



Service Manual

MG125a



Model : MG125a



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1. INTRODUCTION

1.1 Purpose

This manual provides the 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 does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

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

C. Changes in Service

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

D. Maintenance Limitations

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

1. INTRODUCTION

E. Notice of Radiated Emissions

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

F. Pictures

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

G. Interference and Attenuation

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

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated  by the sign.

Following information is ESD handling:

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

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

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

1. INTRODUCTION

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

2. PERFORMANCE

2.1 H/W Features

Item	Target Specification
Standard Battery	Li-ion,830mAh
Stand by TIME	Up to 200 hrs: Paging Period 9,RSSI 85dBm
Talk TIME	Up to 200 min: GSM Tx Level 7()
Charging TIME	Approx.2 hrs
RX Sensitivity	GSM850: -109dBm,PCS: -109dBm
TX Output power	GSM850:32.5dBm(Level 5), PCS:29.5dBm(Level 0)
GPRS compatibility	Class 10
SIM card type	3V
Display	LCD:CSTN 128X128 65K,SubLCD 96X64 MONO
Status Indicator	Hard Icons. Key Pad 0-9,#,*,Up/Down Navigation Key, Menu Key, Clear Key Send Key, END/PWR Key Soft Key (Left/Right)
ANT	Internal
EAR Phone Jack	Yes(MONO)
PC Synchronization	No
Speech coding	EFR/FR/HR
Data and Fax	Yes
Vibrator	Yes
Loud Speaker	Yes
Voice Recoding	No
Microphone	Yes
Speaker/Receiver	One way Speaker
Travel Adapter	Yes
MIDI	40 Poly (Mono SPK)
Camera	No

2. PERFORMANCE

2.2 Technical Specification

Item	Description	Specification					
1	Frequency Band	GSM850 TX:824.2MHz-848.8MHz RX:869.2MHz-893.8MHz CHN: 128-251					
		PCS TX:1850.2MHz-1909.8MHz RX:1930.2MHz-1989.8MHz CHN: 512-810					
2	Phase Error	RMS<5 degrees Peak<20 degrees					
3	Frequency Error	<0.1 ppm					
4	Power Level	GSM850					
		Level	Power	Toler	Level	Power	Toler
		5	33dBm	± 2dB	13	17dBm	± 3dB
		6	31dBm	± 3dB	14	15dBm	± 3dB
		7	29dBm	± 3dB	15	13dBm	± 3dB
		8	27dBm	± 3dB	16	11dBm	± 5dB
		9	25dBm	± 3dB	17	9dBm	± 5dB
		10	23dBm	± 3dB	18	7dBm	± 5dB
		11	21dBm	± 3dB	19	5dBm	± 5dB
		12	19dBm	± 3dB			
		PCS					
		Level	Power	Toler	Level	Power	Toler
		0	30dBm	± 2dB	8	14dBm	± 3dB
		1	28dBm	± 3dB	9	12dBm	± 4dB
		2	26dBm	± 3dB	10	10dBm	± 4dB
		3	24dBm	± 3dB	11	8dBm	± 4dB
		4	22dBm	± 3dB	12	6dBm	± 4dB
		5	20dBm	± 3dB	13	4dBm	± 4dB
		6	18dBm	± 3dB	14	2dBm	± 5dB
		7	16dBm	± 3dB	15	0dBm	± 5dB

2. PERFORMANCE

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

2. PERFORMANCE

Item	Description	Specification		
6	Output RF Spectrum (due to switching transient)	PCS		
		Offset from Carrier (kHz).		Max. (dBm)
		400		-22
		600		-24
		1,200		-24
		1,800		-27
7	Spurious Emissions	Conduction, Emission Status		
8	Bit Error Ratio	GSM850 BER (Class II) < 2.439% @-102 dBm		
		PCS BER (Class II) < 2.439% @-100 dBm		
9	RX Level Report Accuracy	± 3 dB		
10	SLR	8 ± 3 dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
		4,000	0	-
12	RLR	2 ± 3 dB		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	2	-7
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		

2. PERFORMANCE

Item	Description	Specification	
14	STMR	13 ± 5 dB	
15	Stability Margin	> 6 dB	
16	Distortion	dB to ARL (dB)	Level Ratio (dB)
		-35	17.5
		-30	22.5
		-20	30.7
		-10	33.3
		0	33.7
		7	31.7
		10	25.5
17	Side Tone Distortion	Three stage distortion < 10%	
18	System frequency (13 MHz) tolerance	≤ 2.5 ppm	
19	32.768KHz tolerance	≤ 30 ppm	
20	Ringer Volume	At least 65 dBspl under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
21	Charge Current	Fast Charge : < 430 mA Slow Charge : < 160 mA	
22	Antenna Display	Antenna Bar Number	Power
		5	-85 dBm ~
		4	-90 dBm ~ -86 dBm
		3	-95 dBm ~ -91 dBm
		2	-100 dBm ~ -96 dBm
		1	-105 dBm ~ -101 dBm
		0	~ -105 dBm
23	Battery Indicator	Battery Bar Number	Voltage
		0	3.48 ~ 3.63 V
		1	3.63 ~ 3.70 V
		2	3.70 ~ 3.76 V
		3	3.76 ~ 3.89 V
		4	3.89 V ~
24	Low Voltage Warning	3.63 ± 0.03 V (Call) every 1 minutes	
		3.48 ± 0.03 V (Standby)	

2. PERFORMANCE

Item	Description	Specification
25	Forced shut down Voltage	3.33 ± 0.03 V
26	Battery Type	1 Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 830mAh
27	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60 Hz Output: 5.2 V, 800 mA

3. TECHNICAL BRIEF

3. TECHNICAL BRIEF

3.1 MG120 Block Diagram

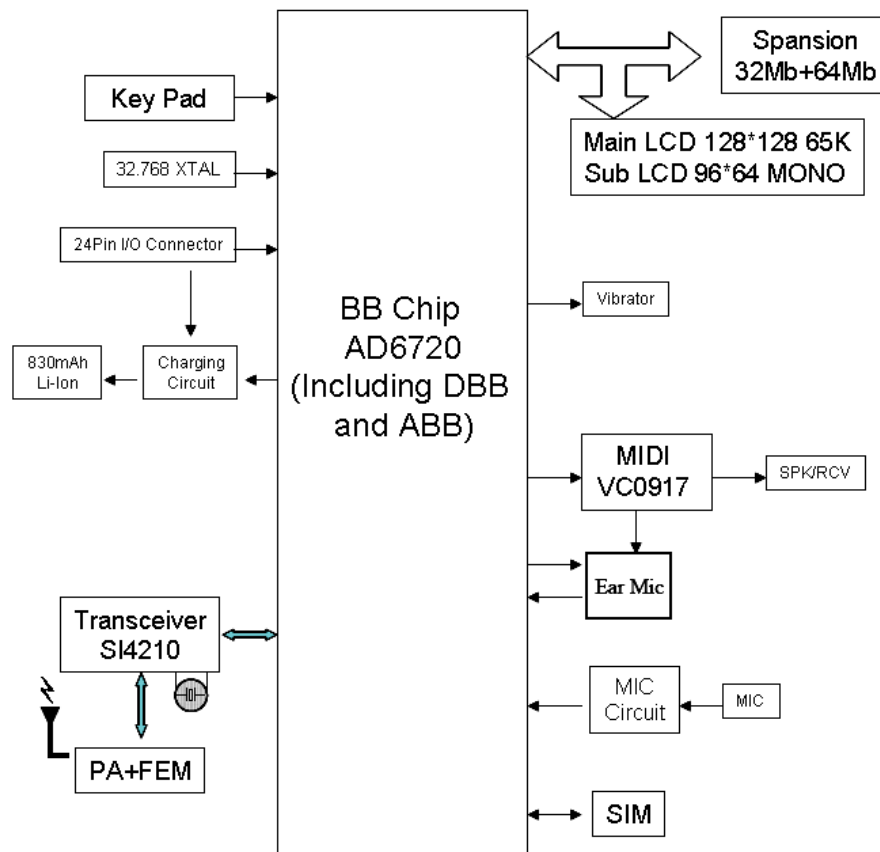


Figure 3-1 TOP LEVEL BLOCK OF MG120

The Figure 3-1 shows the top level block diagram of MG120, it contains RF and BB part. The following list is the detailed.

1. AD6720:ADI baseband chipset,
 2. PA+FEM:RF3166 is The PAM and HWXQ512 is the FEM
 3. Transceiver: SI4210
 4. Flash: Spansion 32Mb+64Mb
 5. Others
- A: 22 keys
B: 128*128 65K CSTN Main LCD and 96*64 MONO FSTN Sub LCD
C: Vibrator, Mic, Speaker, Ear-jack
D: Sim socket
E: Battery connector

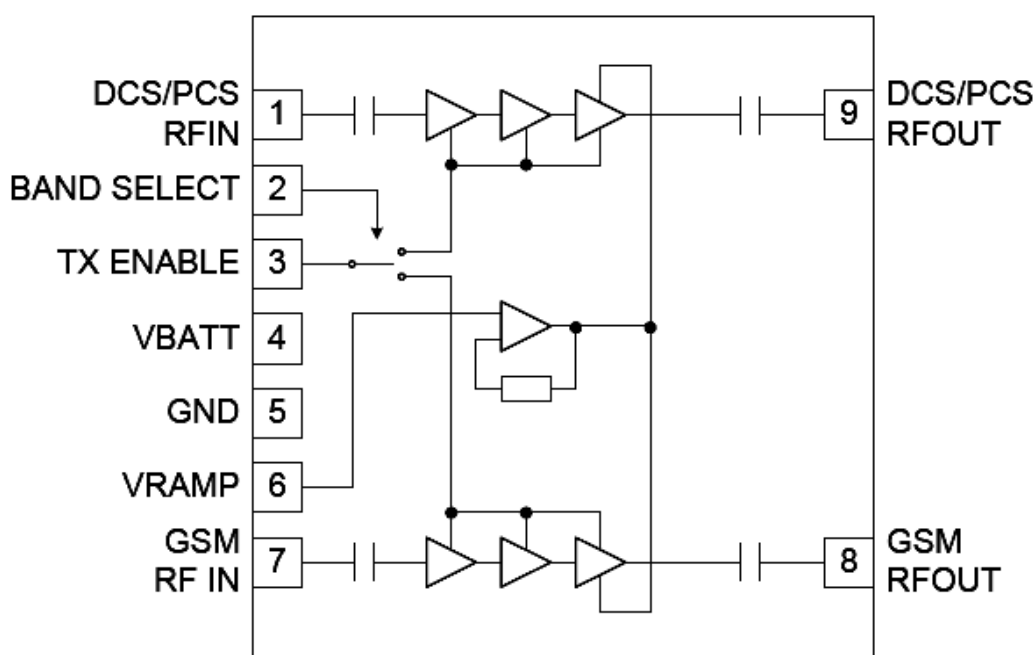
3. TECHNICAL BRIEF

3.2 RF Part Introductions

The RF part consists of a power amplifier part, a transmitter part, a crystal reference system, and an ant-switch part.

3.2.1 Power Amplifier (RF3166, U102)

The RF3166 is a high-power, high-efficiency power amplifier module with integrated power control that provides over 50dB of control range. The device is a self-contained 6mmx6mm module with 50Ω input and output terminals. The device is designed for use as the final RF amplifier in GSM850, EGSM900, DCS and PCS handheld digital cellular equipment and other applications in the 824MHz to 849MHz, 880MHz to 915MHz, 1710MHz to 1785MHz and 1850MHz to 1910MHz bands. The RF3166 incorporates RFMD's latest VBATT tracking circuit, which monitors battery voltage and prevents the power control loop from reaching saturation. The VBATT tracking circuit eliminates the need to monitor battery voltage, thereby minimizing switching transients. The RF3166 requires no external routing or external components, simplifying layout and reducing board space.



Functional Block Diagram

Figure 3-2 Functional Block Diagram

3. TECHNICAL BRIEF

Pin Out Top Down View

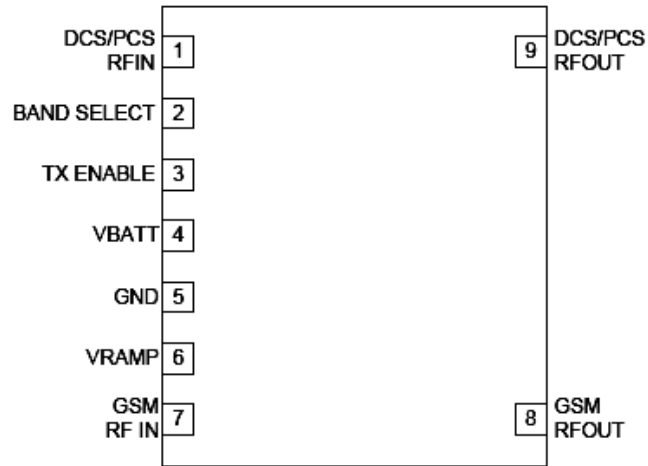


Figure 3-3 RF3166 PAM Pin Configuration-9-Pin

Table 3-1. RF3166 Pin Names and Signal Descriptions

PIN	Function	Description
1	DCS/PCS IN	RF input to the DCS band. This is a 50ohm input
2	BAND SELECT	Logic Low enable GSM band Logic HIGH enable DCS/PCS band
3	TX ENABLE	Enable PA module for operation with a logic high
4	VBATT	Power supply for the module
5	GND	
6	VRAMP	Ramping signal from DAC. No external filtering is required
7	GSM IN	50ohm input pin for GSM band
8	GSM OUT	50ohm output pin for GSM band
9	DCS/PCS OUT	50ohm output pin for DCS/PCS band
Pkg Base	GND	

3. TECHNICAL BRIEF

3.2.2 Transceiver (SI4210, U103)

The SI4210 transceiver is a complete RF front end for multi-band GSM and GPRS wireless communications. The receive section interfaces between the RF band-select SAW filters and the baseband subsystem. The Aero II receiver leverages a proven digital low-IF architecture and enables a universal baseband interface without the need for complex dc offset compensation. The transmit section of Aero II provides a complete upconversion path from the baseband subsystem to the power amplifier (PA) using an offset phase-locked loop (OPLL) integrated with Silicon Laboratories' patented synthesizer technology. All sensitive components, such as TX/RV VCOs, loop filters, tuning inductors, and varactors are completely integrated into a single integrated circuit. The Aero II transceiver includes a digitally-controlled crystal oscillator (DCXO) and completely integrates the reference oscillator and varactor functionality.

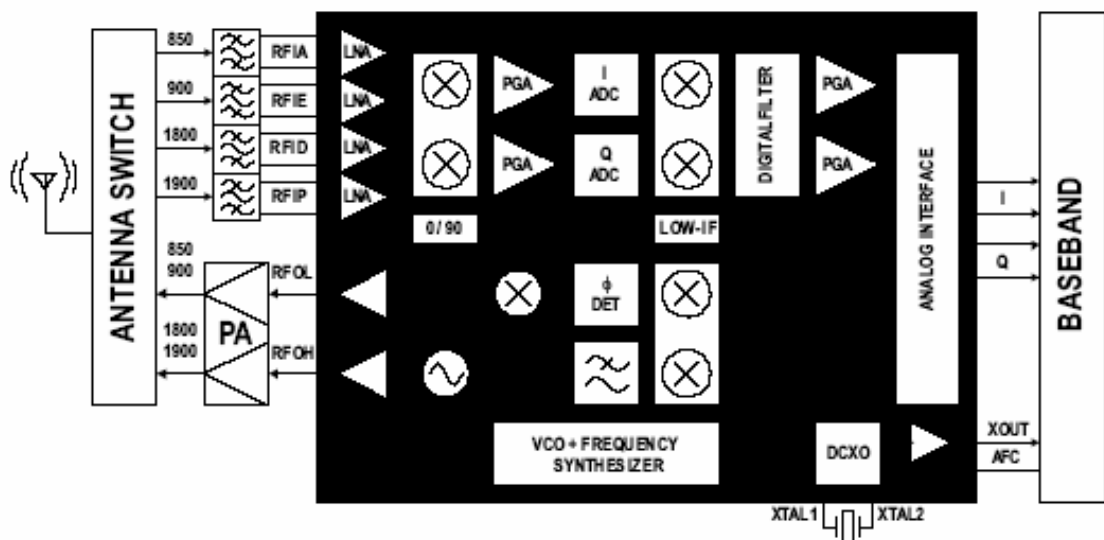


Figure 3-4 Functional Block Diagram

3. TECHNICAL BRIEF

Table 3-2. SI4210 Pin Names and Signal Descriptions

Pin	Number(s)	Name
1	SCLK	Serial clock input
2	SEN	Serial enable input (active low)
3	SDIO	Serial data input/output
4,5	BQP,BQN	Transmit/receiver Q input/output
6,7	BIP,BIN	Transmit/receiver I input/output
8	XOUT	Clock output to baseband
9	PDN	Power down input
10	RESET	Reset pin
11	Vio	Interface supply voltage
12,13,28,29	VDD	supply voltage
14,PAD	GND	Ground
15	RFOL	GSM 850 and EGSM 900 output
16	RFOH	DCS 1800 and PCS 1900 output
17,18	RFIPP,RFIPN	PCS 1900 LNA input
19,20	RFIDP,RFIDN	DCS 1800 LNA input,
21,22	RFIEP,RFIEN	EGSM 900 LNA input
23,24	RFIAP,RFIAN	GSM 850 LNA input
25	XMODE	DCXO/VC-TCXO mode enable
26	XDIV	XOUT frequency select input
27	AFC	Baseband analog AFC input
30,31	XTAL2,XTAL1	Crystal output and input
32	XEN	XOUT pin enable

3. TECHNICAL BRIEF

3.2.3 FEM (HWXQ512,U104)

Table 3-3 Band SW Logic Table

Select Mode	Vc(GSM)	Vc(DCS/PCS)
GSM-Rx	Low	Low
GSM-Tx	High	Low
DCS-Rx	Low	Low
PCS-Rx	Low	Low
DCS/PCS-Tx	Low	High

3.2.4 26MHz Clock (TG-5000LA, X100)

The 26MHz clock (X100) consists of a TCXO(Temperature Compensated Crystal Oscillator) which oscillator at a frequency of 26 MHz. It is used within the RF part and DBB part.

3.3 Baseband Introductions

3.3.1 Baseband Processor (AD6720 , U201)

- AD6720 is an ADI designed processor
- AD6720 consists of
 1. Control Processor Subsystem including:
 - 32-bit MCU ARM7TDMI Control Processor
 - 39 MHz operation at 1.8V
 - 1Mb of on-chip System SRAM Memory
 2. DSP Subsystem including:
 - 16-bit Fixed Point DSP Processor
 - 91 MIPS at 1.8V
 - Data and Program SRAM
 - Program Instruction Cache
 - Full Rate, Enhanced Full Rate and Half Rate
 - Speech Encoding/Decoding
 - Capable of Supporting AMR & PDC Speech Algorithms
 3. Peripheral Functions
 - Parallel and Serial Display Interface
 - Keypad Interface
 - Flash Memory Interface
 - Page-Mode Flash Support
 - 1.8V and 3.0V, 64 kbps SIM Interface
 - Universal System Connector Interface
 - Data Services Interface
 - Battery Interface (e.g. Dallas)
 4. Other
 - Supports 13 MHz and 26 MHz Input Clocks
 - 1.8V Typical Core Operating Voltages
 - 289-Ball Package (12x12mm) , 0.65mm Ball pitch
 5. The AD6720 baseband transmit section supports the following
 - mobile station GMSK modulation power classes:
 - GSM 900/850 power classes 4 and 5,
 - DCS 1800 power classes 1 and 2, and
 - PCS 1900 power classes 1 and 2

3.3.2 Interconnection with external devices

A. RTC block interface

Countered by external X-TAL

The X-TAL oscillates 32.768KHz

3. TECHNICAL BRIEF

B. LCD module interface

Signals	Description
LCD_CS/	Main LCD driver chip enable.
LCD_REST/	This pin resets LCD module.
LWR/	Enable writing to LCD Driver.
SUBLCD_CS/	SUB LCD Driver chip enable
LCD_ID_CHK	This pin determines the LCD module type
A1	Select 16bits interface mode for MAIN LCD

Table 3-4: LCD Pin Description

The backlight of LCD module is controlled by AD6720 via AAT3122, U301. The Control signals related to Backlight LED are given below.

Signals	Description
LCD_BACK_EN	Control LCD backlight in 2 steps
MLED_A	Current source backlight LED

Table 3-5: LCD Backlight LED Control

There are two steps of the LCD back light setting, bright and middle level, this two levels setting will save power in some condition.

C. RF interface

The AD6720 control RF parts through PA_BAND, ANT_SW1, ANT_SW2, CLKON, PA_EN, S_EN, S_DATA, S_CLK, RF_PWR_DWN.

3. TECHNICAL BRIEF

Signals	Description
PA_BAND	PAM Band Select
ANT_SW1	Antenna switch Band Select
ANT_SW2	Antenna switch Band Select
RF_PWR_DWN	Power down input
CLKON	RF LDO Enable/Disable
PA_EN	PAM Enable/Disable
S_EN	PLL Enable/Disable
S_DATA	Serial Data to PLL
S_CLK	Clock to PLL

Table 3-6. RF Control Signals Description

D. SIM interface

The AD6720 provides SIM Interface Module. The AD6720 checks status periodically during established call mode whether SIM card is inserted or not, but it doesn't check during deep Sleep mode. In order to communicate with SIM card, 3 signals SIM_DATA, SIM_CLK, SIM_RST(GPIO_23) are required. The descriptions about the signals are given by bellow Table 3-7 in detail.

signals	Description
SIM_DATA	This pin receives and sends data to SIM card. This model can support only 3.0 volt interface SIM card.
SIM_CLK	Clock 3.25MHz frequency
SIM_RST	Reset SIM block

Table 3-7: SIM Control Signals Description

3. TECHNICAL BRIEF

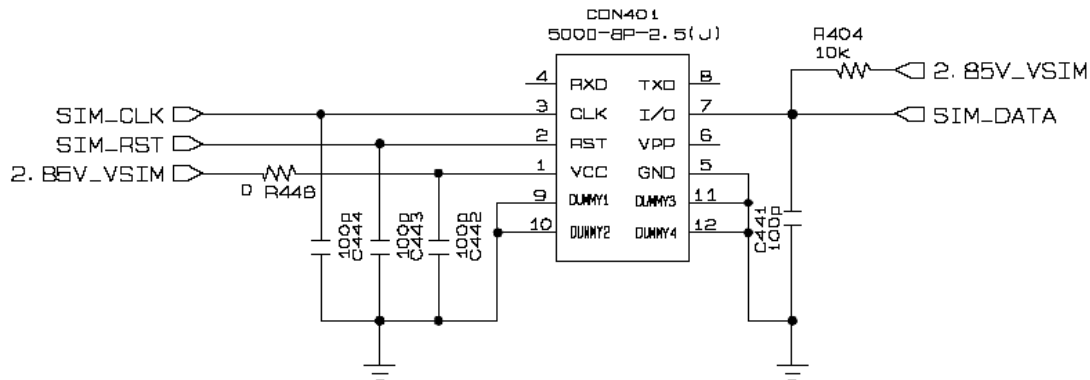


Figure 3-5: SIM Interface of AD6720

E. LDO Block

There are 8 LDOs in the AD6720. We only use 7 of them.

- VCORE : supplies Digital baseband Processor core and AD6720 digital core
- VMEM : supplies external memory and the interface to the external memory on the digital baseband processor (1.8V or 2.8V, 150mA)
- VEXT : supplies Radio digital interface and high voltage interface (2.8V, 170mA)
- VSIM : supplies the SIM interface circuitry on the digital processor and SIM card (2.85V, 20mA)
- VRTC : supplies the Real-Time Clock module (1.8 V, 20A)
- VMIC : supplies the microphone interface circuitry (2.5 V, 1 mA)
- VVCXO : supplies the voltage controlled crystal oscillator (2.75 V, 10 mA)

3.3.3 Battery Charging Block

1. It can be used to charge Lithium Ion batteries. Charger initialization, trickle charging, and Li-Ion charging control are implemented in hardware.

3. TECHNICAL BRIEF

2. Charging Process

- Check charger is inserted or not
- If AD6720 detects that Charger is inserted, the CC-CV charging starts.
- Exception : When battery voltage is lower than 3.2V, the precharge low current charge mode) starts firstly.
- And the battery voltage reach to 3.2V the CC-CV charging starts.

3. Pins used for charging at the AD6720 side.

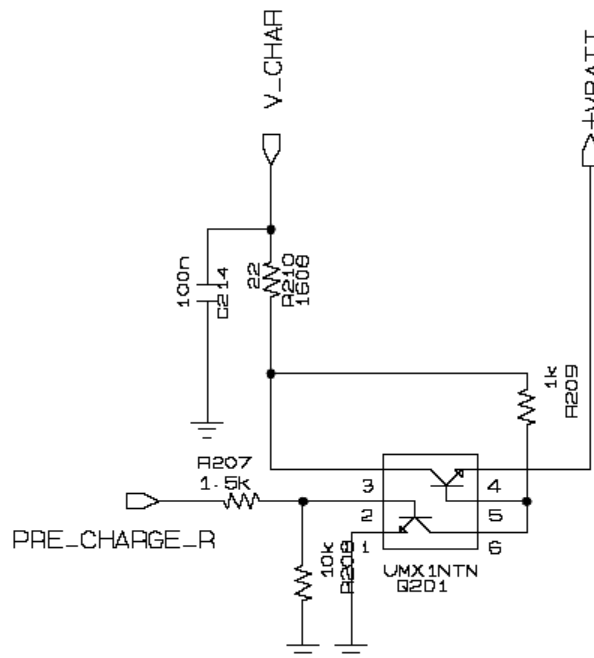
- VCHG : charger supply.
- GATEDRIVE : charge DAC output
- ISENSE : charge current sense input
- VBATSENSE : battery voltage sense input.
- BATTYPE : battery type identification input
- REFCHG : voltage reference output

4. TA (Travel Adaptor)

- Input voltage: AC 85V ~ 260V, 50~60Hz
- Output voltage: DC 5.2V (0.2 V)
- Output current: Max 800mA (50mA)

5. Battery

- Li-ion battery (Max 4.2V, Nom 3.7V)
- Standard battery: Capacity - 830mAh



3. TECHNICAL BRIEF

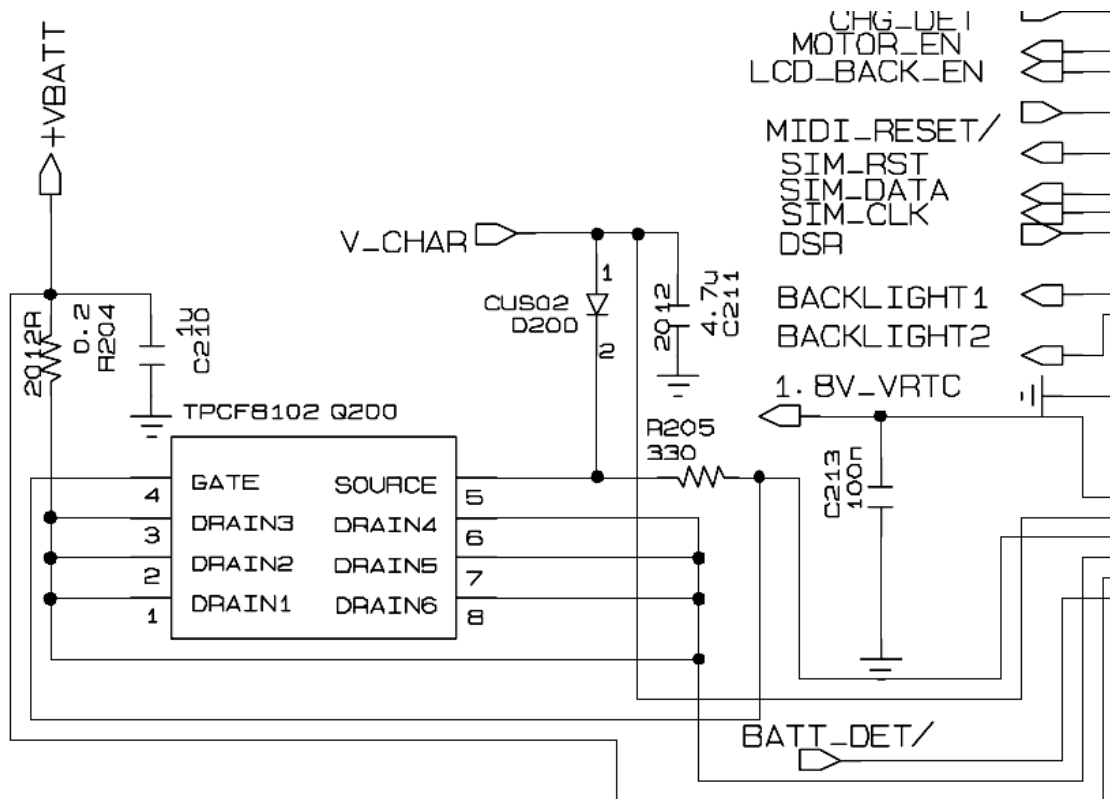


Figure 3-6: Circuit For Battery Charging

3.3.4 Display and Interface

- Main LCD&SUB LCD
Controlled by LCD_CS/,SUB_LCD_CS/,LCD_RESET/,LWR/,LCD_ID_CHK, D[0:15] ports
- LCD_CS/ : MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
- LCD_RESET/ : This pin resets LCD module. This signal comes from AD6720 directly.
- SUB_LCD_CS: SUB LCD driver chip enable. SUB LCD driver IC has own CS pin
- LWR/ : Write control Signal .
- D[0:15] : Parallel data lines.
- LCD_ID_CHK: LCD type selection signals
- For using 65K color, data buses should be 16 bits.

Properties Spec. Unit

Active Screen Size 35.78*39.7*4.8 mm

Color Depth 65,536 colors

Resolution 128 X RGB X 128 dots

SUB LCD B/W 96*64 FSTN

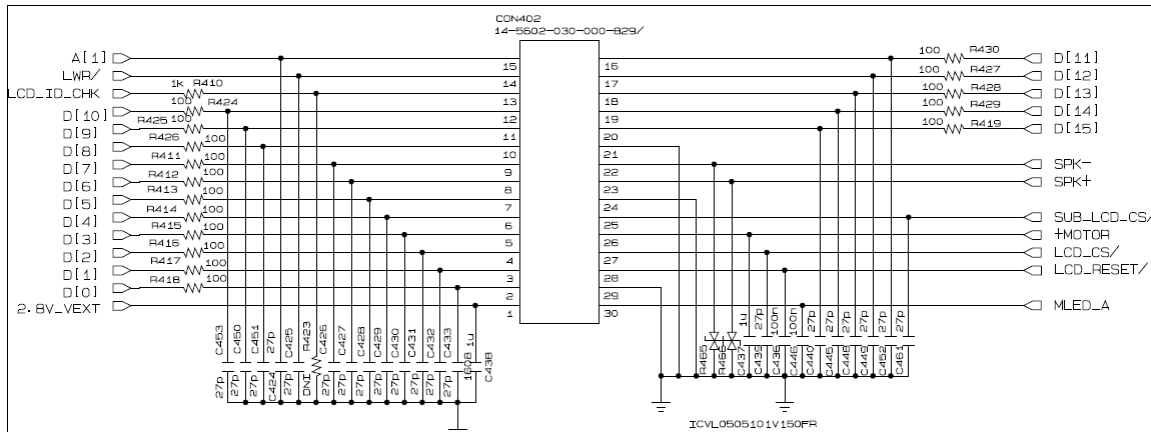
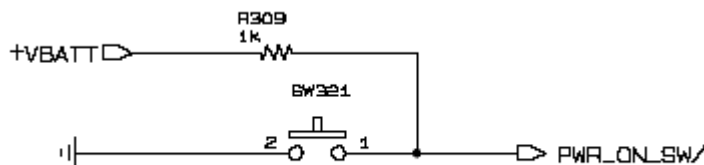


Figure 3-7: LCD Interface Circuit

3.3.5 Keypad Switches and Scanning

The key switches are metal domes, which make contact between two concentric pads on the keypad layer of the PCB when pressed. There are 21 switches, connected in a matrix of 5 rows by 5 columns and additional GPIO 35 for KEY_ROW5, as shown in Figure 3-8, except for the power switch (KB1), which is connected independently. Functions, the row and column lines of the keypad are connected to ports of AD6720. The columns are outputs, while the rows are inputs and have pull-up resistors built in. When a key is pressed, the corresponding row and column are connected together, causing the row input to go low and generate an interrupt. The columns/rows are then scanned by AD6720 to identify the pressed key.

KEYPADON



3. TECHNICAL BRIEF

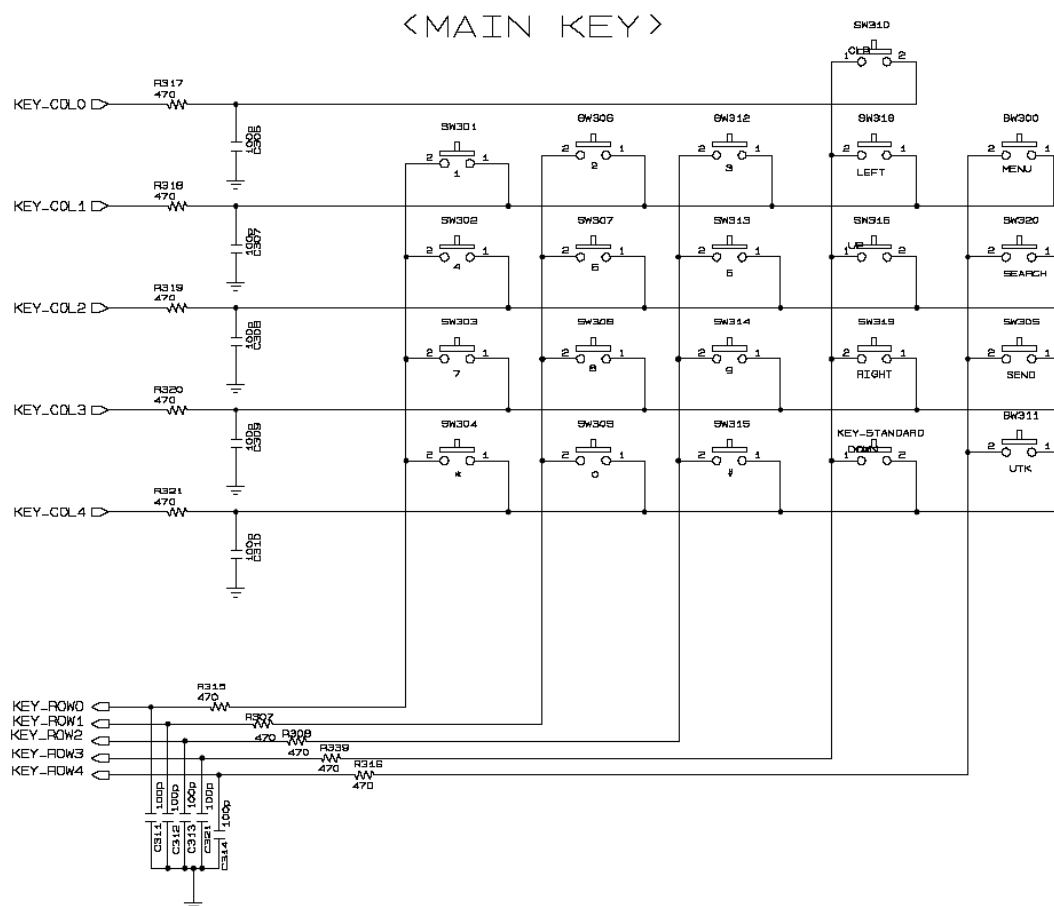


Figure 3-8: Keypad Switches and Scanning

3.3.6 Microphone

The microphone is placed to the A side of PCB. The audio signal is passed to VINNOP and VINNON pins of AD6720. The voltage supply VMIC is output from AD6720, and is a biased voltage for the VINNOP. The VINNOP and VINNON signals are then A/D converted by the voiceband ADC part of AD6720. The digitized speech (PCM 8KHz ,16KHz) is then passed to the DSP section of AD6720 for processing (coding, interleaving etc).

