1.2 SIM Card installed
 - a. Power on Phone
 - b. Press *#878# to enter service mode.

3.1.3 Software Version Check

Select item 6 "Version" in Factory mode to check software version.

4 MMI Tests

- 1. Auto test
- 2. SHOW, IMEI, SW Version
- 3. Echo Loop
- 4. Keypad
- 5. Antenna Test
- 6. Version
- 7. Resource BIN
- 8. Vibrator
- 9. Loud Spk
- 10. Ringtone
- 11. LED
- 12. LCD
- 13. Receiver
- 14. ADC
- 15. Charger
- 16. Headset
- 17. RTC
- 18. MTBF
- 19. UART
- 20. FM Radio

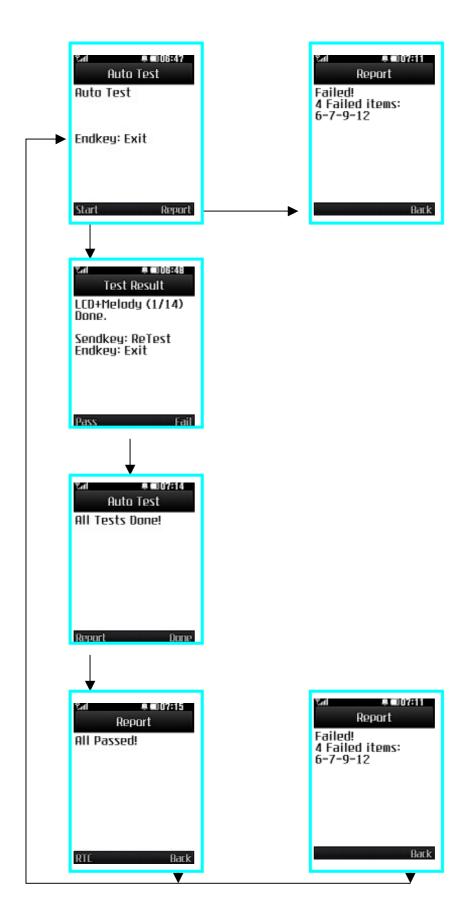
Auto Test Mode

This auto test mode is designed to do the baseband test automatically. When you finish all tests, phone will report the result for you.

Enter and Exit Auto Test Mode

In the idle screen, enter "*#878#" and the Auto Test Mode menu will show up. In Auto Test Mode main menu, press Left-Soft-Key (LSK) "Start" will process the test automatically or End key to go back to the idle screen.

Work Flow



All Auto Test

Charger Test, LCD+Melody+Torch, BackLight+Vib+Flashlight, MIC, Headset, KeyPad, FM-Radio, RTC, ADC, Antenna

1. Charger Test

Check the charger fucntoin is correct or not and charging current.

2 .LCD+Melody+Torch

LCD Backlight, LCD pattern and MIDI melody playing.

3 .LCM Backlight

The LCD backlight and keypad backlight with Vibrator on/off on every 0.5sec.

4.MIC

Enable microphone audio path to pass input sounds to receiver for checking the microphone and receiver component.

5. Headset

To test the analog loop back path from headset MIC to headset Receiver.

6 .KeyPad

Test all keypad keys. All the keys are displayed on the screen. When a key is pressed, the depression is detected and the key disappears from the screen. Once all keys are detected, the test stops and exits.

7.FM-Radio

Force FM-Radio to receive FM signal and show the RSSI in 100.7 MHz channel.

8 .RTC/ADC test

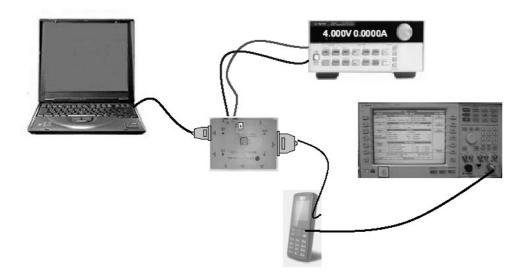
Test RTC and adc, show report in the same screen.

9.Antenna

To test the antenna module.

11.CALIBRATION

11.1 Test Equipment set up



11.2 Calibration Steps

Environment Requirement:

OS:

MS Windows 2000 or XP

Hardware:

Generic Pentium III or above PC (256M RAM or above)

GPIB Card

- National Instruments GPIB device and driver
- o Agilent GPIB card and driver
- KEITHLEY GPIB card and driver

Radio Communication Tester

- o Rohde & Schwarz CMU 200
- o Agilent 8960
- o Anritsu MT8820
- Rohde & Schwarz CMD55
- o Willtek WT4400
- Agilent N4010A (for Bluetooth test)
- Rohde & Schwarz CBT (for Bluetooth test)
- Anritsu MT88852 (for Bluetooth test)

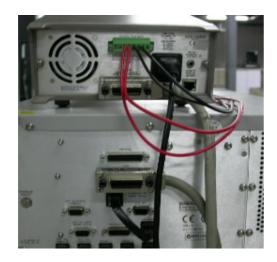
DC Power Supply

- Agilent 661x or Agilent 663x2 series power supply
- R&S NGSM Power Supply
- o KEITHLEY 2303, 2304, 2306
- o Agilent 3631A power supply
- Willtek WT4400 power supply option

Others

USB download cable Dummy battery RF cable The following diagrams depict the system setups when using the Agilent test platform.

Connect 8960, power supply, computer, phone

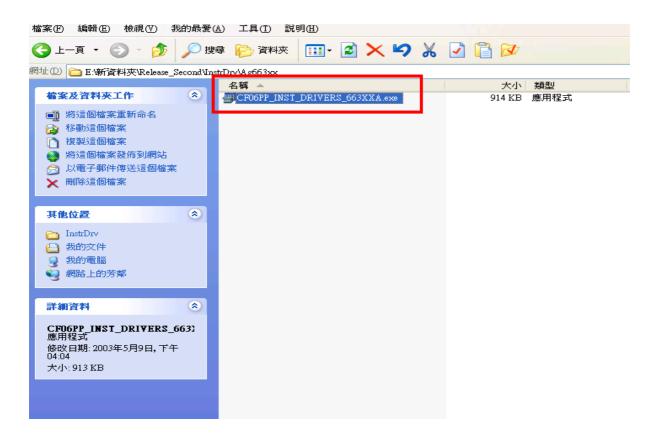


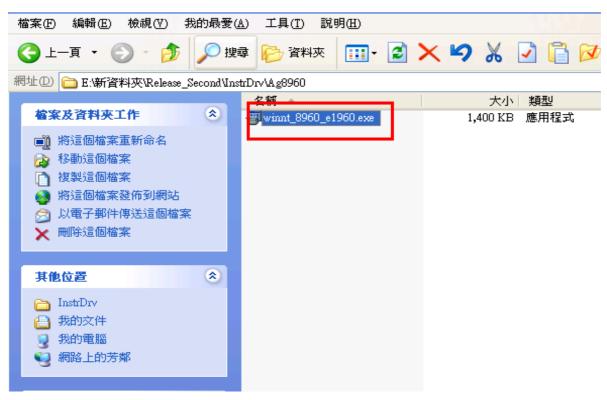






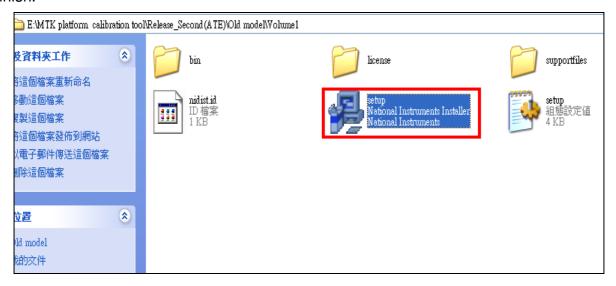
When install the MTK ATE tool, first install driver. In turn execute CF06PP_INST_DRIVERS_663XXA.exe, winnt_8960_e1960.exe, 230x-850a01.exe.



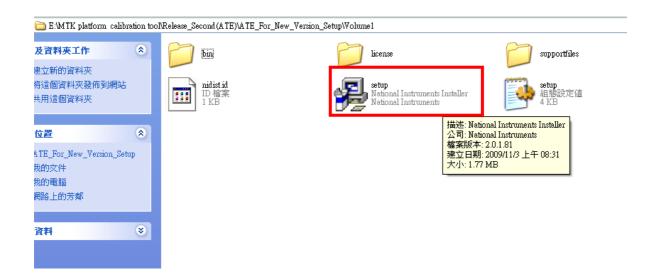




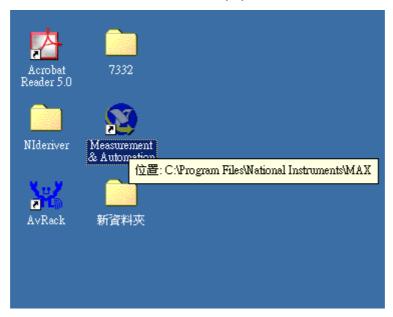
Second, to install the MTK ATE tool, execute the Old model \ Volume1 \setup.exe file. The Installation Wizard guides the user through the installation process step by step, up to Installation finish.



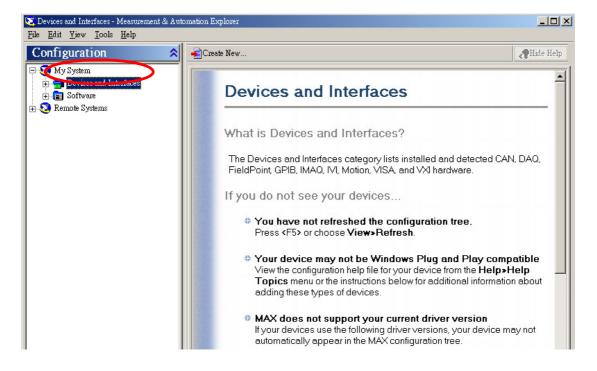
Third, to install the MTK ATE tool, execute the ATE_For_New_Version_Setup \ Volume1 \setup.exe file. The Installation Wizard guides the user through the installation process step by step, up to Installation finish.



