LG Electronics Inc.

SERVICE MANUAL MODEL : G5200 / W5200

LG

GSM Phone
SERVICE MANUAL

MODEL : G5200/W5200

P/N : MMBD0015801

JUNE, 2002

Table Of Contents

1. INTRODUCTION 4

1.1 Purpose 4
1.2 Regulatory Information 4
A. Security 4
B. Incidence of Harm 4
C. Changes in Service 4
D. Maintenance Limitations 4
E. Notice of Radiated Emissions 5
F. Pictures 5
G. Interference and Attenuation 5
H. Electrostatic Sensitive Devices 5
1.3 Abbreviations 6

2. PERFORMANCE 8

2.1 H/W Feature 8
2.2 Technical Specification 9

3. TECHNICAL BRIEF 13

3.1 General Descreption 13
3.2 Receiver 13
A. RF front end 14
B. Demodulator and baseband processing 14
C. DC Offset Compensation 14
3.3 Transmitter Part 15
A. IF Modulator 15
B. OPLL 16
C. Synthesizer 16
D. TX APC Part 17
E. Power Amplifier 17
3.4 13 MHz Clock 18
3.5 Power Supplies and Control Signals 18
3.6 Digital Main Processor 19
3.7 Analog Main Processor 24
3.8 Power Management 26
3.9 Memories 28
3.10 Display and Interfaces 28
3.11 Keypad Switches and Scanning 29
3.12 Microphone 30
3.13 Earpiece 31
3.14 Hands-free Interface 32
3.15 Headset Jack Interface 32
3.16 Key Back-light Illumination 32
3.17 LCD Back-light Illumination 33
3.18 Multi-Color LED Illumination 33
3.19 Speaker & MIDI IC 34

4. TROUBLE SHOOTING 35

4.1 RF Components 35
4.2 Tx Trouble 44
4.3 Power on Trouble 60
4.4 Charging Trouble 62
4.5 LCD Trouble 64
4.6 Receiver Trouble 66
4.7 Speaker Trouble 69
4.8 Mic Trouble 72
4.9 Vibrator Trouble 75
4.10 Backlight Trouble 77
4.11 Folder on/off Trouble 79
4.12 SIM Detect Trouble 81
4.13 Earphone Trouble 83
4.14 HFK Trouble 87

5. ASSEMBLY INSTRUCTION 95

5.1 Disassembly 95

6. DOWNLOAD 102

6.1 Download Setup 102
6.2 Download Procedure 103

7. BLOCK DIAGRAM 106
7.1 Main Board 106
7.2 FPCB 107
7.3 RF 107

8. CIRCUIT DIAGRAM 109
8.1 Baseband Interface 109
8.2 MIDI 110
8.3 KYE, I/F & LCD CON 111
8.4 RF 112

9. PCB LAYOUT 113

10. ENGINEERING MODE 115
10.1 BB Test [MENU 1] 115
10.2 RF Test [MENU 2] 117
10.3 MF Mode [MENU 3] 118
10.4 Trace option [MENU 4] 119
10.5 Call Timer [MENU 5] 119
10.6 Fact. Reset [MENU 6] 119
10.7 S/W version [MENU 7] 119

11. STAND ALONE TEST 120
11.1 Introduction 120
11.2 Setting Method 120
11.3 Means of Test 120

12. AUTO CALIBRATION 121
12.1 Overview 121
12.2 Requirements 121
12.3 Menu and settings 121
12.4 AGC 123
12.5 APC 123
12.6 ADC 123
12.7 Setting 123
12.8 How to do calibration 123

13. EXPLODED VIEW & REPLACEMENT PART LIST 124
13.1 Exploded View 124
13.2 Accessories 126
13.3 Replacement Part List 127

REVISED HISTORY

DATE	ISSUE	CONTENTS OF CHANGES	S/W VERSION
APRIL/2002	ISSUE 1	Initial Release	

* The information in this manual is subject to change without notice and should not be construed as a commitment by LGE Inc. Furthermore, LGE Inc. reserves the right, without notice, to make changes to equipment design as advances in engineering and manufacturing methods warrant.
* This manual provides the information necessary to install, program, operate and maintain the G5200.

1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the G5200.

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. LGE 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. LGE 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 G5200 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 the G5200 must be performed only by the LGE or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

The G5200 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

An G5200 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 milliwatt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
EL	Electroluminescence
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIB	General Purpose Interface Bus
GPRS	General Packet Radio Service
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 Diodet
G5200	LG GSM Phone
LGE	LG Electronics
OPLL	Offset Phase Locked Loop
PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loopr
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
STMR	Side Tone Masking Rating
TA	Travel Adapter

TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

2. PERFORMANCE

2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-ion, 750 mAh Size: 41 ×73.9 ×5mm Weight: 22 g	
AVG TCVR Current	GSM , EGSM: 243 mA, DCS: 209 mA	
Stand by Current	< 4 mA	
Talk time	Up to 3 hours (GSM TX Level 7)	
Stand by time	Up to 200 hours (Paging Period: 9, RSSI: -85 dBm)	
Charging time	2 hours 30mins	
RX Sensitivity	GSM, EGSM: -108 dBm, DCS: -107 dBm	
TX output power	GSM, EGSM: 32 dBm (Level 5) DCS: 29.5 dBm (Level 0)	
GPRS compatibility	Class 10 (This only applies to G5200)	
SIM card type	3V Small	
Display	128 × 128 dots LCD(Main) , 96 × 64 dotsLCD(Sub)	
Status Indicator	Soft icons Key Pad 0 ~ 9, #, *, Navigation Key, Up/Down Side Key Side Key, Confirm Key, Clear Key , Hot Key) Send Key, END/PWR Key	
ANT	External	
EAR Phone Jack	Yes	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data and Fax	Yes	
Vibrator	Yes	
Receiver	Yes	
Roud Speaker	Yes	
Voice Recoding	Yes	
C-Mike	Yes	
Travel Adapter	Yes	
Options	Hands-free kit, CLA, Data Kit	

2.2 Technical Specification

<table>
<tr><th>Item</th><th>Description</th><th colspan="6">Specification</th></tr>
<tr><td>1</td><td>Frequency Band</td><td colspan="6">GSM
• TX: 890 + n × 0.2 MHz
• RX: 935 + n × 0.2 MHz (n = 1 ~ 124)
EGSM
• TX: 890 + (n – 1024) × 0.2 MHz
• RX: 935 + (n – 1024) × 0.2 MHz (n = 975 ~ 1024)
DCS
• TX: 1710 + (n – 512) × 0.2 MHz
• Rx: 1805 + (n – 512) × 0.2 MHz (n = 512 ~ 885)</td></tr>
<tr><td>2</td><td>Phase Error</td><td colspan="6">RMS < 5 degrees
Peak < 20 degrees</td></tr>
<tr><td>3</td><td>Frequency Error</td><td colspan="6">< 0.1 ppm</td></tr>
<tr><td rowspan="20">4</td><td rowspan="20">Power Level</td><td colspan="6">GSM, EGSM</td></tr>
<tr><td>Level</td><td>Power</td><td>Toler.</td><td>Level</td><td>Power</td><td>Toler.</td></tr>
<tr><td>5</td><td>33 dBm</td><td>±2dB</td><td>13</td><td>17 dBm</td><td>±3dB</td></tr>
<tr><td>6</td><td>31 dBm</td><td>±3dB</td><td>14</td><td>15 dBm</td><td>±3dB</td></tr>
<tr><td>7</td><td>29 dBm</td><td>±3dB</td><td>15</td><td>13 dBm</td><td>±3dB</td></tr>
<tr><td>8</td><td>27 dBm</td><td>±3dB</td><td>16</td><td>11 dBm</td><td>±5dB</td></tr>
<tr><td>9</td><td>25 dBm</td><td>±3dB</td><td>17</td><td>9 dBm</td><td>±5dB</td></tr>
<tr><td>10</td><td>23 dBm</td><td>±3dB</td><td>18</td><td>7 dBm</td><td>±5dB</td></tr>
<tr><td>11</td><td>21 dBm</td><td>±3dB</td><td>19</td><td>5 dBm</td><td>±5dB</td></tr>
<tr><td>12</td><td>19 dBm</td><td>±3dB</td><td></td><td></td><td></td></tr>
<tr><td colspan="6">DCS</td></tr>
<tr><td>Level</td><td>Power</td><td>Toler.</td><td>Level</td><td>Power</td><td>Toler.</td></tr>
<tr><td>0</td><td>30 dBm</td><td>±2dB</td><td>8</td><td>14 dBm</td><td>±3dB</td></tr>
<tr><td>1</td><td>28 dBm</td><td>±3dB</td><td>9</td><td>12 dBm</td><td>±4dB</td></tr>
<tr><td>2</td><td>26 dBm</td><td>±3dB</td><td>10</td><td>10 dBm</td><td>±4dB</td></tr>
<tr><td>3</td><td>24 dBm</td><td>±3dB</td><td>11</td><td>8 dBm</td><td>±4dB</td></tr>
<tr><td>4</td><td>22 dBm</td><td>±3dB</td><td>12</td><td>6 dBm</td><td>±4dB</td></tr>
<tr><td>5</td><td>20 dBm</td><td>±3dB</td><td>13</td><td>4 dBm</td><td>±4dB</td></tr>
<tr><td>6</td><td>18 dBm</td><td>±3dB</td><td>14</td><td>2 dBm</td><td>±5dB</td></tr>
<tr><td>7</td><td>16 dBm</td><td>±3dB</td><td>15</td><td>0 dBm</td><td>±5dB</td></tr>
</table>