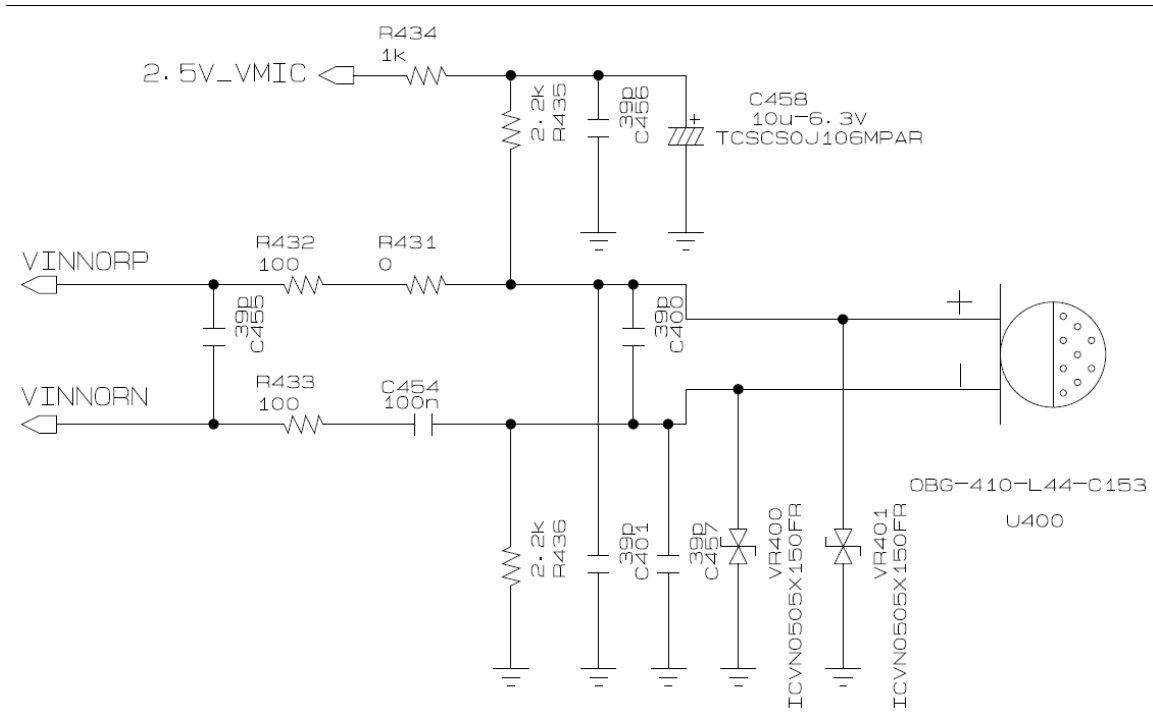


Figure 3-9: Connection Between Microphone And AD6720

3.3.7 Midi and Main Speaker

The Vimicro MIDI IC VC0917 Solution MIDI music player solution offering the following features:

- _ MIDI standards compliant
- _ MIDI files playable as polyphonic ringtones
- _ 40 notes polyphony
- _ MIDI file parser supports Standard MIDI (formats 0, 1 and 2), WAV.

The main speaker is driven directly by vc0917 SPOUT1 and SPOUT2 pins

3. TECHNICAL BRIEF

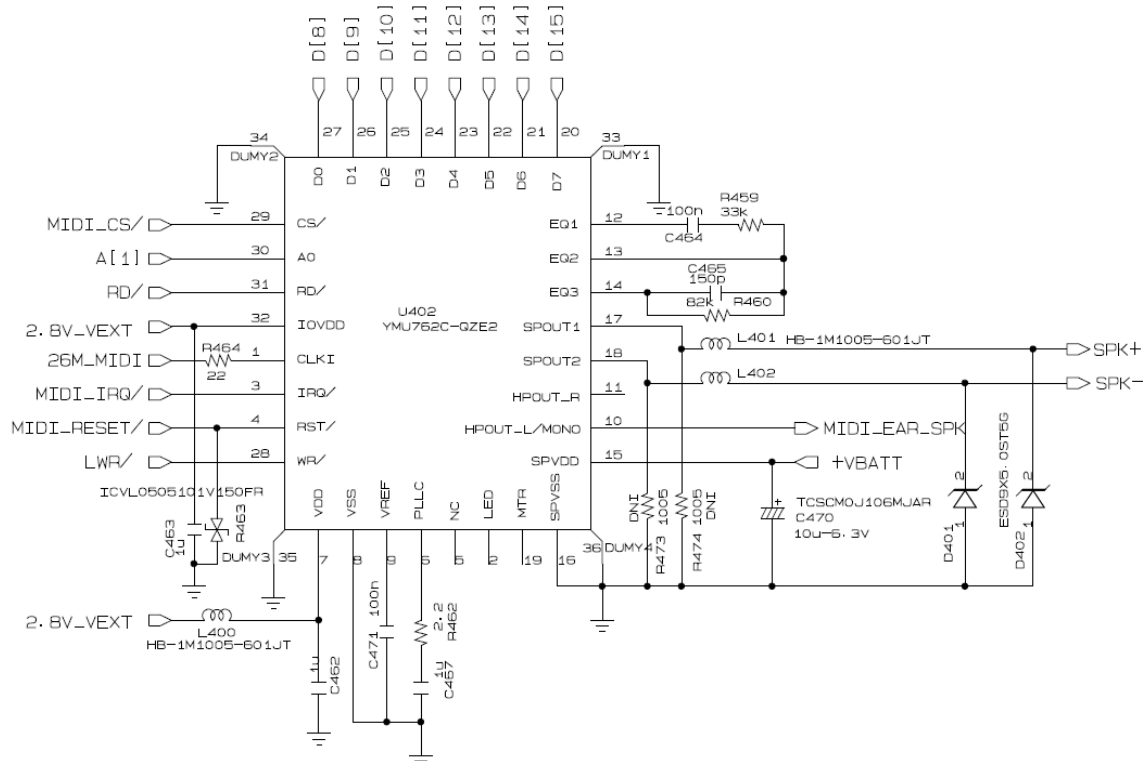


Figure 3-10: Main Speaker Circuit

3.3.8 Headset Interface

This type supports mono sound.

Switching from Receiver to Headset Jack

If jack is inserted, EAR_SENSE/ goes from high to low.

Audio path is switched from receiver to earphone by EAR_SENSE/ interrupt.

Switching from Headset Jack to Receiver

If jack is removed, EAR_SENSE/ goes from low to high.

Audio path is switched from earphone to receiver by EAR_SENSE/ interrupt.

3. TECHNICAL BRIEF

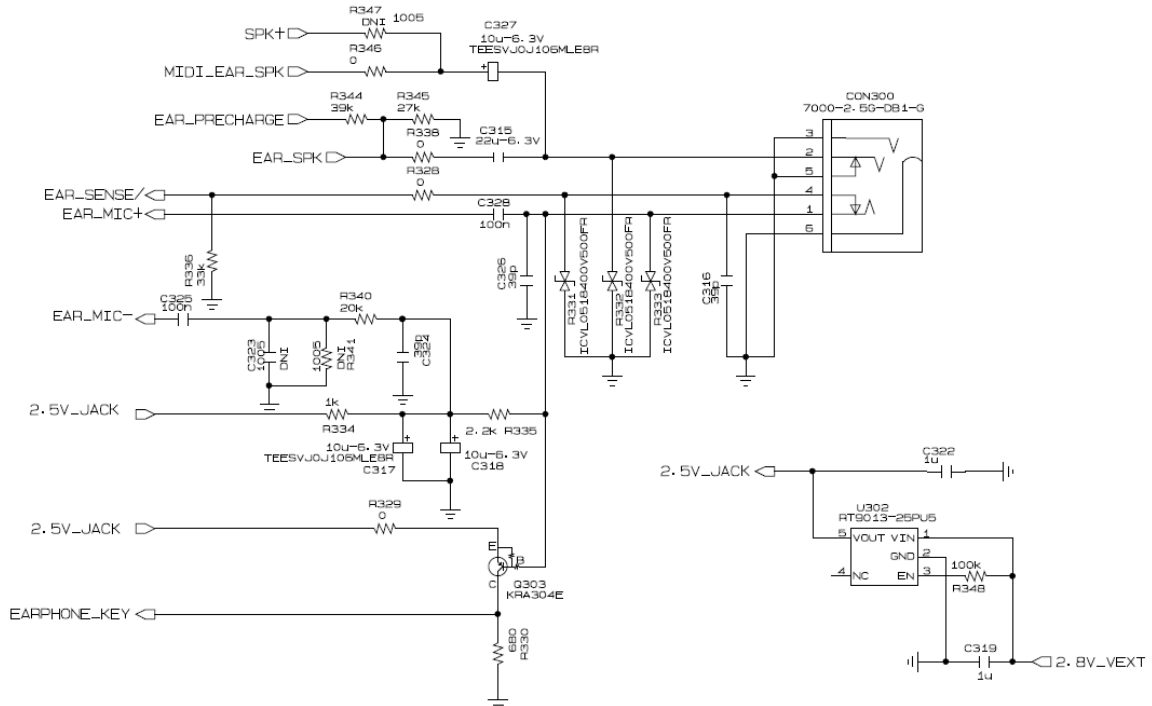
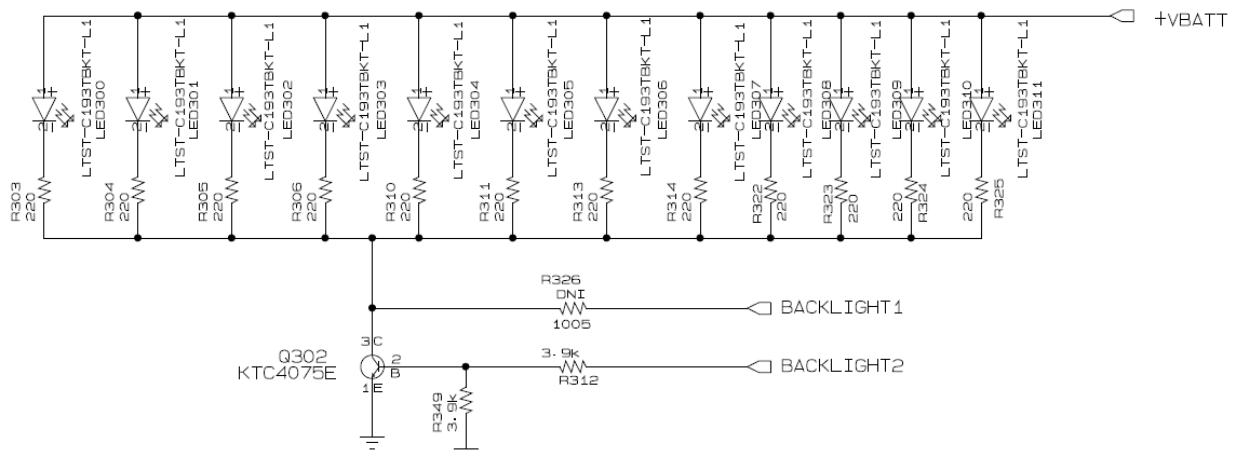


Figure 3-11: Headset Jack Interface

3.3.9 Key Back-light Illumination

In key back-light illumination, there are 12 Blue LEDs in Main Board, which are Driven by BACKLIGHT2 signal from AD6720.



3. TECHNICAL BRIEF

3.3.10 LCD Back-light Illumination

LCD backlight LEDs is controlled by AD6720 via AAT3122, U301.

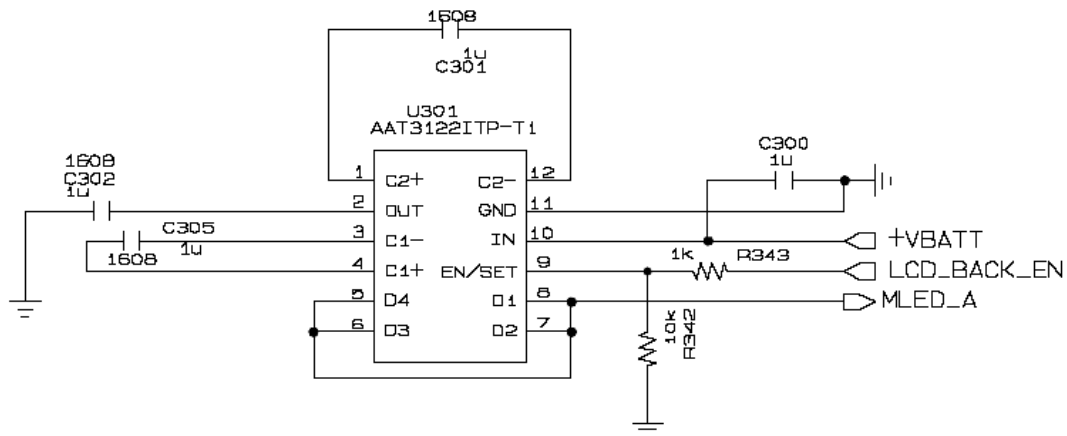


Figure 3-13: Main LCD Backlight Illumination

3.3.11 VIBRATOR

The vibrator is placed in the folder cover and contacted to LCD MODULE. The vibrator is driven from VIBRATOR (GPIO_0) of AD6720

3.3.12 FLIP S/W

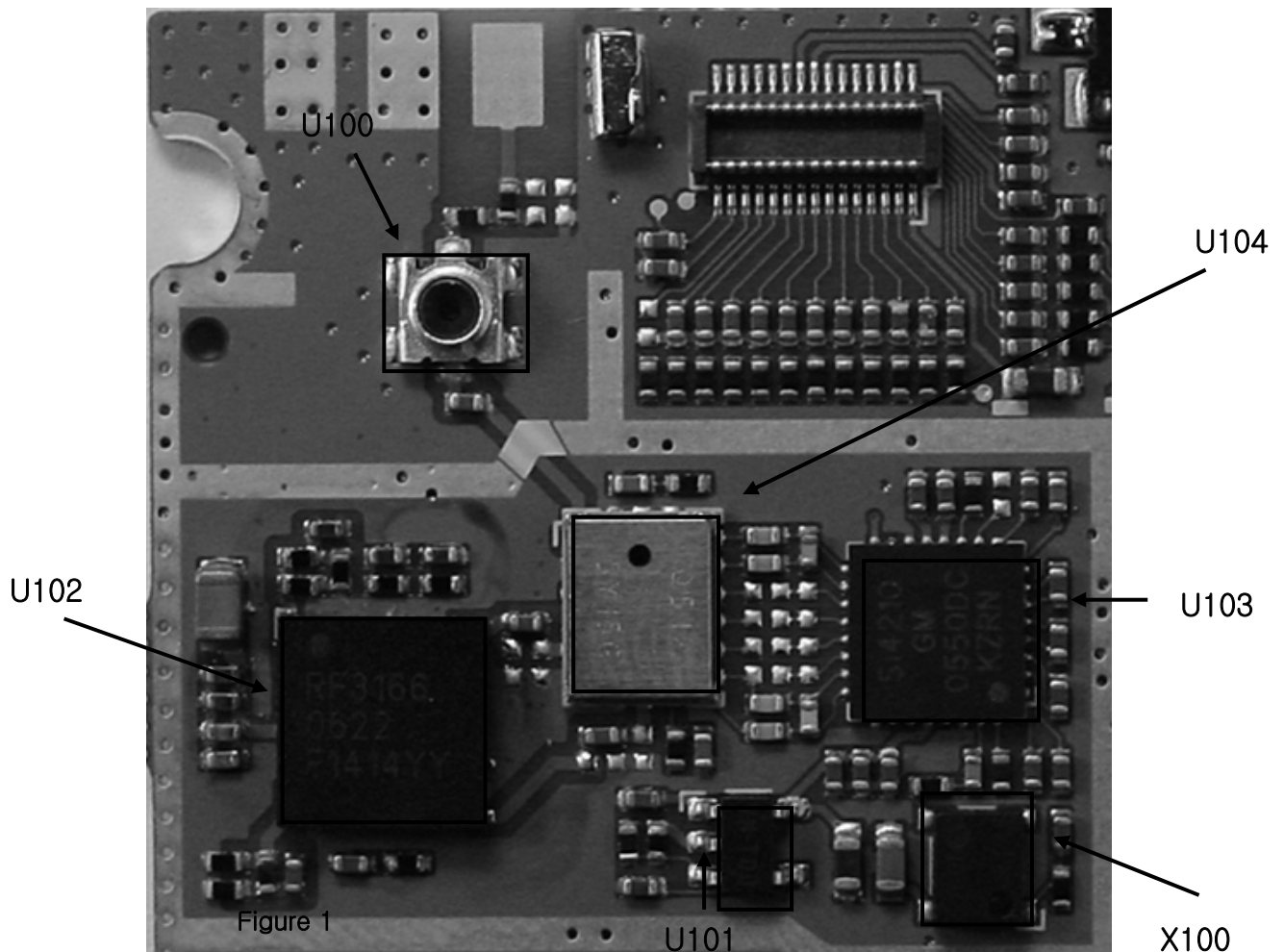
The flip s/w is placed in the A side of the PCB, close to the mic part. The flip s/w will send signal from FLIP/ pin to AD6720 if the folder flip.

Part 4

TROUBLE SHOOTING

4. TROUBLE SHOOTING

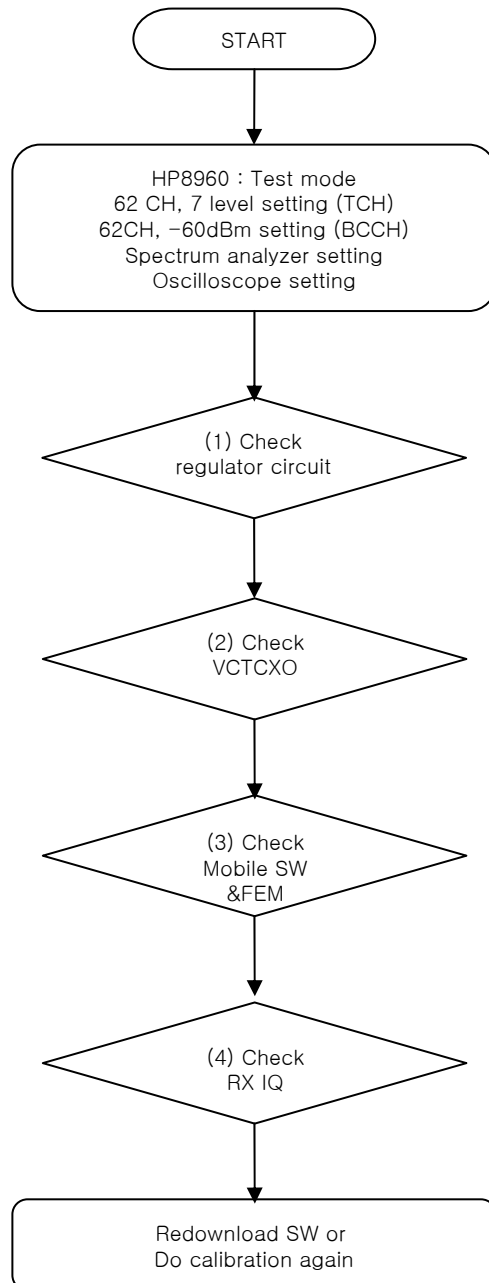
4.1 RF Components



U102	Power Amp Module(RF3166)
U103	RF Main Chip (SI4210)
U101	2.85V Regulator
X100	VCTXO, 26MHz Clock
U104	FEM
U100	Mobile Switch

4.2 RX Trouble

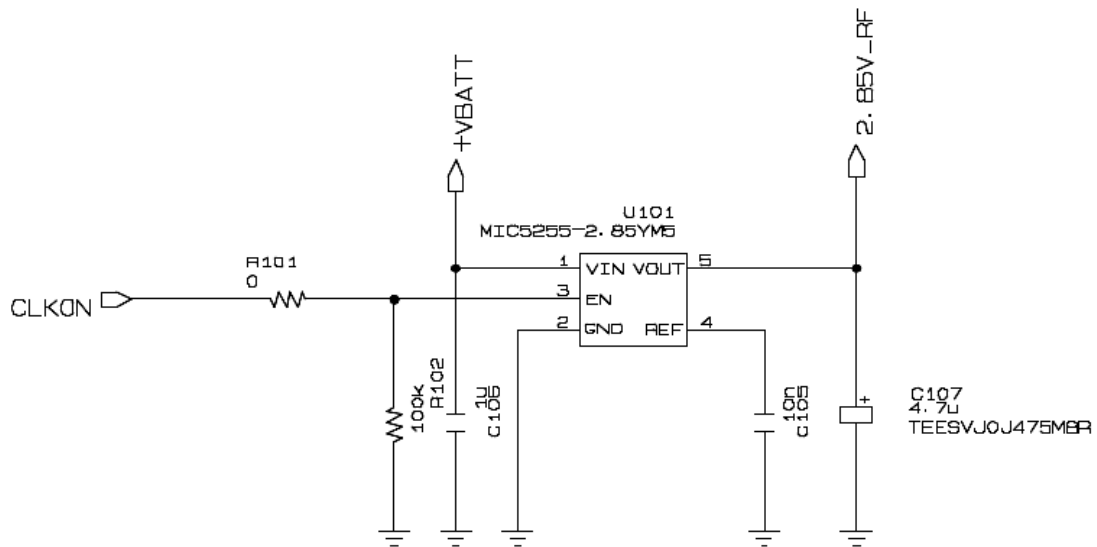
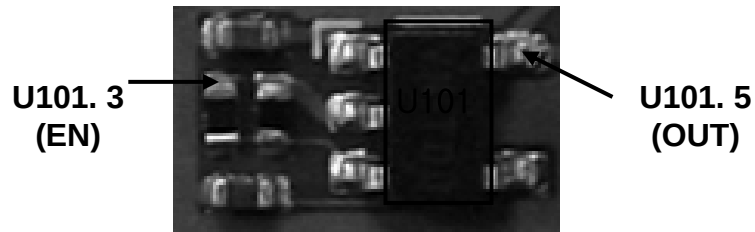
CHECKING FLOW



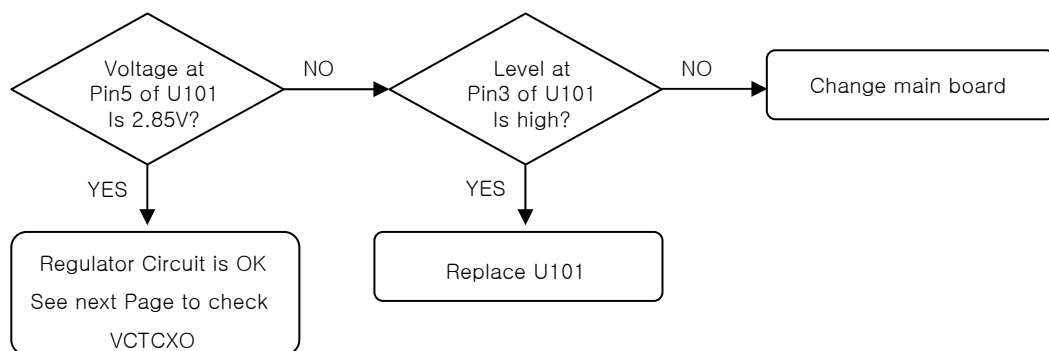
4. TROUBLE SHOOTING

(1) Checking Regulator Circuit

TEST POINT

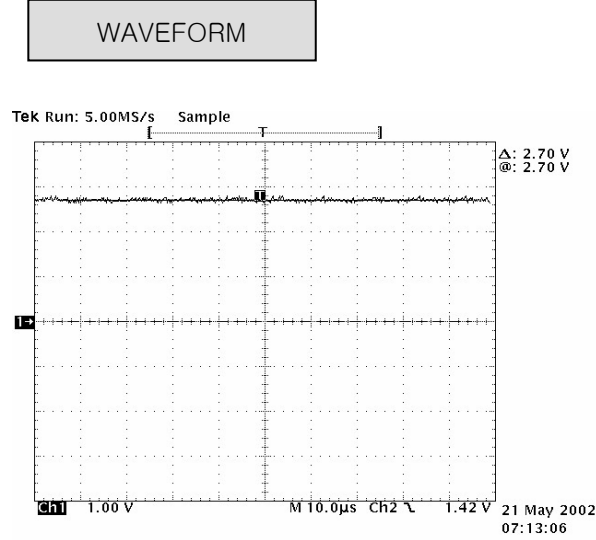
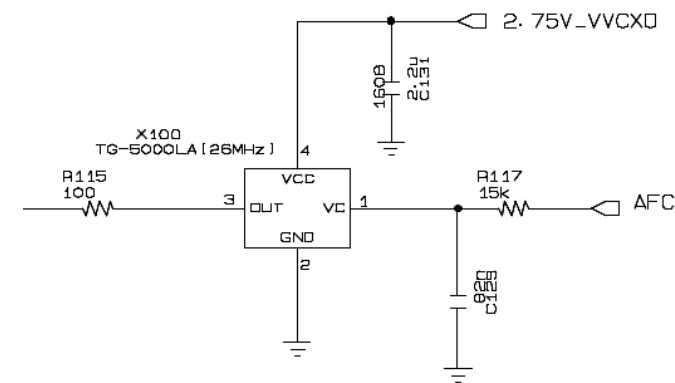
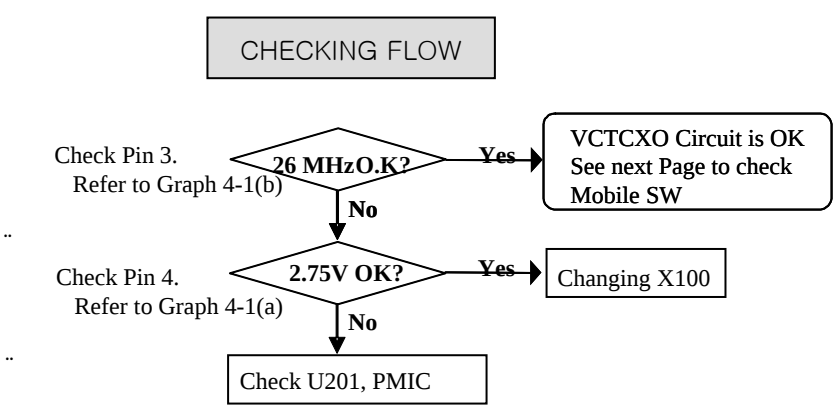
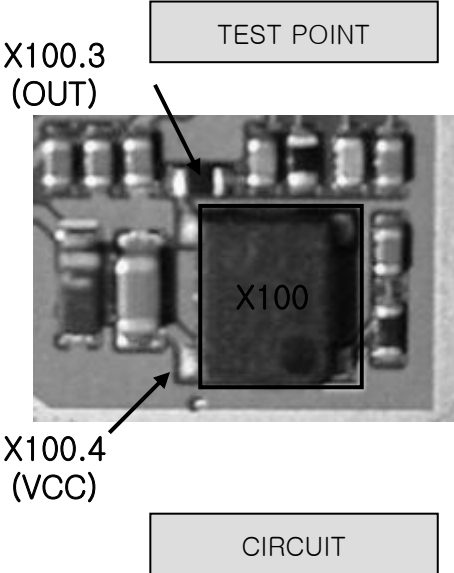


CHECKING FLOW

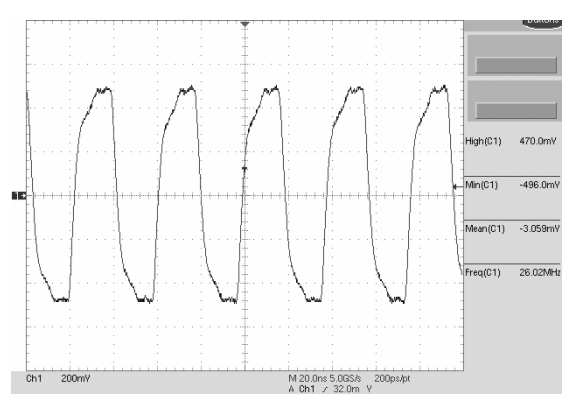


4. TROUBLE SHOOTING

(2) Checking VCTCXO Circuit



Graph 1(a)



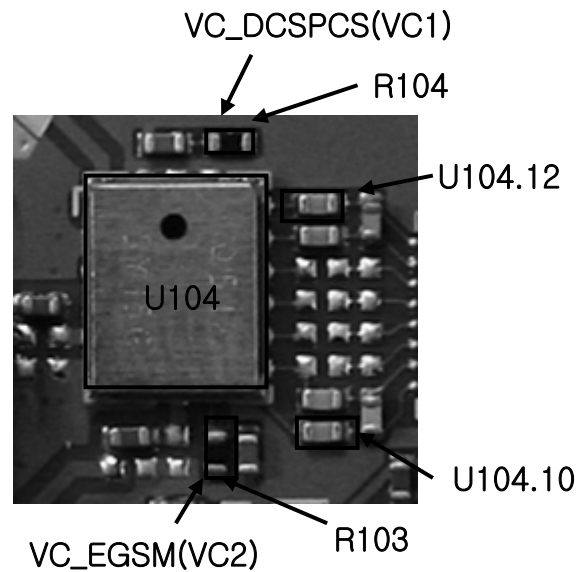
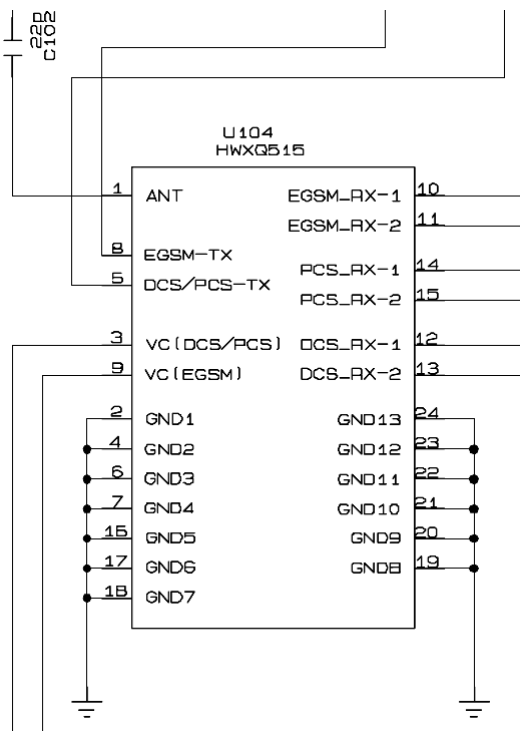
Graph 1(b)

4. TROUBLE SHOOTING

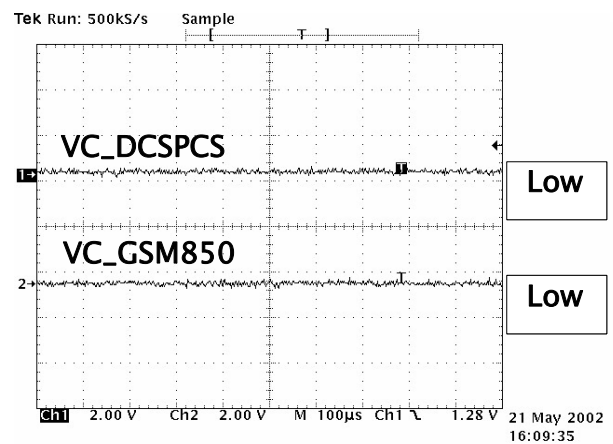
(3) Checking Mobile SW & FEM

TEST POINT

CIRCUIT



WAVEFORM



ANT SW Control GSM& DCS RX Mode

Graph 2

Select Mode	Vc(GSM850)	Vc(DCS/PCS)
GSM850-RX	Low	Low
GSM850-TX	High	Low
DCS -RX	Low	Low
PCS -RX	Low	Low
DCS/PCS -TX	Low	High

Table 1

4. TROUBLE SHOOTING

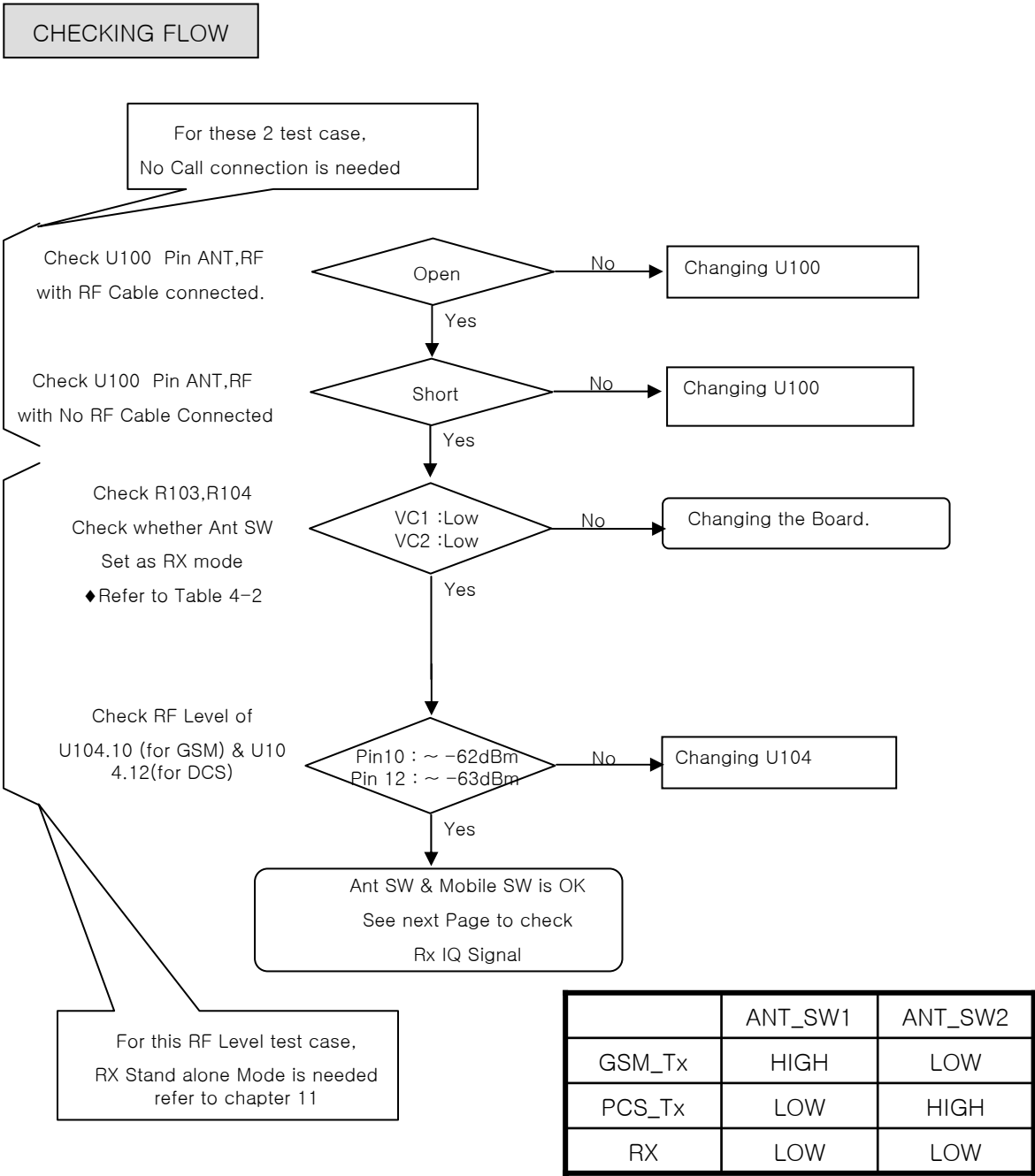


Table 4-2

(4) Checking RX IQ

TEST POINT

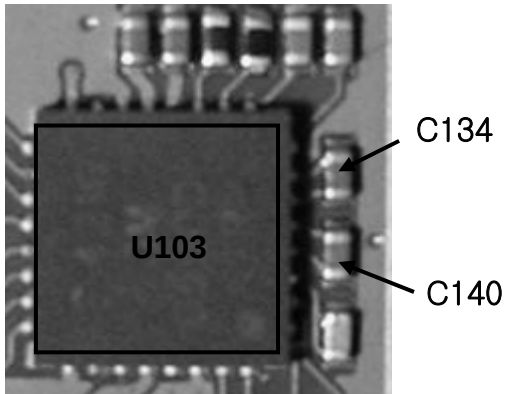
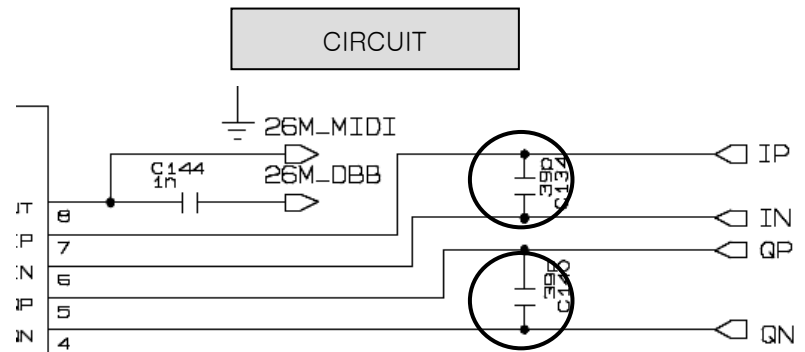
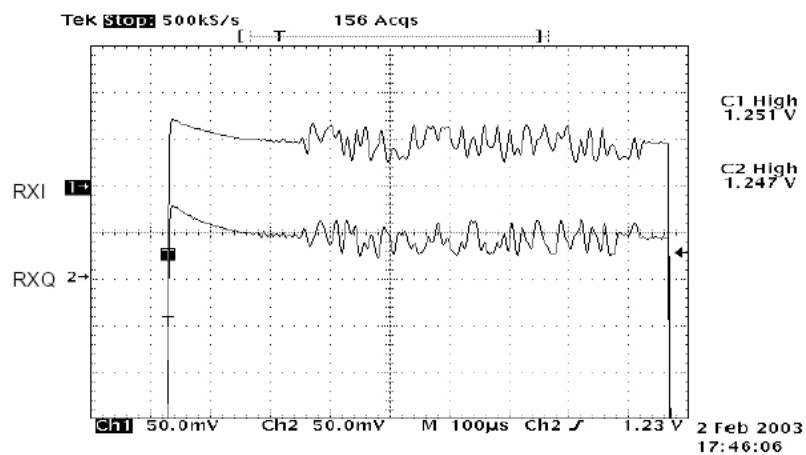