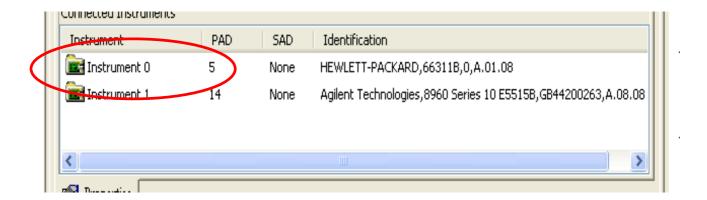
Execute Measurement & Automation to check equipment address



Choose Devices and Interfaces

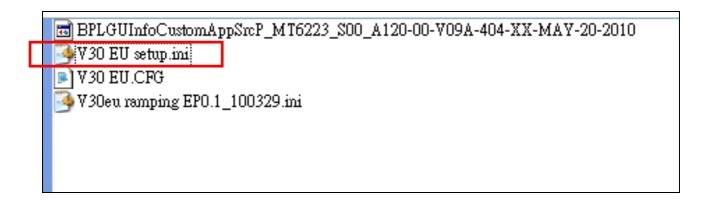


You can see your equipment address

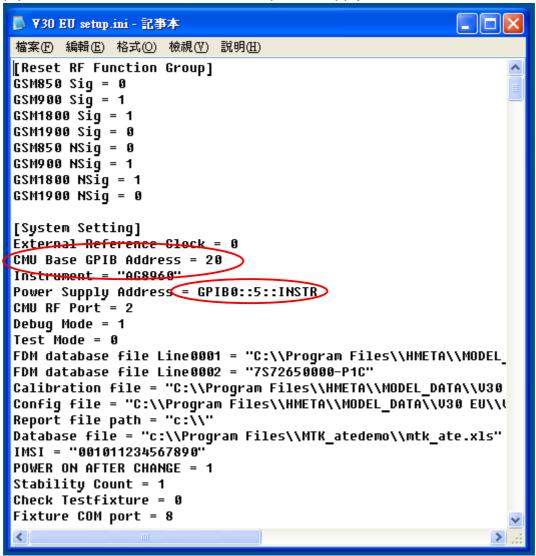


Choose V30 EU setup.ini and open the file to setup from data files .

(For example: A120)



Setup your CMU Base GPIB address and power supply address

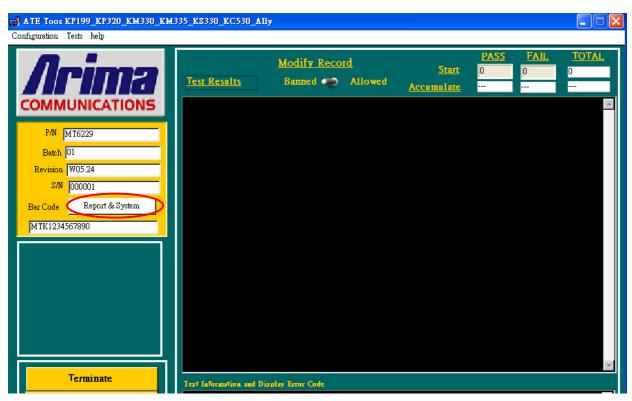


ATE Tool system setting

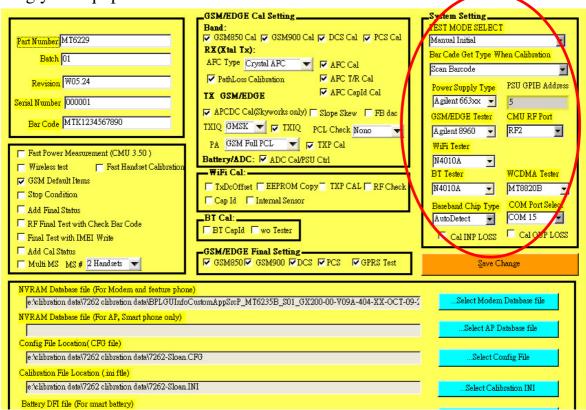
Execute MTK _ ate demo



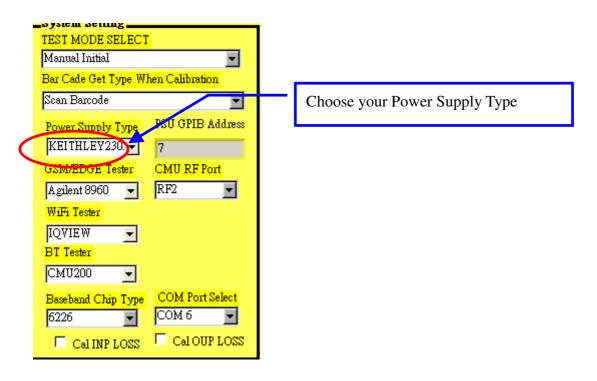
Press Report & System button



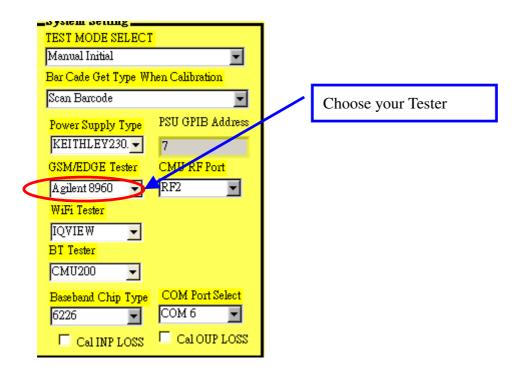
Setting your equipment

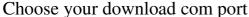


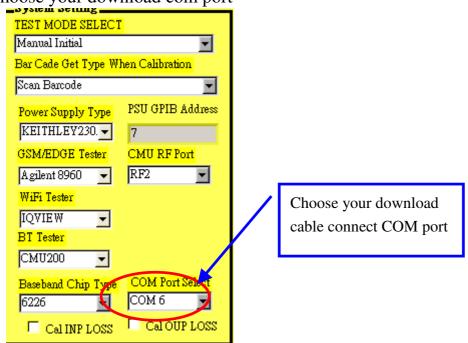
Setting your power supply type



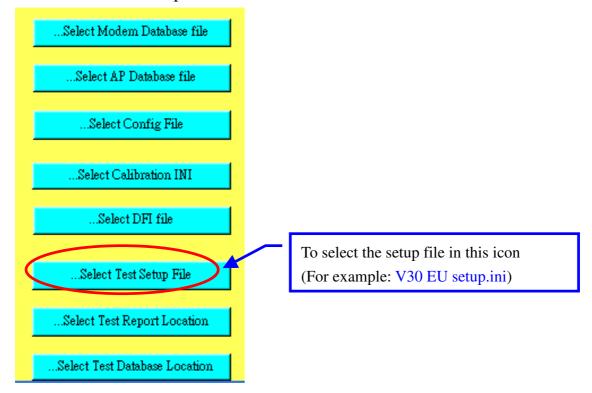
Setting your GSM/EDGE Tester



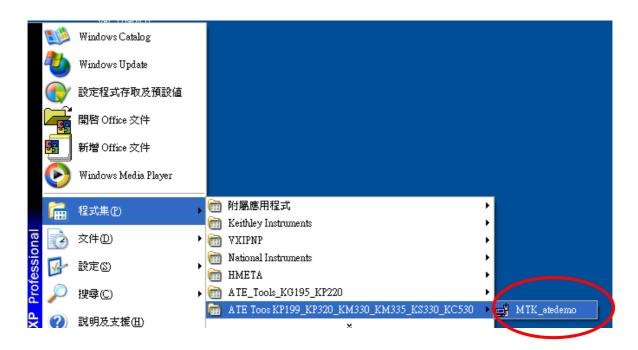




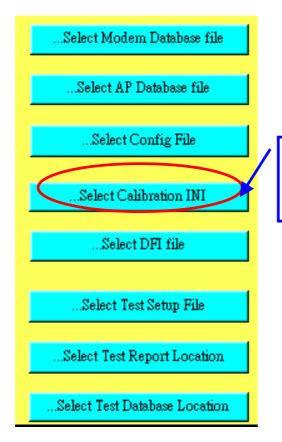
Choose "select test setup file"



Execute MTK _ ate demo again

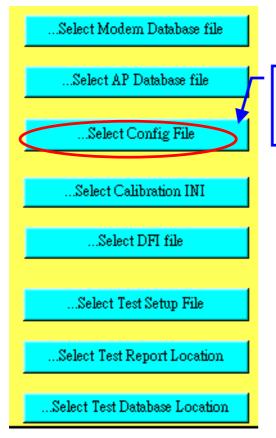


Choose Calibration INI



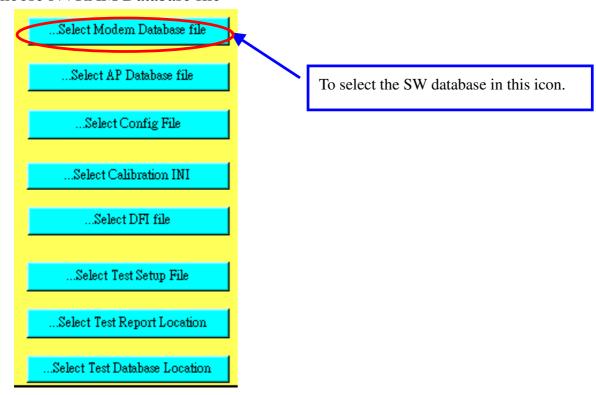
To select the ini file in this icon (For example: V30eu ramping EP0.1_100329.ini)