2. PERFORMANCE

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	GSM, EGSM	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600 ~ <1,200	-60
		1,200 ~ <1,800	-60
		1,800 ~ <3,000	-63
		3,000 ~ <6,000	-65
		6,000	-71
		DCS	
		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)	GSM, EGSM	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-19
		600	-21
		1,200	-21
		1,800	-24
		GSM	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-22
		600	-24
		1,200	-24
		1,800	-27
7	Spurious Emissions	Conduction, Emission Status	

<table>
<tr><th>Item</th><th>Description</th><th colspan="3">Specification</th></tr>
<tr><td>8</td><td>Bit Error Ratio</td><td colspan="3">GSM, EGSM
BER (Class II) < 2.439% @-102 dBm
DCS
BER (Class II) < 2.439% @-100 dBm</td></tr>
<tr><td>9</td><td>RX Level Report Accuracy</td><td colspan="3">±3 dB</td></tr>
<tr><td>10</td><td>SLR</td><td colspan="3">8 ±3 dB</td></tr>
<tr><td rowspan="10">11</td><td rowspan="10">Sending Response</td><td>Frequency (Hz)</td><td>Max.(dB)</td><td>Min.(dB)</td></tr>
<tr><td>100</td><td>-12</td><td>-</td></tr>
<tr><td>200</td><td>0</td><td>-</td></tr>
<tr><td>300</td><td>0</td><td>-12</td></tr>
<tr><td>1,000</td><td>0</td><td>-6</td></tr>
<tr><td>2,000</td><td>4</td><td>-6</td></tr>
<tr><td>3,000</td><td>4</td><td>-6</td></tr>
<tr><td>3,400</td><td>4</td><td>-9</td></tr>
<tr><td>4,000</td><td>0</td><td>-</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>12</td><td>RLR</td><td colspan="3">2 ±3 dB</td></tr>
<tr><td rowspan="11">13</td><td rowspan="11">Receiving Response</td><td>Frequency (Hz)</td><td>Max.(dB)</td><td>Min.(dB)</td></tr>
<tr><td>100</td><td>-12</td><td>-</td></tr>
<tr><td>200</td><td>0</td><td>-</td></tr>
<tr><td>300</td><td>2</td><td>-7</td></tr>
<tr><td>500</td><td>*</td><td>-5</td></tr>
<tr><td>1,000</td><td>0</td><td>-5</td></tr>
<tr><td>3,000</td><td>2</td><td>-5</td></tr>
<tr><td>3,400</td><td>2</td><td>-10</td></tr>
<tr><td>4,000</td><td>2</td><td></td></tr>
<tr><td colspan="3">* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.</td></tr>
<tr><td>14</td><td>STMR</td><td colspan="3">13 ±5 dB</td></tr>
<tr><td>15</td><td>Stability Margin</td><td colspan="3">> 6 dB</td></tr>
<tr><td rowspan="9">16</td><td rowspan="9">Distortion</td><td colspan="2">dB to ARL (dB)</td><td>Level Ratio (dB)</td></tr>
<tr><td colspan="2">-35</td><td>17.5</td></tr>
<tr><td colspan="2">-30</td><td>22.5</td></tr>
<tr><td colspan="2">-20</td><td>30.7</td></tr>
<tr><td colspan="2">-10</td><td>33.3</td></tr>
<tr><td colspan="2">0</td><td>33.7</td></tr>
<tr><td colspan="2">7</td><td>31.7</td></tr>
<tr><td colspan="2">10</td><td>25.5</td></tr>
<tr><td>17</td><td>Side Tone Distortion</td><td colspan="3">Three stage distortion < 10%</td></tr>
<tr><td>18</td><td>System frequency (13 MHz) tolerance</td><td colspan="3">≤ 2.5 ppm</td></tr>
</table>

2. PERFORMANCE

<table>
<tr><th>Item</th><th>Description</th><th colspan="2">Specification</th></tr>
<tr><td>19</td><td>32.768KHz tolerance</td><td colspan="2">≤ 30 ppm</td></tr>
<tr><td>20</td><td>Power Consumption</td><td colspan="2">Full power
< 243 mA (GSM, EGSM) ; < 209 mA (DCS)

Standby
- Normal < 4 mA (Max. power)</td></tr>
<tr><td>21</td><td>Talk Time</td><td colspan="2">GSM/ Level 7 (Battery Capacity 750mA): Up to 180 Min
GSM/ Level 12 (Battery Capacity 750mA): Up to 300 Min</td></tr>
<tr><td>22</td><td>Standby Time</td><td colspan="2">Under conditions, Up to 200 hours:
1. Brand new and full 750mAh battery
2. Full charge, no receive/send and keep GSM in idle mode.
3. Broadcast set off.
4. Signal strength display set at 3 level above.
5. Backlight of phone set off.</td></tr>
<tr><td>23</td><td>Ringer Volume</td><td colspan="2">At least 80 dB under below conditions:
1. Ringer set as ringer.
2. Test distance set as 50 cm</td></tr>
<tr><td>24</td><td>Charge Voltage</td><td colspan="2">Fast Charge : < 500 mA
Slow Charge: < 60 mA</td></tr>
<tr><td rowspan="7">25</td><td rowspan="7">Antenna Display</td><td>Antenna Bar Number</td><td>Power</td></tr>
<tr><td>5</td><td>-85 dBm ~</td></tr>
<tr><td>4</td><td>-90 dBm ~ -86 dBm</td></tr>
<tr><td>3</td><td>-95 dBm ~ -91 dBm</td></tr>
<tr><td>2</td><td>-100 dBm ~ -96 dBm</td></tr>
<tr><td>1</td><td>-105 dBm ~ -101 dBm</td></tr>
<tr><td>0</td><td>~ -105 dBm</td></tr>
<tr><td rowspan="5">26</td><td rowspan="5">Battery Indicator</td><td>Battery Bar Number</td><td>Voltage</td></tr>
<tr><td>0</td><td>~ 3.62 V</td></tr>
<tr><td>1</td><td>3.62 ~ 3.73 V</td></tr>
<tr><td>2</td><td>3.73 ~ 3.82 V</td></tr>
<tr><td>3</td><td>3.82 V ~</td></tr>
<tr><td rowspan="2">27</td><td rowspan="2">Low Voltage Warning</td><td colspan="2">3.5 ± 0.03 V (Call)</td></tr>
<tr><td colspan="2">3.62 ± 0.03 V (Standby)</td></tr>
<tr><td>28</td><td>Forced shut down Voltage</td><td colspan="2">3.35 ± 0.03 V</td></tr>
<tr><td>29</td><td>Battery Type</td><td colspan="2">1 Li-ion Battery
Standard Voltage = 3.7 V
Battery full charge voltage = 4.2 V
Capacity: 750 mAh</td></tr>
<tr><td>30</td><td>Travel Charger</td><td colspan="2">Switching-mode charger
Input: 100 ~ 240 V, 50/60 Hz
Output: 5.2 V, 600 mA</td></tr>
</table>

3. TECHNICAL BRIEF

3.1 General Descreption

The RF parts consists of a transmitter part,a receiver part,a synthesizer part,a voltage supply part,a VCTCXO part. And the main RF Chipset CX74017[U411]is a single-chip dual-band transceiver for the extended global system for mobile communication[E- GSM900MHz]/Digital communication system[DCS1800MHz] voice and data transfer applications.

This device integrated a direct conversion receiver architecture, which eliminates the need of Intermediate Frequency, a transmitter based on a modulation loop architecture and fractional-N synthesizer part with built in TXVCO and Local-VCO.

3.2 Receiver

The Receiver part in CX74017 contains all active circuits completely, full receiver chain with the exception of discrete front-end RF SAW filters. The filtered and amplified signal is down converted in the RF-mixer to the baseband output. The receiver path is supported by internal channel filtering.

The RF front-end circuit is shown Figure 3-1.

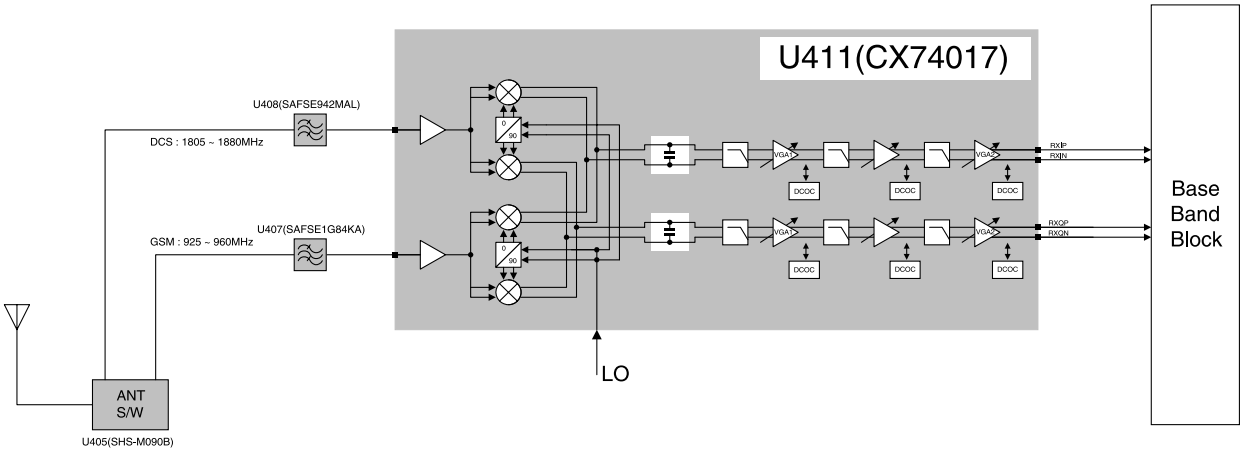


Figure 3-1. RF front-end circuit.