Figure 5

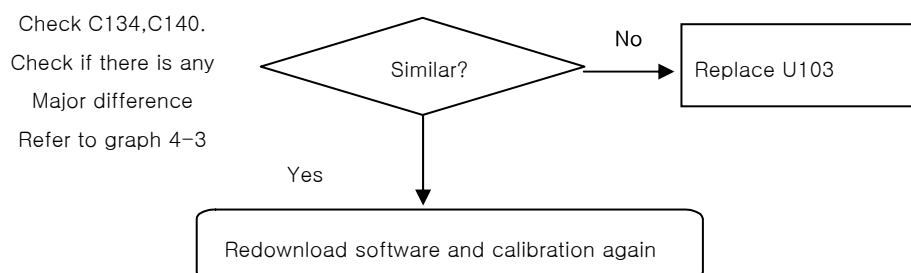


WAVEFORM

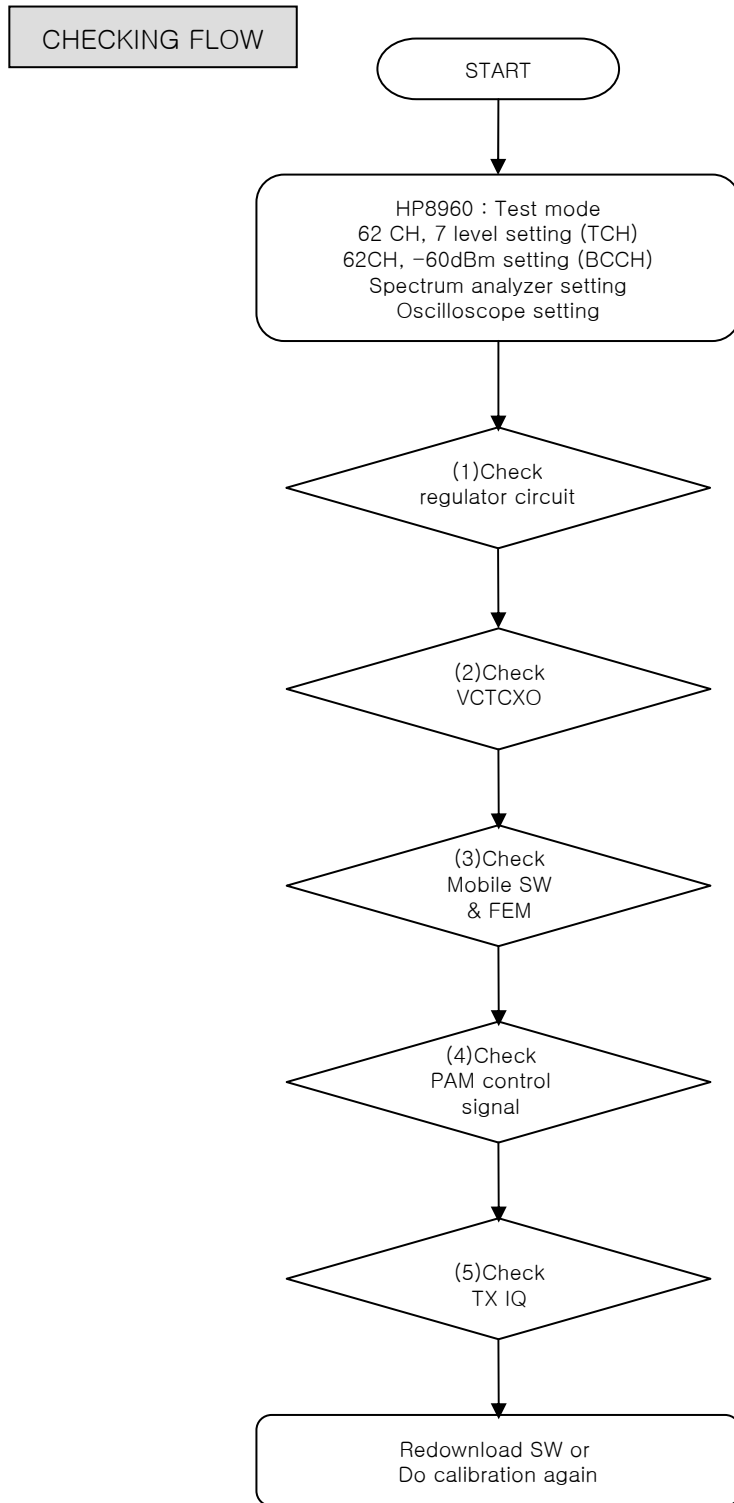


Graph 3

CHECKING FLOW



4.3 TX Trouble



4. TROUBLE SHOOTING

(1) Checking Regulator Circuit

TEST POINT

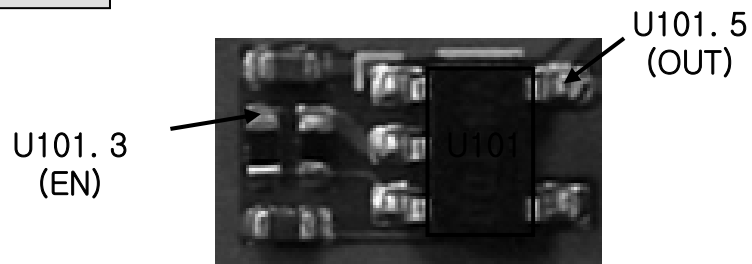
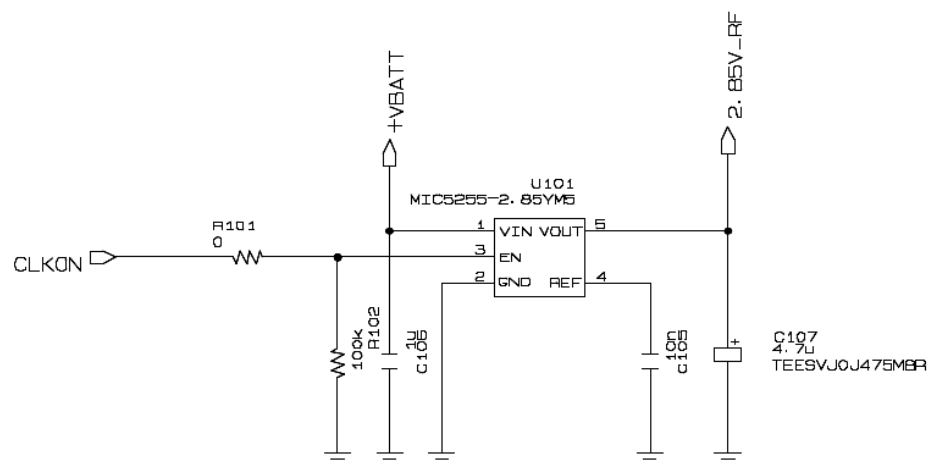
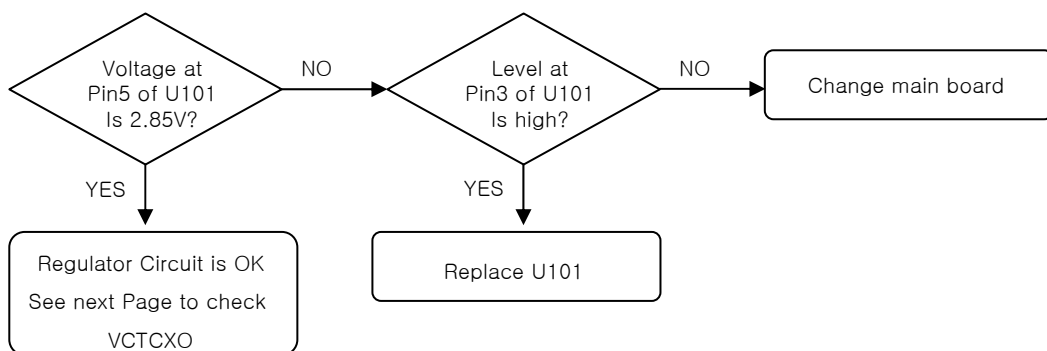


Figure 6

CIRCUIT

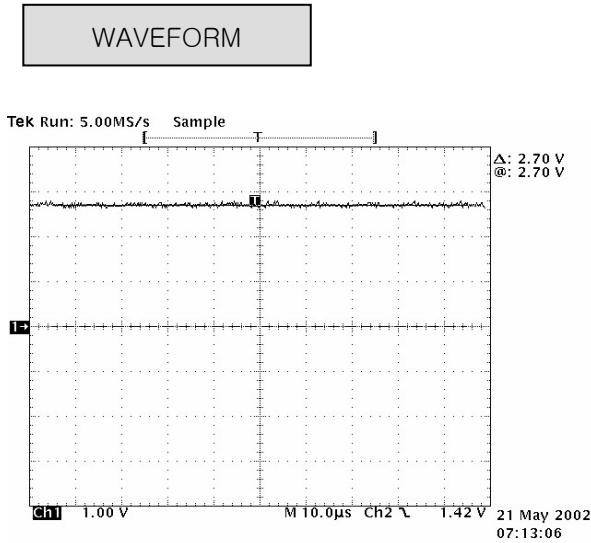
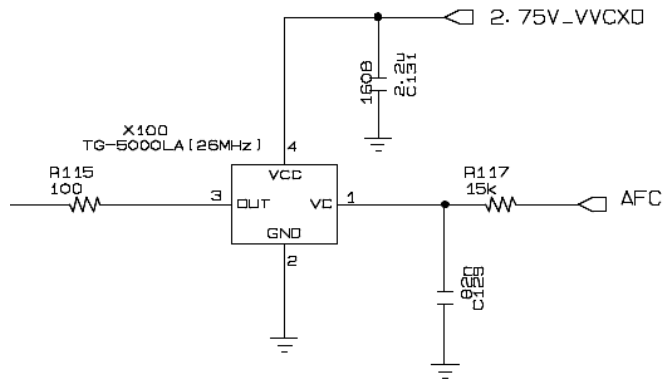
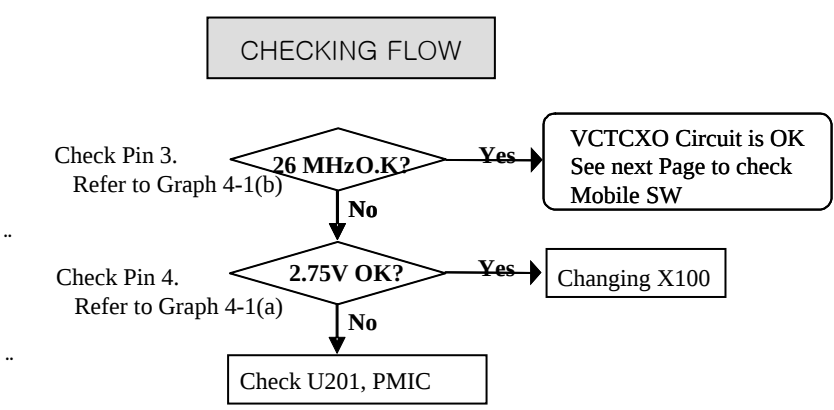
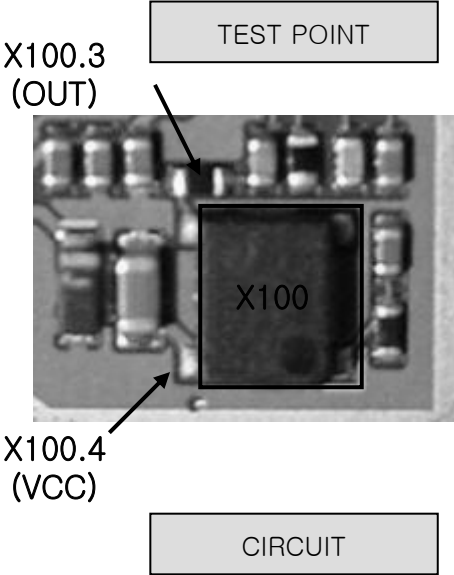


CHECKING FLOW

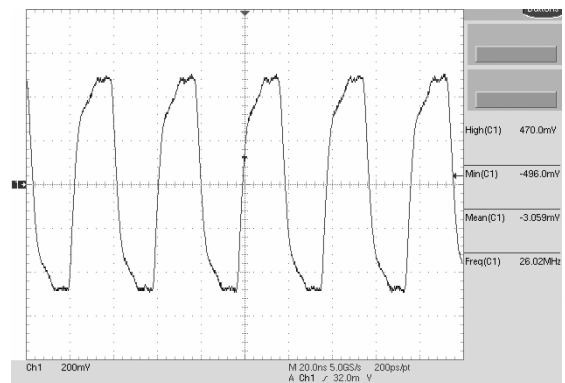


4. TROUBLE SHOOTING

(2) Checking VCTCXO Circuit



Graph 1(a)



Graph 1(b)

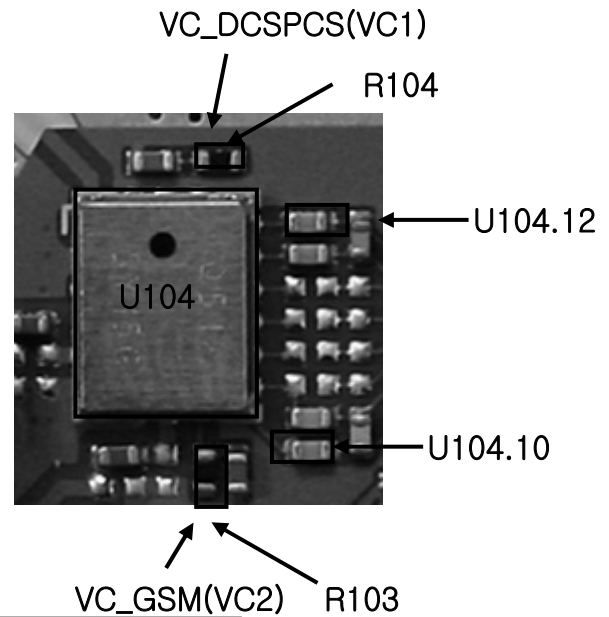
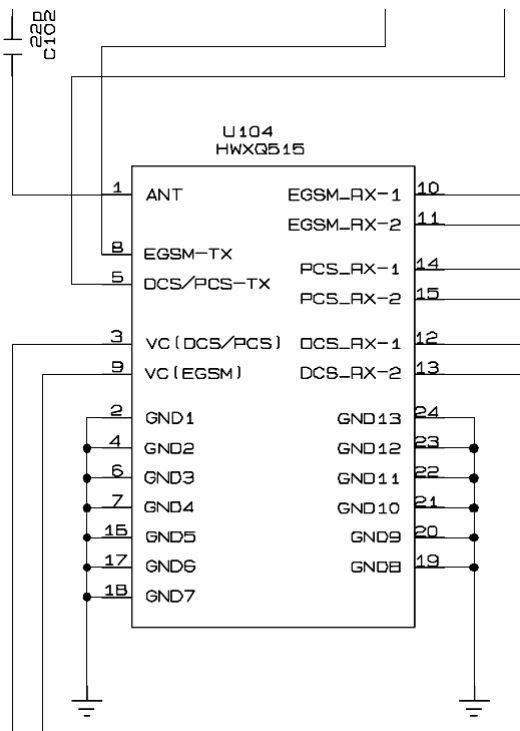
4. TROUBLE SHOOTING

(3) Checking Mobile SW & FEM

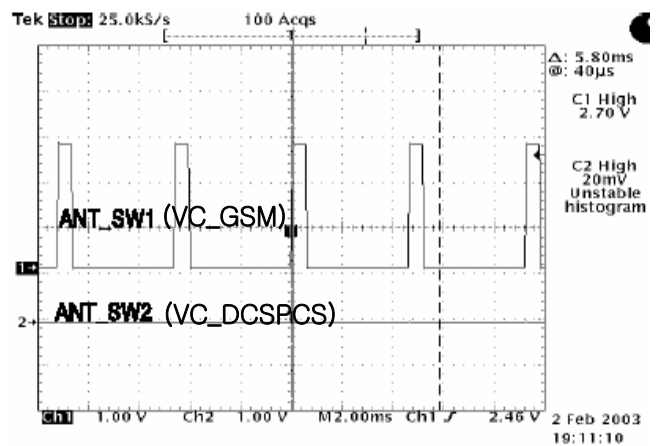
TEST POINT

Figure 8

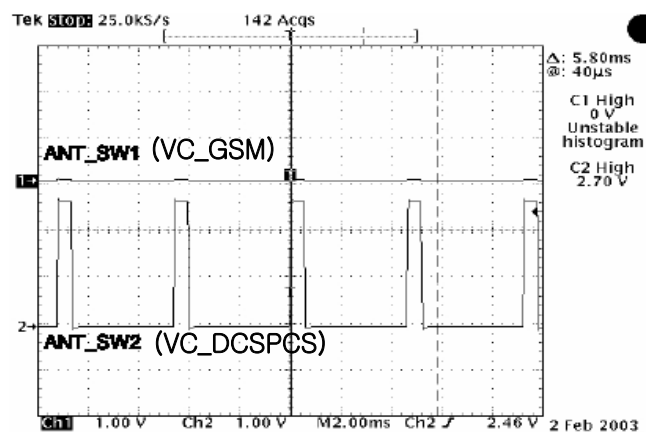
CIRCUIT



WAVEFORM



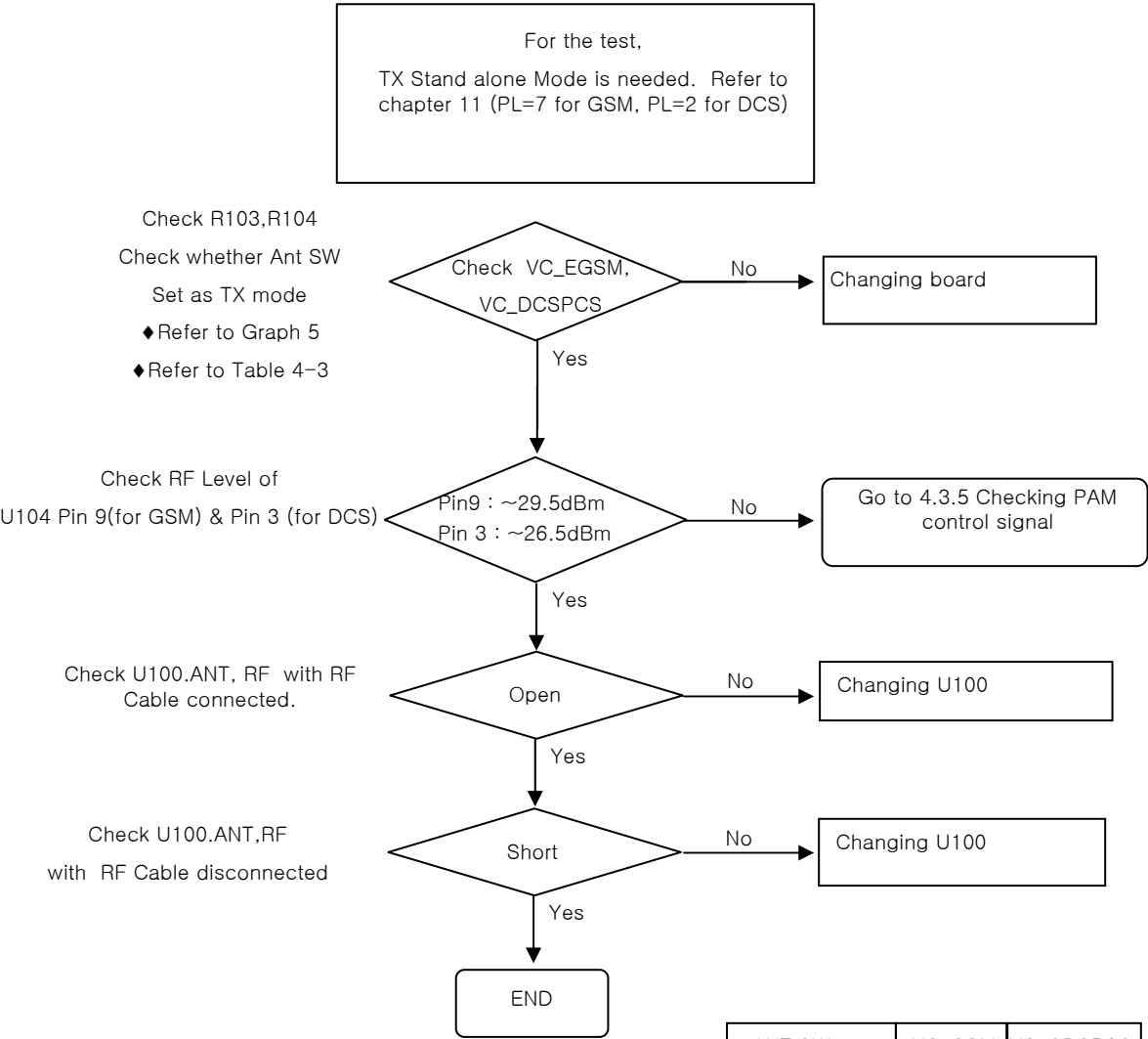
Graph 5(a) GSM Tx mode



Graph 5(b) DCS,PCS Tx mode

4. TROUBLE SHOOTING

CHECKING FLOW



ANT SW	VC_GSM	VC_CDSPCS
PCS TX	0	1
GSM TX	1	0
GSM, PCS RX	0	0

Table 4-3

4. TROUBLE SHOOTING

(4) Checking PAM Control Signal

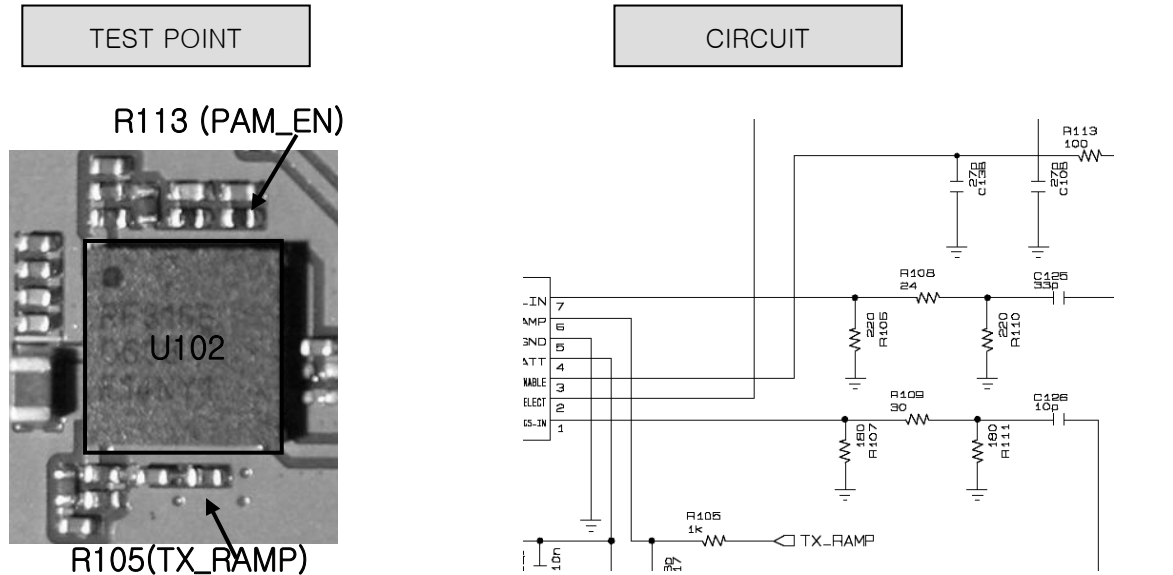
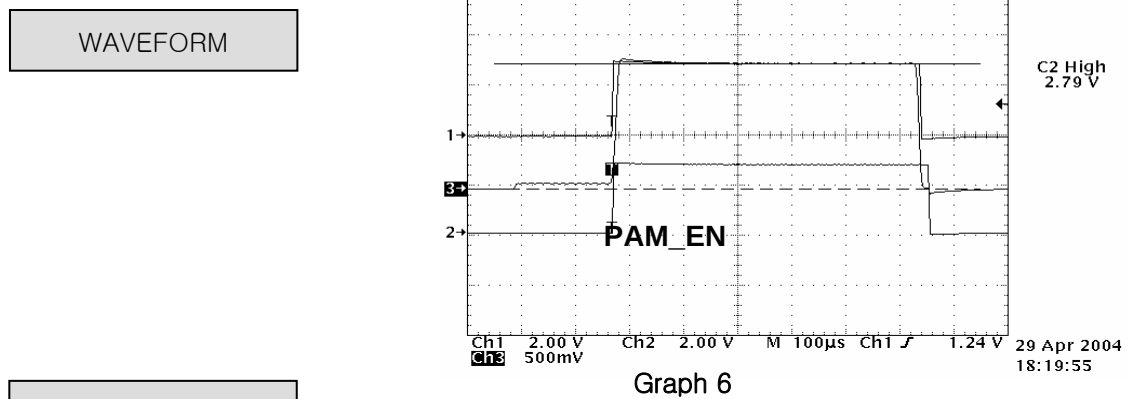
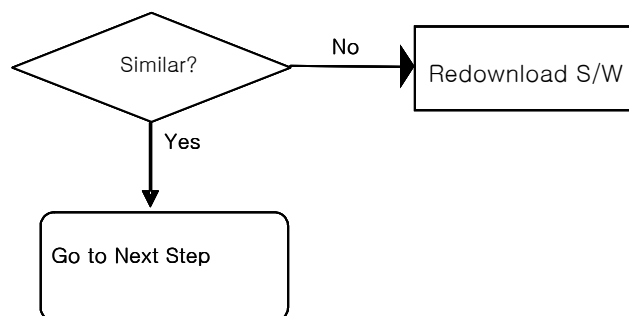


Figure 9



CHECKING FLOW

Check TX_RAMP and PA_EN
Check if there is
Any Major Difference or not
Refer to Graph 6



4. TROUBLE SHOOTING

(5) Checking TX IQ

TEST POINT

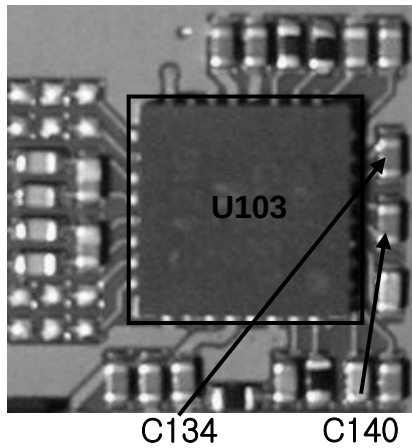
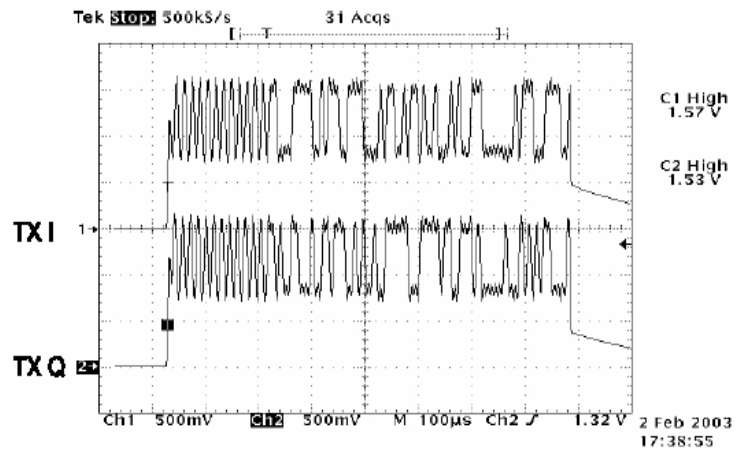