Choose Con fig File

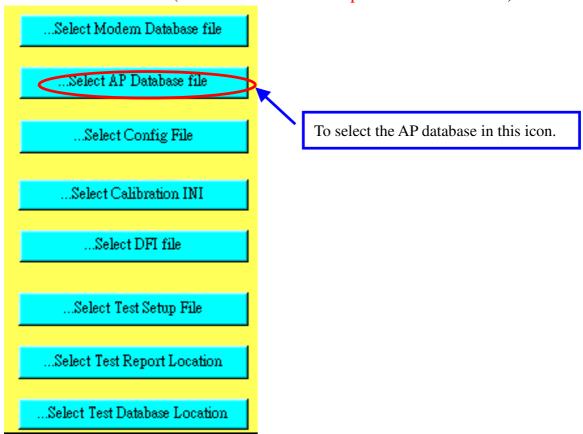


To select the CFG file in this icon (For example: V30 EU.CFG)

Choose NVRAM Database file



Choose AP database file (Caution: ONLY Smart phone need choose it)



Choose Battery DFI file (Caution: ONLY Smart battery need choose it)



How to setup your test report location

Choose my computer



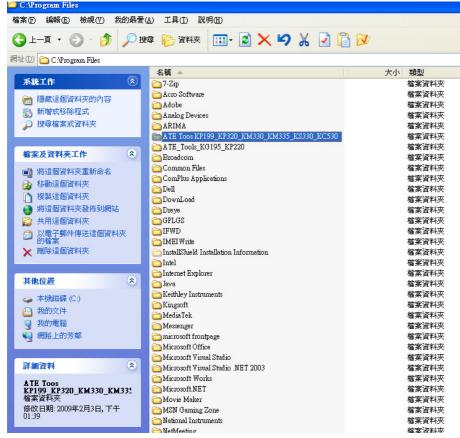
Choose "C" disk

名稱 △	类	型	大小總計	可用空間	
■3.5 軟碟機	(A:) 3	5 吋軟式磁碟機			
■ 本機磁碟 (C:) 4	機磁碟	18.6 GB	15.6 GB	
■新增磁碟區	[(D:) ≉	機磁碟	18.6 GB	16.0 GB	
─────────────────────────────────────	用空間: 15	.6 GB,容量: 18.6 GB			

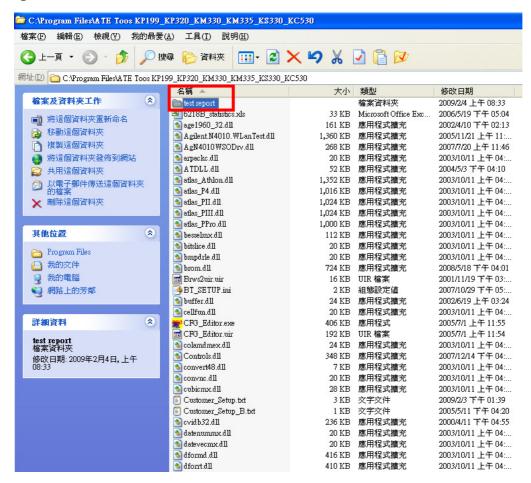
Choose "program files"



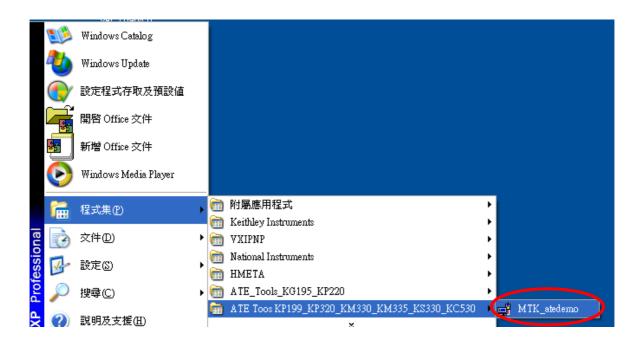
Choose "Program Files \ATE Tools KP199_KP320_KM330_KM335_KC530" file



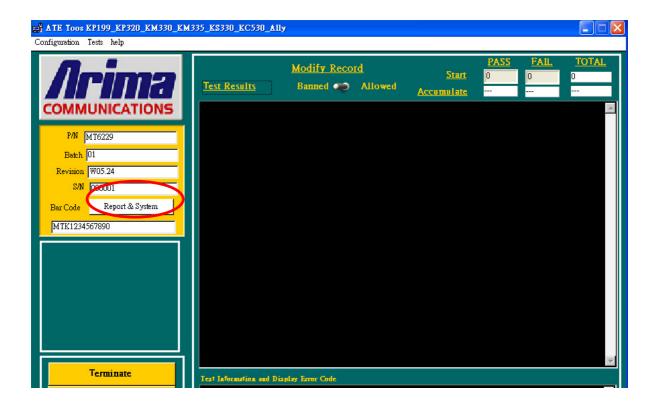
Setup new file and leave the window



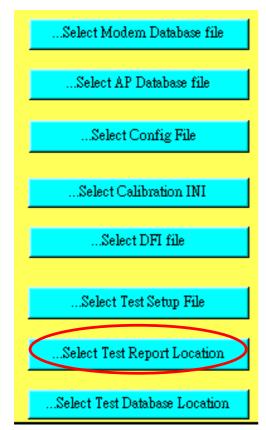
Execute MTK _ ate demo



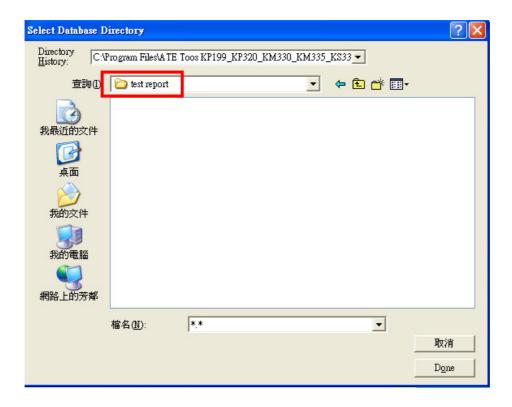
Press Report & System button



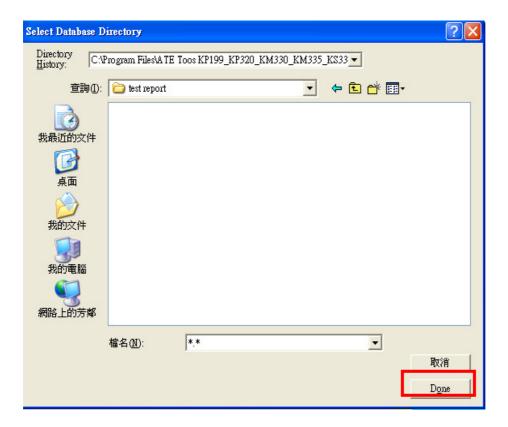
Press "select test report location"



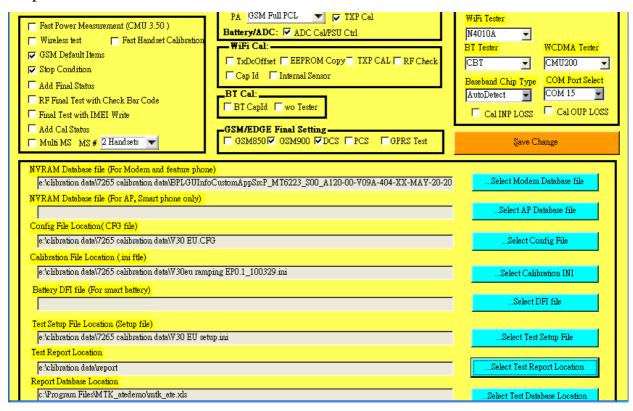
Choose your setup report



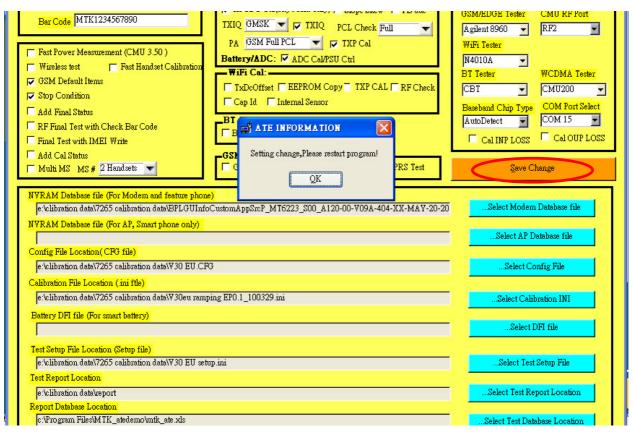
Press "Done"



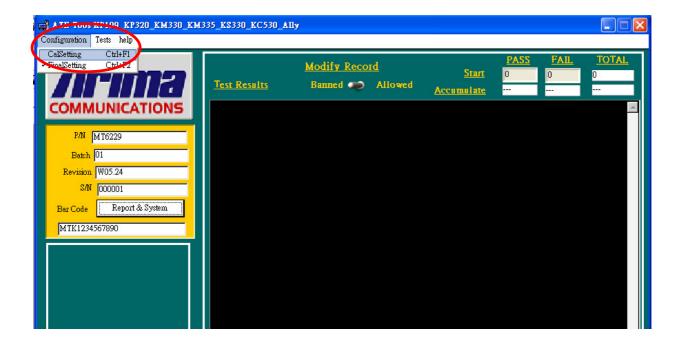
Setup finish



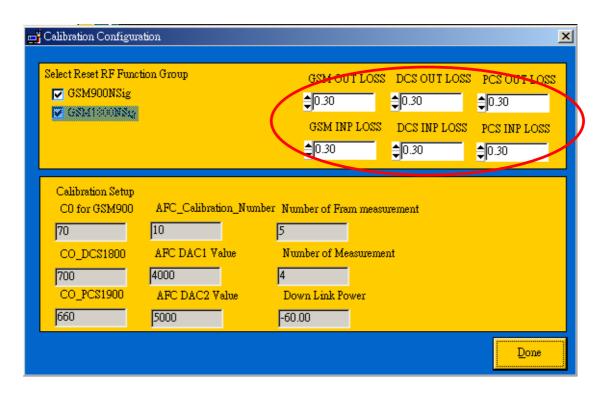
When you finish the setup then you press save change icon.