A. RF front end

RF front end consists of Antenna Switch(U405), dual band LNAs integrated in transceiver(U411). The Received RF signals (GSM 925MHz ~ 960MHz, DCS 1805MHz ~ 1880MHz) are fed into the antenna or mobile switch. An antenna matching circuit is between the antenna and the mobile switch.

The Antenna Switch (U405) is used to control the Rx and TX paths. And, the input signals VC1 and VC2 of a U405 are connected to 2-Input AND Gates(U401) to switch either TX or RX path on. When the RX path is turned on, the received RF signal then feeds either Rx_900_RF or RX_1800_RF path selected by GSM-RX and DCS-RX respectively. This Rx_900_RF path contains one SAW filter, followed after the Antenna Switch (U405), to filter any unwanted signal apart from the DCS RX band. And, the RX_1800_RF path is the same case.

The logic and current for Antenna Switch is given below Table 3-1.

Table 3-1. The logic and current

	VC1	VC2	Current
GSM TX	0 V	2.7 V	10.0 mA max
DCS TX	2.7 V	0 V	10.0 mA max
GSM/DCS RX	0 V	0 V	< 0.1 mA

These two paths are then connected to the LNAGSMN (#11) and LNADCSIN (#13) of CX74017 (U411), respectively. A low-noise bipolar RF amplifier, contained within the U411, amplifies the RF signal. The RF signals from the front-end pass to the receiver mixers within the U411 device.

B. Demodulator and baseband processing

In direct conversion receiver there is only one mixer down-converting received RF signal to BB signal directly. The gain down converting mixer is 40dB at high gain mode and 22dB at low gain mode.

The Rx gain setting is done in the AGC algorithm. The nominal gain of the receiver is set as a function of the expected signal strength at the antenna input so that a desired level is reached at the Rx I/Q. 7 blocks in the receiver chain have variable gains, LNA, Mixer, LPF1, VGA1, gmC Filter, Auxiliary gain control and VGA2. The gain settings can be adjustable via 3-wire bus control lines.

The baseband signals pass via integrated low-pass filters to the baseband A/D converters.

The remainder of the channel filtering is performed by the baseband chipset. The demodulator contains switches to maintain the sense of the baseband I/Q outputs with respect to the incoming RF signal on both GSM900 and DCS 1800.

C. DC Offset Compensation

Three correction loops ensure that DC offsets, generated in the CX74017, do not overload the baseband chain at any point.

After compensation, the correction voltages are held on capacitors for the duration of the receive slot(s). A rising edge on the RXEN signal, selected via the serial interface, placed the DC compensation circuitry in the track mode.

3.3 Transmitter Part

The Transmitter part contains CX74017 active parts and PAM, APC IC, coupler and Antenna Switch. The CX74017 active part consists of a vector modulator and offset phase-locked loop block(OPLL) including down-converter, phase detector, loop filter and dual band transmit VCO which can operate at either final RF output frequency. The RF GMSK outputs from the transmit VCO are fed directly to the RF power amplifiers.

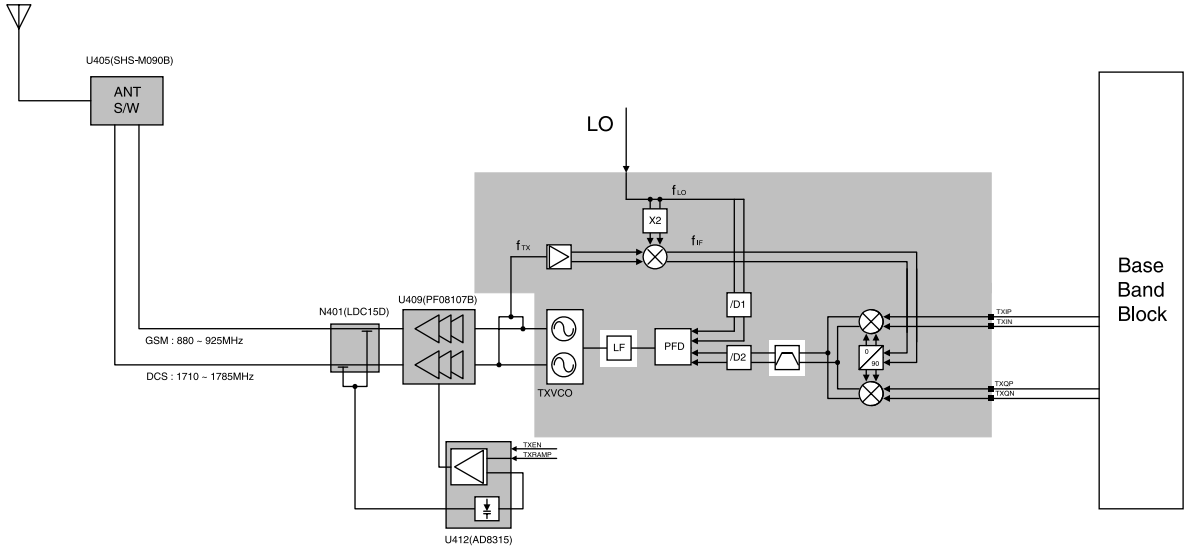


Figure 3-2. Transmitter Block diagram

The peak output power and the profile of the transmitted burst are controlled by means of a closed feedback loop. A dual band directional coupler is used to sample the RF output from either PA. The PA outputs from the directional coupler pass to the antenna connector via Antenna Switch.

A. IF Modulator

The baseband converter(BBC) within the GSM chipset generates I and Q baseband signals for the transmit vector modulator. The modulator provides more than 40dBc of carrier and unwanted side-band rejection and produces a GMSK modulated signal. The baseband software is able to cancel out differential DC offsets in the I/Q baseband signals caused by imperfections in the D/A converters.
The TX-Modulator implements a quadrature modulator. The IF-frequency input signal is split into two precise orthogonal carriers, which are multiplied by the baseband modulation signal IT/ITX and QT/QTX. It is used as reference signal for the OPLL.

B. OPLL

The offset mixer down converts the feedback Tx RF signal using LO to generate a IF modulating signal. The IF signal goes via external passive bandpass filter to one port of the phase detector.

The other side of the phase detector input is LO signal. The phase detector generates an error current proportional to the phase difference between the modulated signal from the offset mixer and the reference signal from the LO.

The error current is filtered by a second order low-pass filter to generate an output voltage which depends on the GMSK modulation and the desired channel frequency. This voltage controls the transmit VCO such that the VCO output signal, centered on the correct RF channel, is frequency modulated with the original GMSK data. The OPLL acts as a tracking narrowband band pass filter tuned to the desired channel frequency. This reduces the wideband noise floor of the modulation and up-conversion process and provides significant filtering of spurious products.

C. Synthesizer

The CX74017 includes a fully integrated UHF VCO with an on-chip LC tank.

A single sigma-delta fractional-N synthesizer can phase lock the local osillator used in both transmit and receive path to a precision frequency reference input. Fractional-N operation offers low phase noise and fast setting times, allowing for multiple slot applications such as GPRS.

The generated frequency is given by the following equation

$$f_{VCO} = \frac{\left(N + 3.5 + \frac{FN}{2^{22}}\right) f_{ref}}{R}$$

where : f_{VCO} = Generated VCO frequency

N = N-divider ratio integer part

FN = Fractional setting

R = R-divider ratio

f_{VCO} = Reference Frequency

The counter and mode settings of the synthesizer are also programmed via 3-wire interface.

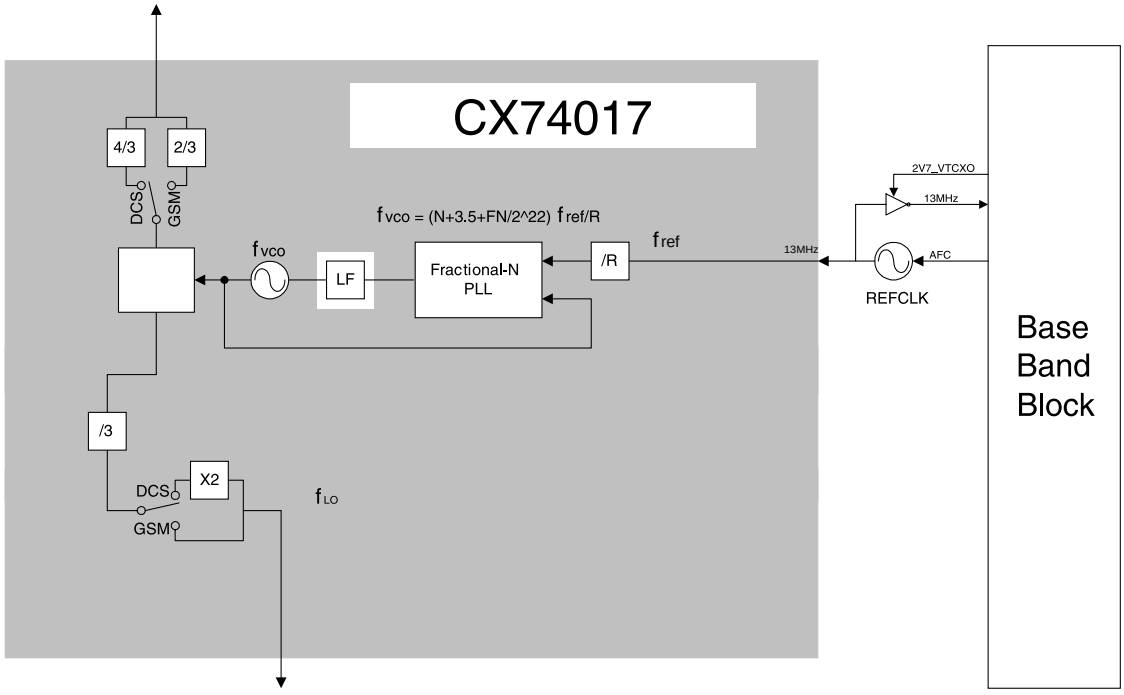


Figure 3-3. Synthesizer Block diagram

D. TX APC Part

The AD8315[U412] is a dual band RF power controller for RF power amplifiers operating in the 850MHz to 2GHz range.