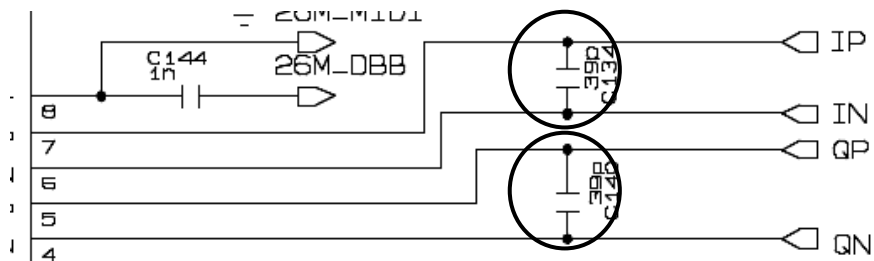
Figure 10

WAVEFORM

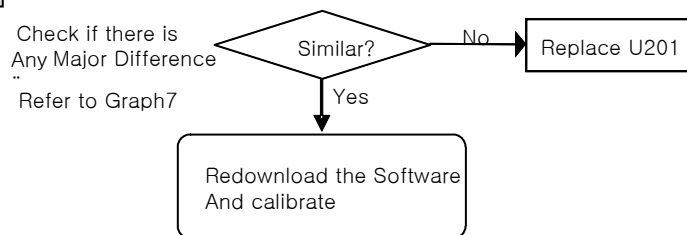


Graph 7

CIRCUIT

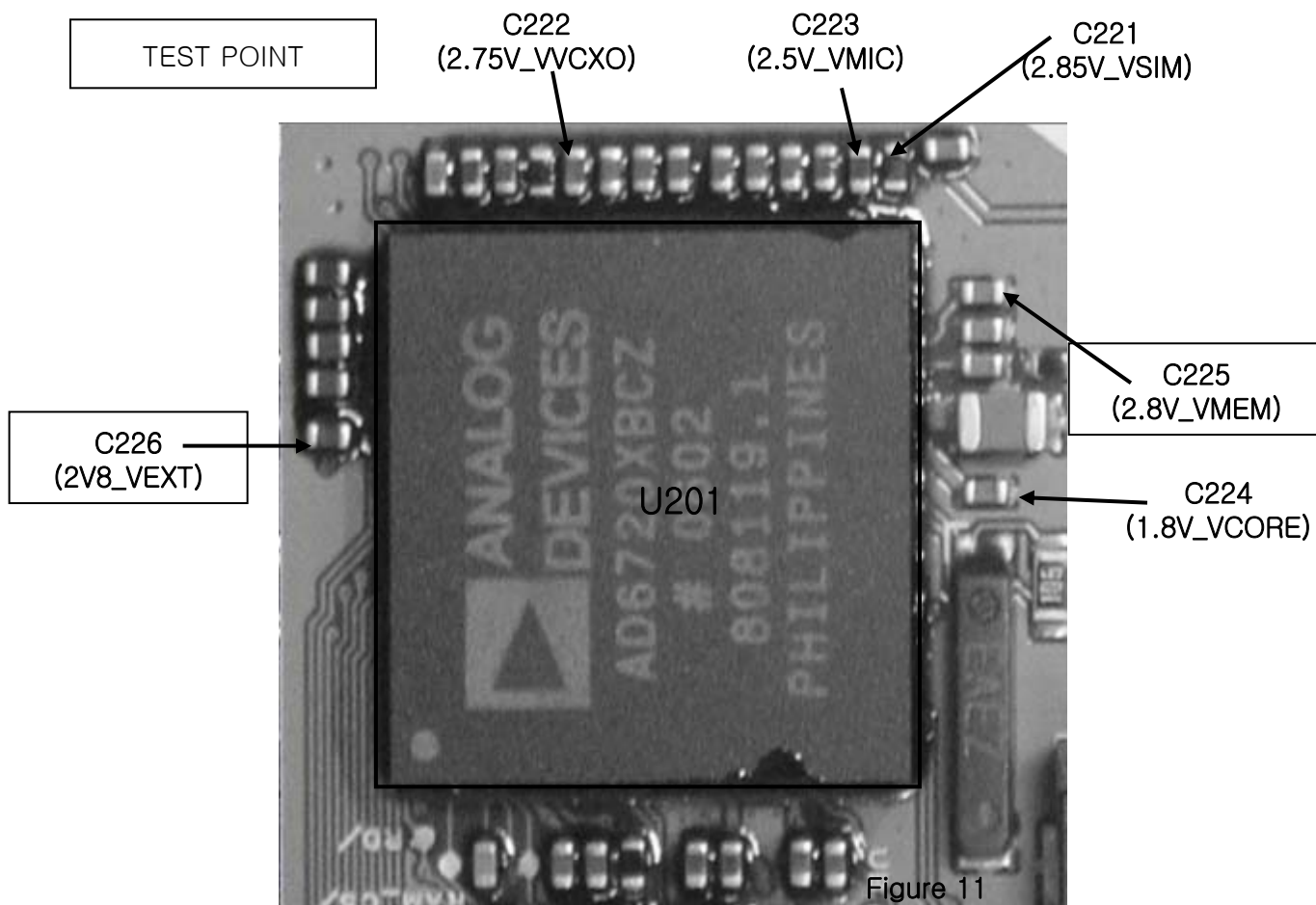


CHECKING FLOW

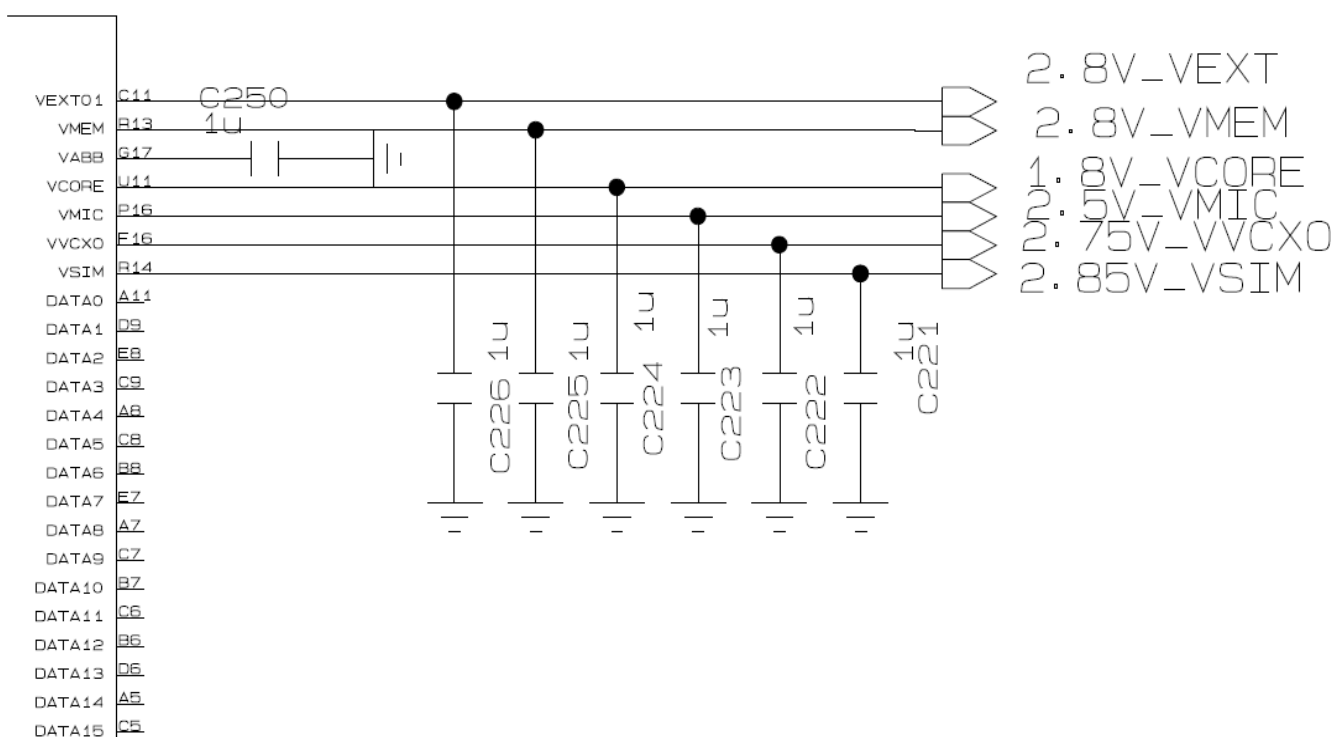


4. TROUBLE SHOOTING

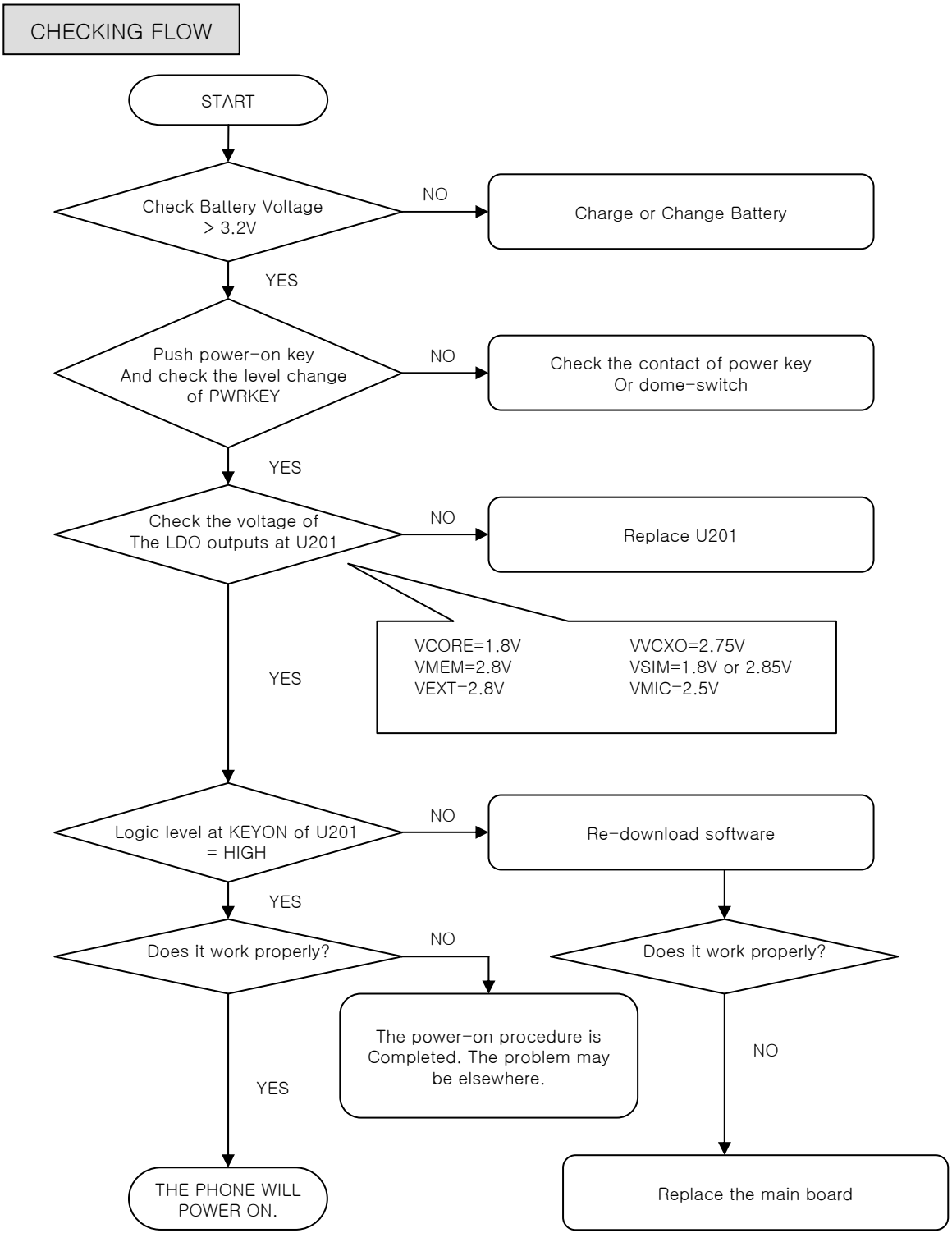
4.4 Power On Trouble



CIRCUIT



4. TROUBLE SHOOTING



TEST POINT

TEST POINT

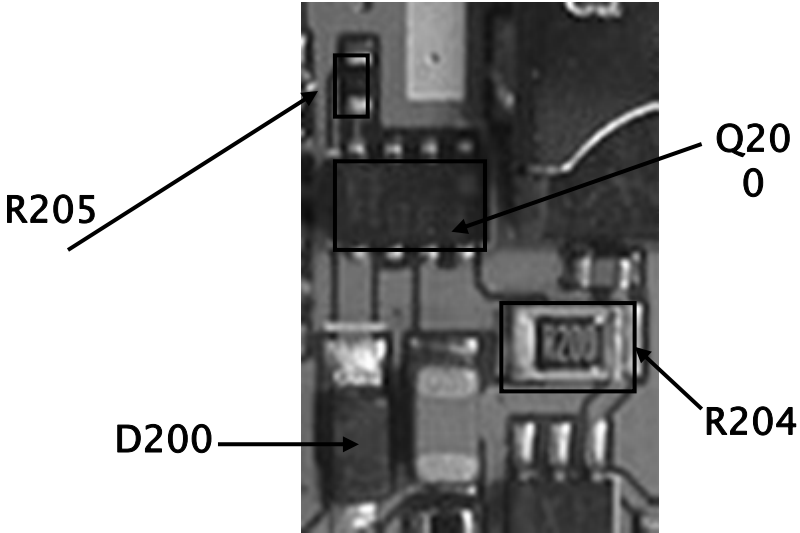
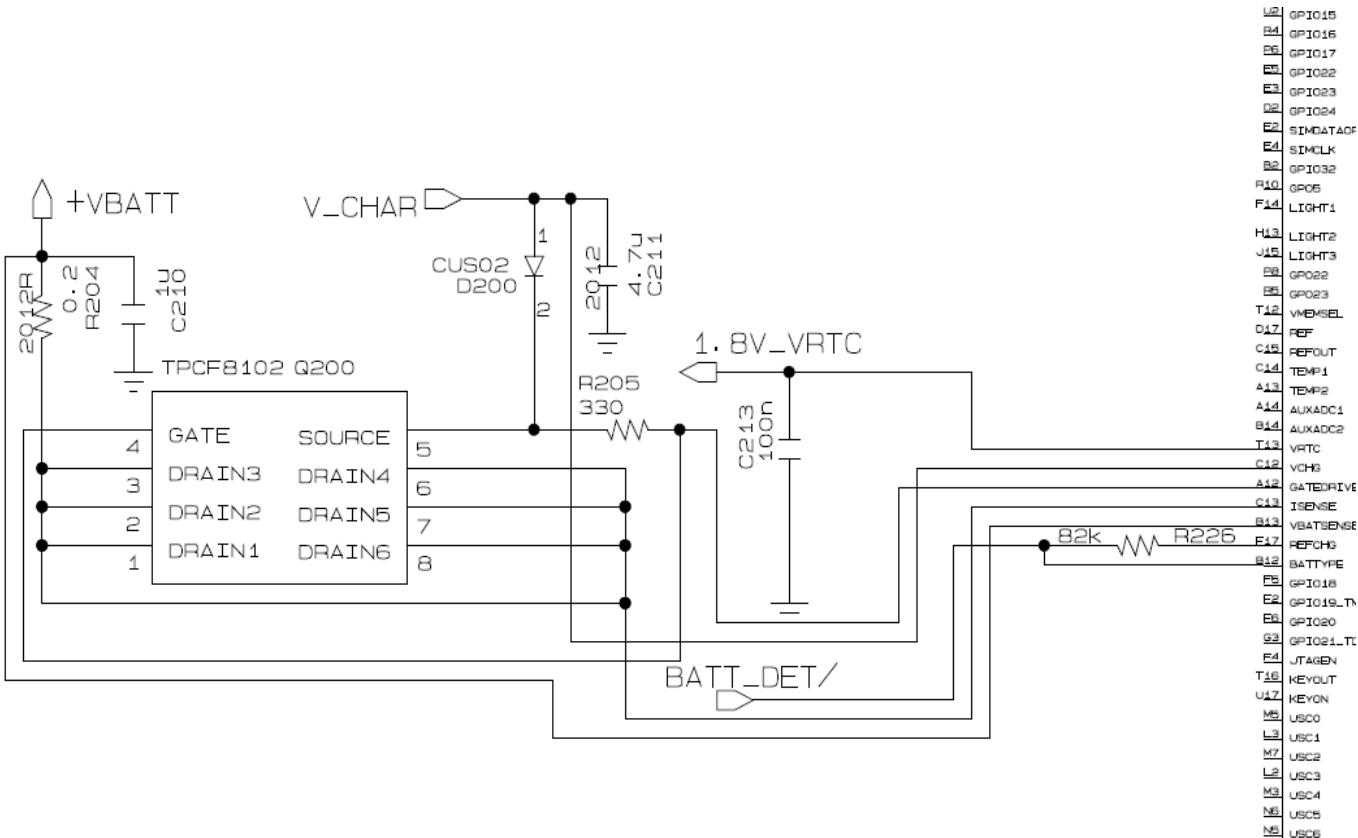


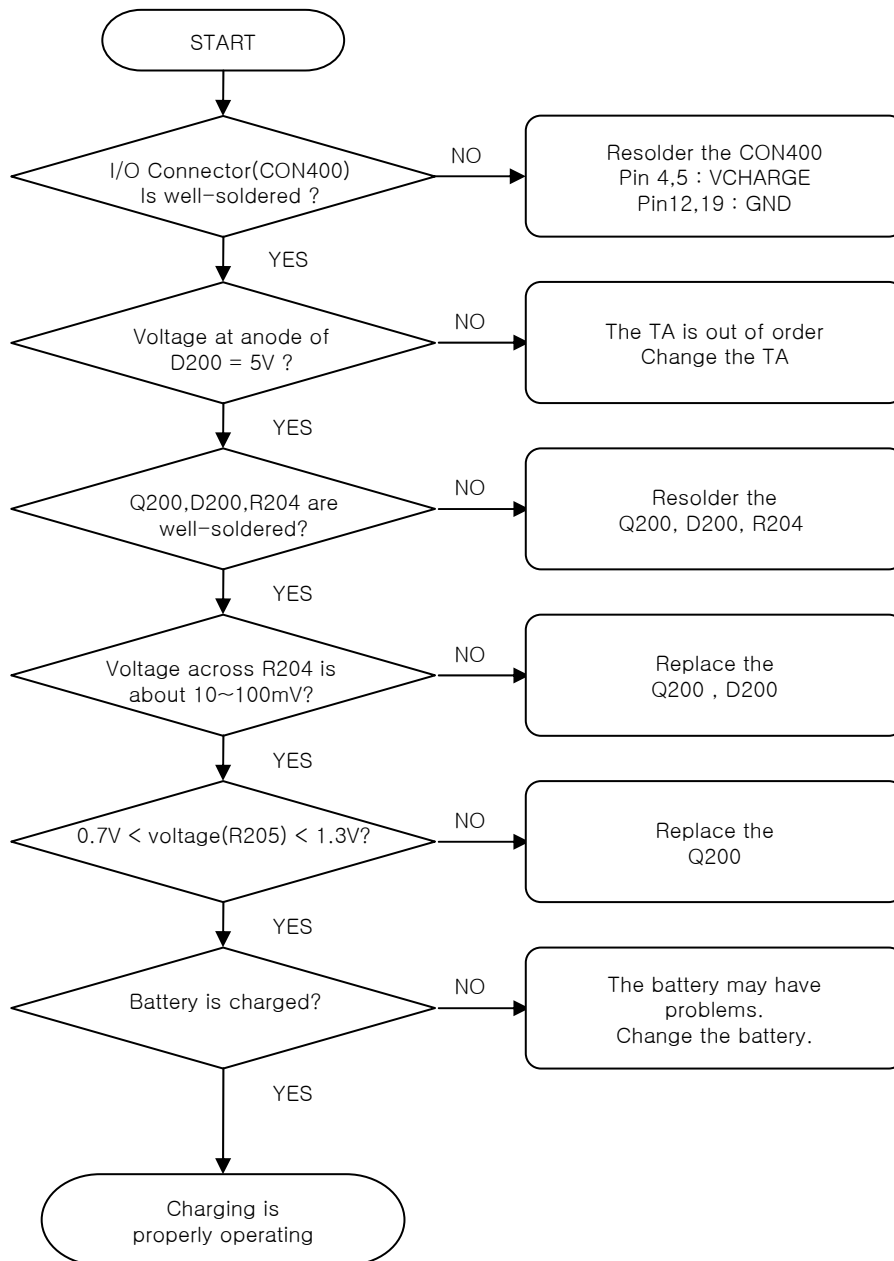
Figure 12

CIRCUIT



4. TROUBLE SHOOTING

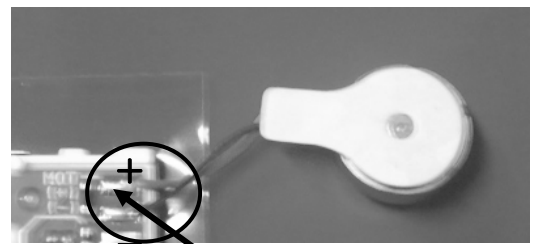
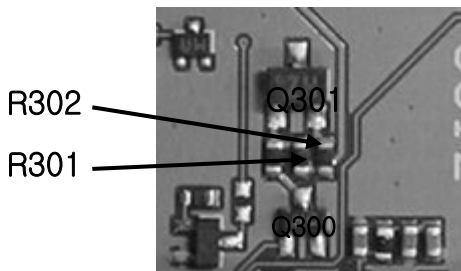
CHECKING FLOW



4. TROUBLE SHOOTING

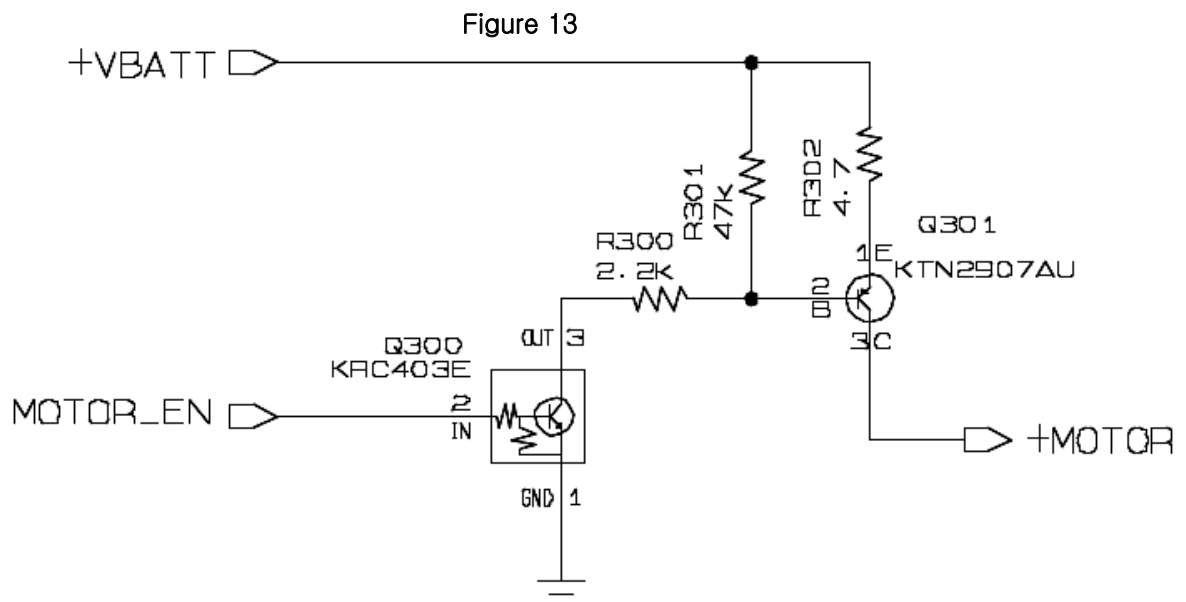
4.6 Vibrator Trouble

TEST POINT



Soldering Check in LCD Module

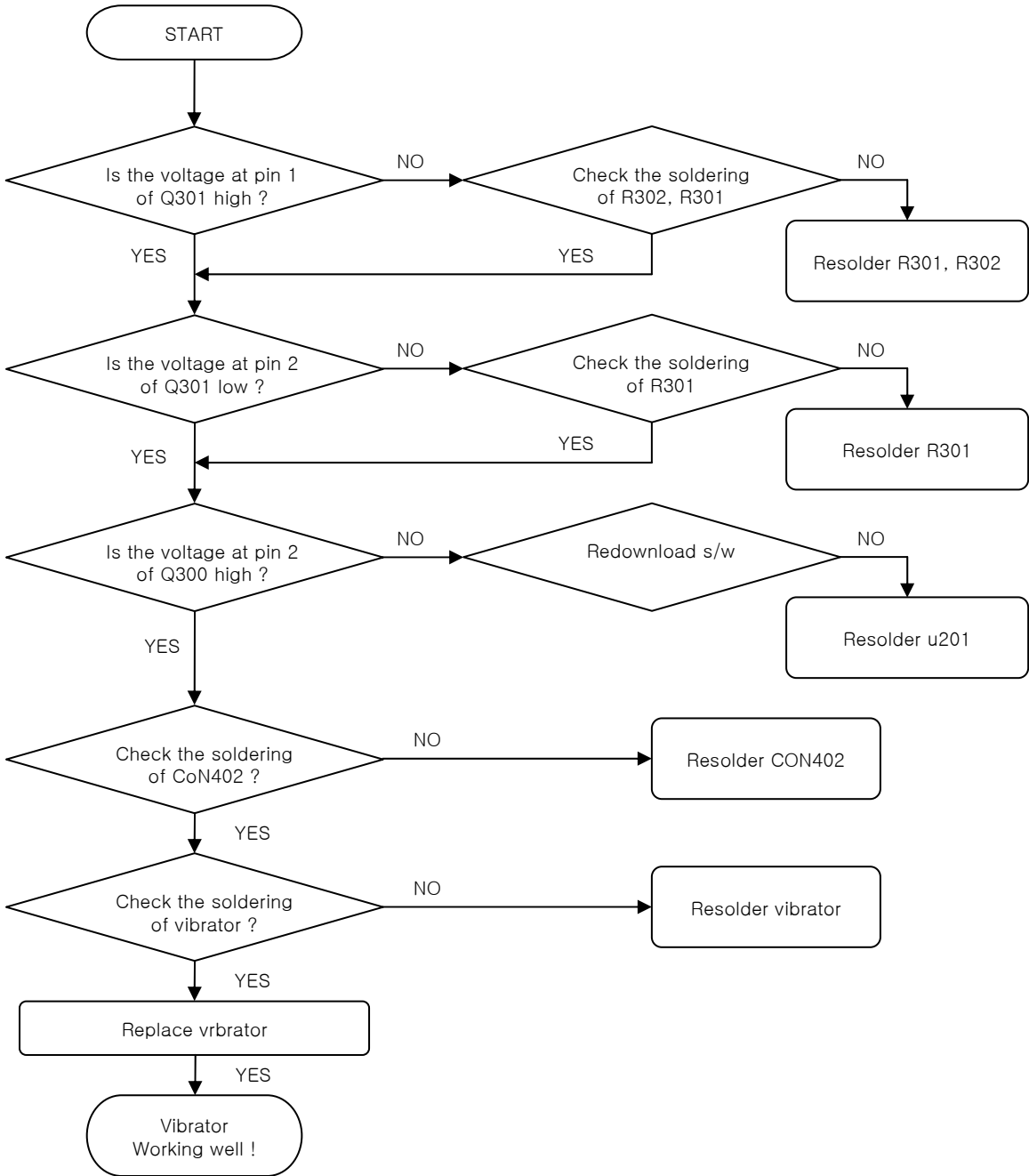
CIRCUIT



4. TROUBLE SHOOTING

CHECKING FLOW

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



4. TROUBLE SHOOTING

4.7 LCD Trouble

TEST POINT

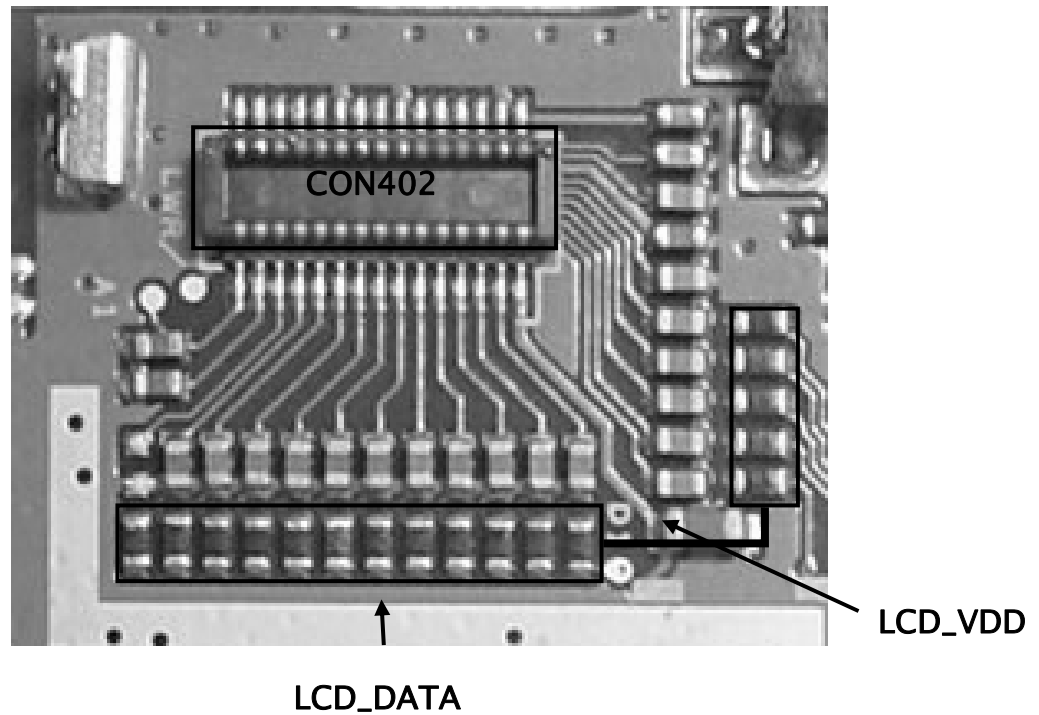


Figure 14

LCD Module

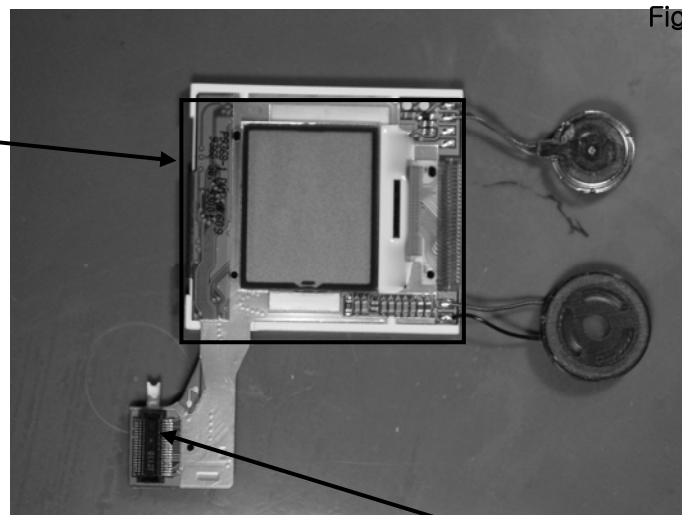
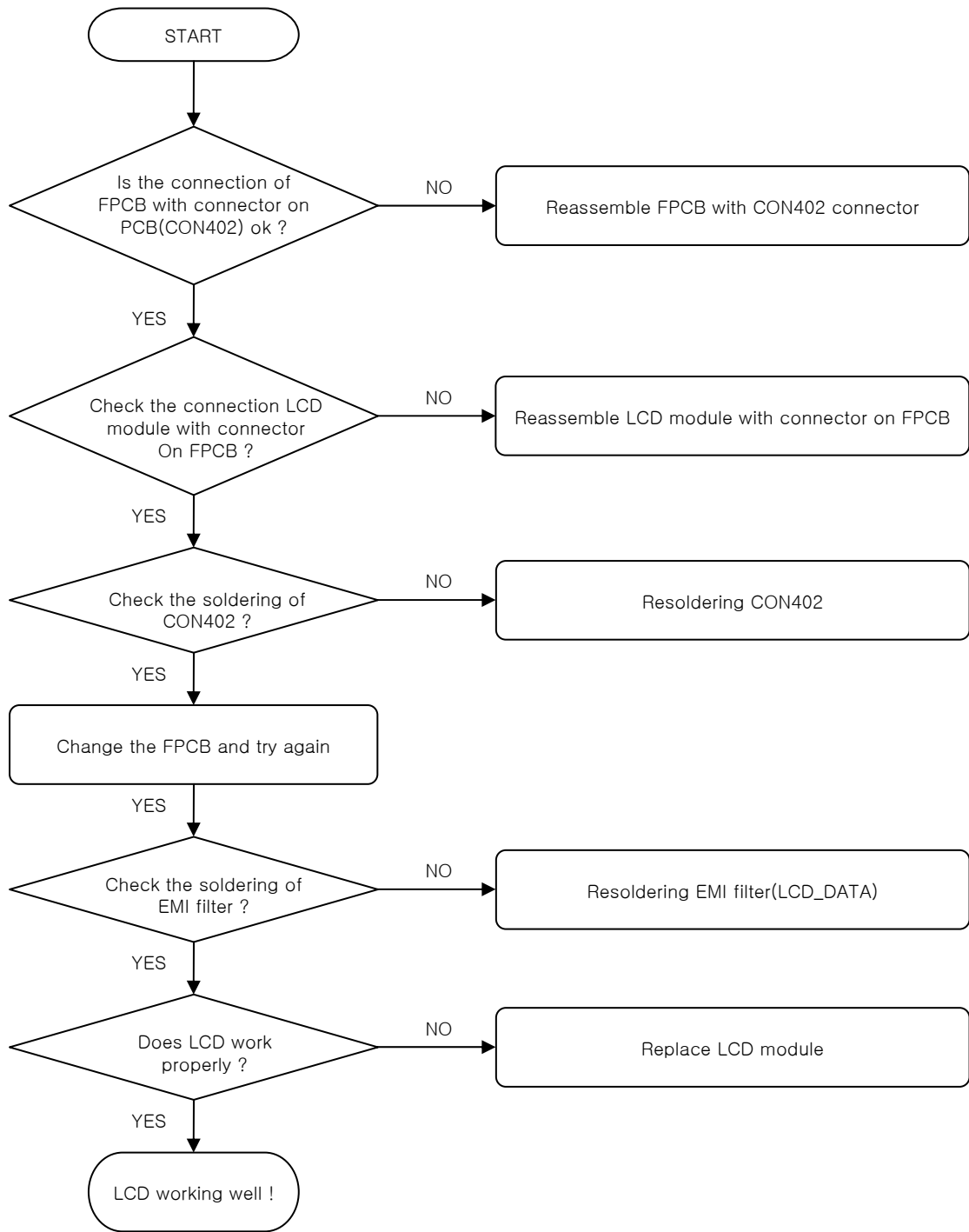


Figure 15

LCD Module connection
connector(40Pin, male)

4. TROUBLE SHOOTING

CHECKING FLOW



4. TROUBLE SHOOTING

4.8 Speaker Trouble

TEST POINT

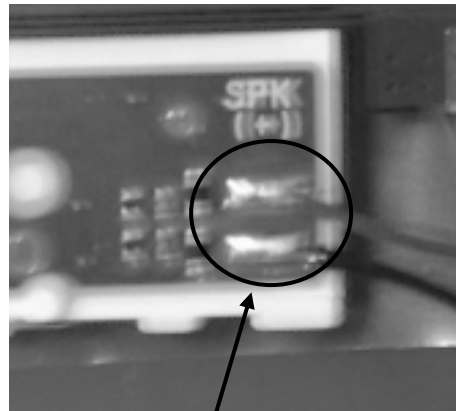
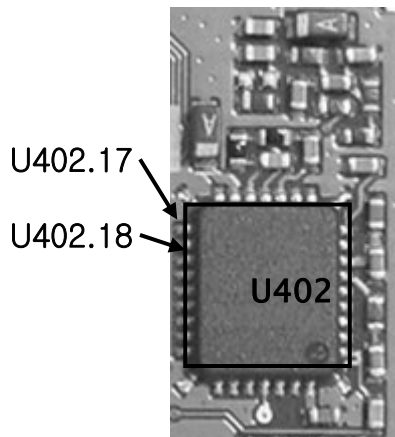
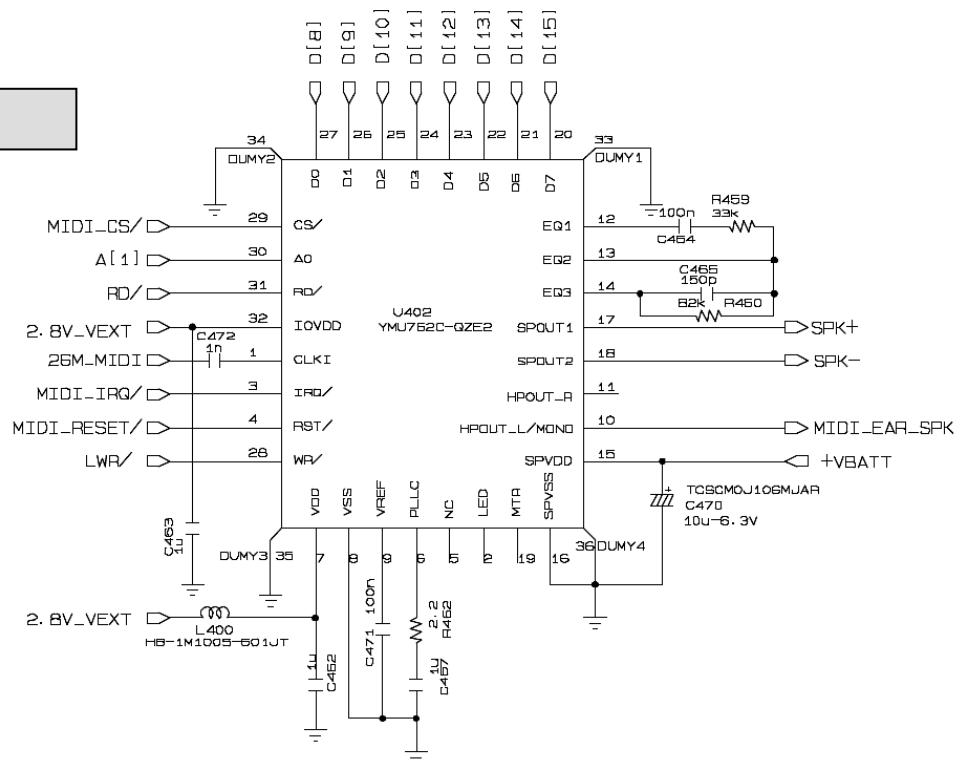


Figure 18

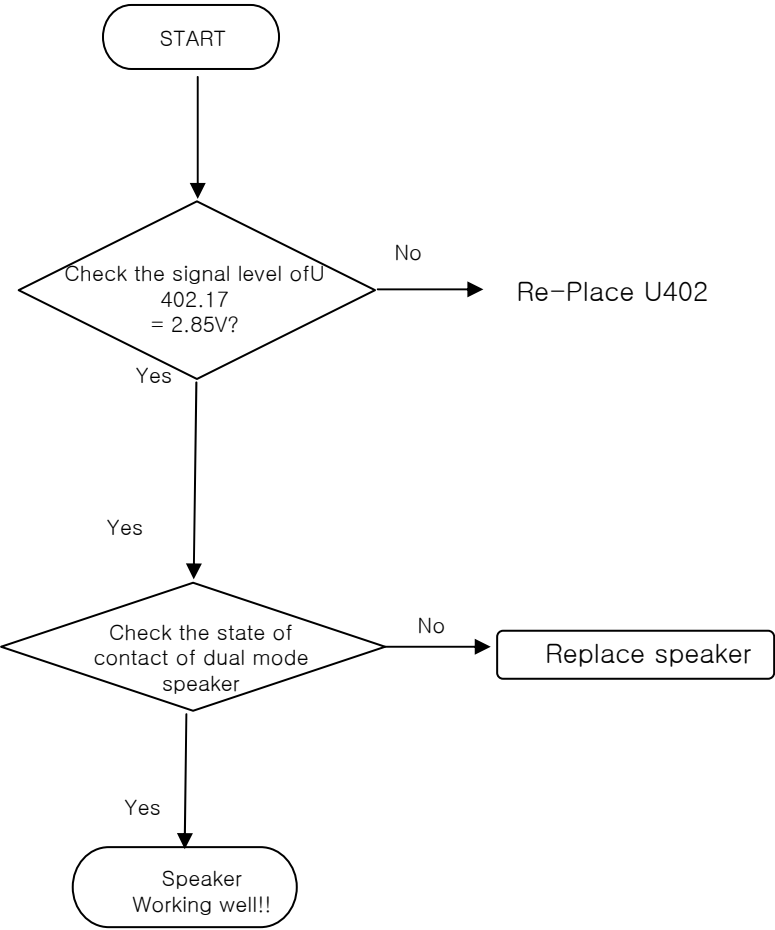
Soldering Check

CIRCUIT



4. TROUBLE SHOOTING

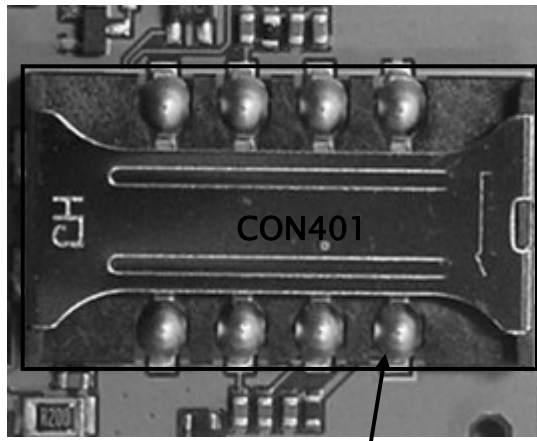
CHECKING FLOW



4. TROUBLE SHOOTING

4.9 SIM Card Interface Trouble

TEST POINT

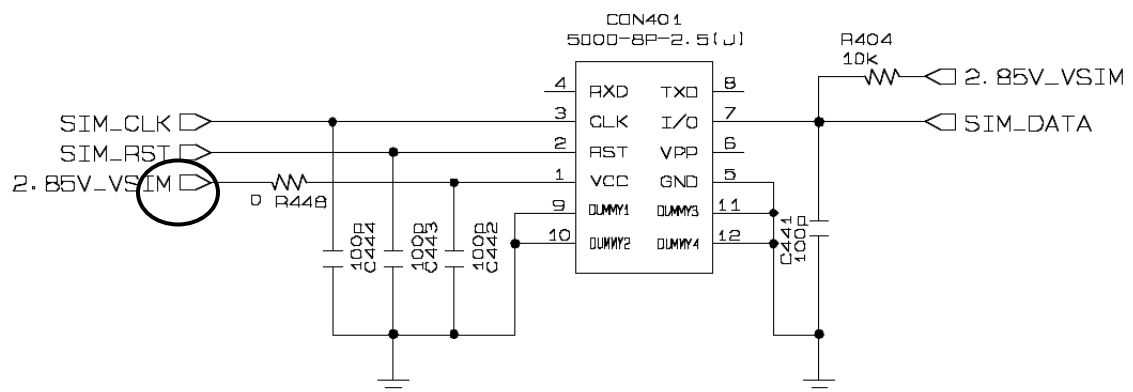


CON401.1
(C442,R448)