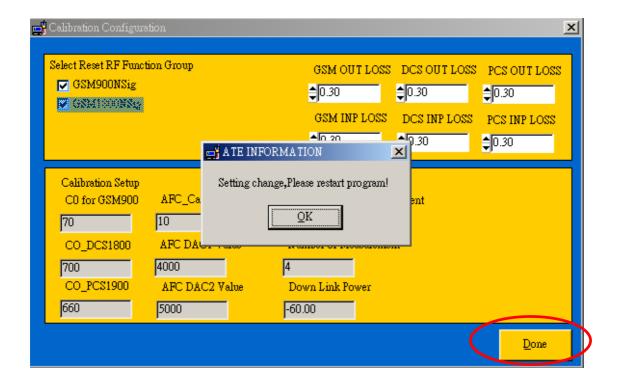
Press Configuration choose Cal Setting



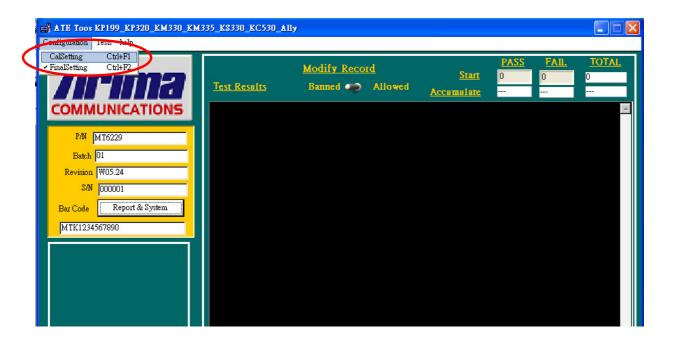
Setting your cable loss



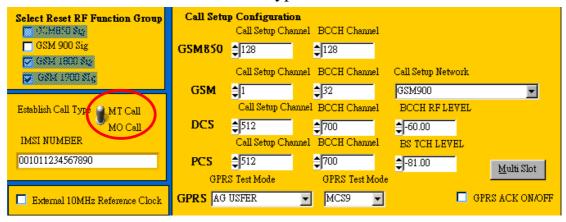
Press Done to save



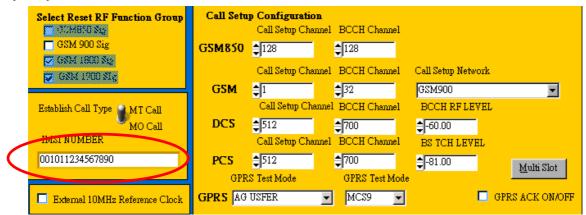
Press Configuration choose Final setting



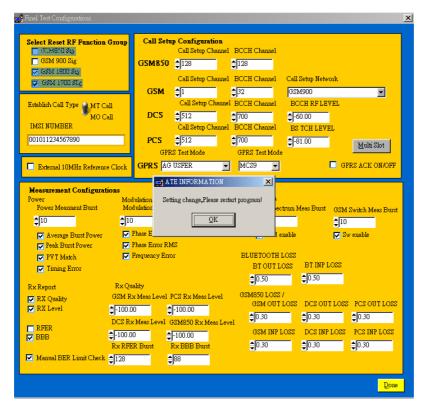
Choose "MT Call" from Establish Call Type



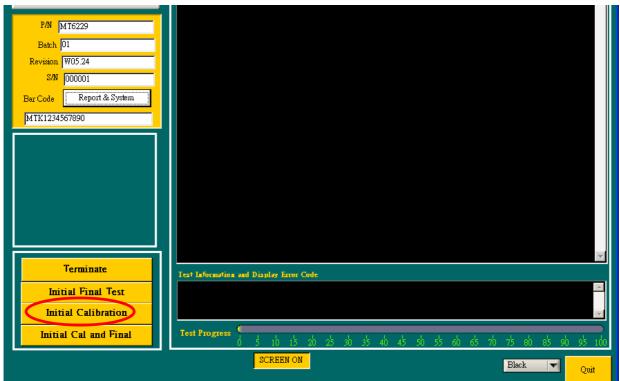
Key in your test SIM card number form IMSI NUMBER



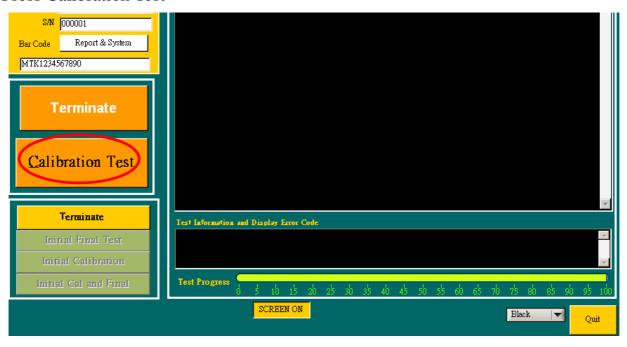
Press "Done" and save your setting



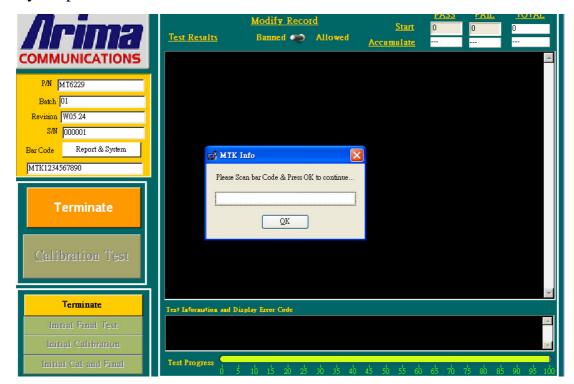
If you want calibration, you can press "initial calibration"



Press Calibration Test



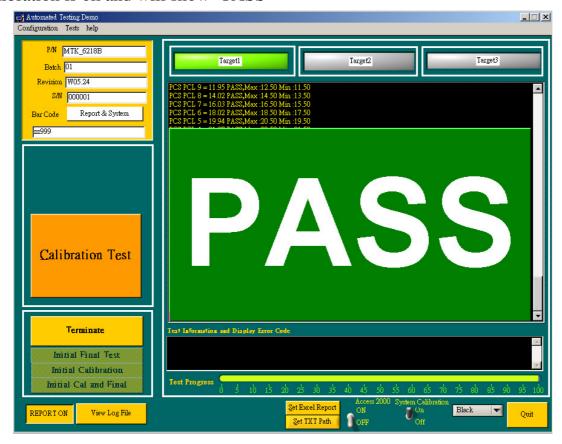
Key-in your phone bar Code



Press your phone of power on key and Start calibration



Calibration is ok and will show "PASS"



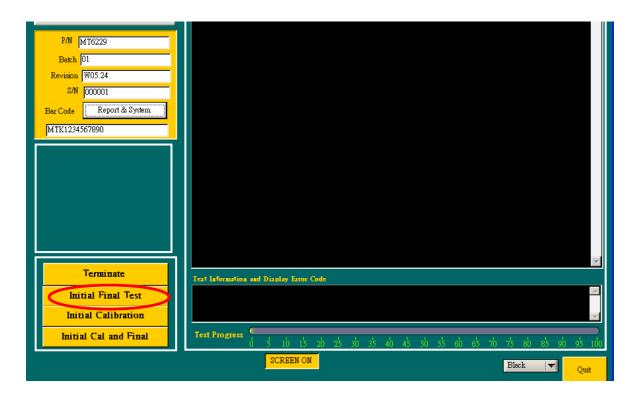
You can see the test report

ATE Tool Version:5.0.3
Part Number: MTK_6218B
Serial Number: 000001
Revision: W05.24

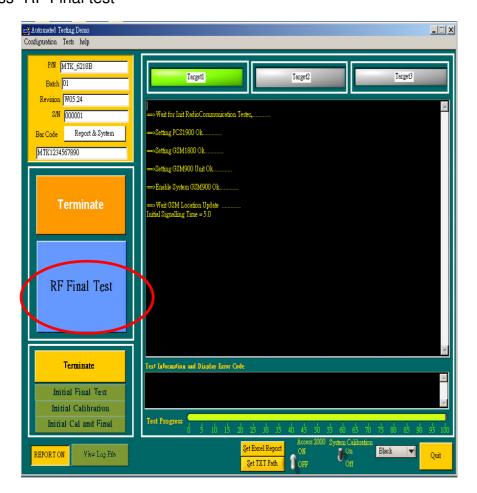
Batch: 01 Bar Code: qqq Error Code: 000

==>Wait GSM Location Update Enter into META Mode OK AFC Calibration OK Slope=2.824,min:1.000,max:10.000 Use Default Value=3836 AFC Calibration time=1.64(sec) PL GSM TCH 15 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 30 = 1.00 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 45 = 0.88 Pass MAX:3.00 MIN:-3.00 MIN:-3.00 PL GSM TCH 60 = 1.25 Pass MAX:3.00 PL GSM TCH 75 = 1.38 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 80 = 1.50 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 100 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 124 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 975 = 1.50 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 1000 = 1.38 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 1023 = 1.00 Pass MAX:3.00 MIN:-3.00 PL DCS TCH 550 = 0.50 Pass MAX:3.00 MIN:-3.00 PL DCS TCH 590 = 1.00 Pass MAX:3.00 MIN:-3.00