The AD8315[U412] controls the power output of the selected RF channel. RF power is controlled by driving the RF amplifier power control pins and sensing the resultant RF output power via a directional coupler. The RF sense voltage is peak detected using an on-chip Schottky diode.

This detected voltage is compared to the DAC voltage at the VSET pin to control the output power.

An internal input signal[TXRAMP] is applied to the positive input of the AD8315 amplifier during the TXEN mode and a directional coupler near the antenna feeds a portion of the RF output signal back to the AD8315 peak detector converts this signal to a low frequency feedback signal that balances the amplifier when this signal equals the RAMP input signal level.

E. Power Amplifier

The PF08107B[U409] is Dual band amplifier for E-GSM(880 to 915MHz) and DCS1800(1710 to 1785MHz). The efficiency of module is the 50% at nominal output power for E-GSM and the 43% at 32dBm for DCS1800. This module should be operated under the GSM burst pulse. To avoid permanent degradation, CW operation should not be applied. To avoid the oscillation at no input power, before the input is cut off, the control voltage Vapc should be control to less than 0.5V.

We have to improve thermal resistance, the through holes should be layouted as many as possible on PCB under the module. And to get good stability, all the GND terminals and the metal cap should be soldered to ground plane of PCB.

3.4 13 MHz Clock

The 13 MHz clock (VC-TCXO-208C) consists of a TCXO (Temperature Compensated Crystal Oscillator) which oscillates at a frequency of 13 MHz.

It is used within the CX74017 RF Main Chip, BB Analog chip-set (AD6521), and Digital (AD6522).

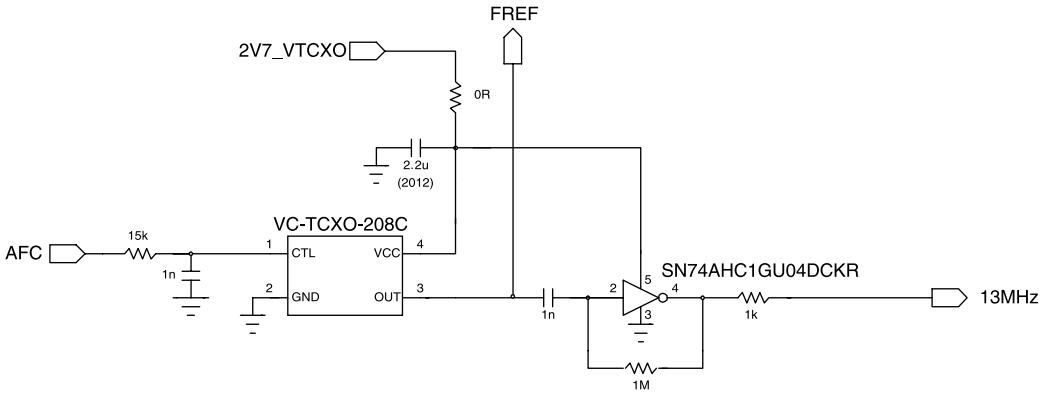


Figure 3-4. VCTCXO Circuit.

3.5 Power Supplies and Control Signals

There are two regulators used in the phone to provide RF power. One is contained inside of ADP3408 (U101), power management IC to provide the power for the VCTXO (X302). The other is used to provide the power for remaining RF circuits.

Table 3-2.

Regulator	Voltage	Powers	Enable Signal
Regulator 1 (U1, 2V7_VTCXO)	2.7 V ± 0.5 V	VCTXO	
Regulator 2 (U414, RF2V8)	2.85 V ± 0.5 V	RF circuitry	VSYNTHEN

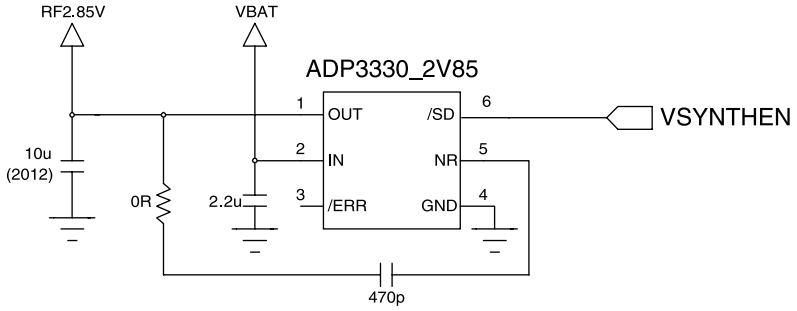


Figure 3-5. Regulator Circuit.

3.6 Digital Main Processor

The AD6522 is an ADI designed processor.

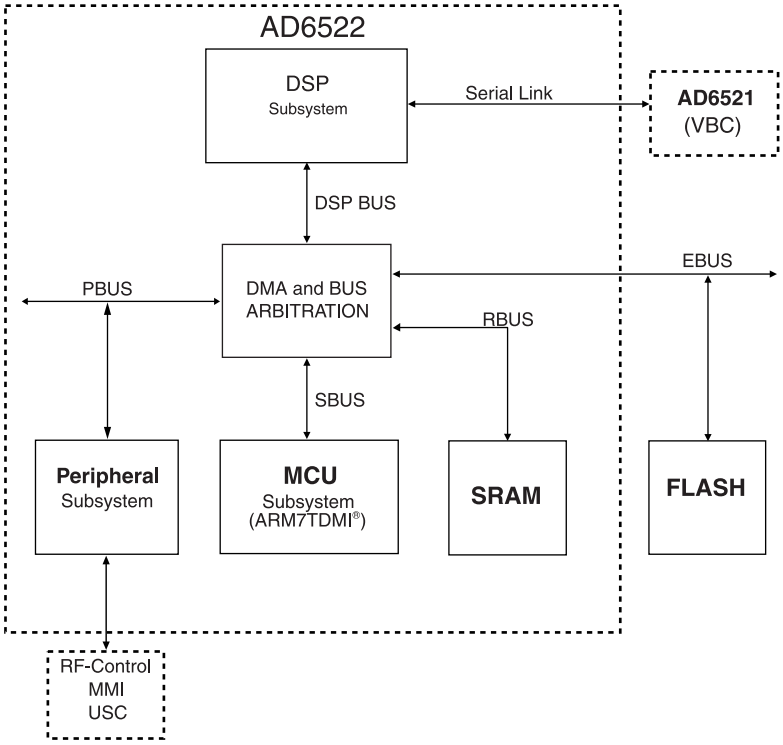


Figure 3-6. Top level block diagram of the AD6522 internal architecture.

BUS Arbitration Subsystem

It is to work as a cross point for data accesses between the three main busses. EBUS is for external accesses, primarily from Flash memory for code and data. RBUS is for internal RAM access. PBUS is for access to internal peripheral modules such as UART, RTC or SIM. In addition to the three main system busses, it has SBUS, IOBUS and DMABUS.

DSP subsystem

It consists of ADI DSP, Viterbi coprocessor, Ciphering unit and a cache memory/controller system. The DSP can run at a maximum clock frequency of 78 MHz at 2.45 V. The Viterbi and ciphering accelerators enable a very efficient implementation of the channel equalization, encryption and decryption tasks.

MCU subsystem

It consists of an ARM7TDMI central processing unit, a boot ROM, a clock generation and access control module.

The maximum clock frequency for the ARM7TDMI is 39 MHz at 2.45 V.

The main clock is 13MHz and it is provided by VCTCXO. The Clock & BS(Bus Select) generator make internal clock by multiplying the main clock by 1X, 1.5X, 2X and 3X.

The boot ROM contains MCU code for basic communication between the ARM and one of the serial ports in the Universal System Connector subsystem.

Peripheral subsystem

It contains four major groups of elements.

The MMI group is a collection of all the functionality that are needed to implement a complete user interface including keyboard, display, backlight, RTC, general purpose I/O etc.

House Keeping group consists of three different sub-modules: The Watch Dog Timer, the Interrupt Controller, and the general timers.

GSM system group consists of the time base generation together with the synthesizer interface, which form the radio control.

Direct Memory Access is located between the three system buses (PBUS, RBUS and EBUS) and can move any data from any address location on one system bus to any address location on another system bus.