Figure 19

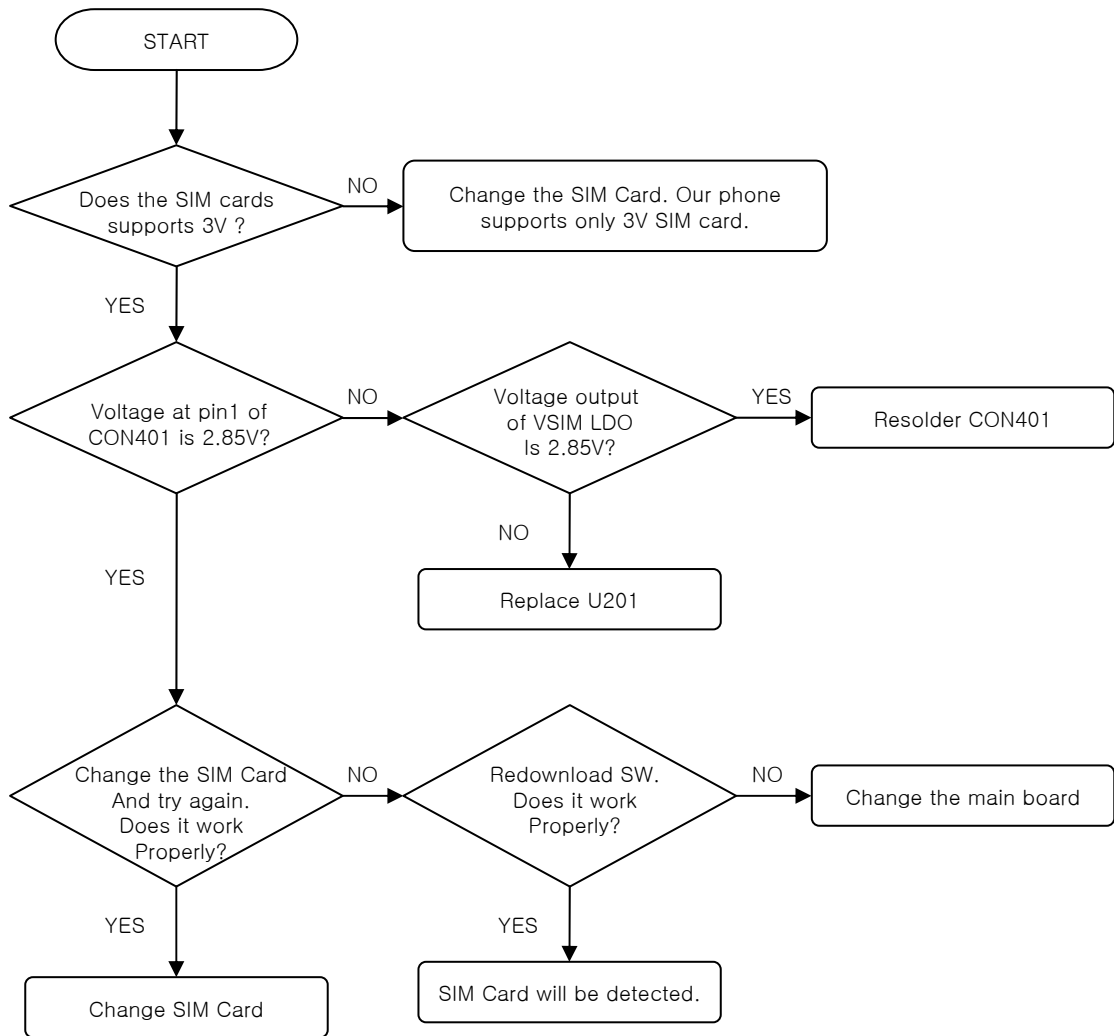
CIRCUIT

< SIM SOCKET >



4. TROUBLE SHOOTING

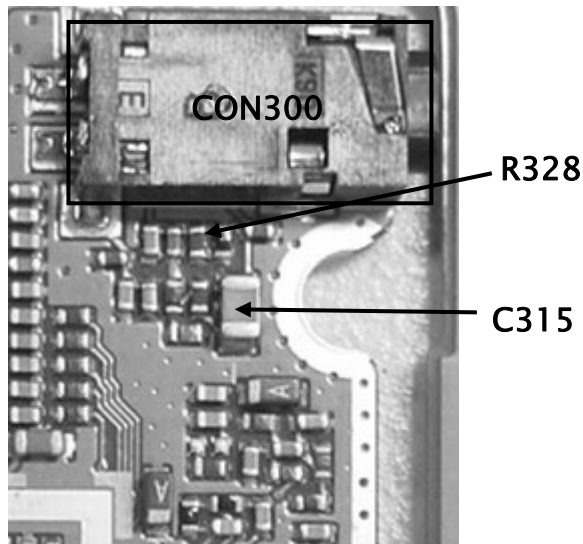
CHECKING FLOW



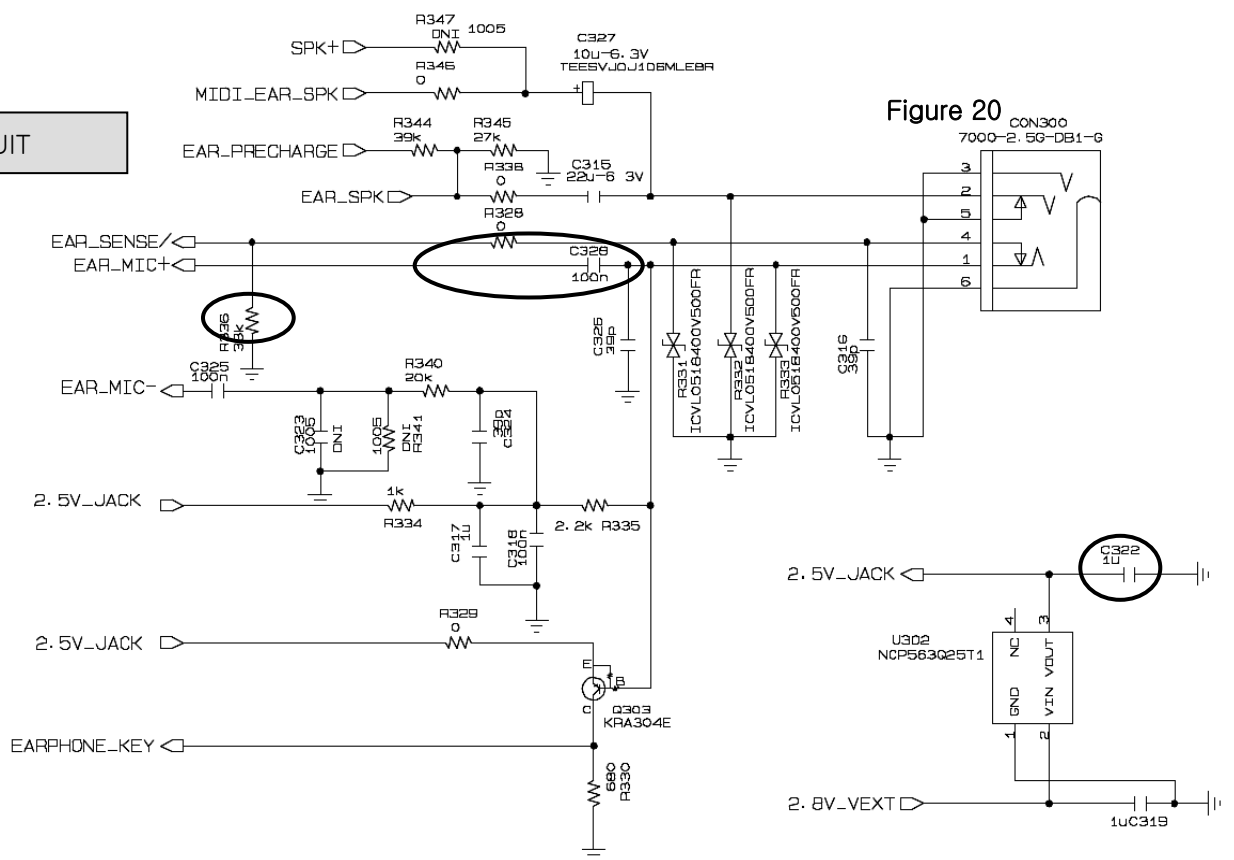
4. TROUBLE SHOOTING

4.10 Earphone Trouble

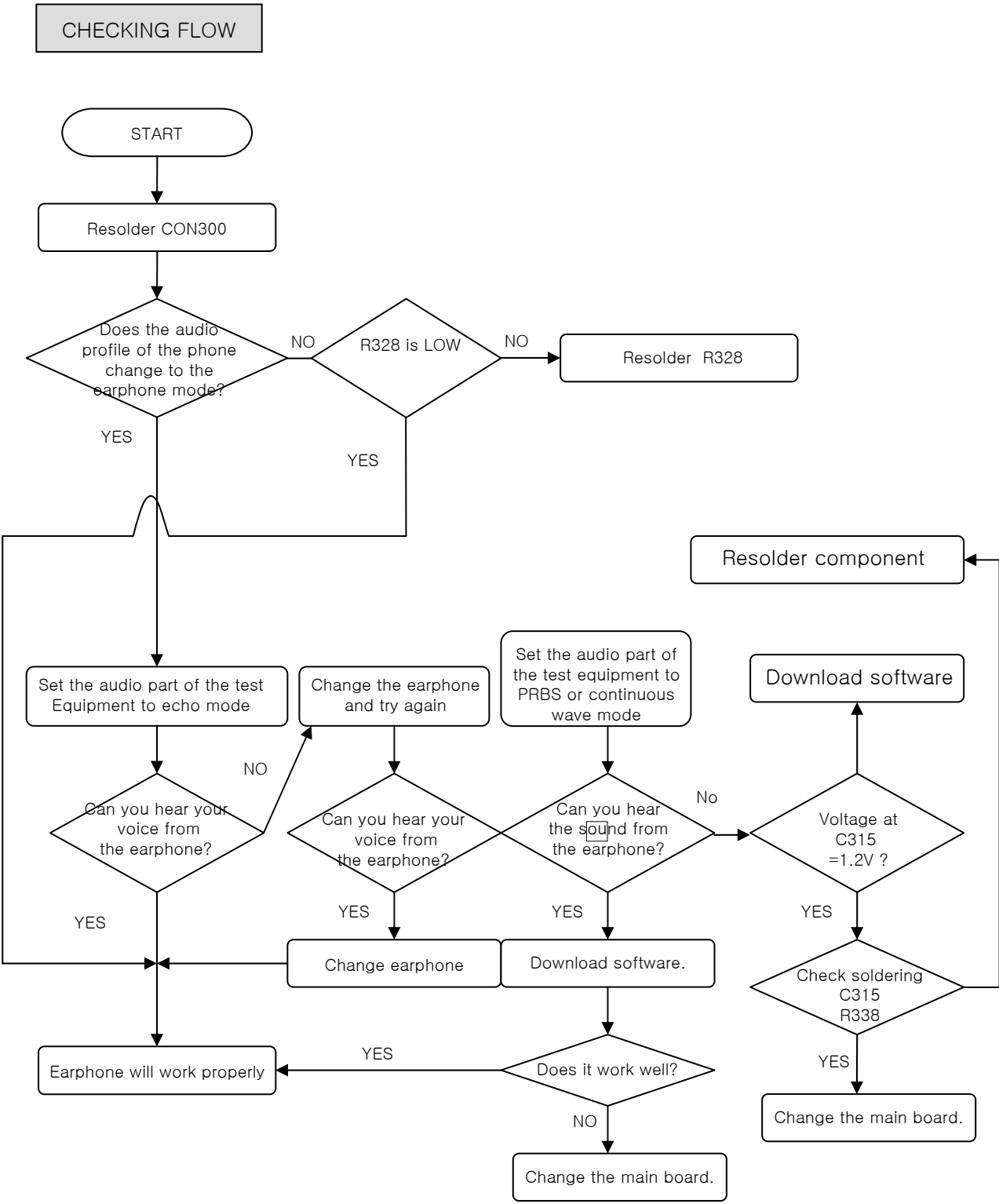
TEST POINT



CIRCUIT



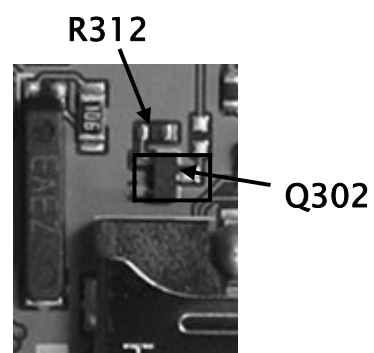
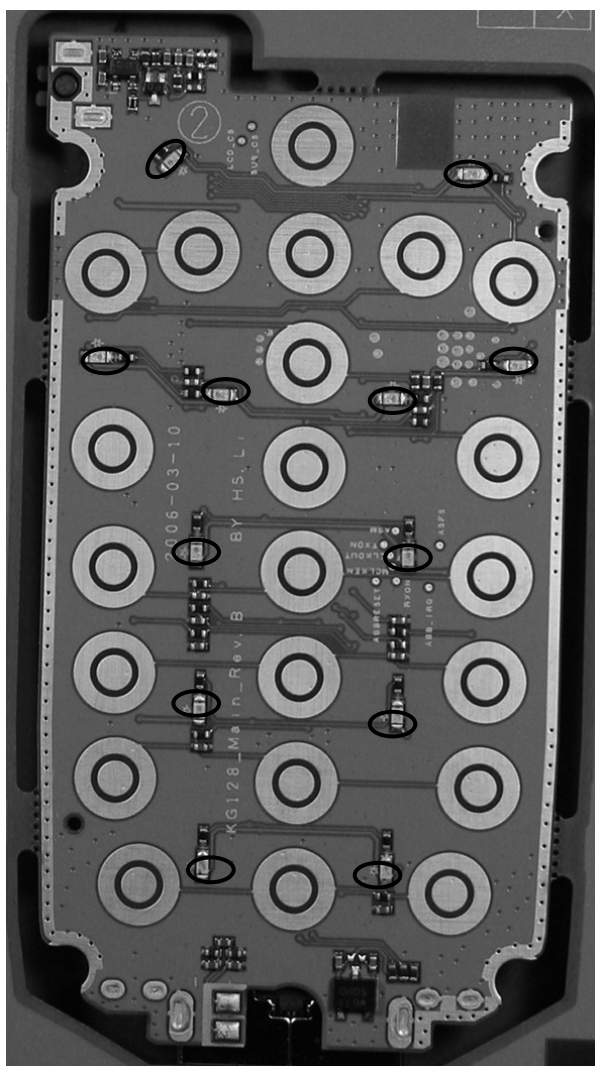
4. TROUBLE SHOOTING



4. TROUBLE SHOOTING

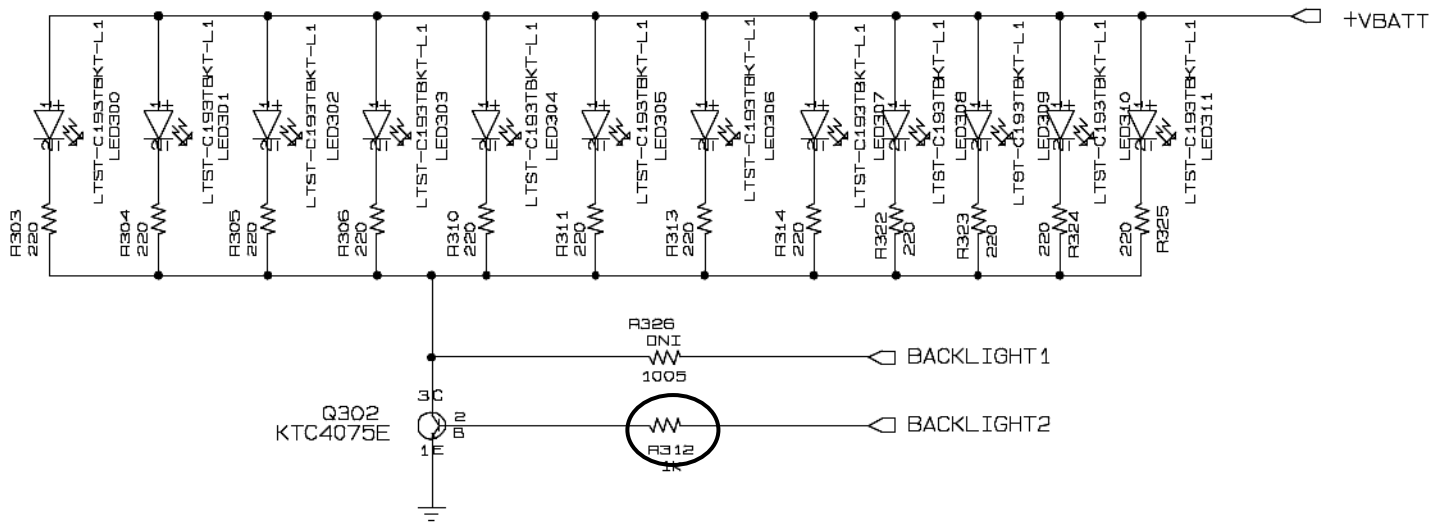
4.11 KEY backlight Trouble

TEST POINT

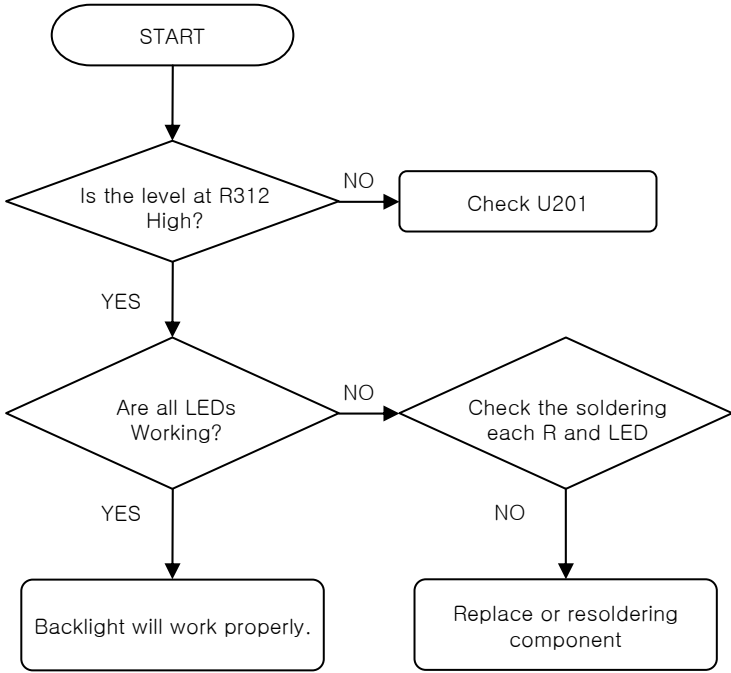


4. TROUBLE SHOOTING

CIRCUIT



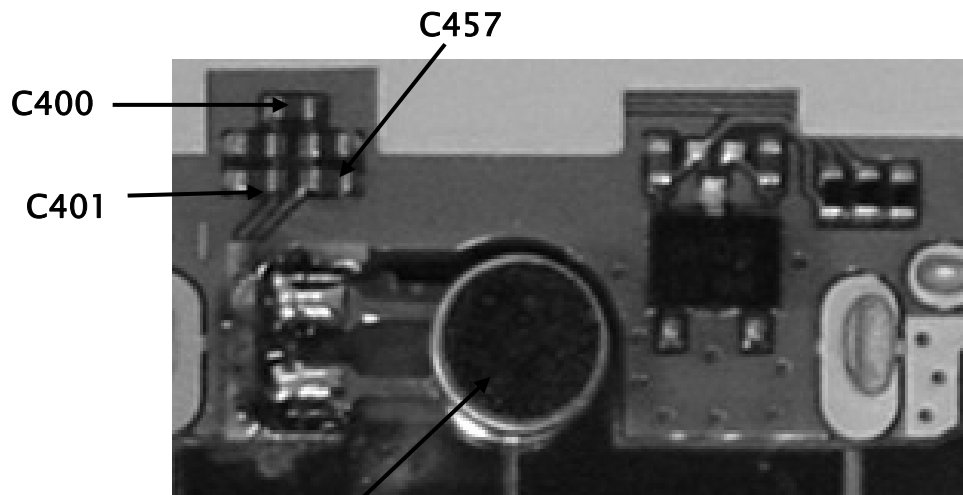
CHECKING FLOW



4. TROUBLE SHOOTING

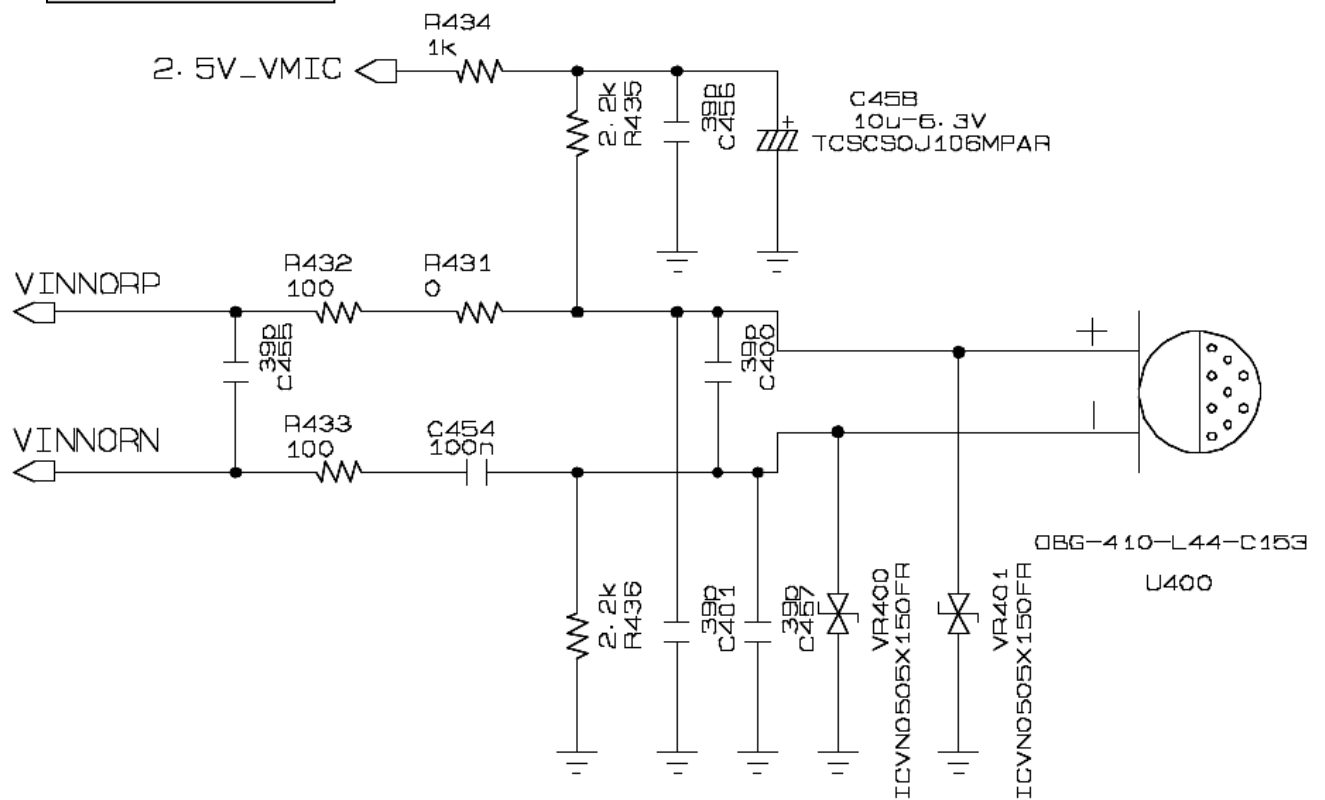
4.12 Microphone Trouble

TEST POINT



U400

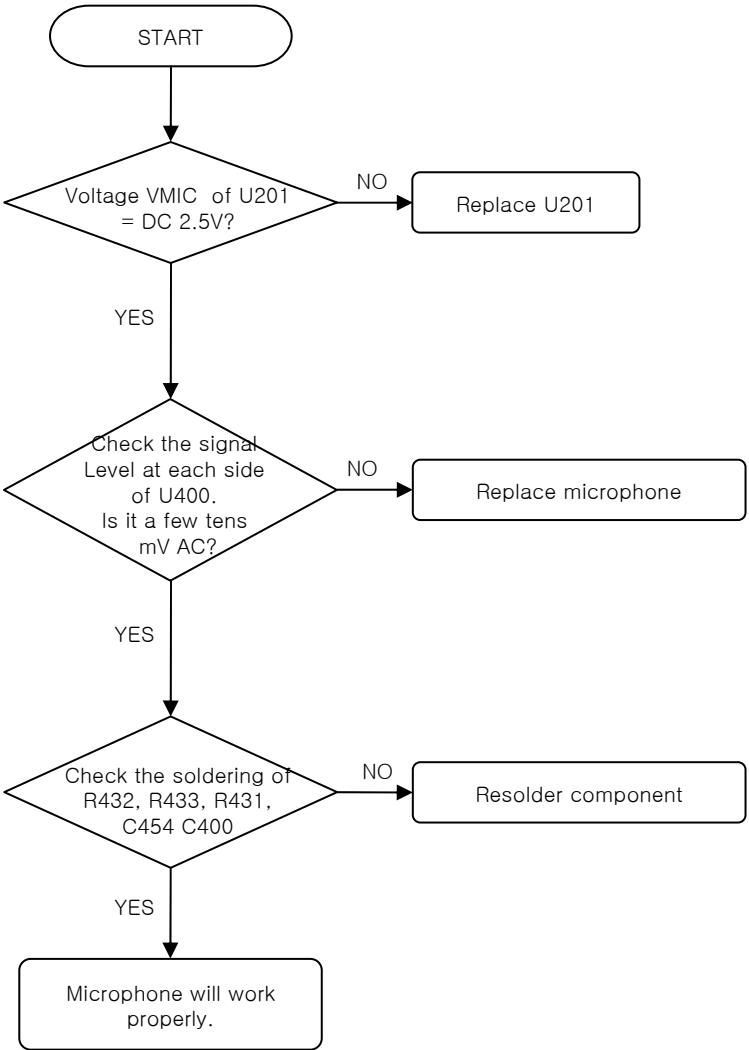
CIRCUIT



4. TROUBLE SHOOTING

CHECKING FLOW

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode



4. TROUBLE SHOOTING

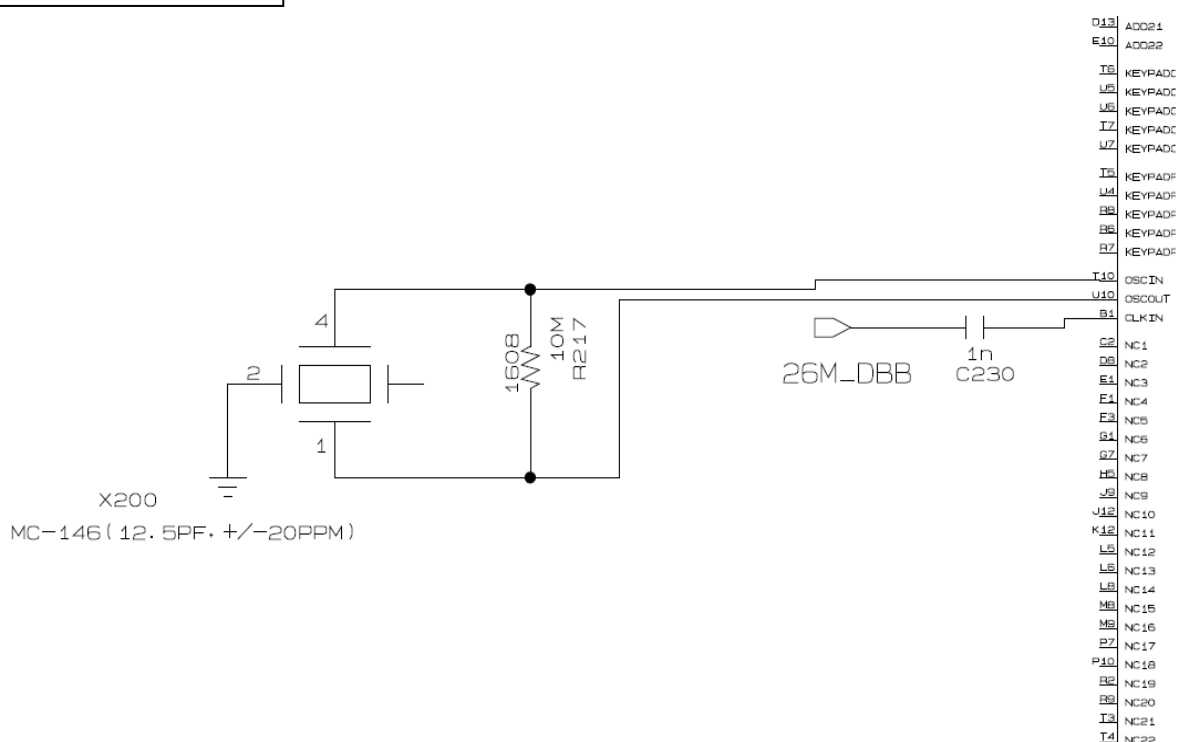
4.13 RTC Trouble

TEST POINT

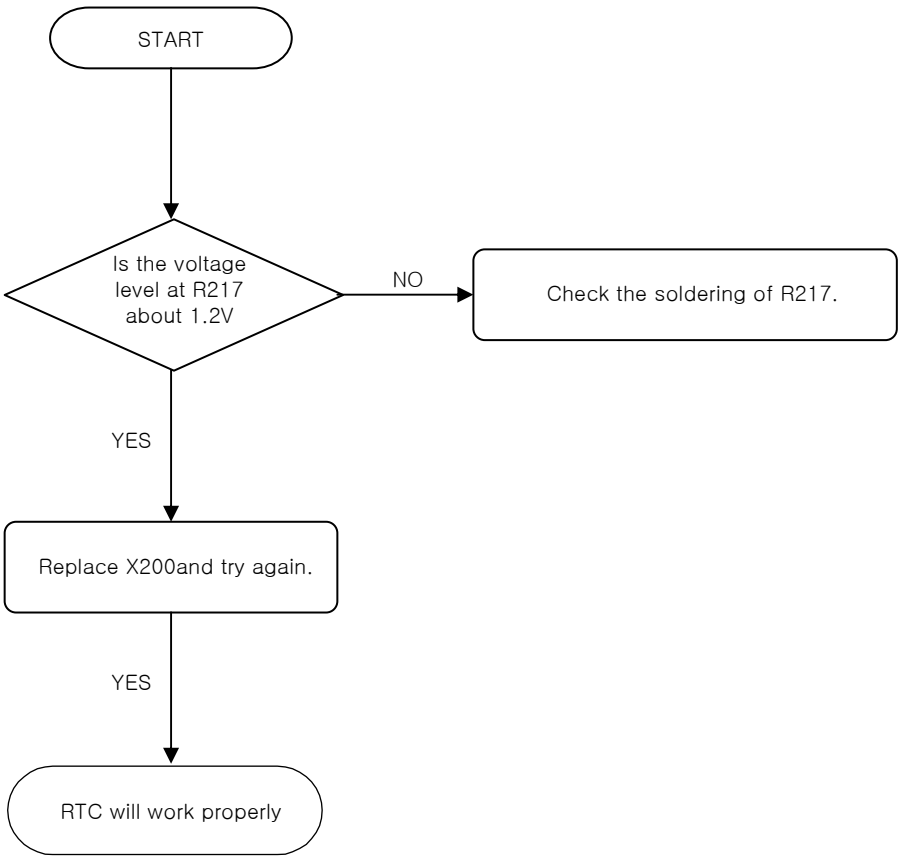


CIRCUIT

Figure 24



CHECKING FLOW



4. TROUBLE SHOOTING

4.14 Folder on/off Trouble

TEST POINT

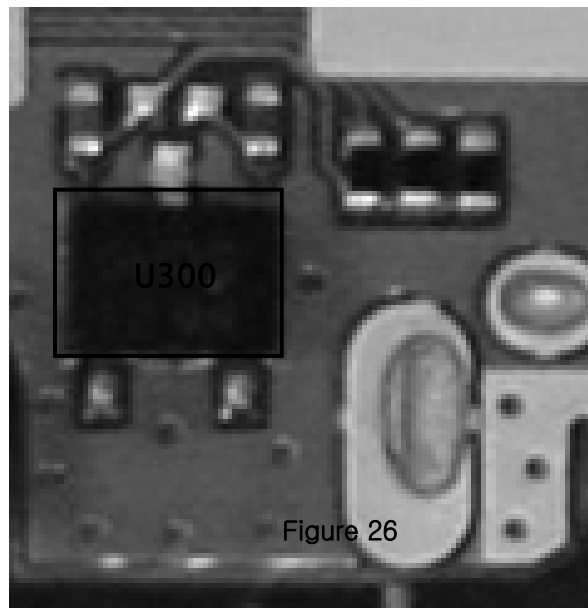
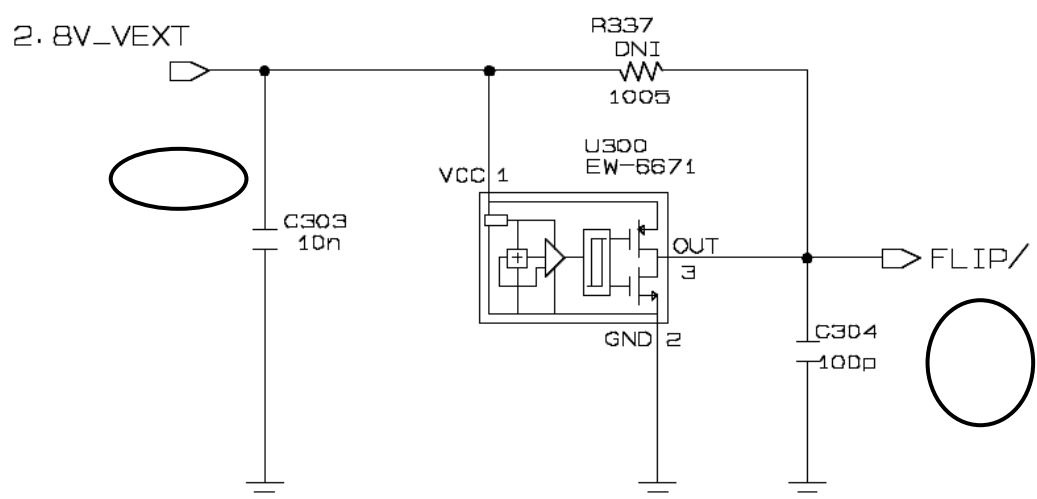