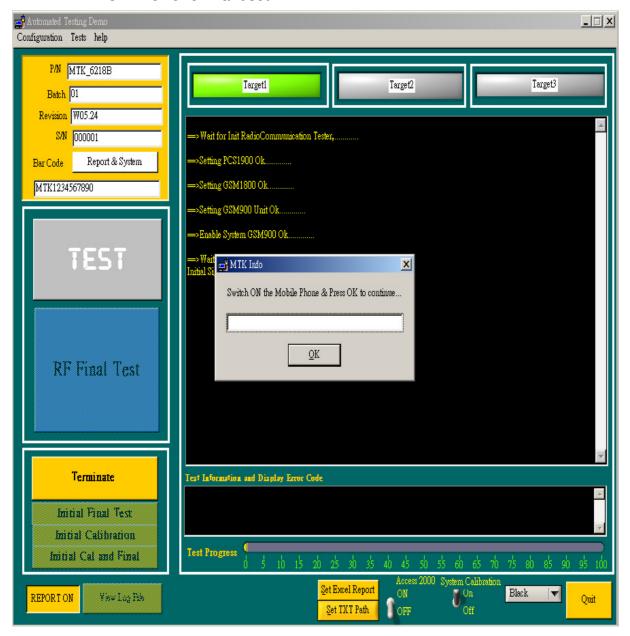
If you want final test, you can press "initial final test"



Press "RF Final test"



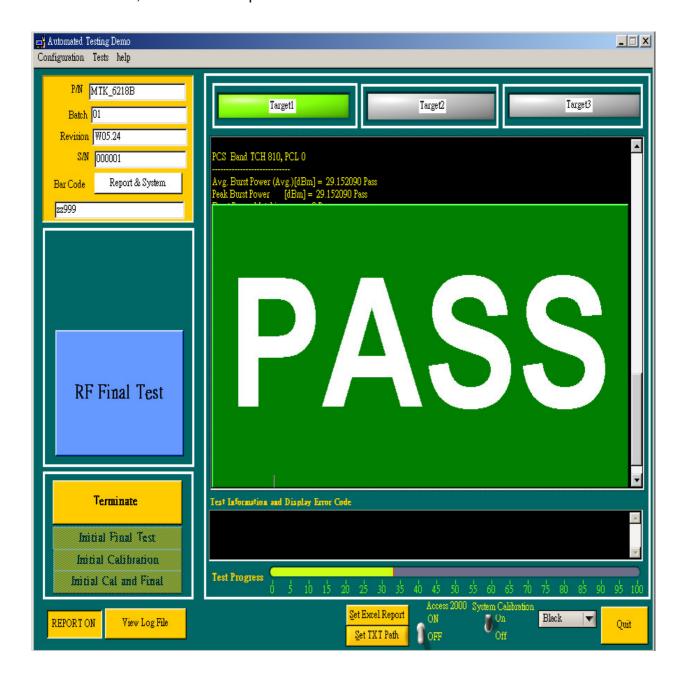
- 1. Handset to insert SIM card
- 2. Key-in bar code or IMEI number
- 3. Power on handset



ATE start final test



If ATE test finish, ATE will show pass



You can see the test report

ATE Tool Version:5.0.3 Part Number: MTK 6218B

000001

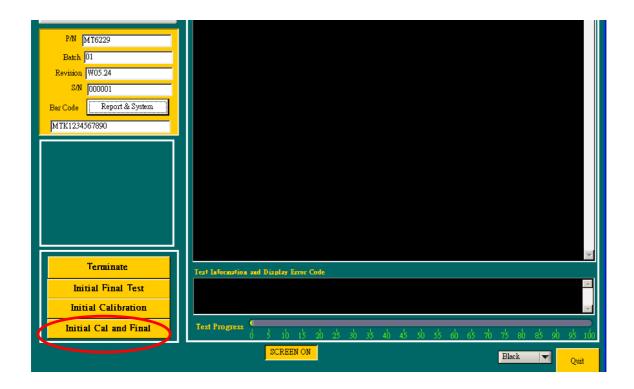
Serial Number:

Revision: W05.24 Batch: 01 Bar Code: qqq Error Code: 000 ==>Wait GSM Location Update Enter into META Mode OK AFC Calibration OK Slope=2.824,min:1.000,max:10.000 Use Default Value=3836 AFC Calibration time=1.64(sec) PL GSM TCH 15 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 30 = 1.00 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 45 = 0.88 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 60 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 75 = 1.38 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 80 = 1.50 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 100 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 124 = 1.25 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 975 = 1.50 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 1000 = 1.38 Pass MAX:3.00 MIN:-3.00 PL GSM TCH 1023 = 1.00 Pass MAX:3.00 MIN:-3.00 PL DCS TCH 550 = 0.50 Pass MAX:3.00 MIN:-3.00

MIN:-3.00

PL DCS TCH 590 = 1.00 Pass MAX:3.00

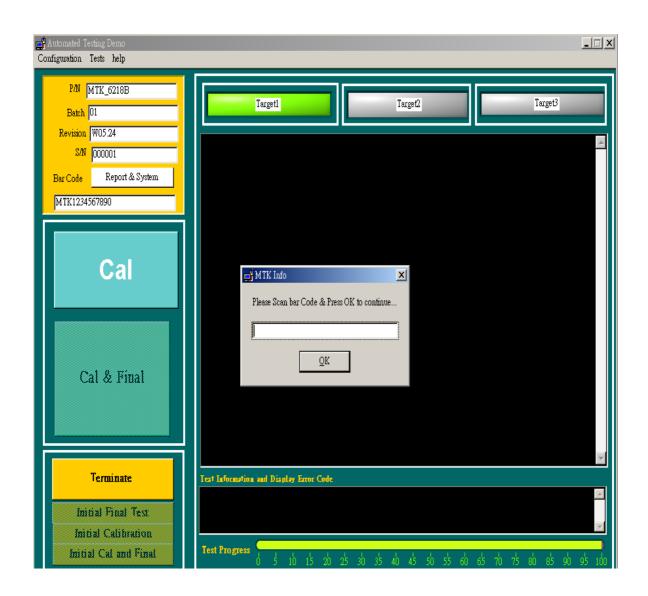
If you want initial cal and final test, you can press "initial cal and final test"



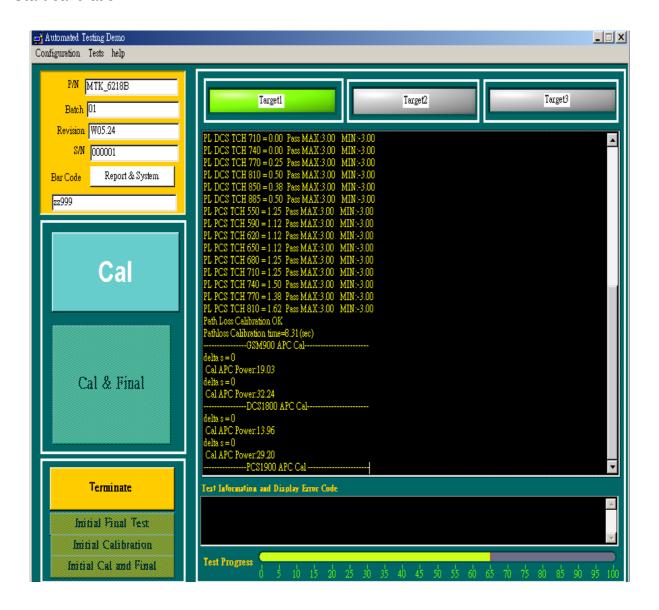
Press "Cal & Final"



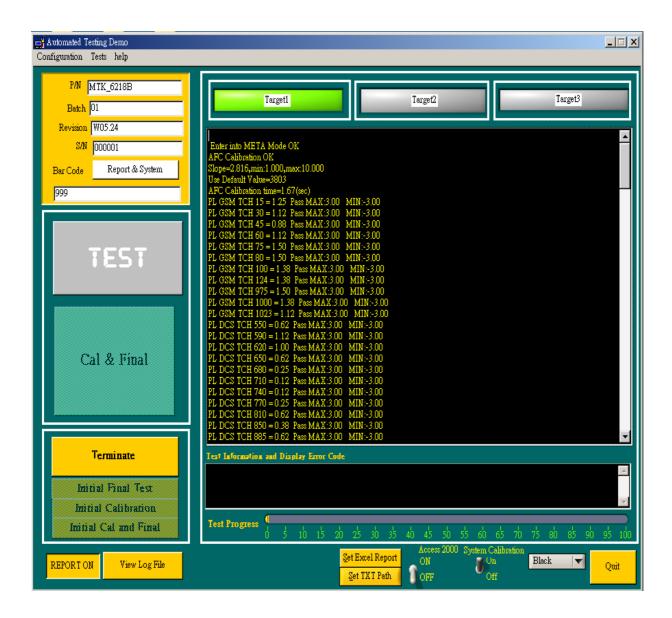
- 1. Handset to insert SIM card
- 2.Key-in bar code or IMEI number
- 3. Power on handset