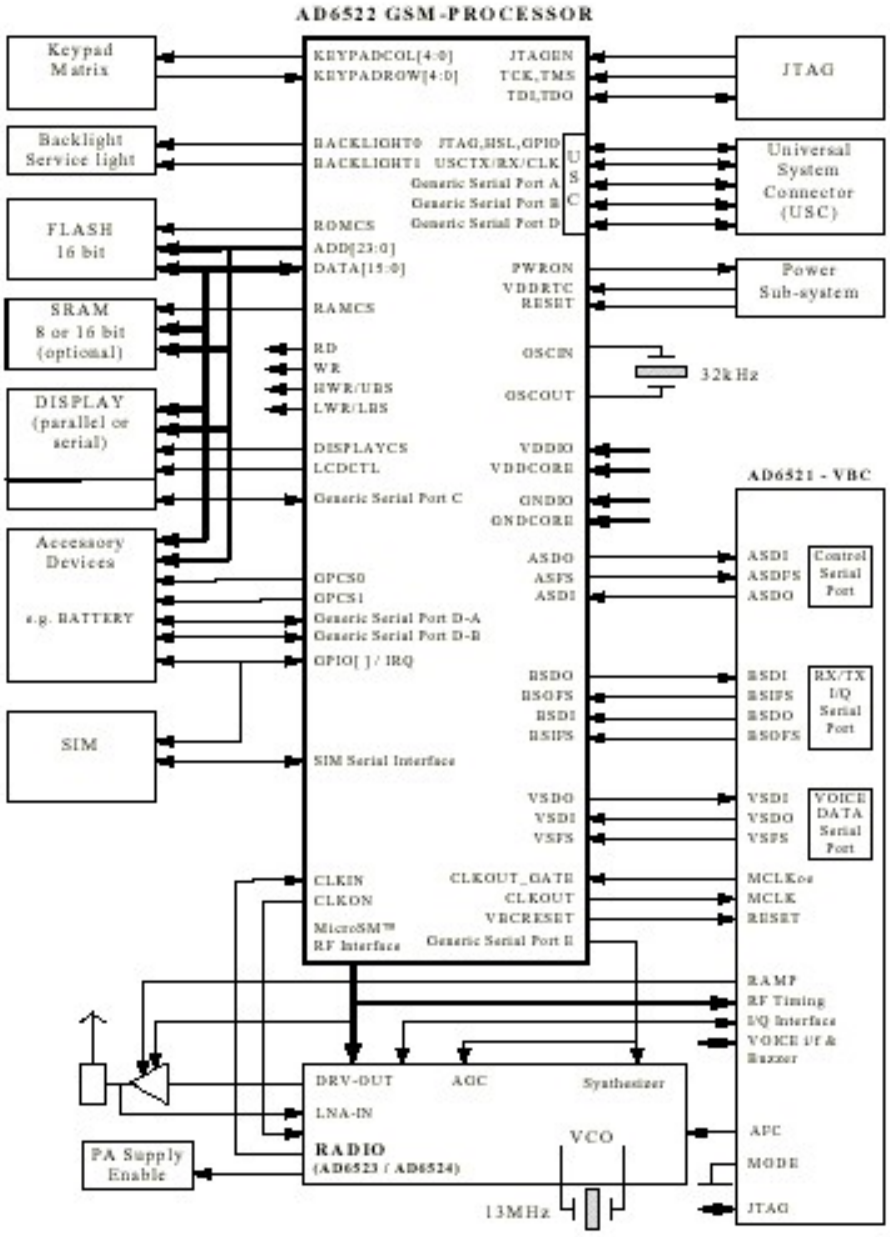


Figure 3-7. System interconnection of AD6522 external interfaces

Interconnection with external devices

RTC block interface

Countered by external X-TAL

The X-TAL oscillates 32.768KHz

LCD module interface

Controlled by LCD_MAIN/SUB_CS, LCD_RES, LCD_A0, /WR, /RD, DATA [00...07] ports

Table 3-3.

	Description
LCD_MAIN_CS LCD_SUB_CS	LCD chip enable. Each LCD has CS pin
LCD_RES	This pin resets LCD module.
LCD_A0	This pin determines whether the data to LCD module is display data or control data
/WR, /RD	Read/Write control
DATA [00...07]	Parallel data line

RF interface

The AD6522 control RF parts through TXEN, RXON1, RXON2, AGCEN, SDATA, SCLK, SEN etc.

Table 3-4.

Signal Name	Description
TXEN	TX Enable/Disable
RXON1	LNA, Mixer1 On/Off
RXON2	Mixer 2 On/Off
AGCEN	AGC Enable/Disable
SDATA	Serial Data to PLL
SCLK	Clock to PLL
SEN	PLL Enable/Disable

SIM interface

The AD6522 check status periodically in call mode if SIM card is inserted or not, but the AD6522 don't check in deep sleep mode.

Interface by SIM_IO, SIM_CLK, SIM_RST

Table 3-5.

	Description
SIM_IO	This pin receives and sends data to SIM card. G5200 support only 3.0 volt interface SIM card.
SIM_CLK	Clock 3.5MHz frequency.
SIM_RST	Reset SIM block.

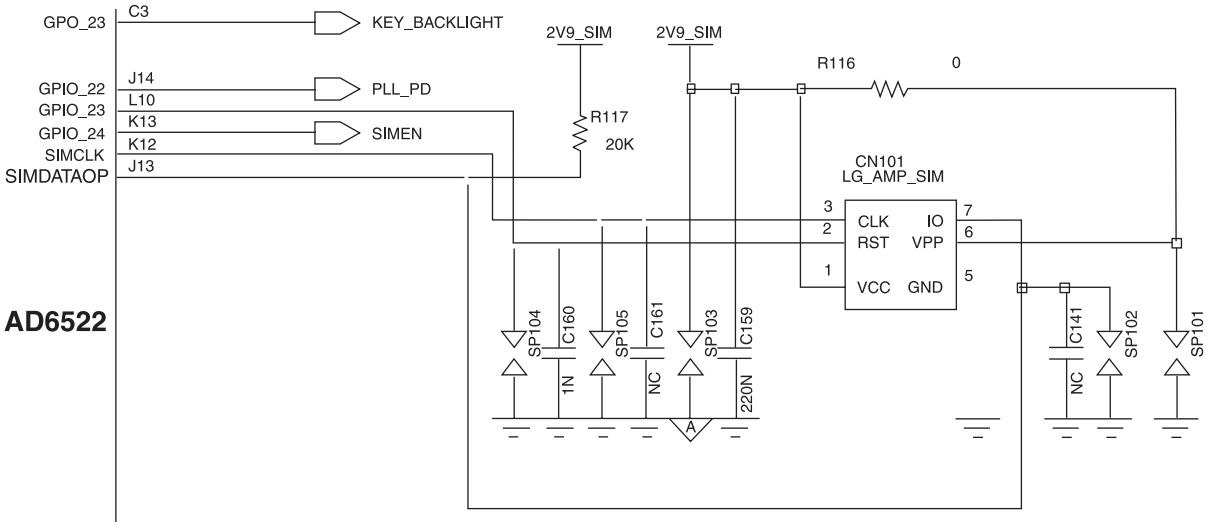


Figure 3-8.

Key interface

Include 5 column and 5 row

The AD6522 detect key press by interrupt

ADP3408 interrupt

There are two interrupts EOC and CHARGEDETECT

EOC: End of Charge. Charging would be stopped when AD6522 receive this input.

CHARGEDETECT: This interrupt is generated when charge is inserted.

3.7 Analog Main Processor

AD6521

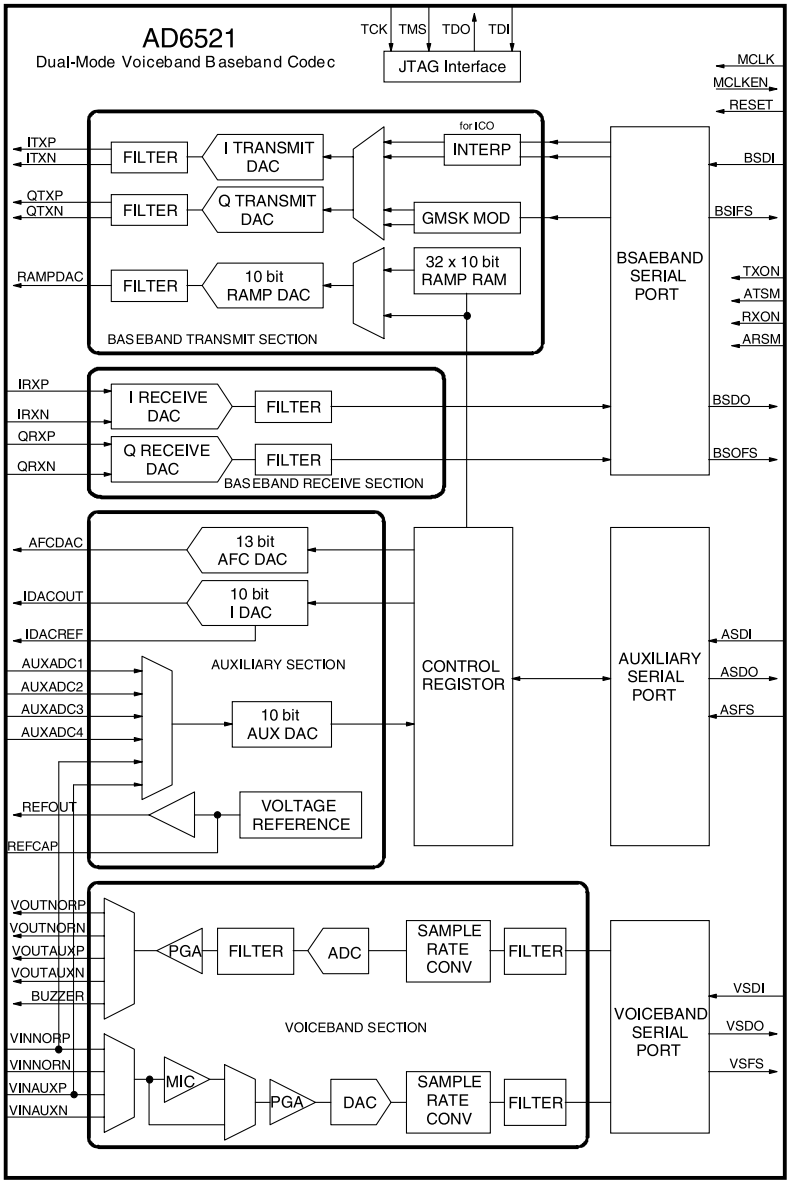


Figure 3-9. AD6521 function block diagram

BB Transmit section

This section generates in-phase and quadrature BB modulated GMSK signals (BT = 0.3) in accordance with GSM 05.05 Phase 2 specifications