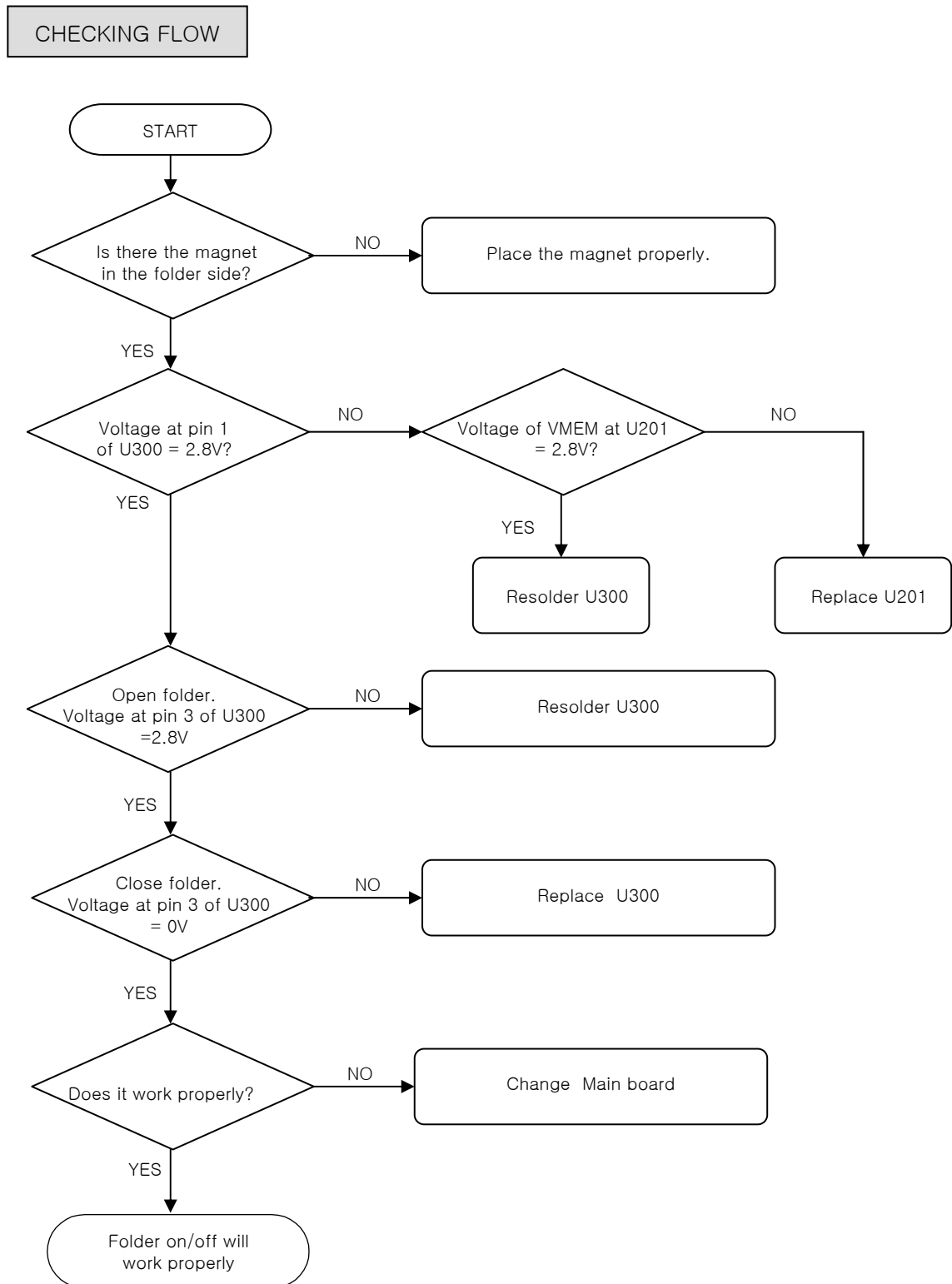
Figure 26

CIRCUIT

<FLIP S/W>



4. TROUBLE SHOOTING

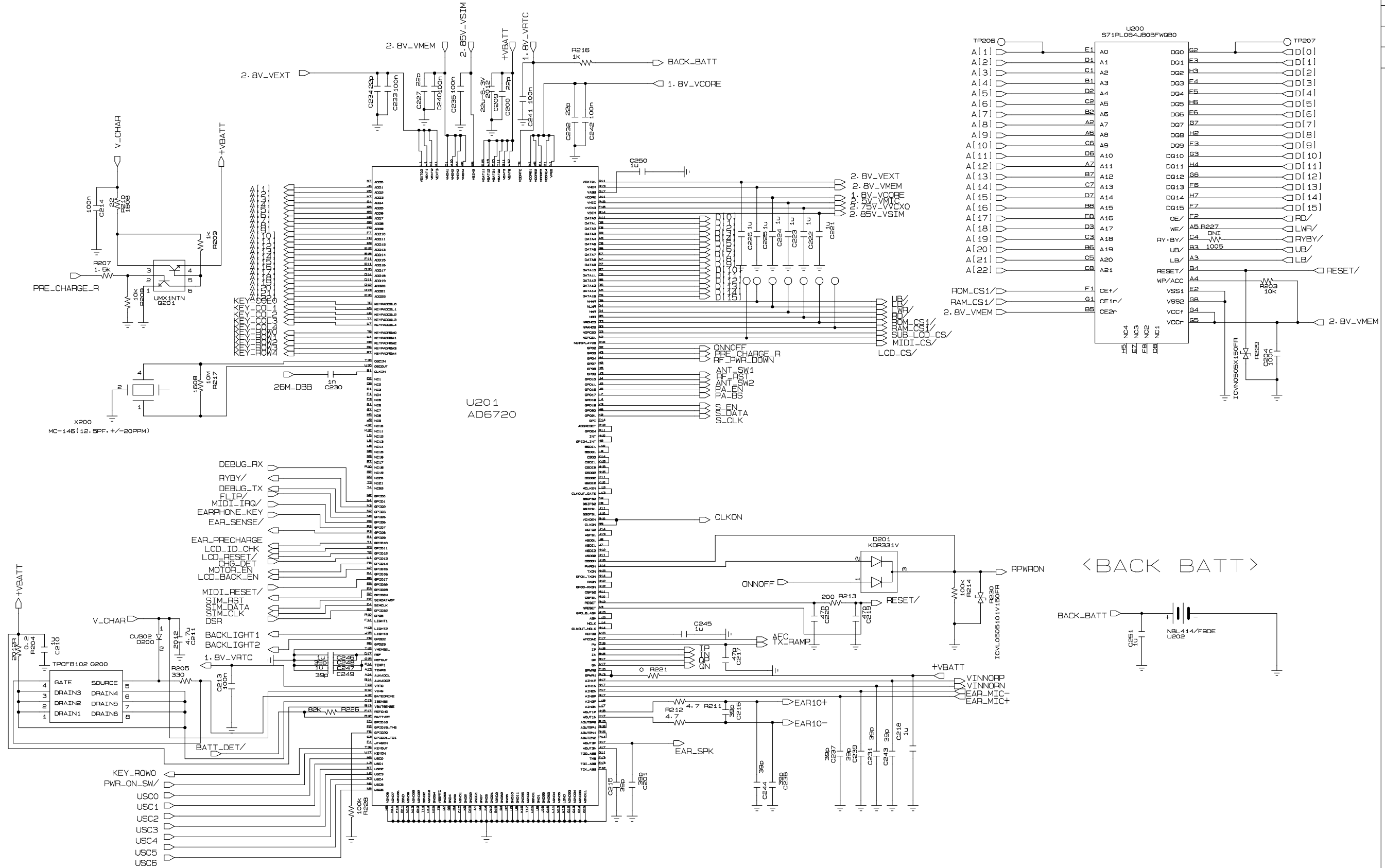


Part 5

Circuit and PCB Layout (P71–P76)