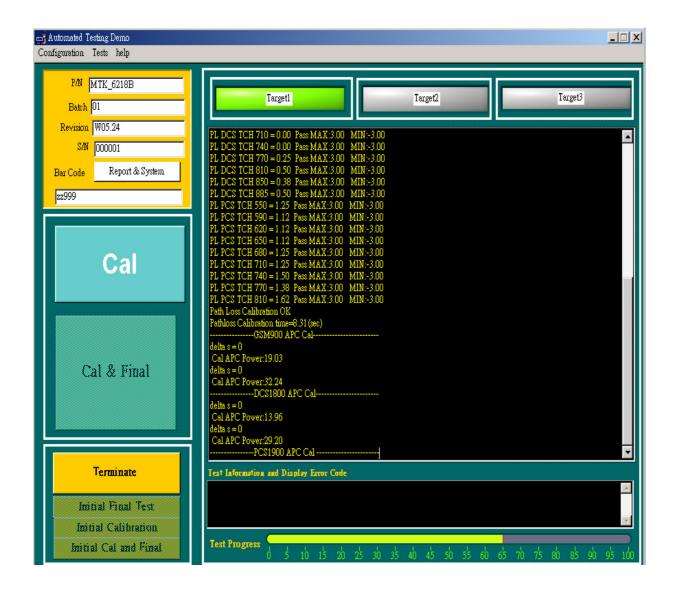
Start calibration



Calibration finish and power on handset again

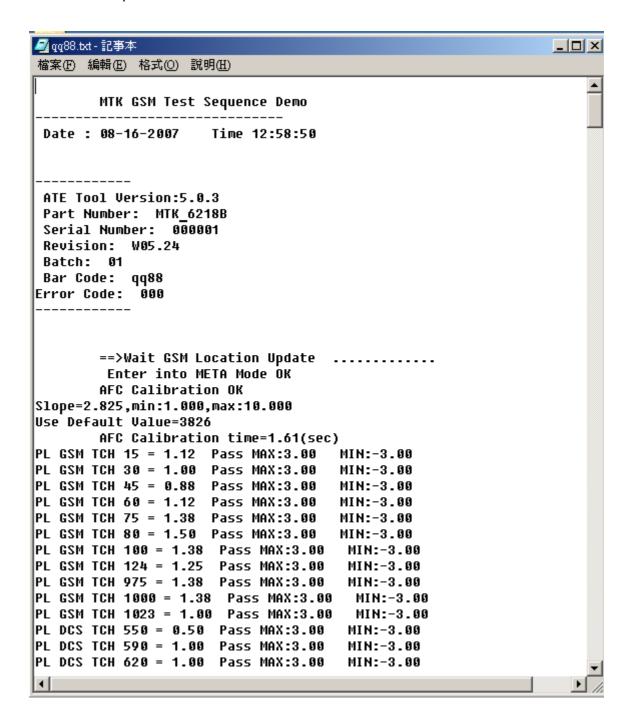


Start final test



Finish "Cal & Final test"



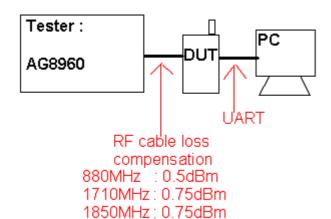


12. STAND ALONE TEST

12.1 RF TX & RX Test:

Test Configuration & Expected Outcome

Test Configuration:



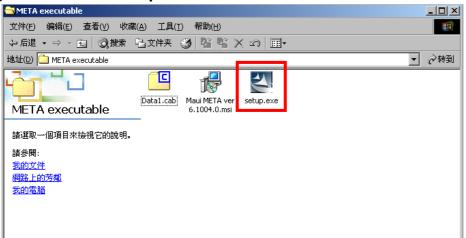
Expected Outcome:

TX power : 32.5 +/- 1.5 dBm for GSM900 TX power : 29.5 +/- 1.5 dBm for DCS1800

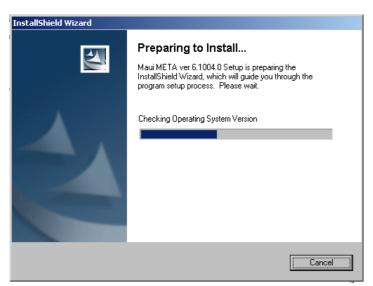
RX power : -85 +/- 4 dBm for GSM900, DCS1800

12.2 META Install & RF TX & RX Check META Tool Install process :

(1) Double click "setup.exe"



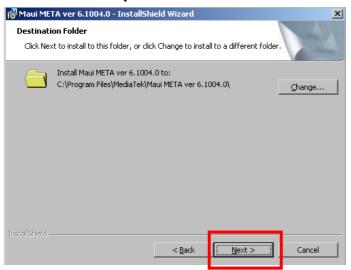
(2) Install Process



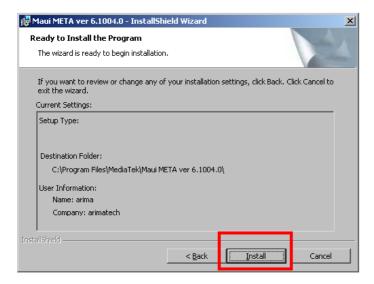
(3) Install Process - press "Next"



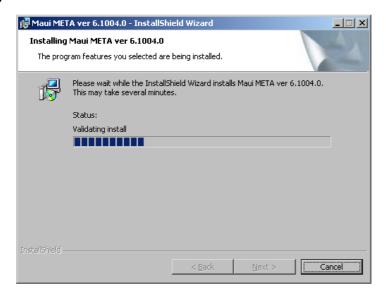
(4) Install Process - press "Next"



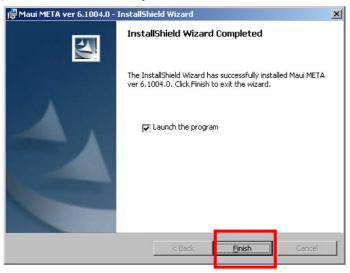
(5) Install Process – press "Install"



(6) Install Process



(7) Install Process – press "Finish"



12.3 RF RX Check:

(1) Open " Meta_RF_Tool "



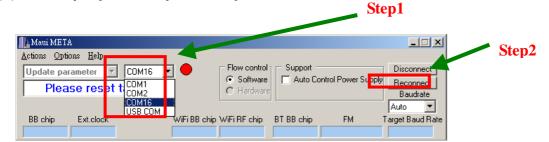
(2) Pull in UART cable



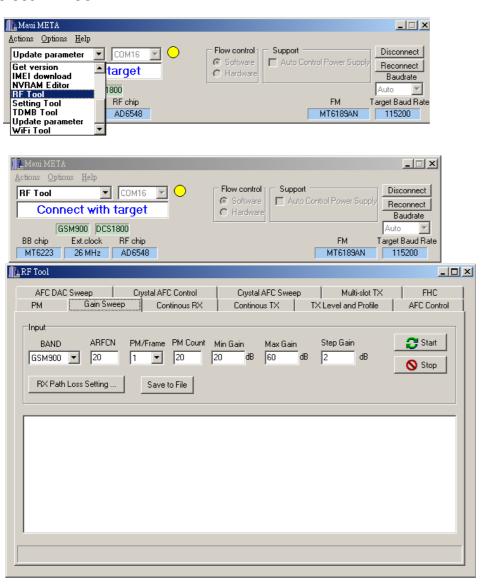
(3) Inset RF-Cable (AG8960)



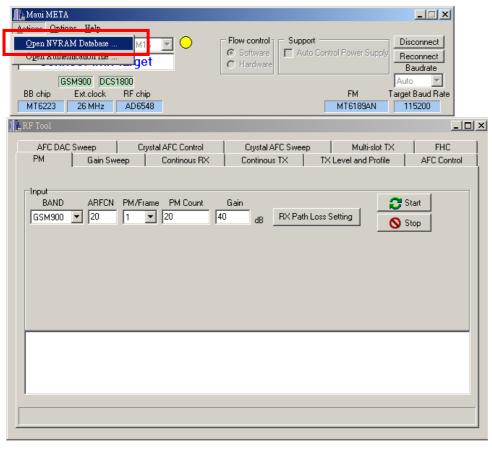
(4) Select proper com port and press "Reconnect".

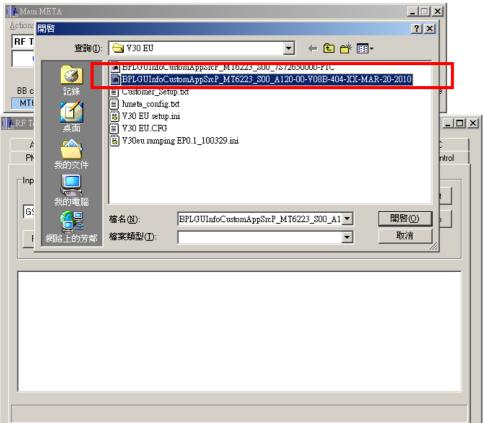


(5)Press handset's power key and it will show LG logo. Than appear the following picture. Select RF Tool.

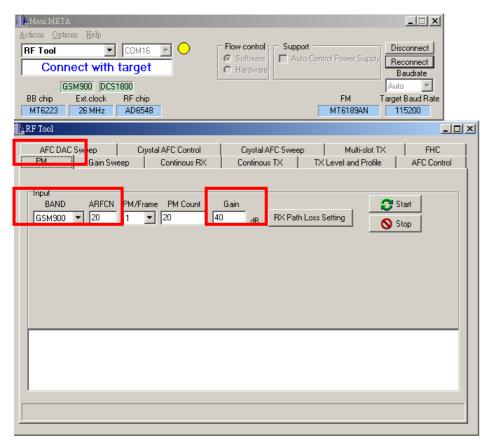


(6)Loading database Make sure the same to handset.

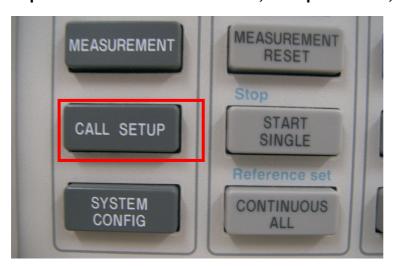


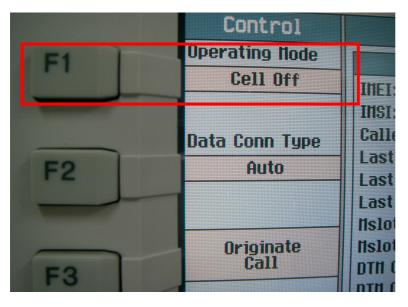


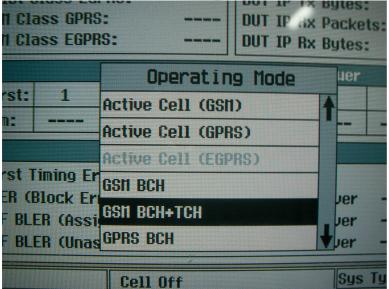
(7) Press "PM" to RX check. Select proper Band, ARFCN and PM Count.



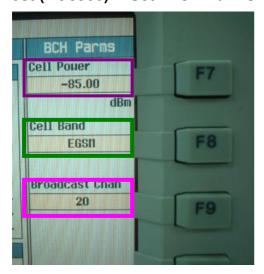
(8) Setup AG8960: Press CALL SETUP, than press "F1", and select "GSM BCH+TCH".