The transmit channel consists of a digital GMSK modulator, a matched pair of 10-bit DACs and a matched pair of reconstruction filter

BB Receive section

This section consists of two identical ADC channels that process baseband in-phase(I) and quadrature(Q) input signals.

Each channel consists of a coarse switched capacitor input filter, followed by a high-order sigma-delta modulator and a lowpass digital filter

Auxiliary section

This section contains two auxiliary DACs(AFC DAC, IDAC) for system control.

This section also contains AUX ADC and Voltage Reference

AUX ADC: 6 channel 10 bits

AFC DAC: 13 bits

IDAC: 10 bits

Voiceband section

Receive audio signal from MIC. G5200 use differential configuration.

Send audio signal to Receiver. G5200 use differential configuration.

It interconnect with external device like main microphone, main receiver, ear-phone and Hands free kit

through the VINNORP, VINNORN, VOUTNORP, VOUTNORN, VINAUXP, VINAUXN,

VOUTAUXP, VOUTAUXN

VINNORP, VINNORN: Main MIC positive/negative terminal.

VOUTNORP, VOUTNORN: Main Receiver positive/negative terminal.

VINAUXP, VINAUXN: Hands free kit mic positive/negative terminal.

VOUTAUXP, VOUTAUXON: Hands free kit speaker positive/negative terminal.

3.8 Power Management

ADP3408

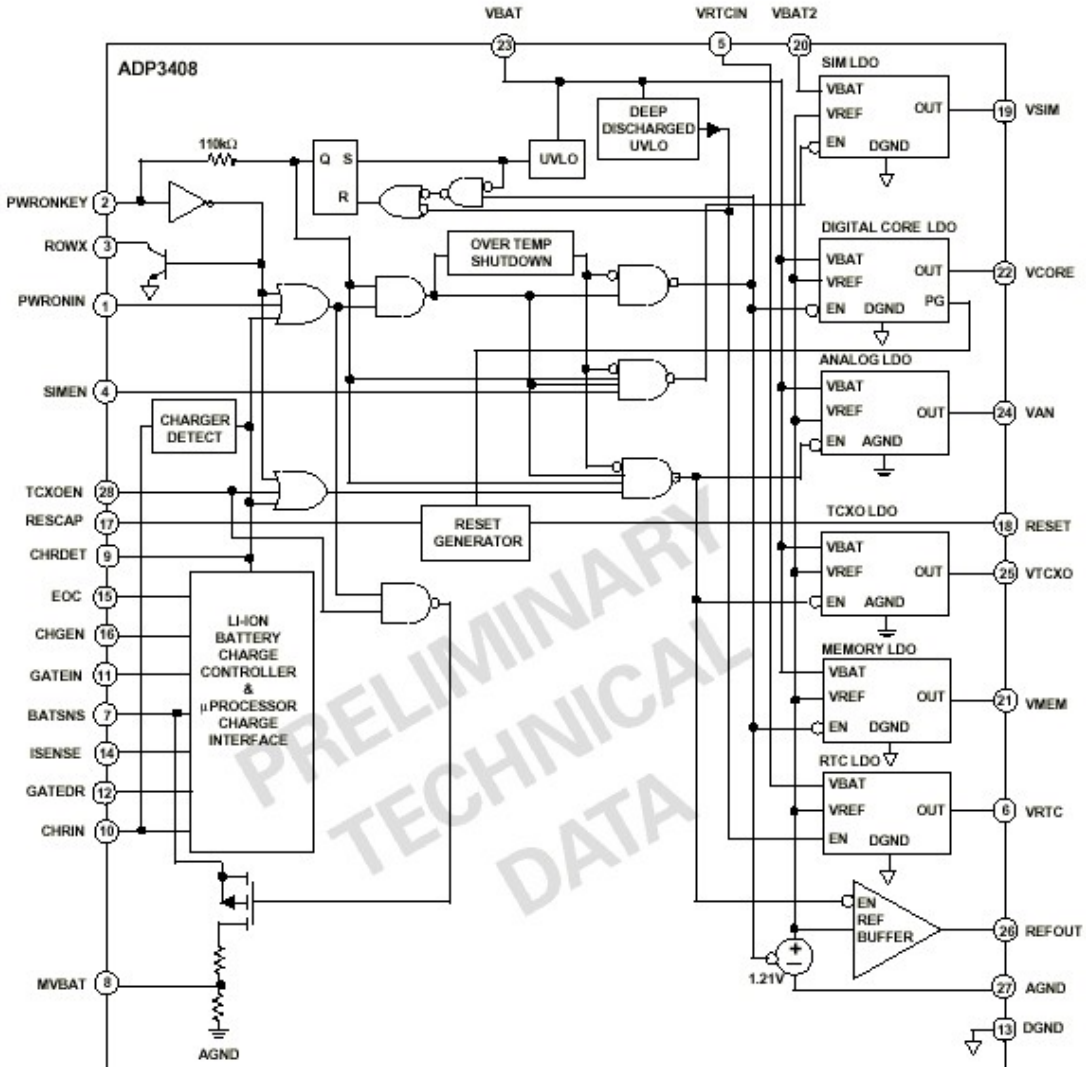


Figure 3-10. ADP3408 inner block diagram.

Power up sequence logic

The ADP3408 controls power on sequence

Power on sequence

If a battery is inserted, the battery powers the 6 LDOs.

Then if PWRONKEY is detected, the LDOs output turn on.

REFOUT is also enabled

Reset is generated and send to the AD6522

LDO block

There are 6 LDOs in the ADP3408

Table 3-6.

	Description
VSIM	2.86 V (is provided to SIM card)
VCORE	2.45 V (is provided to the AD6522 & AD6521's digital core)
VRTC	2.45 V (is provided to the RTC and Backup Battery)
VAN	2.45 V (is provided to the AD6521 I/O and used as microphone bias)
VTCXO	2.715 V (is provided to VCTCXO)
VMEM	2.80 V (is provided to Flash)

Battery charging block

It can be used to charge Lithium Ion and/or Nickel Metal Hydride batteries. G5200 use Li-Ion battery only. Charger initialization, trickle charging, and Li-Ion charging control are implemented in hardware.

Charging Process

Check charger is inserted or not

If ADP3408 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.

Pins used for charging

CHARGERDETECT: Interrupt to AD6522 when charger is plugged.

CHARGEEN: Control signal from AD6522 to charge Li+ battery

EOC: Interrupt to AD6522 when battery is fully charged

GATEIN: Control signal from AD6522 to charge NiMH battery. But, not used.

MVBAT: Battery voltage divider. Divide ratio is 1:2.3 and it is sensed in AD6521 AUX_ADC

TA (Travel Adaptor)

Input voltage: AC 85V ~ 260V, 50~60Hz

Output voltage: DC 5.2V (±0.2 V)

Output current: Max 850mA (±50mA)

Battery

Li-ion battery (Max 4.2V, Nom 4.0V)

Standard battery : Capacity - 750mAh, Li-ion

3.9 Memories

64M flash memory + 16M SRAM
16 bit parallel data bus
ADD01 ~ ADD21.
RF Calibration data are stored in Flash

3.10 Display and Interface

Table 3-7

	Main LCD	Sub LCD
Display Format	128 x 128 dots	96 x 64 dots
Back light	EL Backlight	EL Backlight

G5200 has dual type LCD. There are the control output LCD_MAIN/SUB_CS which is derived from AD6522, this acts as the chip select enable for the Main/Sub LCD. AD6522 uses DATA[00:07] pins to send data for displaying graphical text onto the each LCD (Main/Sub).

3.11 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 25switches (S301-S325), connected in a matrix of 5 rows by 5 columns, as shown in Figure, except for the power switch (S310), which is connected independently.

Functions, the row and column lines of the keypad are connected to ports of AD6522. 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 AD6522 to identify the pressed key.