< AD6720 >

< MEMORY >

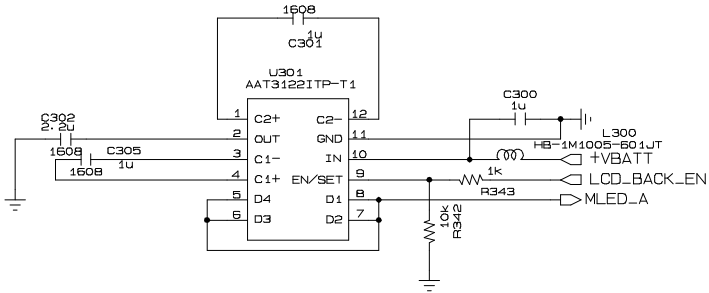


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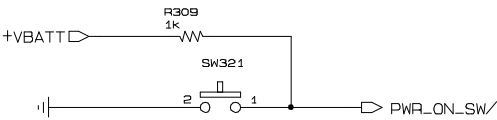
A->B
DELETE SHEET :
  SPK_P  SPK_N
DELETE :
  R224  R202
  R200
  C202  ;C203
  C205 ;C206
  C207 ;
CHANGE :
  C204
  ( 10u->100n )
  C208->R229
ADD :
  R228
  C251 ( 1u )
  B->C
ADD :
  R230

```

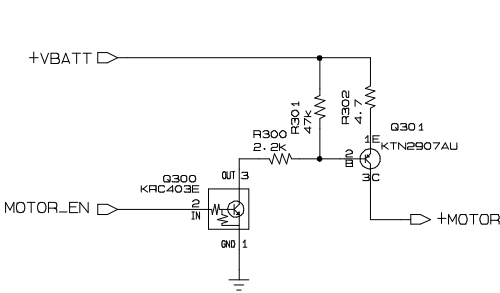
<CHARGE PUMP>



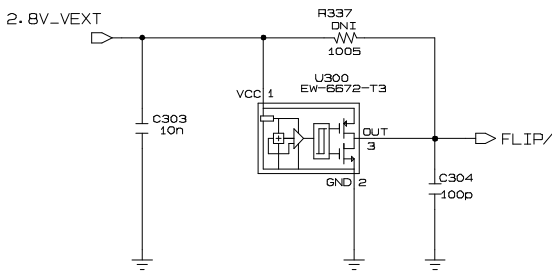
<POWER ON/OFF SWITCH>



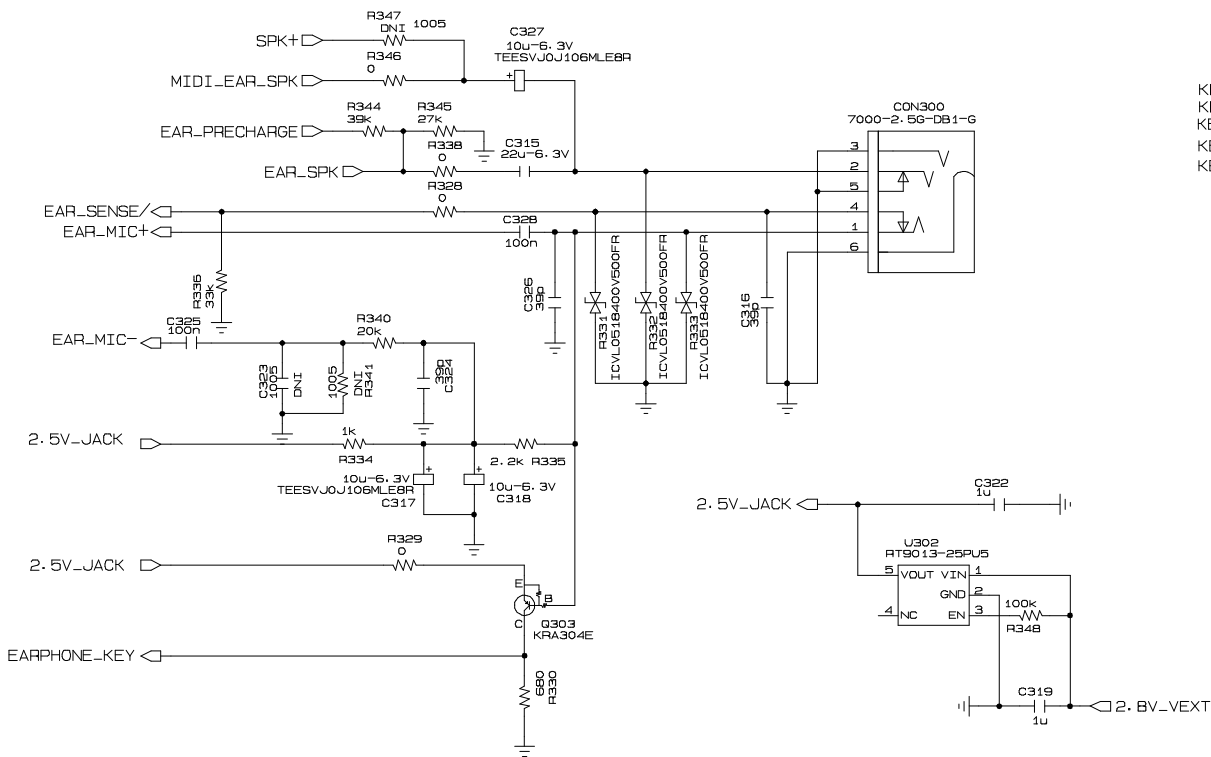
<MOTOR>



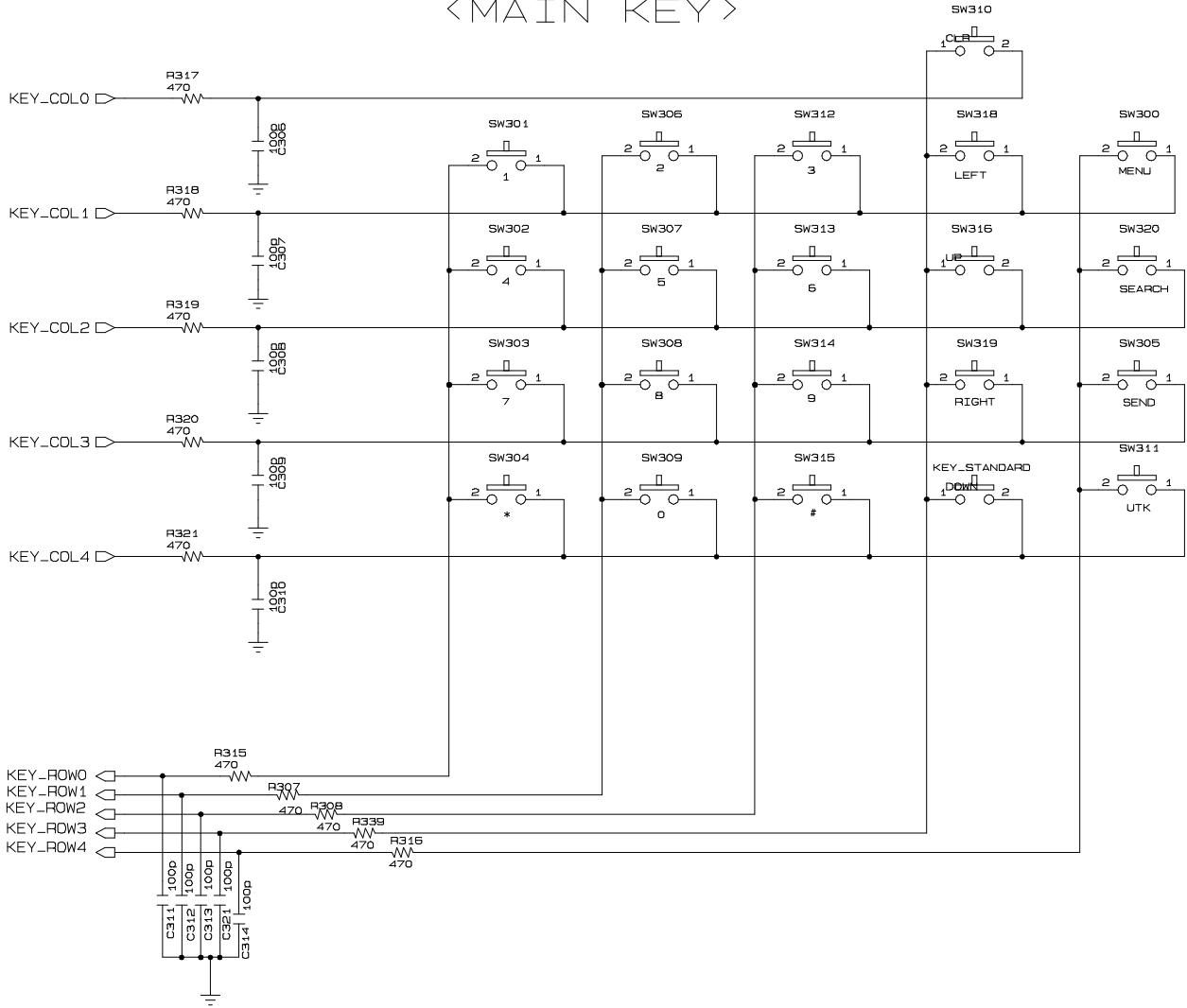
<FLIP S/W>



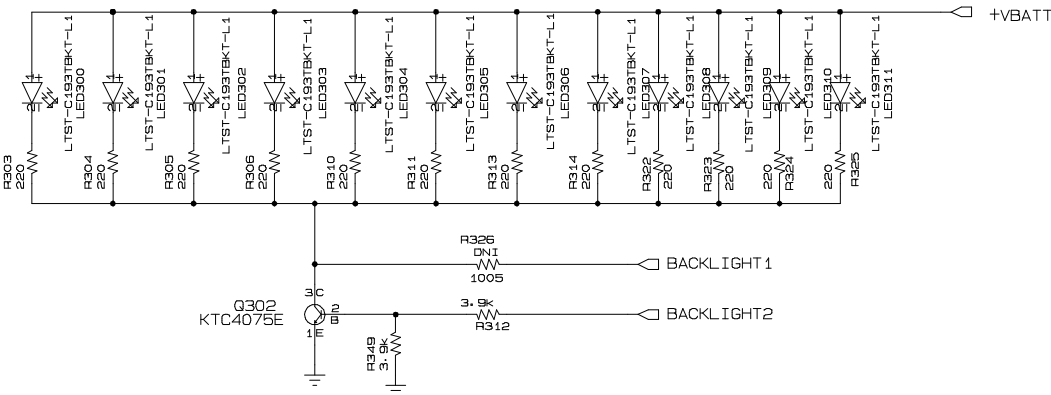
<EAR MIC JACK>



<MAIN KEY>



<KEYPAD LED>



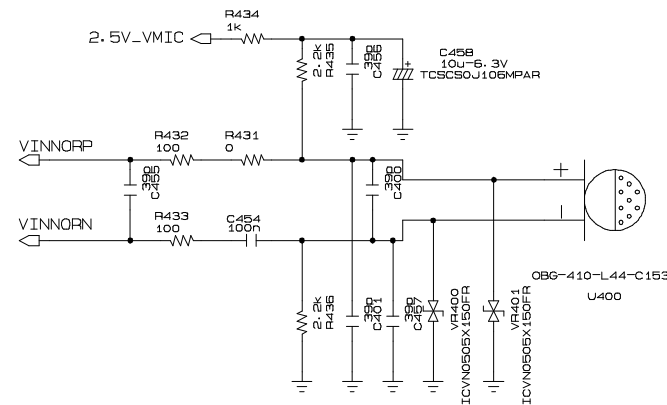
A->B
ADD SHEET :
MIDI_EAR_SPK

ADD :
C327
R346(0)
R347(DNI)
CHANGE :
R327->C328
C316 :
(10n->39p)
R336 :
(100k->33k)

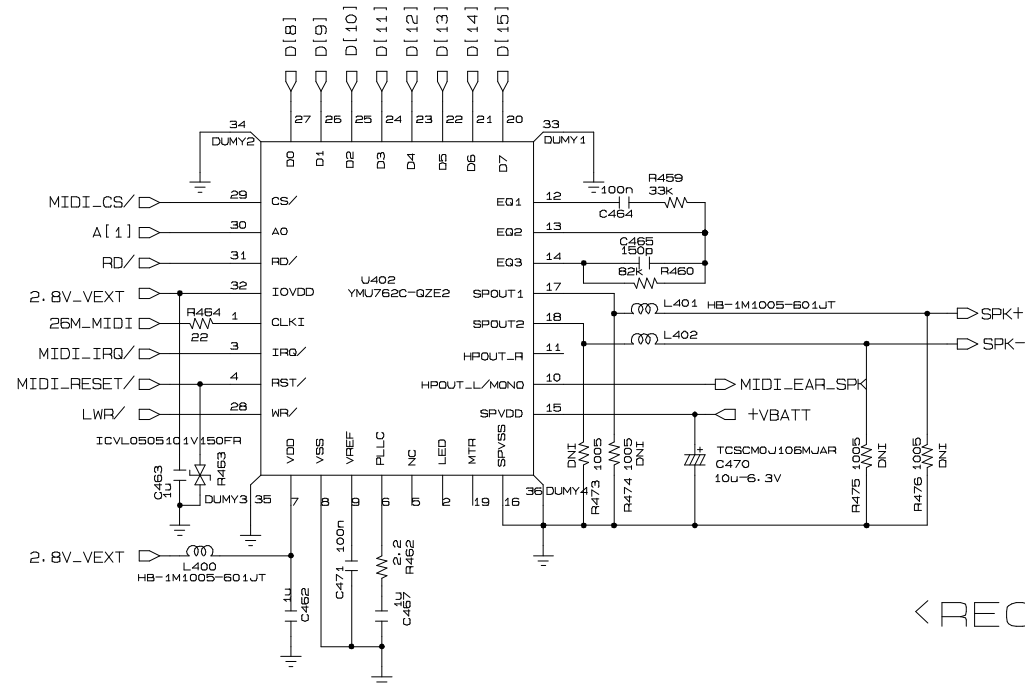
B->C
C302
1u->2.2u
ADD : L300
R348(100K)
CHANGE :
U302

C->D
ADD :
R349(3.9K)
CHANGE :
R312
(1K->3.9K)

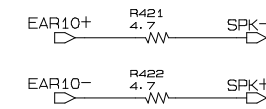
<MIC>



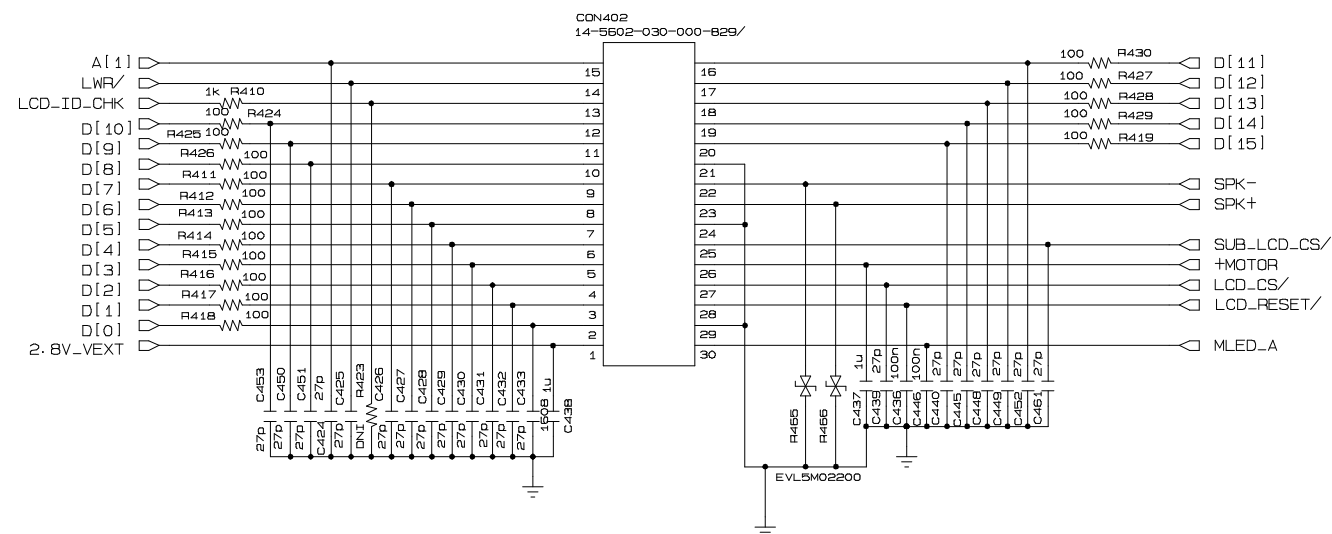
<MIDI PART>



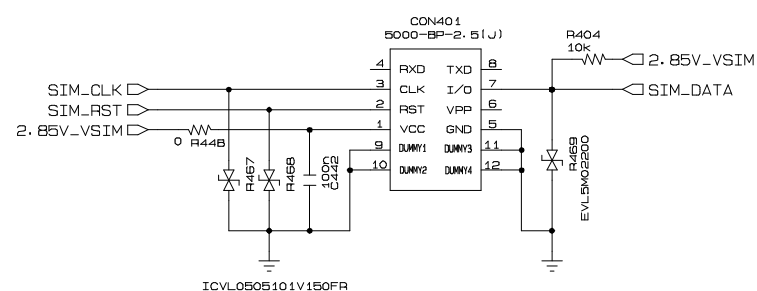
<RECEIVE PART>



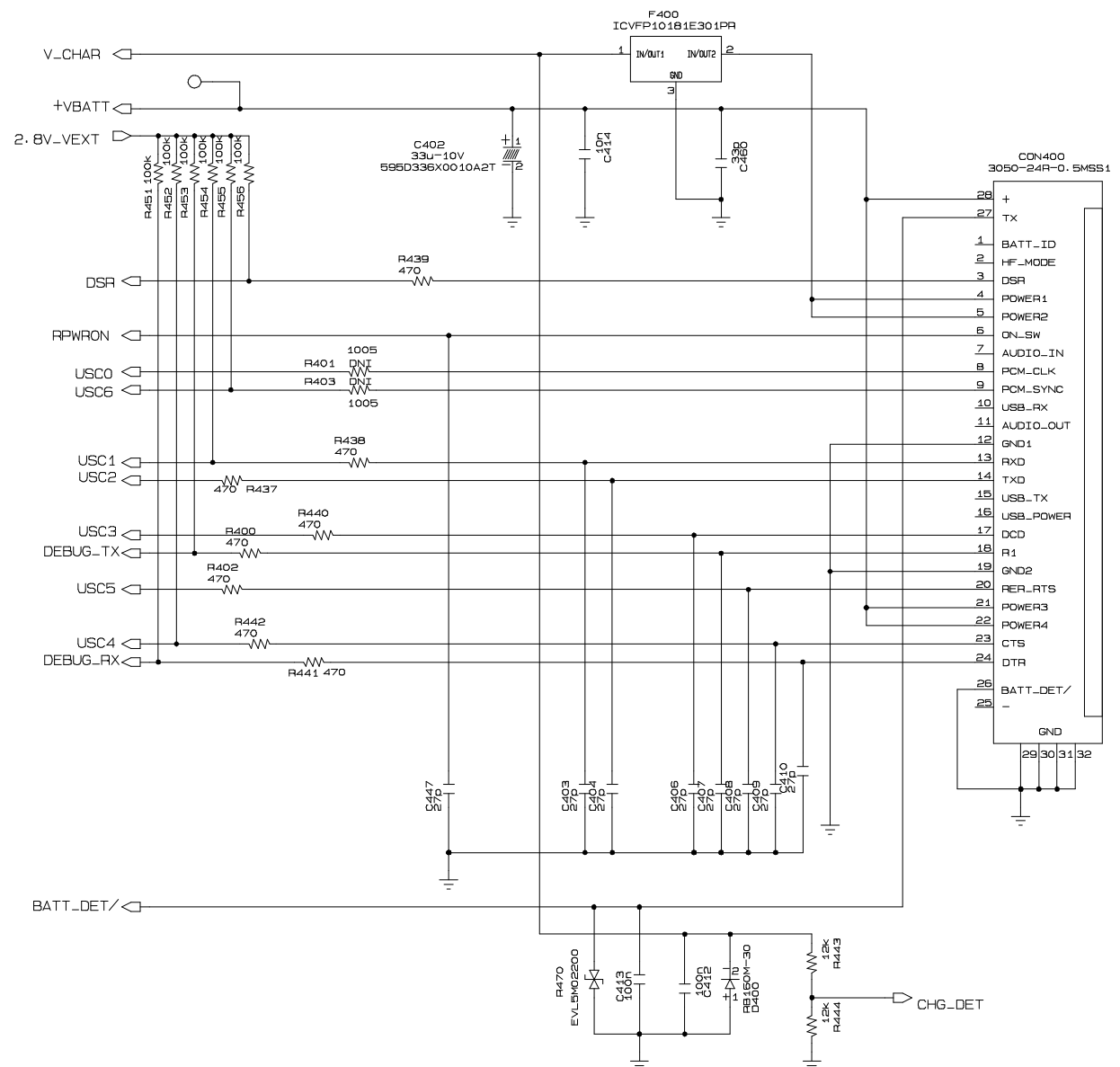
<LCD CONNECTOR>



<SIM SOCKET>



<RECEPTACLE with DC JACK>



A->B

ADD :

MIDI PART

TERMINAL PAD

DELETE :

AUDIO AMP

B->C

ADD :

R463, R470

C473, C474

CHANGE :

C472->R464

C434->R465

C435->R466

C444->R467

C443->R468

C441->R469

C->D

DELETE :

C473, C474

CHANGE :

C412

(1n->0.1u)

C413

(33p->0.1u)

D->1.0

ADD :

R473 R474

R475 R476

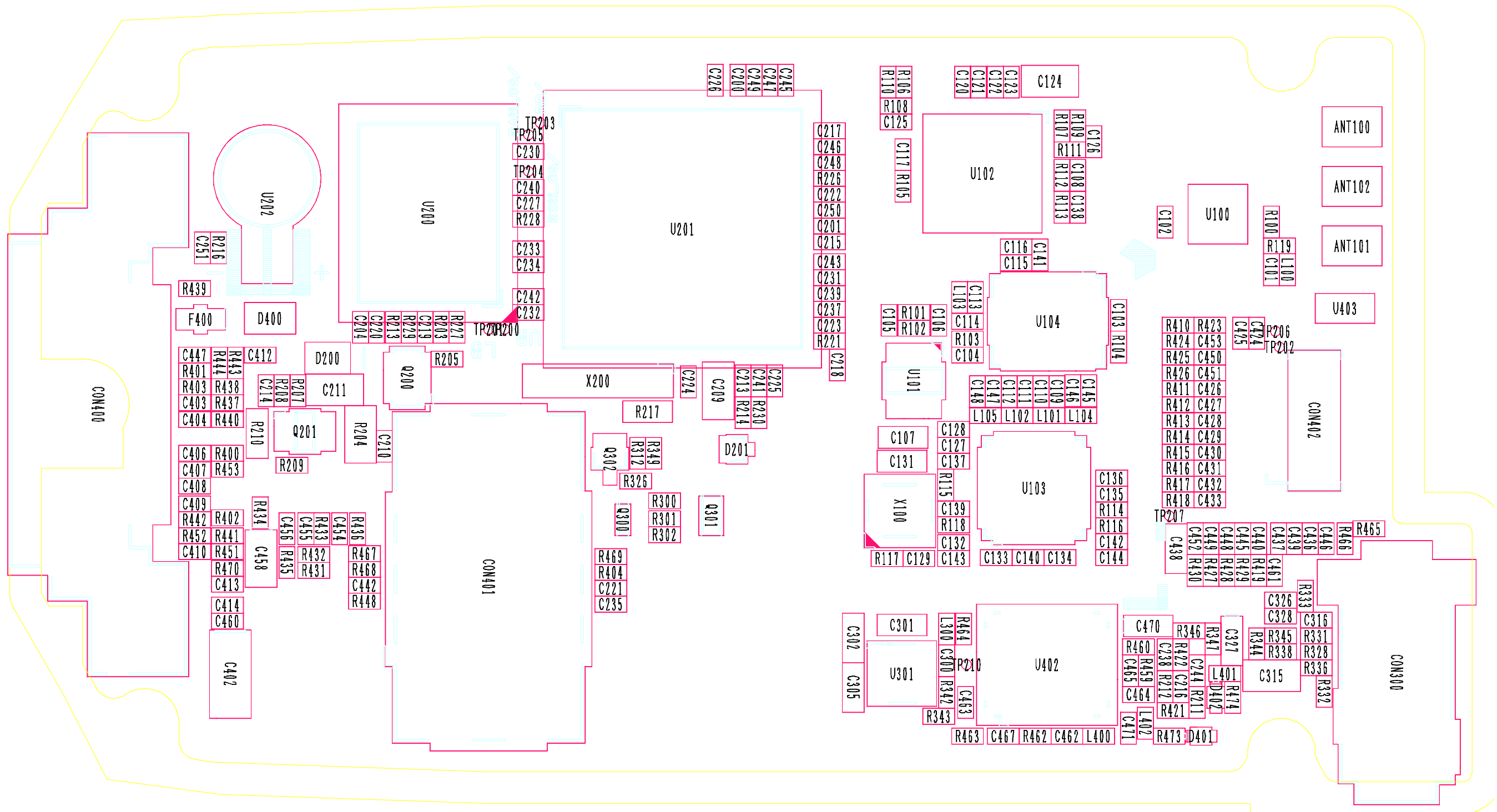
L401 L402

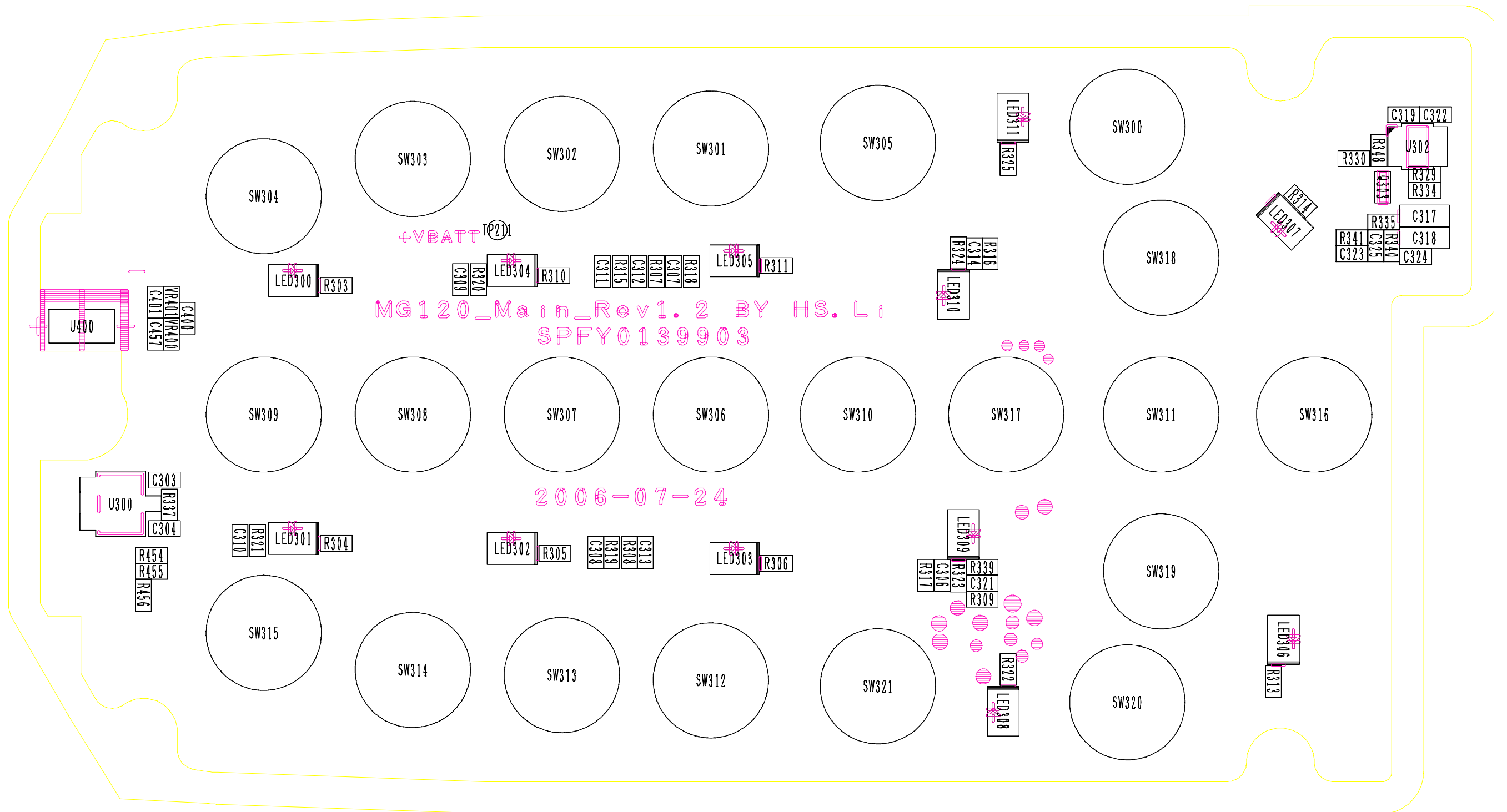
BOM CHANGE

(06.07.22)

R469(100p->200p)

C442(100p->1000p)





MG120_Main_Rev1.2 BY HS. L:
SPFY0139903

2006-07-24

6. ENGINEERING MODE

A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

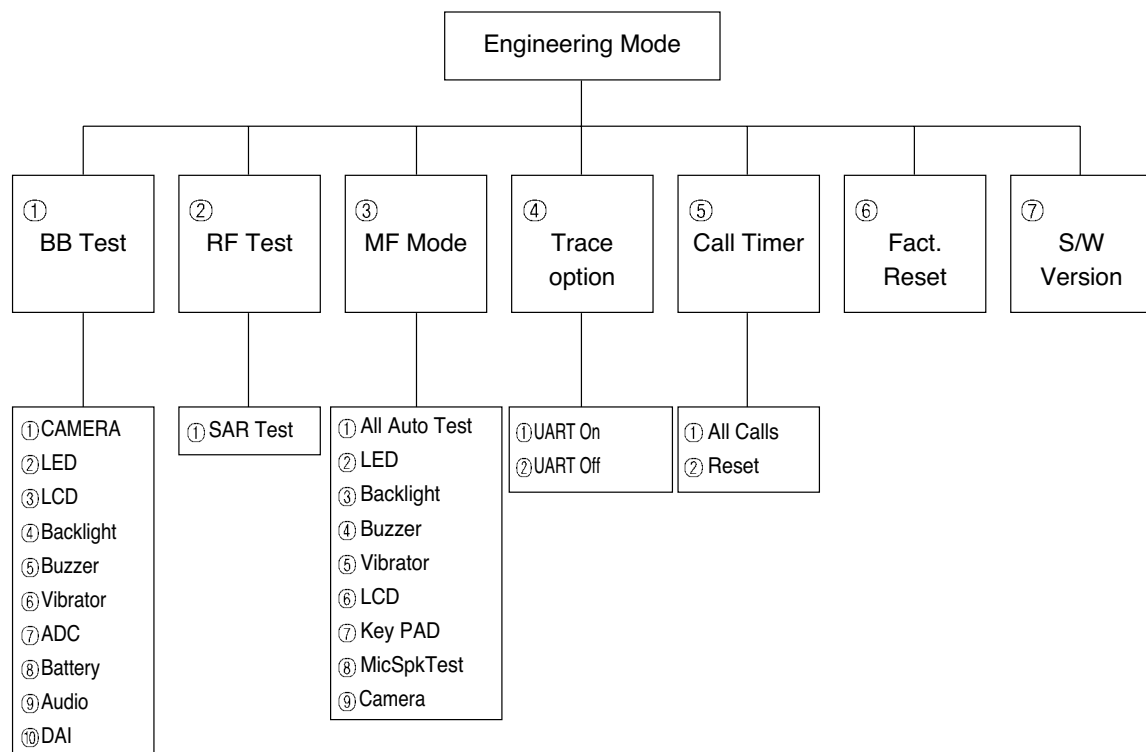
B. Access Codes

The key sequence for switching the engineering mode on is 2945##. Pressing END will switch back to non-engineering mode operation.

C. Key Operation

Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing 'back' key will switch back to the original test menu.

D. Engineering Mode Menu Tree



6. ENGINEERING MODE

6.1 BB Test [MENU 1]

6.1.1 CAMERA

This menu is to test the Camera.

- 1) Main LCD preview : It shows the picture on Main LCD.

6.1.2 LED

This menu is to test the LED.

- 1) Green On
- 2) Green Off
- 3) Red On
- 4) Red Off

6.1.3 LCD

- 1) COLOUR : WHITE, RED, GREEN, BLUE, BLACK
- 2) Contrast Value

6.1.4 Backlight

This menu is to test the LCD Backlight and Keypad EL Backlight.

- 1) Backlight on : LCD Backlight and Keypad EL Backlight light on at the same time.
- 2) Backlight off : LCD Backlight and Keypad EL Backlight light off at the same time.
- 3) Backlight value : This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left/Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

6.1.5 Buzzer

This menu is to test the melody sound.

- 1) Melody on : Melody sound is played through the speaker.
- 2) Melody off : Melody sound is off.

6.1.6 Vibrator

This menu is to test the vibration mode.

- 1) Vibrator on : Vibration mode is on.
- 2) Vibrator off : Vibration mode is off.

6.1.7 ADC (Analog to Digital Converter)

This displays the value of each ADC.

- 1) MVBAT ADC : Main Voltage Battery ADC
- 2) AUX ADC : Auxiliary ADC
- 3) TEMPER ADC : Temperature ADC

6.1.8 BATTERY

- 1) Bat Cal : This displays the value of Battery Calibration.

The following menus are displayed in order : BAT_LEV_4V, BAT_LEV_3_LIMIT, BAT_LEV_2_LIMIT, BAT_LEV_1_LIMIT, BAT_IDLE_LIMIT, BAT_INCALL_LIMIT, SHUT_DOWN_VOLTAGE, BAT_RECHARGE_LMT

- 2) TEMP Cal : This displays the value of Temperature Calibration.

The following menus are displayed in order : TEMP_HIGH_LIMIT, TEMP_HIGH_RECHARGE_LMT, TEMP_LOW_RECHARGE_LMT, TEMP_LOW_LIMIT

6.1.9 Audio

This is a menu for setting the control register of Voiceband Baseband Codec chip.

Although the actual value can be written over, it returns to default value after switching off and on the phone.

- 1) VbControl1 : VbControl1 bit Register Value Setting
- 2) VbControl2 : VbControl2 bit Register Value Setting
- 3) VbControl3 : VbControl3 bit Register Value Setting
- 4) VbControl4 : VbControl4 bit Register Value Setting
- 5) VbControl5 : VbControl5 bit Register Value Setting
- 6) VbControl6 : VbControl6 bit Register Value Setting

6.1.0 DAI (Digital Audio Interface)

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) DAI AUDIO : DAI audio mode
- 2) DAI UPLINK : Speech encoder test
- 3) DAI DOWNLINK : Speech decoder test
- 4) DAI OFF : DAI mode off

6. ENGINEERING MODE

6.2 RF Test [MENU 2]

6.2.1 SAR test

This menu is to test the Specific Absorption Rate.

- 1) SAR test on : Phone continuously process TX only. Call-setup equipment is not required.
- 2) SAR test off : TX process off

6.3 MF mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

6.3.1 All auto test

LCD, Backlight, Vibrator, Buzzer, Key Pad, Mic&Speaker,

6.3.2 Backlight

LCD Backlight is on for about 1.5 seconds at the same time, then off.

6.3.3 Buzzer

This menu is to test the volume of Melody. It rings in the following sequence. Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

6.3.4 Vibrator

Vibrator is on for about 1.5 seconds.

6.3.5 LCD

1)LCD

Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.

6.3.6 Key pad

When a pop-up message shows 'Press Any Key', you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 seconds automatically.

6.3.7 MicSpk Test

The sound from MIC is recorded for about 3 seconds, then it is replayed on the speaker automatically.

6.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

6.5 Call timer [MENU 5]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) All calls : This displays total conversation time. User cannot reset this value.
- 2) Reset settings : This resets total conversation time to this, [00:00:00].

6.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

Attention

- ① Fact. Reset (i.e.Factory Reset) should be only used during the Manufacturing process.
- ② Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

6.7 S/W version

This displays software version stored in the phone.

7. STAND ALONE TEST

7. STAND ALONE TEST

7.1 Introduction

This manual explains how to examine the status of RX and TX of the model.

A. Tx Test

TX test - this is to see if the transmitter of the phones is activating normally.

B. Rx Test

RX test - this is to see if the receiver of the phones is activating normally.

7.2 Setting Method

A. COM port

- a. Move your mouse on the "Connect" button, then click the right button of the mouse and select "Com setting".
- b. In the "Dialog Menu", select the values as explained below.
 - Port : select a correct COM port
 - Baud rate : 38400
 - Leave the rest as default values

B. Tx

1. Selecting Channel

- Select one of GSM or DCS Band and input appropriate channel.

2. Selecting APC

- a. Select either Power level or Scaling Factor.
- b. Power level
 - Input appropriate value GSM (between 5~19) or DCS (between 0~15)
- c. Scaling Factor
 - A 'Ramp Factor' appears on the screen.
 - You may adjust the shape of the Ramp or directly input the values.

C. Rx

1. Selecting Channel

- Select one of GSM or DCS Band and input appropriate channel.

2. Gain Control Index (0~ 26) and RSSI level

- See if the value of RSSI is close to -16dBm when setting the value between 0 ~ 26 in Gain Control Index.
- Normal phone should indicate the value of RSSI close to -16dBm.

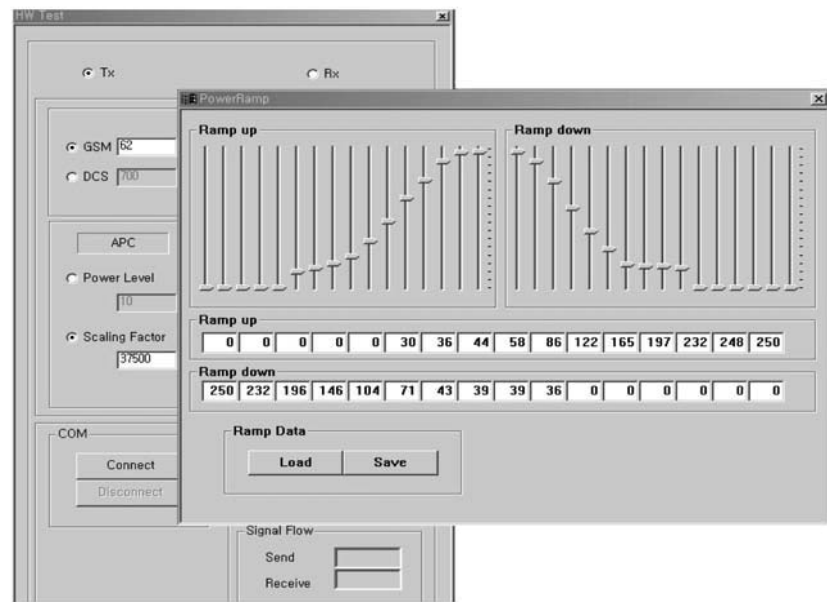
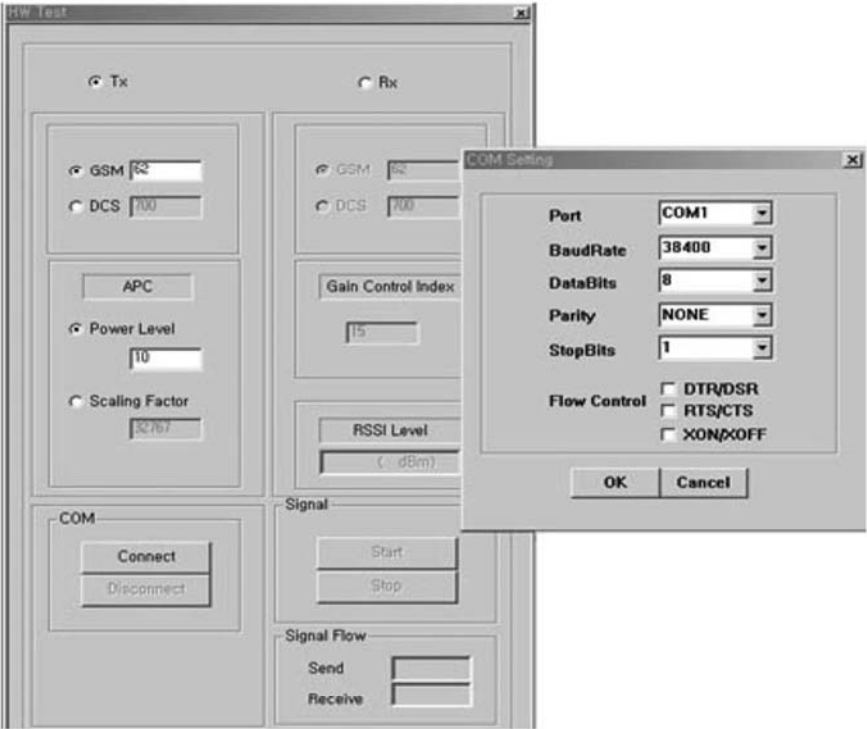
7.3 Means of Test

- Select a COM port
- Set the values in Tx or Rx
- Select band and channel
- After setting them all above, press connect button.
- Press the start button

The screenshot displays the 'HW Test' application window. It features two main configuration panels: 'Tx' (selected) and 'Rx'. Both panels allow selection of GSM or DCS bands with corresponding channel number inputs. The Tx panel includes an 'APC' button, 'Power Level' (selected) with a value of 10, and 'Scaling Factor' with a value of 32767. The Rx panel includes a 'Gain Control Index' with a value of 15 and an 'RSSI Level' input. At the bottom left, a 'COM' section contains 'Connect' and 'Disconnect' buttons. At the bottom right, a 'Signal' section has 'Start' and 'Stop' buttons, and a 'Signal Flow' section with 'Send' and 'Receive' buttons, each accompanied by a text input field.

Section	Option	Value / Label
Tx Configuration	Band	GSM
	Channel	62
	Power Level	10
	Scaling Factor	32767
Rx Configuration	Band	GSM
	Channel	62
	Gain Control Index	15
	RSSI Level	(dBm)
COM Port	Connect / Disconnect	
Signal Control	Start / Stop	
Signal Flow	Send / Receive	

7. STAND ALONE TEST



8. Calibration

8.1.H/W Tool Setup

Tool List	Option	Reference
RF test set	8960/ Agilent	Address 1
Power Supply	66311B/Agilent	Address 2
PC	Only Windolw2000 or WinXP	English Version
PIF Jig	Dip sw mode "ADI"	
GPIB card & Install SW		
GPIB Cable		
RS 232 Cable		
RF Cable	MXGT83QE3000 MURTA	
I/O Cable	EDGE Cable + Connect zender	
Connect cable		

Table8-1 Tool List

8.2 Test Jig Operation

Table 8-2 Test Jig Power

Power Source	Description
Power Supply	usually 4.2V
Travel Adaptor	Use TA, name is TA-22GT2(24pin)

Table 8-3 Test Jig SW Setup

Switch Number	Name	Description
Switch 1	ADI-REMOTE	In ON state, phone is awaked. It is used ADI chipset.
Switch 2	TI-REMOTE	In ON state, phone is awaked. It is used TI chipset.
Switch 3	VBAT	Power is provided for phone from battery
Switch 4	PS	Power is provided for phone from Power supply

8. Calibration

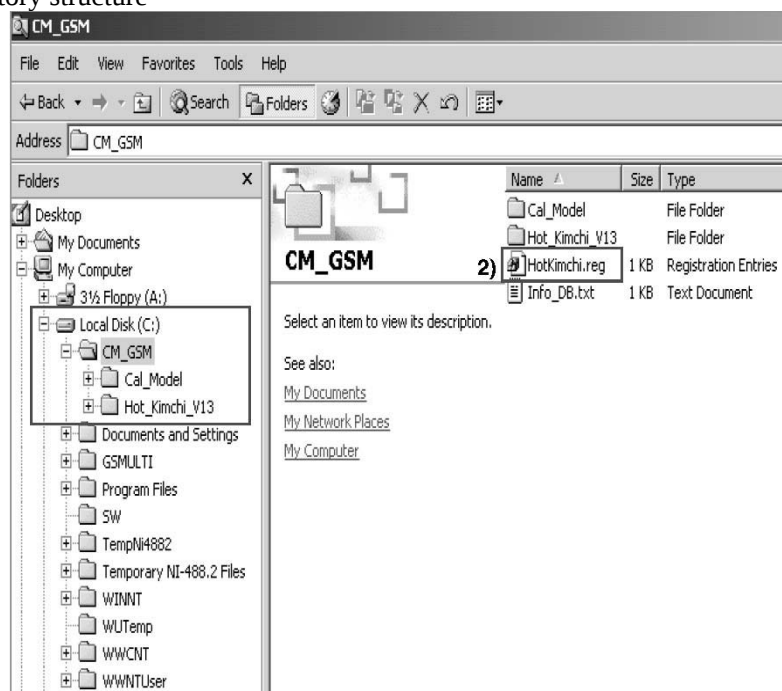
Table 8-4 Test Jig LED

LED Number	Name	Description
LED 1	Power	Power is provided for Test Jig
LED 2	TA	Indicate charging state of the phone battery
LED 3	UART	Indicate data transfer state through the UART port
LED 4	MON	Indicate data transfer state through the MON port

1. Connect RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general
2. Set the Power Supply 4.2V
3. Set the 3rd, 4th of DIP SW ON state always
4. Press the Phone power key, if the Remote ON is used, 1st ON state

8.3 Install & Directory structure

- 1) Copy a Cal. Program in local Disk(C:). This program name is “Hotkimchi”
 - Folder name : Only “CM_GSM”
 - This Cal. Program is on GCSC Website
 - Execute by double click : 3) Directory structure
- 2) Registry of Calibration Program
 - Execute by double click : HotKimchi.reg
- 3) Directory structure

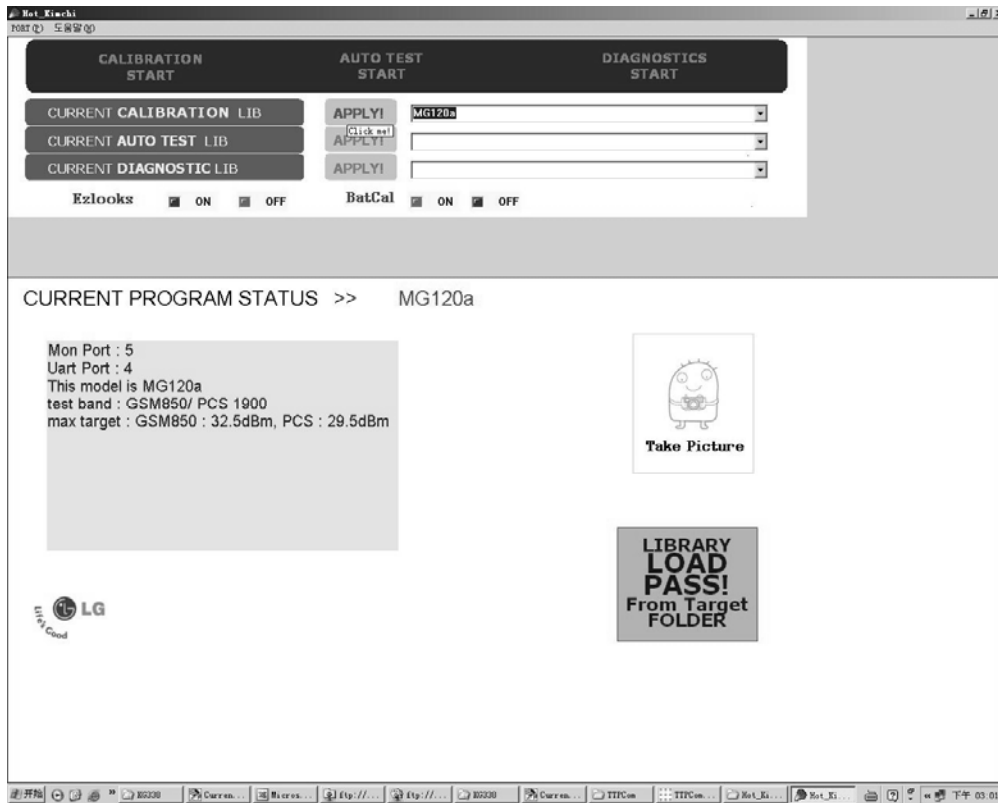


- 4) Copy the director which contains Model file to //CM_GSM/Cal_Model

8.4 Cal. Procedure

- 1) Execute.Hot_Kimchi.exe

8. Calibration



① Click. And choose the model name.

② Click.

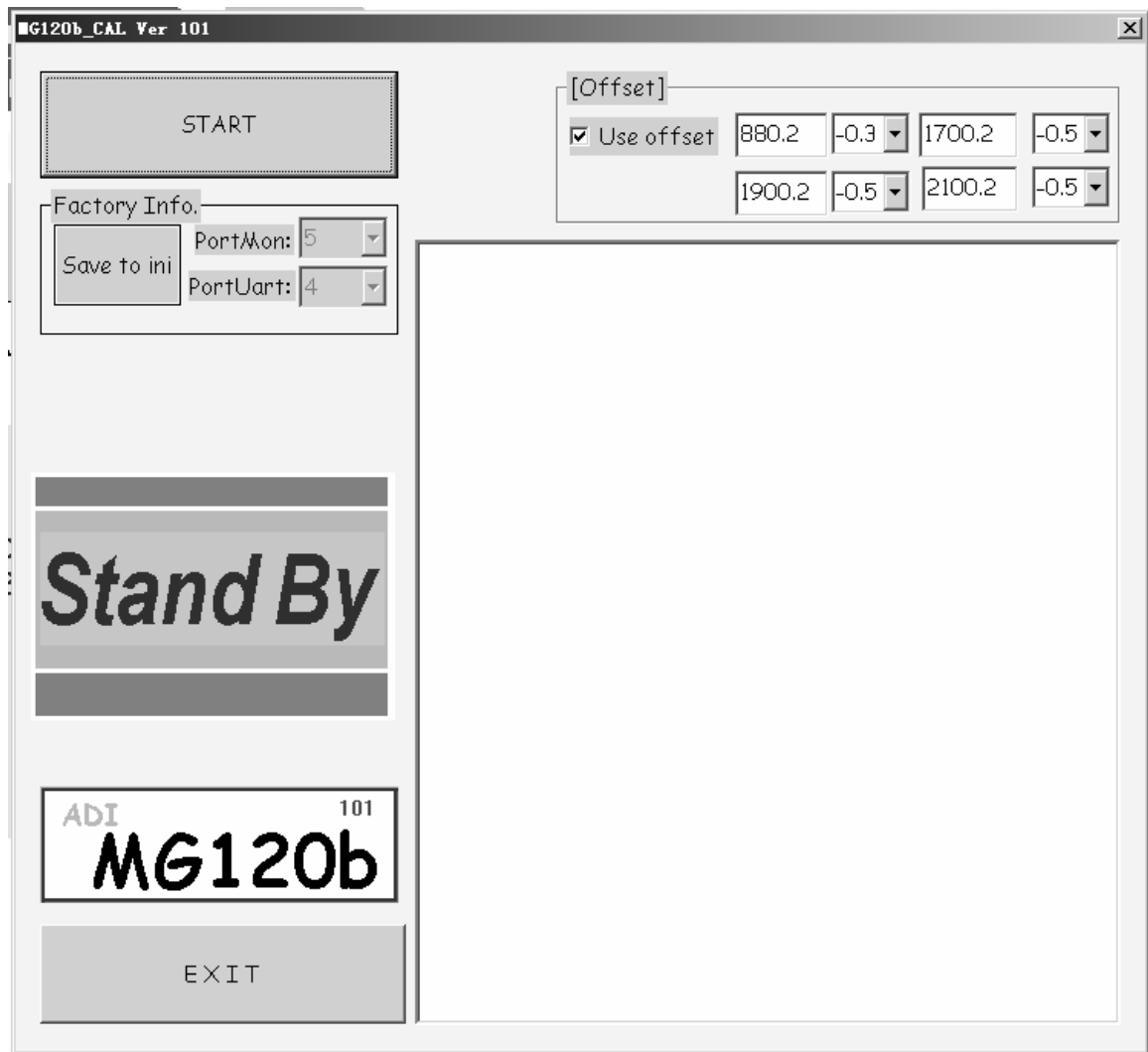
APPLY!

③ Click.

**CALIBRATION
START**

When the left window pop-up,

8. Calibration



first of all turn on the phone.

And then click **Start** button after finishing turn on

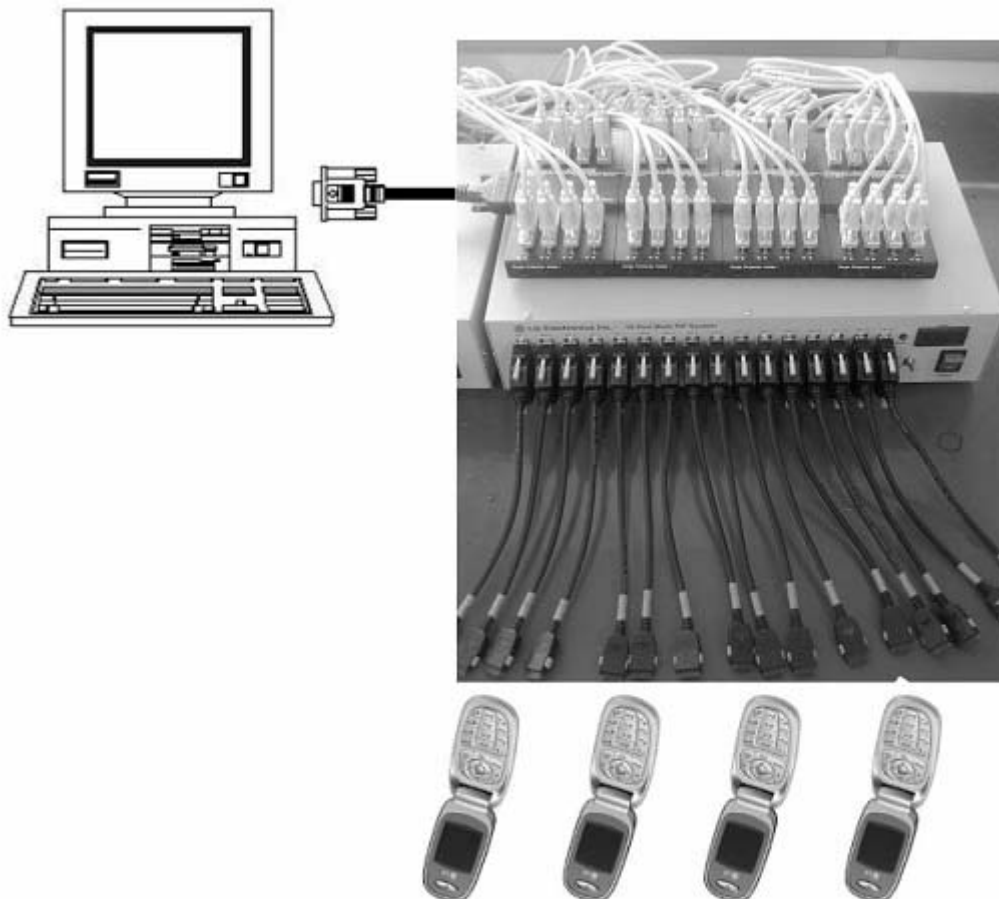
- ④ The software is just progress screen.
Phone is being auto re-start after finishing cal.

9. DOWNLOAD

9.1 Download

A. Download Setup

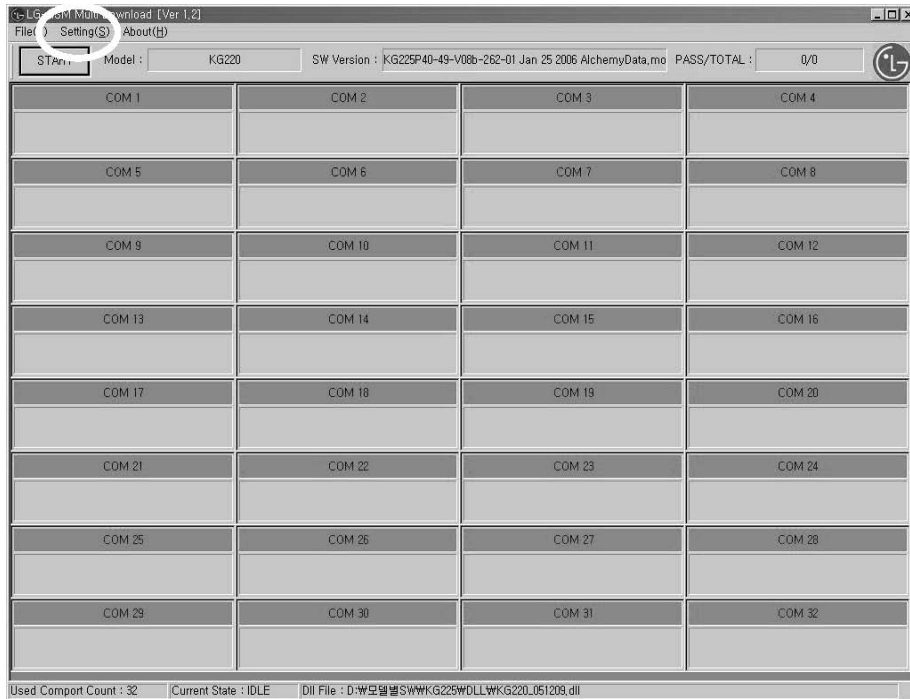
Figure describes Download setup



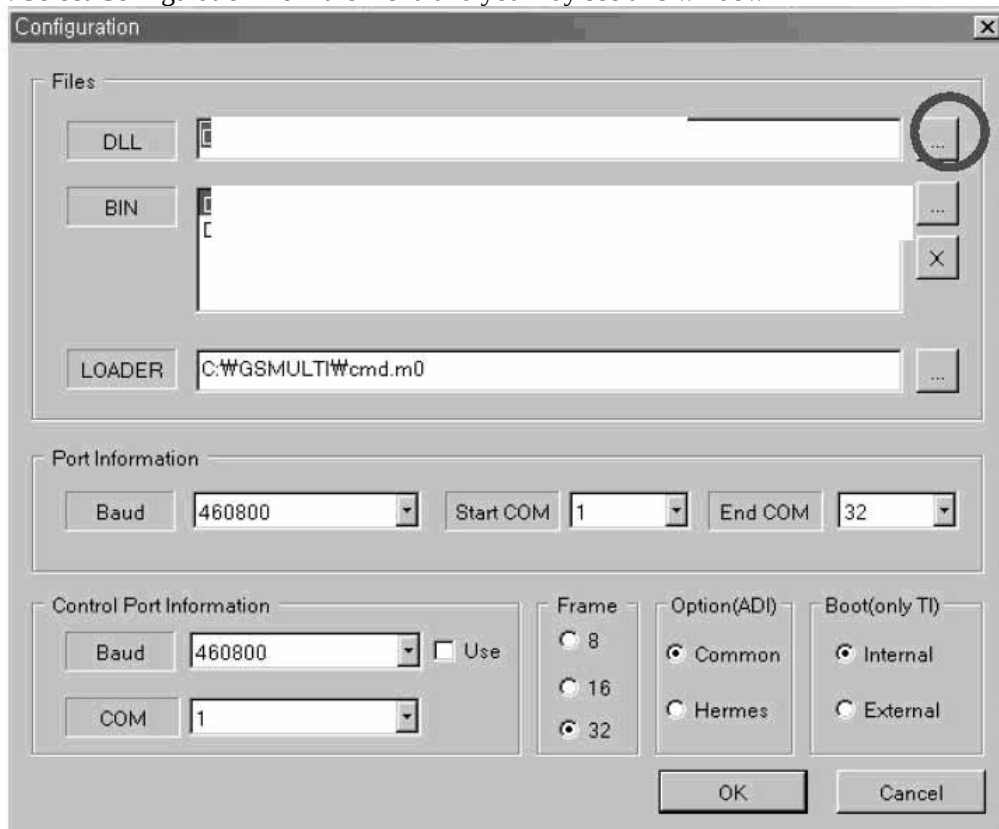
B. Multi Download Procedure

1. Run GSM Multi Download program and select Setting

9. DOWNLOAD



2. Select Configuration from the menu and you may see this window



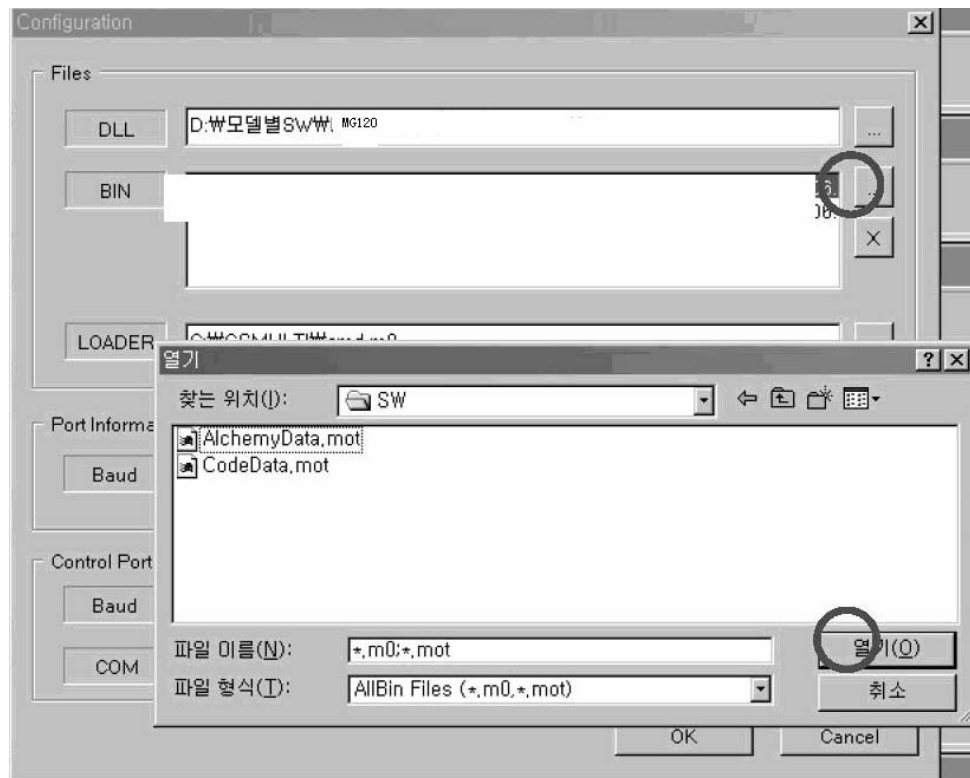
3. Press  key to select the DLL files

4. Press  key to select the mot files

5. Select AlchemyData.mot and press open

9. DOWNLOAD

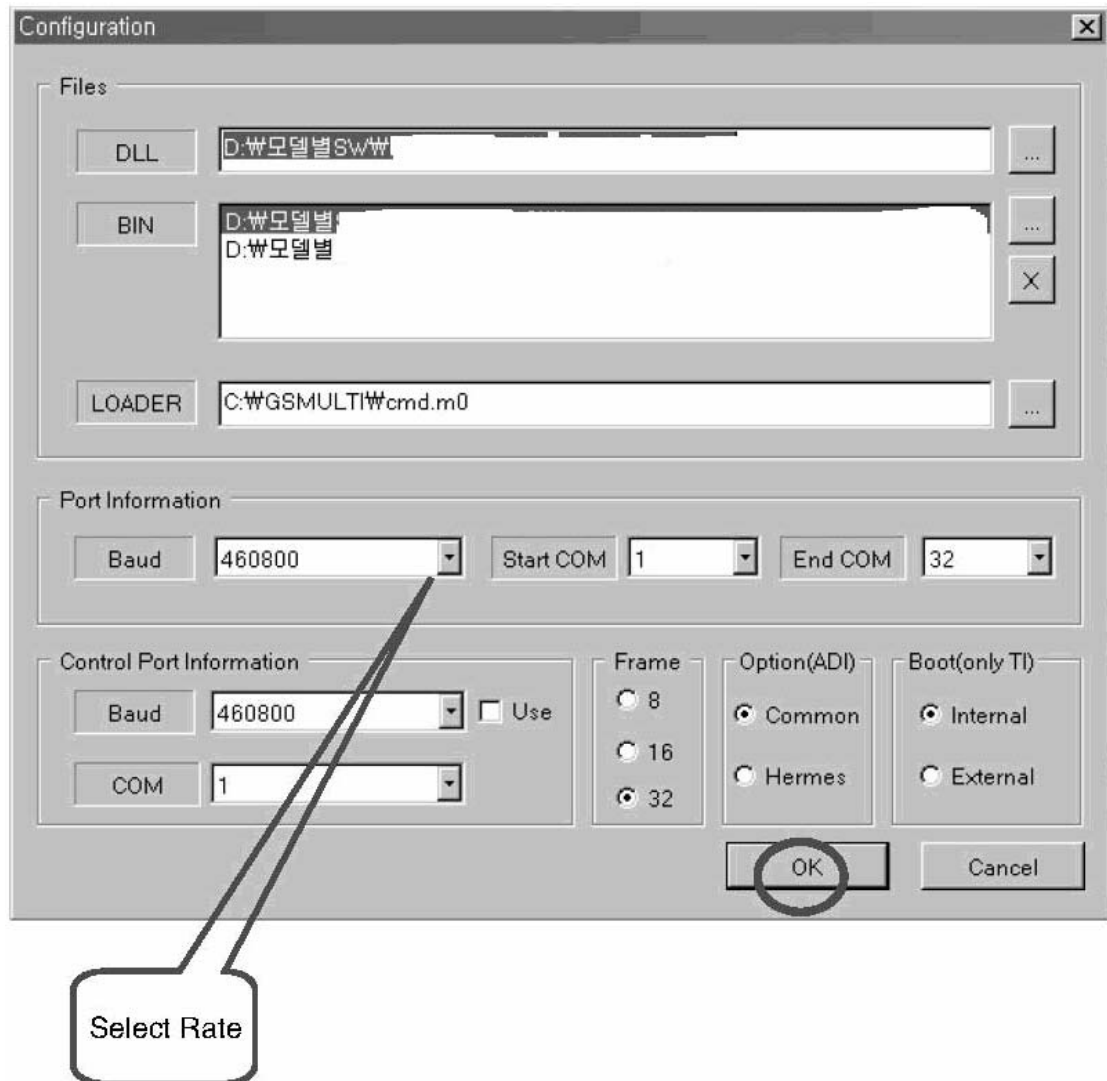
6. Repeat step 4-5 to select CodeData.mot



7. Check if the ADI option is set to Hermes

8. Press OK to end Configuration

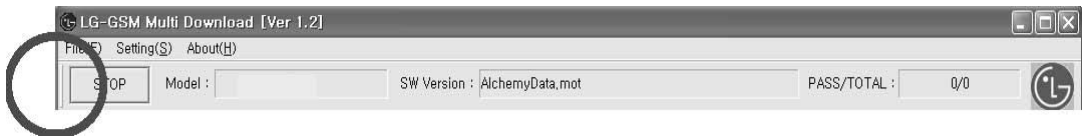
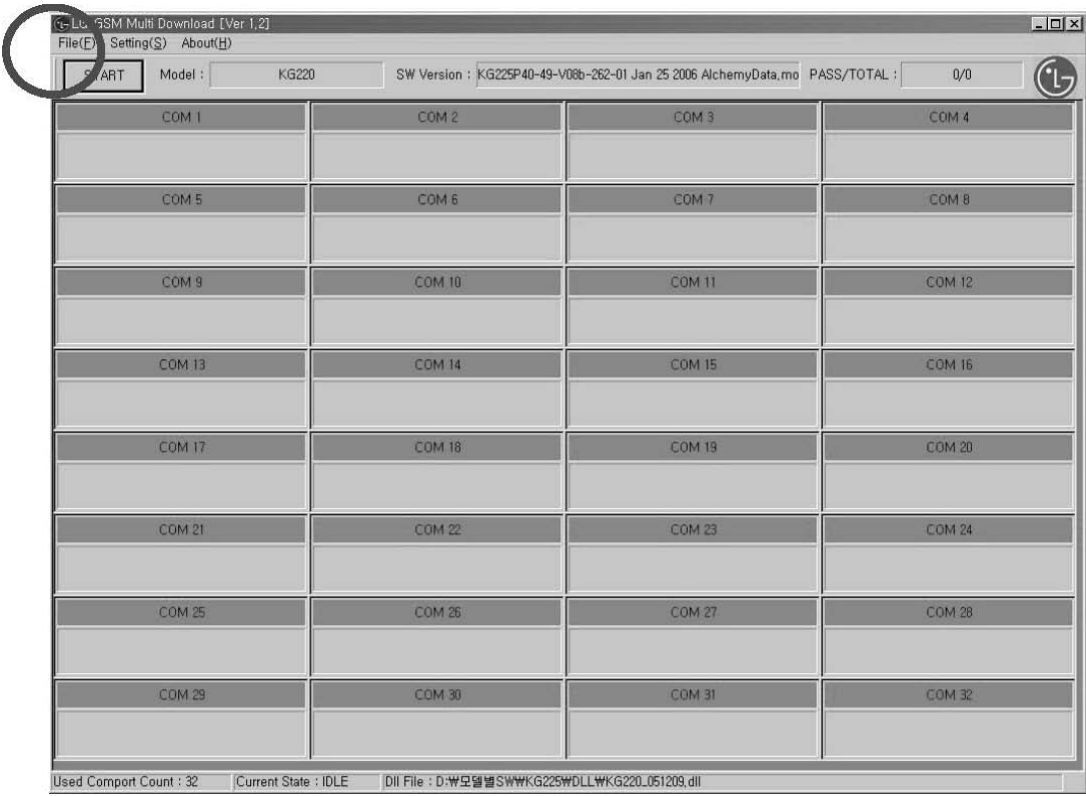
9. DOWNLOAD



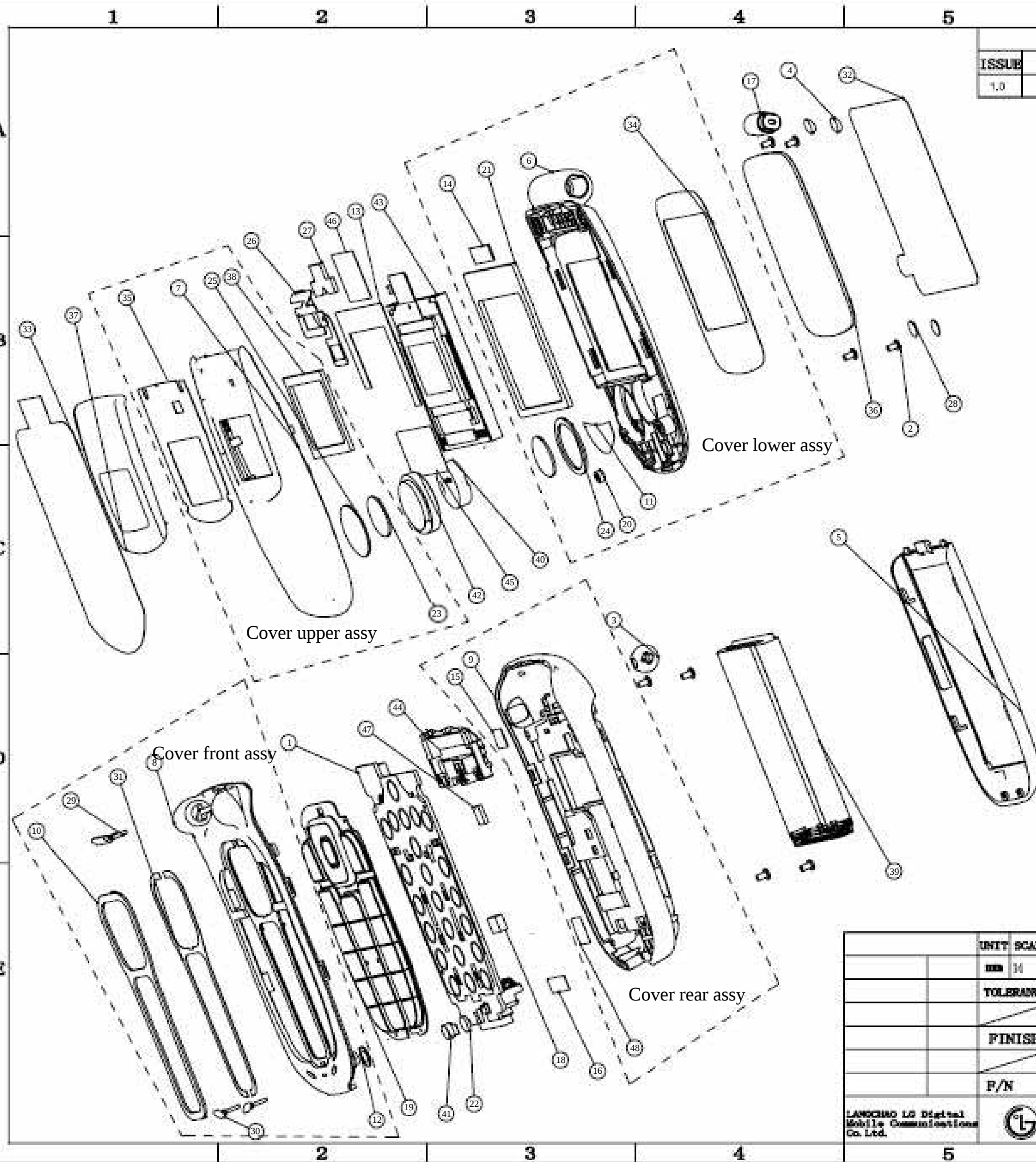
9. Press START to execute download

10. Once downloading is started, press STOP button to keep from re-downloading after downloading is completed.

9. DOWNLOAD



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REVISION				
ISSUE	CONTENTS	ENGINEER	APPROVER	DATE
1.0	1st Drawing	Yu Huiyuan	Kjm Y.M	2008.08.04

48	GASKET_PCB_2	1	MGAZ0041401	
47	GASKET_PCB_1	1	MGAZ0041201	
46	GASKET_LCD	1	MGAZ0041101	
45	INSULATOR,FOLDER	1	MIDA0024101	
44	ANTTENA	1	SNGF0020201	
43	LCD	1	SVLY0026601	
42	SPK	1	SUSY0015501	
41	MIC	1	SUMY0003809	
40	MOTOR	1	SJMY0002601	
39	BATTERY	1	SBPL0086001	
38	FPCB	1	SACE0047001	
37	WINDOW,SUB	1	MWAF0034201	
36	WINDOW LCD (MAIN)	1	MWAF0069501	
35	TAPE,WINDOW(SUB)	1	MTAE0028401	
34	TAPE,WINDOW(MAIN)	1	MTAD0055901	
33	TAPE,PROTELCD(SUB)	1	MTAB0064101	
32	TAPE,PROTELCD(MAIN)	1	MATB0015802	
31	TAPE,DEC,FRONT	1	MTAA0114001	
30	STOPPER,L/R	2	MSGY0016603	
29	STOPER,HINGE	1	MSGB0015003	
28	PLATE,COVER_L/R	2	MPFB0002001	
27	PAD,FPCB	1	MPBA0138501	
26	PAD,LCD(SUB)	1	MPBQ0029101	
25	PAD,RECEIVER(UPPER)	1	MPBM0013601	
24	PAD,RECEIVER(LOWER)	1	MPBM0013101	
23	PAD,MOTOR	2	MPBJ0032601	
22	PAD,MIC	1	MPBH0026901	
21	PAD,LCD(MAIN)	1	MPBG0048701	
20	MAGNET SWITCH	1	MMAA0001601	
19	KEYPAD	1	MKAZ0030203	
18	TAPE INSULATOR	1	MIDZ0107701	
17	HINGE	1	MGFD0003701	
16	GASKET,RECEPTACLE	1	MGAZ0034401	
15	GASKET,CONNECTOR,REAR	1	MGAZ0034301	
14	GASKET,CONNECTOR,LOWER	1	MGAZ0034201	
13	GASKET_LCD_2	1	MGAZ0044901	
12	FILTER,MIC	1	MPBH0026901	
11	FILTER,SPK	1	MFBB0016401	
10	DECO,FRONT	1	MDAG0020903	
9	COVER REAR	1	MCJN0056101	
8	COVER FRONT	1	MCJK0059203	
7	COVER UPPER	1	MCJJ0044801	
6	COVER FOLDER	1	MCJH0035902	
5	COVER BATTERY	1	MCJA0033303	
4	CAP,SCREW	2	MCCH0089902	
3	CAP EARPPHONE	1	MCCH0038203	
2	SCREW MACHINE,BIND	8	GMEY0002001	
1	PCB	1	SAFY0184901	
NO	DESCRIPTION	Q'TY	DRWING NO	REMARK

UNIT	SCALE	NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK
mm	1:1		PARTS INDEX			
TOLERANCE		DATE	NAME	MATERIAL	MG120a TFSDG PHONE	
APP.	20-07-05	Yu Huiyuan				
FINISH	CHGC.			REL DWG		
DESIG.	25-Ju-05	Yu Huiyuan		DWG NAME		
F/N			SIZE	DWG NO.	APEY0369401-MP	
LANCHAO LG Digital Mobile Communications Co. Ltd.			LG		LCLG<24> A-5923	

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Components List

Ref No	Part Name	Part Number	Color	Remark
	GSM(FOLDER)	TGFF0092809	Dark Gray	
AAAY00	ADDITION	AAAY0188001	Without Color	
ACGA00	COVER ASSY,BATTERY	ACGA0016303	BROWN	5
MCJA00	COVER,BATTERY	MCJA0033303	BROWN	
AMBA00	MANUAL ASSY,OPERATION	AMBA0082501	Without Color	
MMBB00	MANUAL,OPERATION	MMBB0224401	Without Color	
SBPL00	BATTERY PACK,LI-ION	SBPL0086002		39
SSAD00	ADAPTOR,AC-DC	SSAD0007873		
APAY00	PACKAGE	APAY0075701	Without Color	
APLY00	PALLET ASSY	APLY0001101	Without Color	
MBEC00	BOX,CARTON	MBEC0000207	Without Color	
MCJZ00	COVER	MCJZ0030501	Without Color	
MPCY00	PALLET	MPCY0013701	Without Color	
MSCY00	SLEEVE	MSCY0001001	Without Color	
MBAD00	BAG,VINYL(PE)	MBAD0005201	DARK BLUE	
MBEE00	BOX,MASTER	MBEE0051801	Without Color	
MBEF	BOX,UNIT	MBEF0112901	Without Color	
MLAC00	LABEL,BARCODE	MLAC0004502	Without Color	
MLAJ00	LABEL,MASTER BOX	MLAJ0004401	Without Color	
MPAD00	PACKING,SHELL	MPAD0005804	Without Color	
APEY00	PHONE	APEY0369401	Without Color	
ACGG00	COVER ASSY,FOLDER	ACGG0075001	BROWN	
ACGH00	COVER ASSY,FOLDER(LOWER)	ACGH0044902	Black	
MCJH00	COVER,FOLDER(LOWER)	MCJH0035902	Black	
MFBB00	FILTER,RECEIVER	MFBB0016401	Black	11