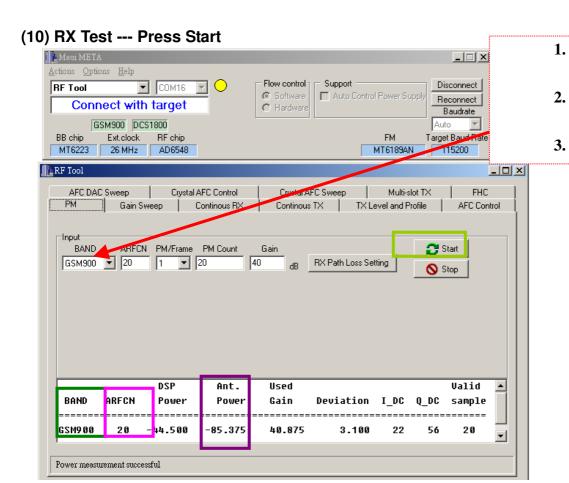






(9) RX Test (AG8960)--- Set "BCH Parms",





Select Band

(GSM/DCS)

Set channel

Press "Start"

number

12.4 RF TX Check:

(1) Open " Meta_RF_Tool ".



(2) Pull in UART cable.



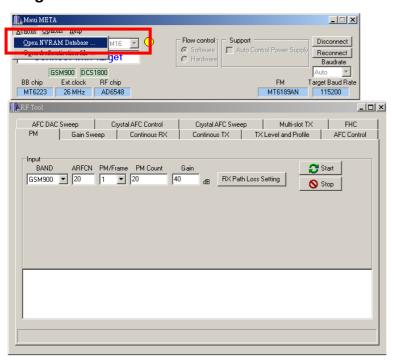
(3) Inset RF-Cable (AG8960).

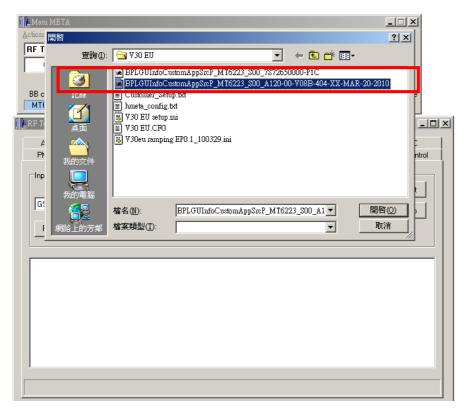


(4) Select proper com port and press "Reconnect" and then press handset's power key.



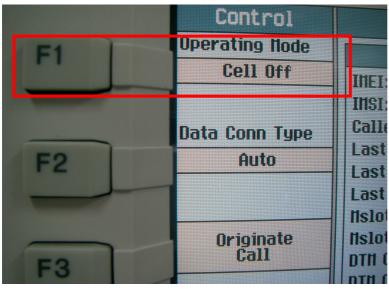
(5) Loading database Make sure the same to handset.

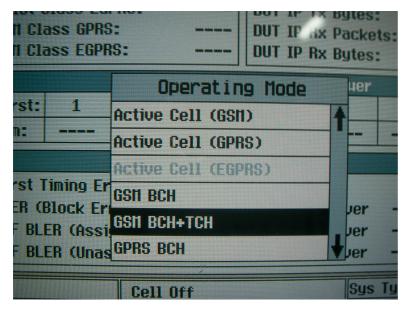




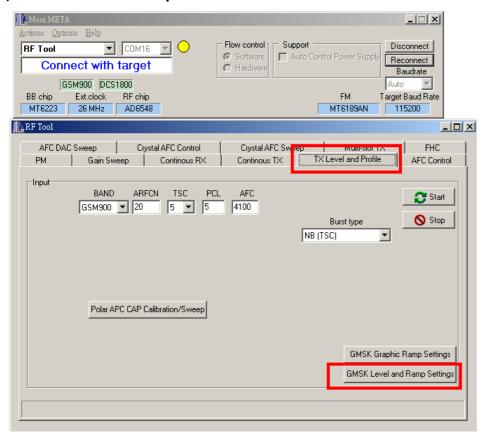
(6) AG8960 need to set TCH Parms.



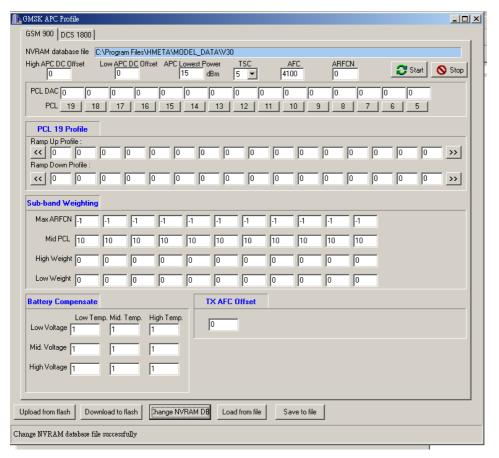


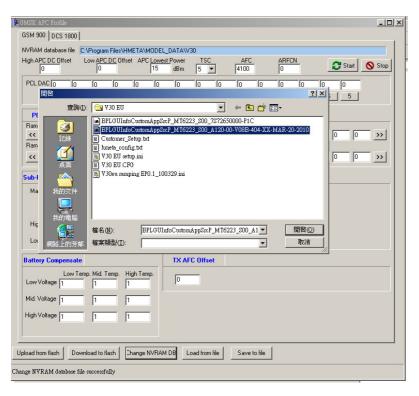


(7)Press "TX level and profile" to TX Test, and click "GMSK Level and Ramp settings".

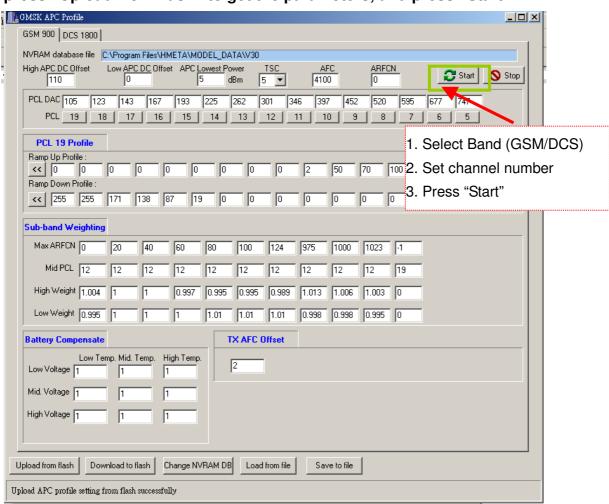


(8) Select "Change NVRAM DB" to choose the right database of the mobile.

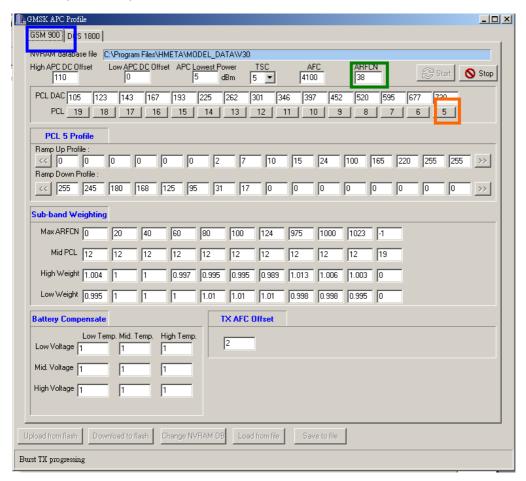


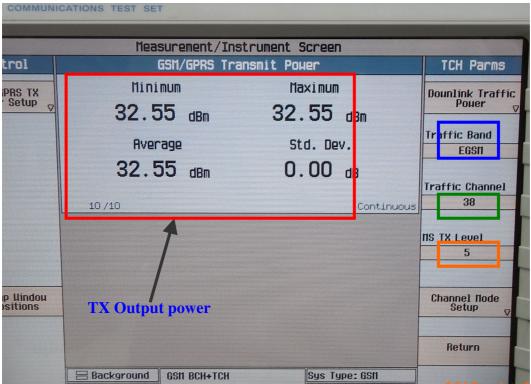


Then press "Upload from flash" to get the parameters, and press "Start"

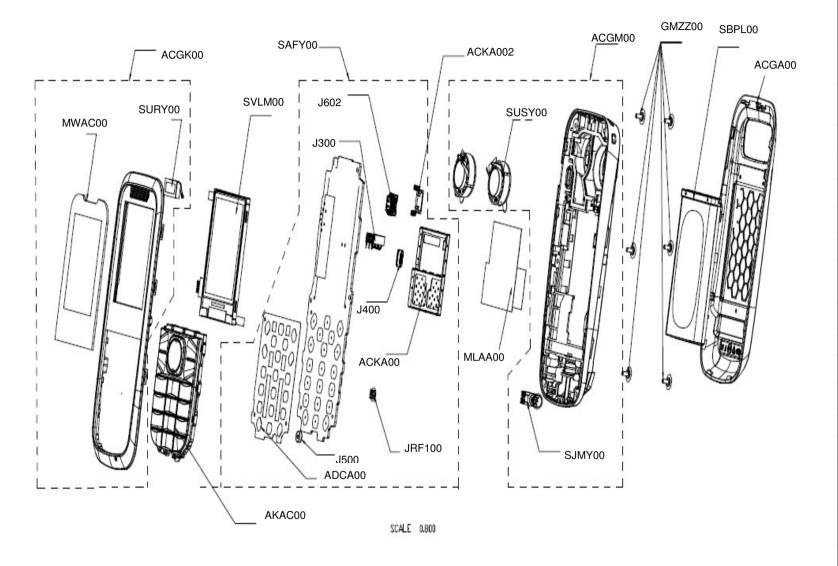


(9) TX Test (AG8960) --- Need set "Band", "Channel" & "Power Level"