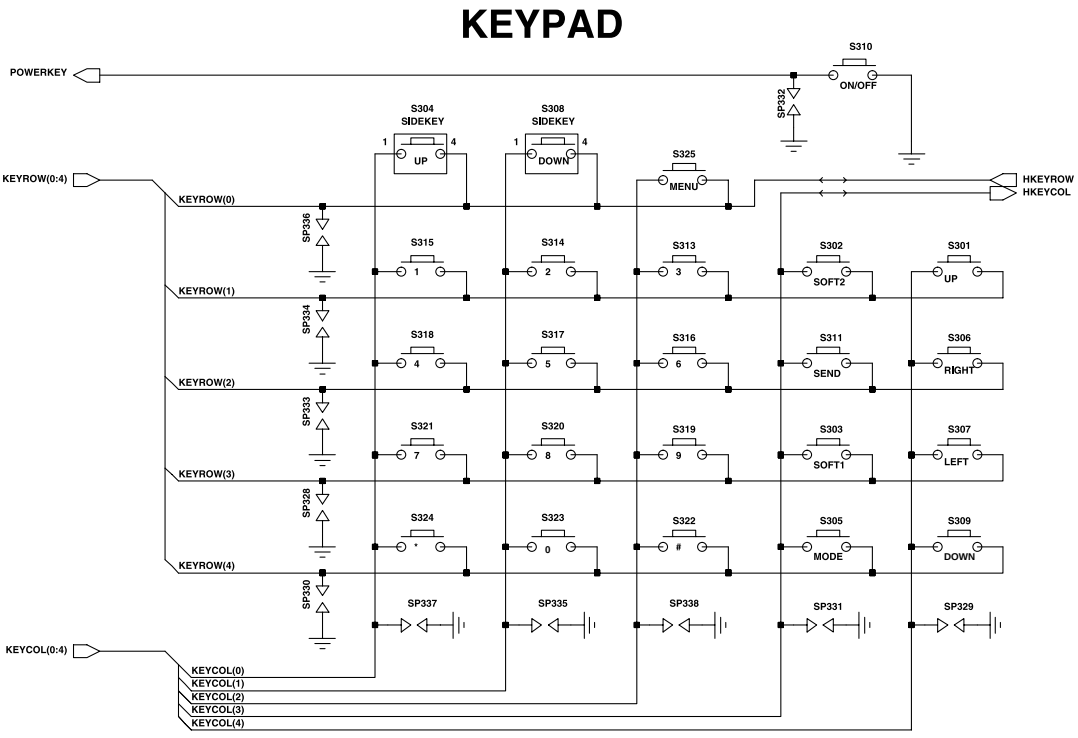


Figure 3-11. Keypad Switches and Scanning.

3.12 Microphone

The microphone is soldered to the main PCB. The audio signal is passed to VINNORP (#K8) and VINNORN (#K7) pins of AD6522. The voltage supply 2V45_VCORE is output from ADP3408, and is a bias voltage for both the VINNOR (through R105) and VINAUX (through R104) lines.

The VINNOR or VINAUX signal is then A/D converted by the Voiceband ADC part of AD6521.

The digitized speech is then passed to the DSP section of AD6522 for processing (coding, interleaving etc.).

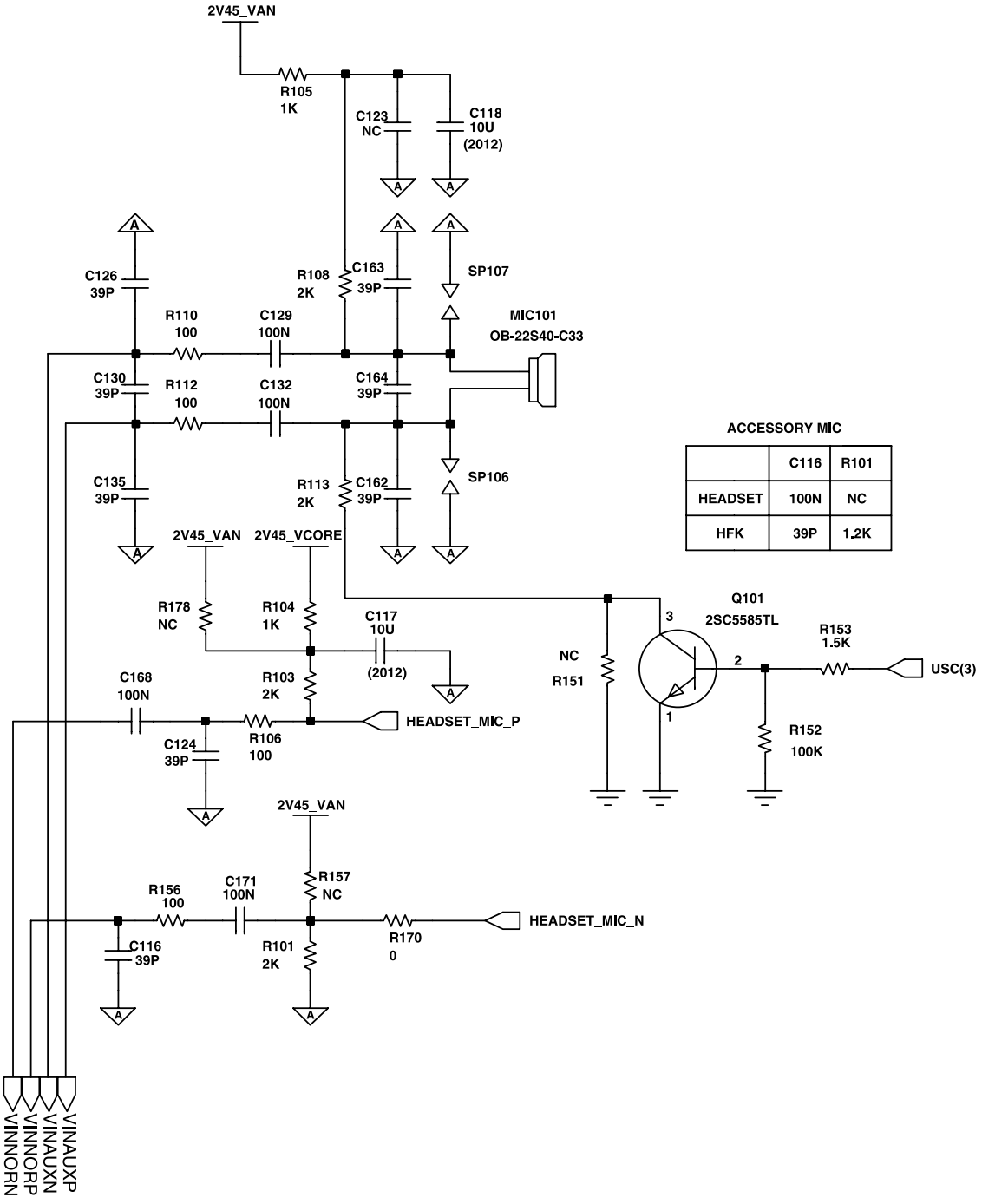


Figure 3-12. Microphone.

3.13 Earpiece

The earpiece is driven directly from AD6521 VOUTNORP (#K8) and VOUTNORN (#K7) pins and the gain is controlled by the PGA in an AD6521. The earpiece is located in the handset floder front panel, and the signals are routed to it via FPCB connector between Main Board and FPCB board.

But, The VOUTNORP signal has to be selected by the control signal “SPK_EN”. If SPK_EN is low, VOUTNORP is directly connected to the Earpiece, else VOUTNOTP is connected to the Midi Chip(U203).