MGAZ00	GASKET	MGAZ0034201	Black	14
MMAA00	MAGNET,SWITCH	MMAA0001601	Silver	20
MPBG00	PAD,LCD	MPBG0048901	Black	
MPBJ00	PAD,MOTOR	MPBJ0032601	Black	23
MPBM00	PAD,RECEIVER	MPBM0013101	Black	24
MTAD00	TAPE,WINDOW	MTAD0055901	Yellow	34
ACGJ00	COVER ASSY,FOLDER(UPPER)	ACGJ0058701	BROWN	7
MCJJ00	COVER,FOLDER(UPPER)	MCJJ0044801	BROWN	
MPBJ00	PAD,MOTOR	MPBJ0032601	Black	
MPBM00	PAD,RECEIVER	MPBM0013601	Black	25
MPBQ00	PAD,LCD(SUB)	MPBQ0029101	Black	26
MTAE00	TAPE,WINDOW(SUB)	MTAE0028401	Yellow	35
ACGK00	COVER ASSY,FRONT	ACGK0074803	Black	8
MCJK00	COVER,FRONT	MCJK0059203	Black	
MDAG00	DECO,FRONT	MDAG0020903	Black	10

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Ref No	Part Name	Part Number	Color	Remark
MPBH00	PAD,MIKE	MPBH0026901	Black	22
MSGB00	STOPPER,HINGE	MSGB0015003	Black	29
MSGY00	STOPPER	MSGY0016603	Black	30
MTAA00	TAPE,DECO	MTAA0114901	Without Color	31
GMEY00	SCREW MACHINE,BIND	GMEY0009201	Black	2
MCCH01	CAP,SCREW	MCCH0089902	Black	4
MGAZ00	GASKET	MGAZ0044901	Yellow	13
MGAZ01	GASKET	MGAZ0041101	Yellow	46
MHFD00	HINGE,FOLDER	MHFD0003701	Without Color	
MIDA00	INSULATOR,LCD	MIDA0024101	Blue	45
MPBZ00	PAD	MPBZ0138501	Black	
MPFB00	PLATE,COVER	MPFB0002001	Black	28
MTAB00	TAPE,PROTECTION	MTAB0110201	Without Color	
MTAB01	TAPE,PROTECTION	MTAB0064101	Without Color	33
MWAC00	WINDOW,LCD	MWAC0069501	Black	36
MWAF00	WINDOW,LCD(SUB)	MWAF0034201	Black	37
BFAA00	FILM,INMOLD	BFAA0043901	Black	
SACY00	PCB ASSY,FLEXIBLE	SACY0052401		
SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0033601		
SJMY00	VIBRATOR,MOTOR	SJMY0007202		40
SUSY00	SPEAKER	SUSY0015501		42
SVLM00	LCD MODULE	SVLM0016702		
	LCD	SVLY0026601		43
SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0047001		38
SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0026101		
ENBY00	CONNECTOR,BOARD TO BOARD	ENBY0022001		
SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0036101		
ENBY00	CONNECTOR,BOARD TO BOARD	ENBY0012301		
SPCY00	PCB,FLEXIBLE	SPCY0094101		
ACGM00	COVER ASSY,REAR	ACGM0076901	BROWN	9
MCJN00	COVER,REAR	MCJN0056101	BROWN	
MGAZ00	GASKET	MGAZ0034301	Black	15
MIDZ00	INSULATOR	MIDZ0107701	Blue	
GMEY00	SCREW MACHINE,BIND	GMEY0009201	Black	
MCCC00	CAP,EARPHONE JACK	MCCC0038203	BROWN	3
MKAZ00	KEYPAD	MKAZ0030203	Black	19
MLAK00	LABEL,MODEL	MLAK0006901		
SAFY00	PCB ASSY,MAIN	SAFY0184301	Without Color	
SAFB	PCB ASSY,MAIN,INSERT	SAFB0066401		
ADCA00	DOME ASSY,METAL	ADCA0052701	White	
MGAZ00	GASKET	MGAZ0034401	Black	16

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Ref No	Part Name	Part Number	Color	Remark
MGAZ01	GASKET	MGAZ0041201	Yellow	47
MGAZ02	GASKET	MGAZ0041401	Yellow	48
MPBH00	PAD,MIKE	MPBH0023401	Black	
SUMY00	MICROPHONE	SUMY0003809		41
SAFF00	PCB ASSY,MAIN,SMT	SAFF0105401		
MLAB00	LABEL,A/S	MLAB0000601	Without Color	
MLAZ00	LABEL	MLAZ0038301	Without Color	
SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0084701		1
C102	CAP,CERAMIC,CHIP	ECCH0000115		
C103	CAP,CHIP,MAKER	ECZH0001116		
C104	CAP,CHIP,MAKER	ECZH0001116		
C105	CAP,CHIP,MAKER	ECZH0001202		
C106	CAP,CHIP,MAKER	ECZH0001215		
C107	CAP,CHIP,MAKER	ECZH0001511		
C108	CAP,CHIP,MAKER	ECZH0000826		
C113	CAP,CHIP,MAKER	ECZH0000830		
C117	CAP,CHIP,MAKER	ECZH0000830		
C120	CAP,CERAMIC,CHIP	ECCH0000155		
C121	CAP,CHIP,MAKER	ECZH0000816		
C122	CAP,CERAMIC,CHIP	ECCH0000113		
C123	CAP,CHIP,MAKER	ECZH0000830		
C124	CAP,CERAMIC,CHIP	ECCH0000393		
C125	CAP,CHIP,MAKER	ECZH0000830		
C126	CAP,CERAMIC,CHIP	ECCH0000110		
C127	CAP,CERAMIC,CHIP	ECCH0000115		
C128	CAP,CERAMIC,CHIP	ECCH0002001		
C129	CAP,CHIP,MAKER	ECZH0001207		
C131	CAP,CERAMIC,CHIP	ECCH0005603		
C132	CAP,CHIP,MAKER	ECZH0000826		
C133	CAP,CHIP,MAKER	ECZH0000826		
C134	CAP,CERAMIC,CHIP	ECCH0000120		
C135	CAP,CERAMIC,CHIP	ECCH0000115		
C136	CAP,CERAMIC,CHIP	ECCH0002001		
C137	CAP,CHIP,MAKER	ECZH0000813		
C138	CAP,CHIP,MAKER	ECZH0000826		
C139	CAP,CERAMIC,CHIP	ECCH0000143		
C140	CAP,CERAMIC,CHIP	ECCH0000120		
C141	CAP,CERAMIC,CHIP	ECCH0000115		
C142	CAP,CHIP,MAKER	ECZH0000826		
C143	CAP,CHIP,MAKER	ECZH0000826		
C144	CAP,CERAMIC,CHIP	ECCH0000143		

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Ref No	Part Name	Part Number	Color	Remark
C145	CAP,CHIP,MAKER	ECZH0000803		
C146	CAP,CHIP,MAKER	ECZH0000803		
C147	CAP,CHIP,MAKER	ECZH0000803		
C148	CAP,CHIP,MAKER	ECZH0000803		
C200	CAP,CERAMIC,CHIP	ECCH0000115		
C201	CAP,CERAMIC,CHIP	ECCH0000120		
C204	CAP,CERAMIC,CHIP	ECCH0002001		
C209	CAP,CERAMIC,CHIP	ECCH0000393		
C210	CAP,CHIP,MAKER	ECZH0001215		
C211	CAP,CHIP,MAKER	ECZH0025501		
C213	CAP,CERAMIC,CHIP	ECCH0002001		
C214	CAP,CERAMIC,CHIP	ECCH0002001		
C215	CAP,CERAMIC,CHIP	ECCH0000120		
C216	CAP,CERAMIC,CHIP	ECCH0000120		
C217	CAP,CERAMIC,CHIP	ECCH0000122		
C218	CAP,CHIP,MAKER	ECZH0001215		
C219	CAP,CERAMIC,CHIP	ECCH0000122		
C220	CAP,CERAMIC,CHIP	ECCH0000122		
C221	CAP,CHIP,MAKER	ECZH0001215		
C222	CAP,CHIP,MAKER	ECZH0001215		
C223	CAP,CHIP,MAKER	ECZH0001215		
C224	CAP,CHIP,MAKER	ECZH0001215		
C225	CAP,CHIP,MAKER	ECZH0001215		
C226	CAP,CHIP,MAKER	ECZH0001215		
C227	CAP,CERAMIC,CHIP	ECCH0000115		
C230	CAP,CERAMIC,CHIP	ECCH0000143		
C231	CAP,CERAMIC,CHIP	ECCH0000120		
C232	CAP,CERAMIC,CHIP	ECCH0000115		
C233	CAP,CERAMIC,CHIP	ECCH0002001		
C234	CAP,CERAMIC,CHIP	ECCH0000115		
C235	CAP,CERAMIC,CHIP	ECCH0002001		
C237	CAP,CERAMIC,CHIP	ECCH0000120		
C238	CAP,CERAMIC,CHIP	ECCH0000120		
C239	CAP,CERAMIC,CHIP	ECCH0000120		
C240	CAP,CERAMIC,CHIP	ECCH0002001		
C241	CAP,CERAMIC,CHIP	ECCH0002001		
C242	CAP,CERAMIC,CHIP	ECCH0002001		
C243	CAP,CERAMIC,CHIP	ECCH0000120		
C244	CAP,CERAMIC,CHIP	ECCH0000120		
C245	CAP,CHIP,MAKER	ECZH0001215		
C246	CAP,CHIP,MAKER	ECZH0001215		

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Ref No	Part Name	Part Number	Color	Remark
C247	CAP,CHIP,MAKER	ECZH0001215		
C248	CAP,CERAMIC,CHIP	ECCH0000120		
C249	CAP,CERAMIC,CHIP	ECCH0000120		
C250	CAP,CHIP,MAKER	ECZH0001215		
C251	CAP,CHIP,MAKER	ECZH0001215		
C300	CAP,CHIP,MAKER	ECZH0001215		
C301	CAP,CHIP,MAKER	ECZH0001501		
C302	CAP,CHIP,MAKER	ECZH0001511		
C305	CAP,CHIP,MAKER	ECZH0001501		
C315	CAP,CERAMIC,CHIP	ECCH0000393		
C316	CAP,CERAMIC,CHIP	ECCH0000120		
C326	CAP,CERAMIC,CHIP	ECCH0000120		
C327	CAP,TANTAL,CHIP,MAKER	ECTZ0005201		
C328	CAP,CERAMIC,CHIP	ECCH0002001		
C402	CAP,TANTAL,CHIP,MAKER	ECTZ0000318		
C403	CAP,CHIP,MAKER	ECZH0000826		
C404	CAP,CHIP,MAKER	ECZH0000826		
C406	CAP,CHIP,MAKER	ECZH0000826		
C407	CAP,CHIP,MAKER	ECZH0000826		
C408	CAP,CHIP,MAKER	ECZH0000826		
C409	CAP,CHIP,MAKER	ECZH0000826		
C410	CAP,CHIP,MAKER	ECZH0000826		
C412	CAP,CERAMIC,CHIP	ECCH0002001		
C413	CAP,CERAMIC,CHIP	ECCH0002001		
C414	CAP,CERAMIC,CHIP	ECCH0000155		
C424	CAP,CHIP,MAKER	ECZH0000826		
C425	CAP,CHIP,MAKER	ECZH0000826		
C426	CAP,CHIP,MAKER	ECZH0000826		
C427	CAP,CHIP,MAKER	ECZH0000826		
C428	CAP,CHIP,MAKER	ECZH0000826		
C429	CAP,CHIP,MAKER	ECZH0000826		
C430	CAP,CHIP,MAKER	ECZH0000826		
C431	CAP,CHIP,MAKER	ECZH0000826		
C432	CAP,CHIP,MAKER	ECZH0000826		
C433	CAP,CHIP,MAKER	ECZH0000826		
C436	CAP,CERAMIC,CHIP	ECCH0002001		
C437	CAP,CHIP,MAKER	ECZH0001215		
C438	CAP,CHIP,MAKER	ECZH0001501		
C439	CAP,CHIP,MAKER	ECZH0000826		
C440	CAP,CHIP,MAKER	ECZH0000826		
C442	CAP,CERAMIC,CHIP	ECCH0002001		

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Ref No	Part Name	Part Number	Color	Remark
C445	CAP,CHIP,MAKER	ECZH0000826		
C446	CAP,CERAMIC,CHIP	ECCH0002001		
C447	CAP,CHIP,MAKER	ECZH0000826		
C448	CAP,CHIP,MAKER	ECZH0000826		
C449	CAP,CHIP,MAKER	ECZH0000826		
C450	CAP,CHIP,MAKER	ECZH0000826		
C451	CAP,CHIP,MAKER	ECZH0000826		
C452	CAP,CHIP,MAKER	ECZH0000826		
C453	CAP,CHIP,MAKER	ECZH0000826		
C454	CAP,CERAMIC,CHIP	ECCH0002001		
C455	CAP,CERAMIC,CHIP	ECCH0000120		
C456	CAP,CERAMIC,CHIP	ECCH0000120		
C458	CAP,TANTAL,CHIP,MAKER	ECTZ0003701		
C460	CAP,CHIP,MAKER	ECZH0000830		
C461	CAP,CHIP,MAKER	ECZH0000826		
C462	CAP,CHIP,MAKER	ECZH0001215		
C463	CAP,CHIP,MAKER	ECZH0001215		
C464	CAP,CERAMIC,CHIP	ECCH0002001		
C465	CAP,CERAMIC,CHIP	ECCH0000187		
C467	CAP,CHIP,MAKER	ECZH0001215		
C470	CAP,TANTAL,CHIP	ECTH0003701		
C471	CAP,CERAMIC,CHIP	ECCH0002001		
CON300	CONN,JACK/PLUG,EARPHONE	ENJE0004301		
CON400	CONNECTOR,I/O	ENRY0003401		
CON401	CONN,SOCKET	ENSY0014301		
CON402	CONNECTOR,BOARD TO BOARD	ENBY0022101		
D200	DIODE,SWITCHING	EDSY0012101		
D201	DIODE,SWITCHING	EDSY0017301		
D400	DIODE,SWITCHING	EDSY0006601		
D401	DIODE,TVS	EDTY0009101		
D402	DIODE,TVS	EDTY0009101		
F400	FILTER,EMI/POWER	SFEY0007101		
L104	INDUCTOR,CHIP	ELCH0010613		
L105	INDUCTOR,CHIP	ELCH0010621		
L300	FILTER,BEAD,CHIP	SFBH0000903		
L400	FILTER,BEAD,CHIP	SFBH0000903		
L401	FILTER,BEAD,CHIP	SFBH0000903		
L402	FILTER,BEAD,CHIP	SFBH0000903		
Q200	TR,FET,P-CHANNEL	EQFP0004201		
Q201	TR,BJT,ARRAY	EQBA0000406		
Q300	TR,BJT,NPN	EQBN0012701		

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Ref No	Part Name	Part Number	Color	Remark
Q301	TR,BJT,PNP	EQBP0004102		
Q302	TR,BJT,NPN	EQBN0007601		
R100	RES,CHIP,MAKER	ERHZ0000401		
R101	RES,CHIP,MAKER	ERHZ0000414		
R102	RES,CHIP,MAKER	ERHZ0000204		
R103	RES,CHIP	ERHY0003301		
R104	RES,CHIP	ERHY0003301		
R105	RES,CHIP,MAKER	ERHZ0000404		
R106	RES,CHIP	ERHY0003501		
R107	RES,CHIP,MAKER	ERHZ0000429		
R108	RES,CHIP,MAKER	ERHZ0000522		
R109	RES,CHIP,MAKER	ERHZ0000457		
R110	RES,CHIP	ERHY0003501		
R111	RES,CHIP,MAKER	ERHZ0000429		
R112	RES,CHIP	ERHY0003301		
R113	RES,CHIP	ERHY0003301		
R114	RES,CHIP,MAKER	ERHZ0000401		
R115	RES,CHIP	ERHY0003301		
R117	RES,CHIP,MAKER	ERHZ0000422		
R118	RES,CHIP,MAKER	ERHZ0000405		
R119	RES,CHIP,MAKER	ERHZ0000401		
R203	RES,CHIP,MAKER	ERHZ0000405		
R204	RES,CHIP	ERHY0001102		
R205	RES,CHIP,MAKER	ERHZ0000464		
R207	RES,CHIP,MAKER	ERHZ0000529		
R208	RES,CHIP,MAKER	ERHZ0000405		
R209	RES,CHIP,MAKER	ERHZ0000404		
R210	RES,CHIP,MAKER	ERHZ0000721		
R211	RES,CHIP,MAKER	ERHZ0000488		
R212	RES,CHIP,MAKER	ERHZ0000488		
R213	RES,CHIP,MAKER	ERHZ0000527		
R214	RES,CHIP,MAKER	ERHZ0000406		
R216	RES,CHIP,MAKER	ERHZ0000404		
R217	RES,CHIP	ERHY0000512		
R221	RES,CHIP,MAKER	ERHZ0000401		
R226	RES,CHIP,MAKER	ERHZ0000320		
R228	RES,CHIP,MAKER	ERHZ0000406		
R229	VARISTOR	SEVY0004101		
R230	VARISTOR	SEVY0003601		
R300	RES,CHIP,MAKER	ERHZ0000443		
R301	RES,CHIP,MAKER	ERHZ0000486		

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Ref No	Part Name	Part Number	Color	Remark
R302	RES,CHIP,MAKER	ERHZ0000488		
R312	RES,CHIP,MAKER	ERHZ0000475		
R328	RES,CHIP,MAKER	ERHZ0000401		
R331	VARISTOR	SEVY0004401		
R332	VARISTOR	SEVY0004401		
R333	VARISTOR	SEVY0004401		
R336	RES,CHIP,MAKER	ERHZ0000466		
R338	RES,CHIP,MAKER	ERHZ0000401		
R342	RES,CHIP,MAKER	ERHZ0000405		
R343	RES,CHIP,MAKER	ERHZ0000404		
R344	RES,CHIP,MAKER	ERHZ0000476		
R345	RES,CHIP,MAKER	ERHZ0000454		
R346	RES,CHIP,MAKER	ERHZ0000401		
R349	RES,CHIP,MAKER	ERHZ0000475		
R400	RES,CHIP,MAKER	ERHZ0000484		
R402	RES,CHIP,MAKER	ERHZ0000484		
R404	RES,CHIP,MAKER	ERHZ0000405		
R410	RES,CHIP,MAKER	ERHZ0000404		
R411	RES,CHIP	ERHY0003301		
R412	RES,CHIP	ERHY0003301		
R413	RES,CHIP	ERHY0003301		
R414	RES,CHIP	ERHY0003301		
R415	RES,CHIP	ERHY0003301		
R416	RES,CHIP	ERHY0003301		
R417	RES,CHIP	ERHY0003301		
R418	RES,CHIP	ERHY0003301		
R419	RES,CHIP	ERHY0003301		
R421	RES,CHIP,MAKER	ERHZ0000488		
R422	RES,CHIP,MAKER	ERHZ0000488		
R424	RES,CHIP	ERHY0003301		
R425	RES,CHIP	ERHY0003301		
R426	RES,CHIP	ERHY0003301		
R427	RES,CHIP	ERHY0003301		
R428	RES,CHIP	ERHY0003301		
R429	RES,CHIP	ERHY0003301		
R430	RES,CHIP	ERHY0003301		
R431	RES,CHIP,MAKER	ERHZ0000401		
R432	RES,CHIP	ERHY0003301		
R433	RES,CHIP	ERHY0003301		
R434	RES,CHIP,MAKER	ERHZ0000404		
R435	RES,CHIP,MAKER	ERHZ0000443		

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Ref No	Part Name	Part Number	Color	Remark
R436	RES,CHIP,MAKER	ERHZ0000443		
R437	RES,CHIP,MAKER	ERHZ0000484		
R438	RES,CHIP,MAKER	ERHZ0000484		
R439	RES,CHIP,MAKER	ERHZ0000484		
R440	RES,CHIP,MAKER	ERHZ0000484		
R441	RES,CHIP,MAKER	ERHZ0000484		
R442	RES,CHIP,MAKER	ERHZ0000484		
R443	RES,CHIP,MAKER	ERHZ0002401		
R444	RES,CHIP,MAKER	ERHZ0002401		
R448	RES,CHIP,MAKER	ERHZ0000401		
R451	RES,CHIP,MAKER	ERHZ0000406		
R452	RES,CHIP,MAKER	ERHZ0000406		
R453	RES,CHIP,MAKER	ERHZ0000406		
R459	RES,CHIP,MAKER	ERHZ0000466		
R460	RES,CHIP,MAKER	ERHZ0000320		
R462	RES,CHIP,MAKER	ERHZ0000456		
R463	VARISTOR	SEVY0003601		
R464	RES,CHIP,MAKER	ERHZ0000441		
R465	VARISTOR	SEVY0003901		
R466	VARISTOR	SEVY0003901		
R467	VARISTOR	SEVY0003601		
R468	VARISTOR	SEVY0003901		
R469	VARISTOR	SEVY0003601		
R470	VARISTOR	SEVY0003901		
U100	CONN,RF SWITCH	ENWY0001801		
U101	IC	EUSY0315401		
U102	PAM	SMPY0008901		
U103	IC	EUSY0223202		
U104	FILTER,SEPERATOR	SFAY0005601		
U200	IC	EUSY0250702		
U201	IC	EUSY0280001		
U202	BATTERY,CELL,LITHIUM	SBCL0001303		
U301	IC	EUSY0193801		
U402	IC	EUSY0306404		
U403	TERMINAL,GROUND	MTCA0001801	YELLOW	
X100	VCTCXO	EXSK0005002		
X200	X-TAL	EXXY0004602		
SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0083701		
C303	CAP,CERAMIC,CHIP	ECCH0000155		
C304	CAP,CHIP,MAKER	ECZH0000813		
C306	CAP,CHIP,MAKER	ECZH0000813		

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Ref No	Part Name	Part Number	Color	Remark
C307	CAP,CHIP,MAKER	ECZH0000813		
C308	CAP,CHIP,MAKER	ECZH0000813		
C309	CAP,CHIP,MAKER	ECZH0000813		
C310	CAP,CHIP,MAKER	ECZH0000813		
C311	CAP,CHIP,MAKER	ECZH0000813		
C312	CAP,CHIP,MAKER	ECZH0000813		
C313	CAP,CHIP,MAKER	ECZH0000813		
C314	CAP,CHIP,MAKER	ECZH0000813		
C317	CAP,TANTAL,CHIP,MAKER	ECTZ0005201		
C318	CAP,TANTAL,CHIP,MAKER	ECTZ0005201		
C319	CAP,CHIP,MAKER	ECZH0001215		
C321	CAP,CHIP,MAKER	ECZH0000813		
C322	CAP,CHIP,MAKER	ECZH0001215		
C324	CAP,CERAMIC,CHIP	ECCH0000120		
C325	CAP,CERAMIC,CHIP	ECCH0002001		
C400	CAP,CERAMIC,CHIP	ECCH0000120		
C401	CAP,CERAMIC,CHIP	ECCH0000120		
C457	CAP,CERAMIC,CHIP	ECCH0000120		
LED300	DIODE,LED,CHIP	EDLH0011601		
LED301	DIODE,LED,CHIP	EDLH0011601		
LED302	DIODE,LED,CHIP	EDLH0011601		
LED303	DIODE,LED,CHIP	EDLH0011601		
LED304	DIODE,LED,CHIP	EDLH0011601		
LED305	DIODE,LED,CHIP	EDLH0011601		
LED306	DIODE,LED,CHIP	EDLH0011601		
LED307	DIODE,LED,CHIP	EDLH0011601		
LED308	DIODE,LED,CHIP	EDLH0011601		
LED309	DIODE,LED,CHIP	EDLH0011601		
LED310	DIODE,LED,CHIP	EDLH0011601		
LED311	DIODE,LED,CHIP	EDLH0011601		
Q303	TR,BJT,PNP	EQBP0006701		
R303	RES,CHIP	ERHY0003501		
R304	RES,CHIP	ERHY0003501		
R305	RES,CHIP	ERHY0003501		
R306	RES,CHIP	ERHY0003501		
R307	RES,CHIP,MAKER	ERHZ0000484		
R308	RES,CHIP,MAKER	ERHZ0000484		
R309	RES,CHIP,MAKER	ERHZ0000404		
R310	RES,CHIP	ERHY0003501		
R311	RES,CHIP	ERHY0003501		

11. Appendix

Ref No	Part Name	Part Number	Color	Remark
R313	RES,CHIP	ERHY0003501		
R314	RES,CHIP	ERHY0003501		
R315	RES,CHIP,MAKER	ERHZ0000484		
R316	RES,CHIP,MAKER	ERHZ0000484		
R317	RES,CHIP,MAKER	ERHZ0000484		
R318	RES,CHIP,MAKER	ERHZ0000484		
R319	RES,CHIP,MAKER	ERHZ0000484		
R320	RES,CHIP,MAKER	ERHZ0000484		
R321	RES,CHIP,MAKER	ERHZ0000484		
R322	RES,CHIP	ERHY0003501		
R323	RES,CHIP	ERHY0003501		
R324	RES,CHIP	ERHY0003501		
R325	RES,CHIP	ERHY0003501		
R329	RES,CHIP,MAKER	ERHZ0000401		
R330	RES,CHIP,MAKER	ERHZ0000505		
R334	RES,CHIP,MAKER	ERHZ0000404		
R335	RES,CHIP,MAKER	ERHZ0000443		
R339	RES,CHIP,MAKER	ERHZ0000484		
R340	RES,CHIP,MAKER	ERHZ0000438		
R348	RES,CHIP,MAKER	ERHZ0000406		
R454	RES,CHIP,MAKER	ERHZ0000406		
R455	RES,CHIP,MAKER	ERHZ0000406		
R456	RES,CHIP,MAKER	ERHZ0000406		
SPFY00	PCB,MAIN	SPFY0139901		
U300	IC	EUSY0194002		
U302	IC	EUSY0315001		
VR400	VARISTOR	SEVY0004101		
VR401	VARISTOR	SEVY0004101		
SPFY00	PCB,MAIN	SPFY0139901		
WSYY00	SOFTWARE	WSYY0462501		
SNGF00	ANTENNA,GSM,FIXED	SNGF0021301		44