13. #EV#



Location No	Description
ACGA00	COVER ASSY,BATTERY
SBPL00	BATTERY PACK,LI-ION
ACGK00	COVER ASSY,FRONT
MWAC00	WINDOW,LCD
SURY00	RECEIVER
ACGM00	COVER ASSY,REAR
SJMY00	VIBRATOR,MOTOR
SUSY00	SPEAKER
AKAC00	KEYPAD ASSY,MAIN
GMZZ00	SCREW MACHINE
MLAA00	LABEL,APPROVA L
SAFY00	PCB ASSY,MAIN
ADCA00	DOME ASSY,METAL
ACKA00	CAN ASSY,SHIELD
ACKA002	CAN ASSY.SHIELD
J300	CONNECTOR,BOARD TO
	BOARD
J400	CONNECTOR,FFC/FPC
J602	Connector
JRF100	CONN,RF SWITCH
J500	MICROPHONE
SVLM00	LCD MODULE

Level	Part Name	Arima part number	LG part Number	Description	Qty
.1	Headset	333-0000-00077	SGEY0003218	Headset Stereo Channel Type_EMB-LGE011STKC_16 Ohm_Mic.S/N'58 'dB 42 'dB_PT.CRESYN_Micro USB 5 pin, 750 + 250 mm	1
.1	Battery Cover	405-72650-0002	ACGA0049701	Cover_7265_BLACK_PC+ABS_N/A_Battery cover Ass'y_SKYCROSS_N/A	1
.1	Battery	306-0000-00071	SBPL0090501	Li-ion Battery Cell Packing_3.7V_950mAh_BLACK_LGIP-531A-SBPL0090501_LG INNOTEK_Bar code:SBPL0090501	1
.1	Adapter	331-0000-00134	SSAD0032601	Travel Charger_100~240V_5.10V_700mA_CE;FCC;UL_STA-U34IS_EN50075_JEWOO_SALCOMP_MICRO USB 5PIN,SSAD0032603	1
2	Screw	409-00000-0115	GMZZ0006901	Machine Screw_Flat_Cross(JCIS)_1.4mm_3.0 mm_BLACK_Steel_Plating Zinc_KUAOLENG(SHANGHAI)_Nylok	6
2	Main Key	404-72650-0002	AKAC0021501	Key_7265_BLACK_PC+Rubber_Painting_HINDI_Main keypad_ICHIA(SUZHOU)_N/A	1
3	RECEIVER	313-0000-00177	SURY0015301	RECEIVER_RR120623LF01_12.0 * 6.0mm_32 Ohm_108dB_GETTOP ACOUSTIC_N/A	1
2	Shielding mylar	415-72650-0005	MTAZ0366601	SHEET_7265_BLACK_PET_N/A_Shielding mylar_E-LIN(KUNSHAN)_N/A	1
3	Vibrator	320-0000-00047	SJMY0009601	Vibrator Bar Type_Y0408A-270350122-0021C_R2.5+4.40*5.20*12.60mm_LNLON_Spring contact type	1
3	Speaker	313-0000-00179	SUSY0030401	LOUD SPEAKER_SC160040LA02_Φ 16.0 mm_8 Ohm_93.0dB_GETTOP ACOUSTIC_± 3dB, H=4.00mm,Spring contact	1
3	Display	327-0000-00108	SVLM0042301	LCD TFT_Transmissive_128x160 Pixels_1.77 inch_DM17-BSM02_LG INNOTEK_262K Color,FPC type	1
2	Front Cover Sub-Ass'y (supply type is phantom)	8M-726500-0002	ACGK0175401	01-Front Cover Sub-Ass'y_7265_BLACK_Front cabinet	1
3	Front Cabinet	401-72650-0001	MCJK0139401	Front Cabinet_7265_BLACK_PC_N/A_Front cabinet ass'y_A-TEK PRECISION(SUZHOU)_N/A	1
2	Main Lens	403-72650-0002	MWAC0156101	Lens_7265_BLACK_PMMA+PC_N/A_Main Lens_OPTEC_N/A	1
3	Rear Cabinet	402-72650-0001	ACGM0173601	Rear Cabinet_7265_ORANGE_PC_Painting_Rear cabinet ass'y_SKYCROSS_N/A	1
2	Main PCB Ass'y (supply type is phantom)	8M-726500-0001	SAFY0394301	08-PCBA Sub-Ass'y_7265_NATURAL_Main PCB Ass'y	1
3	Metal Dome	415-72650-0002	ADCA0121901	DOME_7265_WHITE_STAINLESS STEEL_N/A_Metal Dome_MAGMA_N/A	1
.1	HANDSET LABEL	478-726500-001	MLAA0072301	HANDSET LABEL_Packing Label_7265_Global_HIGH TEMP. ART PAPER_N/A_E-LIN(KUNSHAN)	1
3	LCM conductive adhesive	415-72650-0007	MTAD0137801	ADHESIVE_7265_GRAY_CONDUCTIVE GASKET_N/A_LCM conductive adhesive_GUAN YI(WUJIANG)_N/A	2

				-	
5	X200	305-0000-00026	EXSY0024801	Crystal Oscillator_Q13MC1461000200_32.768KHZ_±20ppm_SMD-7*1.5mm-4Pin_EPSON TOYOCOM_MC-146 type	1
5	X100	305-0000-00092	EXSY0025201	Crystal Oscillator_TZ1387A_26.0 MHZ_±10.0ppm_SMD-3.2*2.5mm-4Pin_TAI-SAW_N/A	1
5	D400,D407,D406,D405,D 404,D403,D402,D401	309-0000-00021	EDLH0015001	LED Single Color_LTST-C193TBKT-5A_BLUE_2pin_0603_5mA/18~28mcd_LITEON_Luminous Bin Code=M1/M2	8
5	D301	309-0000-00165	EDLL0009201	LED Single Color_99-216UTC/TR8-1_WHITE_4pin_SMD4_20mA/<1720mcd_EVERLIGHT_2.8*0.86**0.6mm,SIDE VIEW	1
5	U600	311-0000-00881	EUSY0431201	I.C ANALOG SWITCH_ET5223_QFN_10 PINS_NoMemory_ETEK_SPDT SWITCH	1
5	U602	311-0000-00980	EUSY0431301	I.C FM MODULE_AR1210-S85QEGK0_QFN_20 PINS_NoMemory_AIROHA_N/A	1
5	U201	311-0000-00681	EUSY0409801	I.C BASEBAND PROCESSOR_MT6223DA/AN-L_TFBGA_224 BALLS_NoMemory_MTK_FOR GSM/GRRS	1
5	U102	311-0000-00740	EUSY0399701	I.C TRANSCEIVER_AD6548BCPZ_LFCSP_32 PINS_NoMemory_MTK_N/A	1
5	U100	311-0000-00894	EUSY0431401	I.C POWER AMP MODULE(RF)_SKY77542-11_MCM_30PIN_NoMemory_SKYWORKS_TX-RX FEM FOR GSM/GPRS	1
5	U200	311-0000-00970	EUSY0431501	I.C STACKED MEMORY_K5L6433ABM-AD11_FBGA_88 BALLS_64M+32M_SAMSUNG_NOR Flash+UtRAM2	1
5	U301	311-0000-00965	EUSY0431701	I.C CHARGE_APL3206A QBI-TRG_TDFN_6 PINS_NoMemory_ANPEC_N/A	1
5	U400	311-0000-00977	EUSY0431801	I.C DC-DC CONVERT_ET2123_SOT23-6_6_NoMemory_ETEK_N/A	1
5	U500	311-0000-00786	EUSY0399601	I.C AUDIO POWER AMPLIFIER_ETk4992_WLCSP_8 BALLS_NoMemory_ETEK_Vo=3.6v,0.6w,8ohm	1
5	J500	312-0000-00040	SUMY0012401	Omni-MICSOM4013SB-Z422-C3310_58 'dB 42dB_± 2.0dB_Φ4.0*1.30mm_NA_SMD Type_GONGDA_N/A	1
5	JRF100	314-0000-00016	ENWY0006901	CON. ANTENNA CONNECTOR_C90-101-0004_NA_6 pin_SPEED TECH CORP(BEIJING)_For Antenna Switch	1
5	AT100,AT101	314-0000-00434	ENRY0010601	CON. SPRING CONNECTOR_PJSCG-0A-1000S_NA_1 pin_PROCONN_T=2.2 mm	2
5	J301	314-0000-00390	ENSY0023101	CON. SIM CARD CONNECTOR_SIM-06JK3G_2.540 mm_6 pin_OCTEKCONN_H=1.8mm	1
5	J300	314-0000-00391	ENBY0050001	CON. BATTERY CONNECTOR_BTP-03QF4G_3.000 mm_3 pin_OCTEKCONN_H=5.7mm	1
5	J602	314-0000-00430	ELCH0018201	CON. MICRO USB CONNECTOR_GU073-5P-SD-E1500_0.650 mm_5 pin_LS MTRON_H=3mm	1
5	J400	314-0000-00507	ENQY0016601	CON. FPC CONNECTOR_BL310-13G31-TAH0_0.300 mm_13 pin_TAIWAN SUNCAGEY_H=1.0mm	1
5	U101	326-0000-00146	SFSY0042501	Filter SAW_B39182B9500L310_1842.5±37.5MMZ/942.5±17.5MHZ_EPCOS_FOR GSM RX,50/150 OHM-SMD10PIN	1
5	I/O connector shielding	415-72620-0023	ACKA0028101	CASE_7262_SILVER_COPPER-NICKEL-ZINC ALLOY_N/A_I/O connector shielding case_SPEED(KUNSHAN)_N/A	1
5	BB shielding case	415-72650-0004	ACKA0035701	CASE_7265_SILVER_STAINLESS STEEL+COPPER-NICKEL-ZINC ALLOY_N/A_BB shielding case_PLIGHT(JIANGSU)_cover+frame	1
	•				