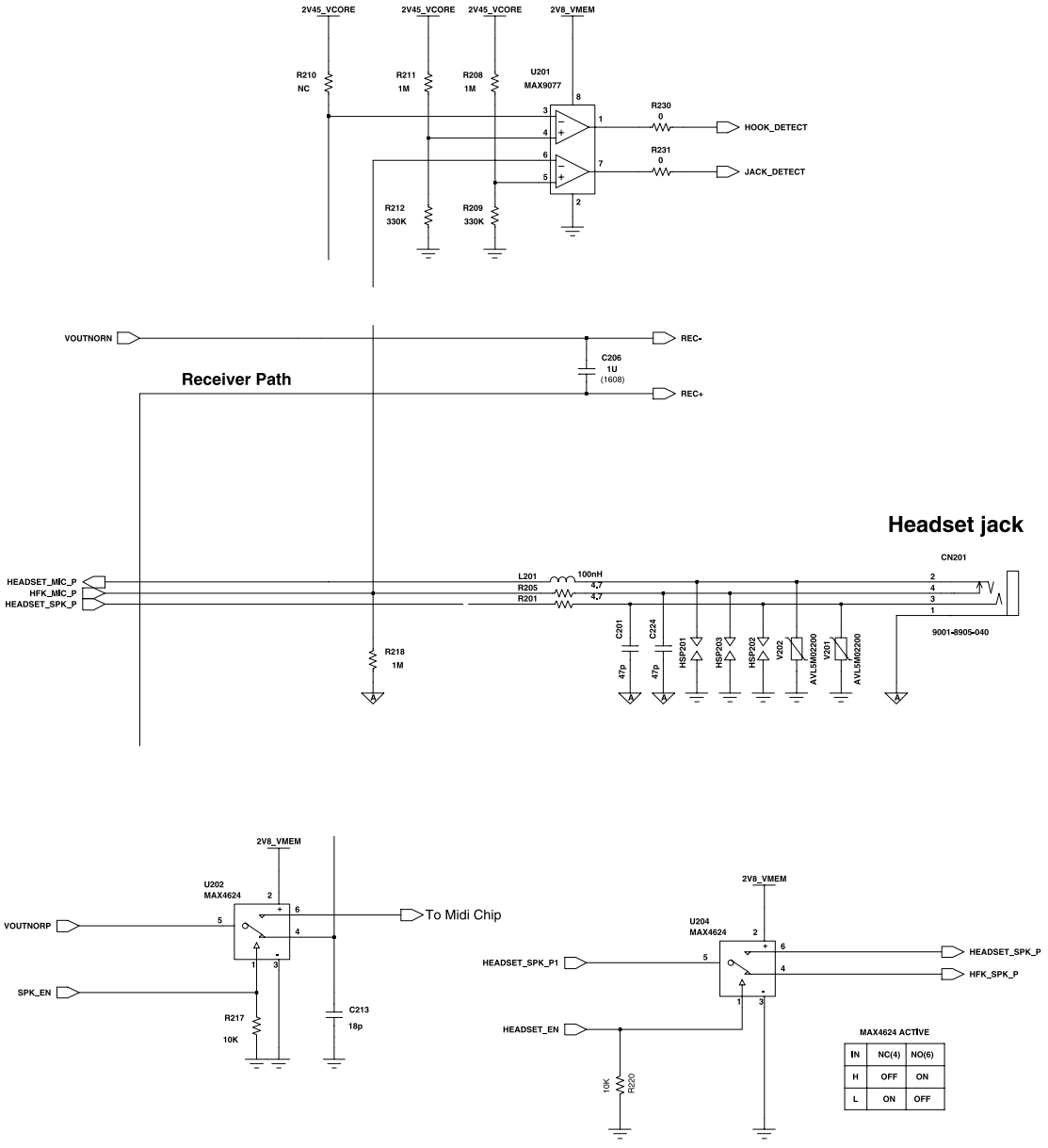


Figure 3-13. Earpiece & Handsfree Interface

3.14 Hands-free Interface

The audio out (VOUTAUXP & VOUTAUXN) to the hands-free kit consists of a pair of differential signals from AD6521 auxiliary outputs (#K9, #K6), which are tracked down the board to carkit connector (CN301) at the base of the handset. The DC level of the signal is supplied to the VOUTAUX pin. And the EXT_IN signal is then input to the VINAUXP (#H10) and VINAUXN (#G10) of AD6521.

3.15 Headset Jack Interface

Headset Jack has the single-end structure in both audio in and out. The audio out to the headset jack is used only one line(VOUTAUXP/HEADSET_SPK_P1) which can be connected to the HEADSET_MIC_P or HFK_SPK_P by the analog switch(U204). If you put in the headset jack in the top of the handset, HEADSET_SPK_P1(VOUTAUXP) is connected to the HEADSET_SPK_P. And the audio in from the headset jack has also one line(VINAUXP/HEADSET_MIC_P). If the headset jack is put in, HEADSET_MIC_P is input from the MIC of headset jack, else HEADSET_MIC_P is connected to HFK_MIC_P which is input from the Hands-free Kit.

3.16 Key Back-light Illumination

In key back-light illumination, there are 12 Blue LEDs in Main Board, which are driven by KEY_BACKLIGHT line from AD6522.

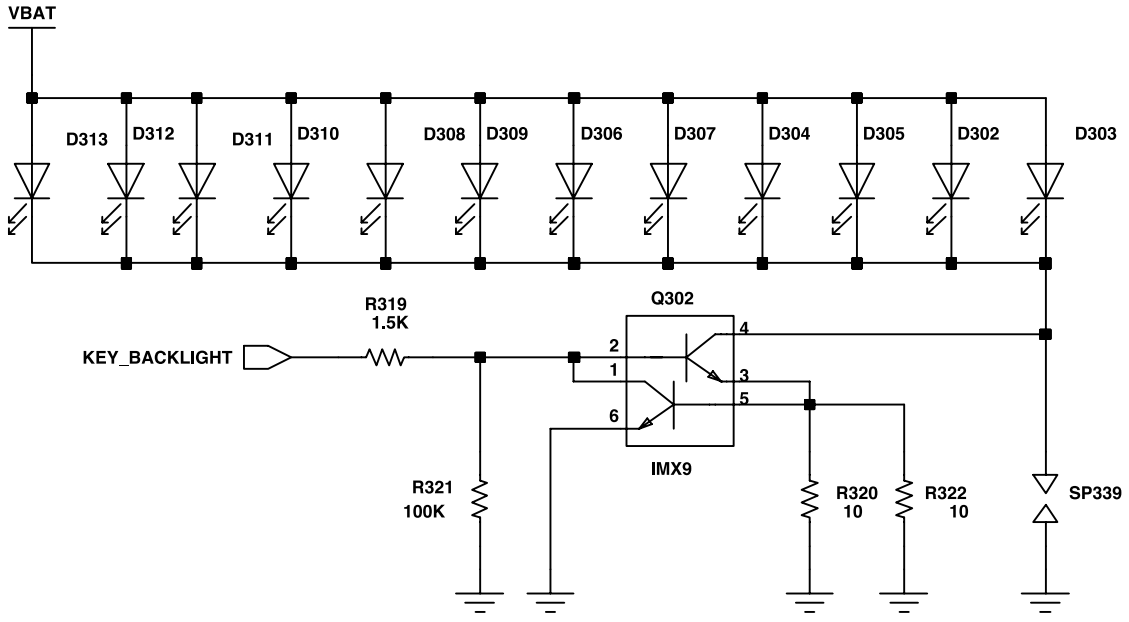


Figure 3-14. Key Back-light Illumination.

3.17 LCD Back-light Illumination

In LCD Back-light illumination, there is an EL driver in sub LCD side of LCD Module, which is driven by BACKLIGHT(EL_EN) line from AD6522.

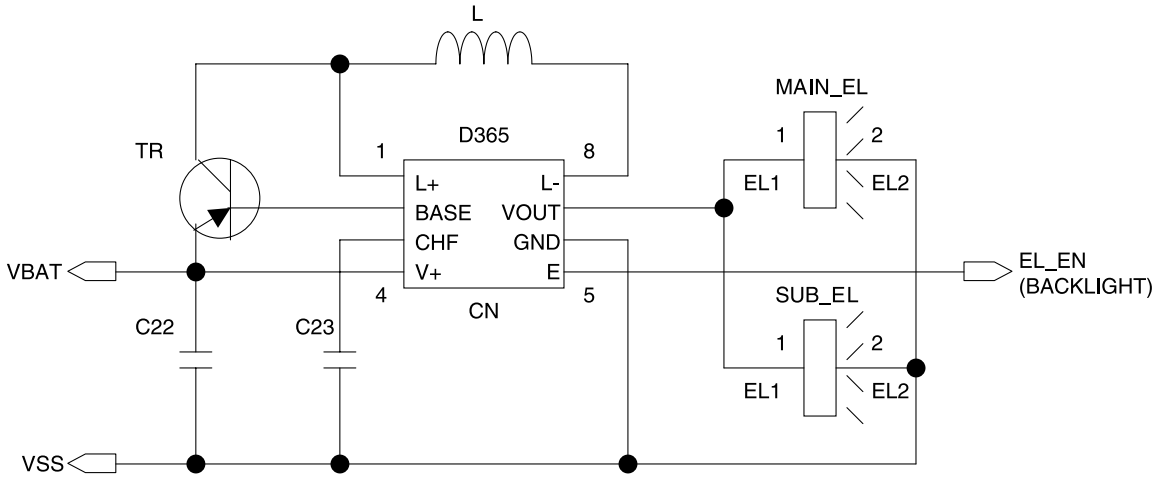


Figure 3-15. LCD Back-light Illumination.

3.18 Multi-Color LED Illumination

In multi-color LED illumination, there is an LED chip and three TRs in sub LCD side of LCD Module, which is driven by LED_G, LED_B and LED_Main line from AD6522.

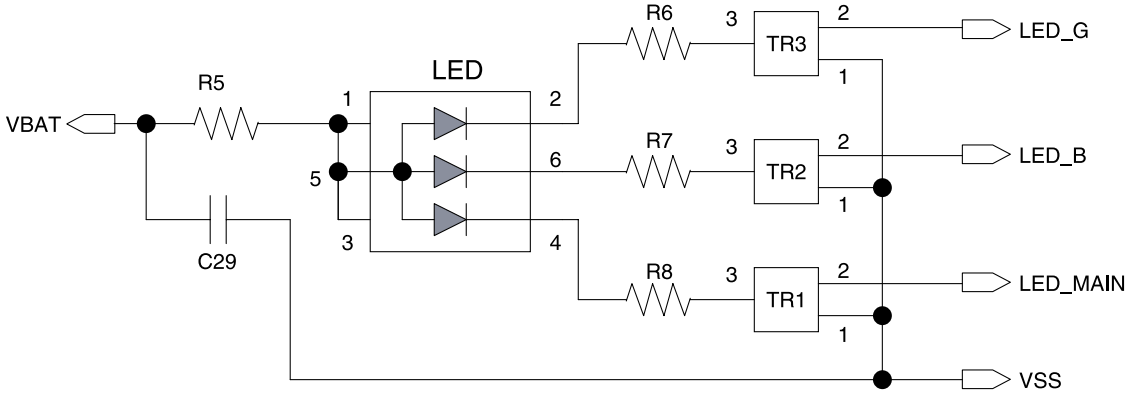


Figure 3-16. Multi-Color LED

3.19 Speaker & MIDI IC

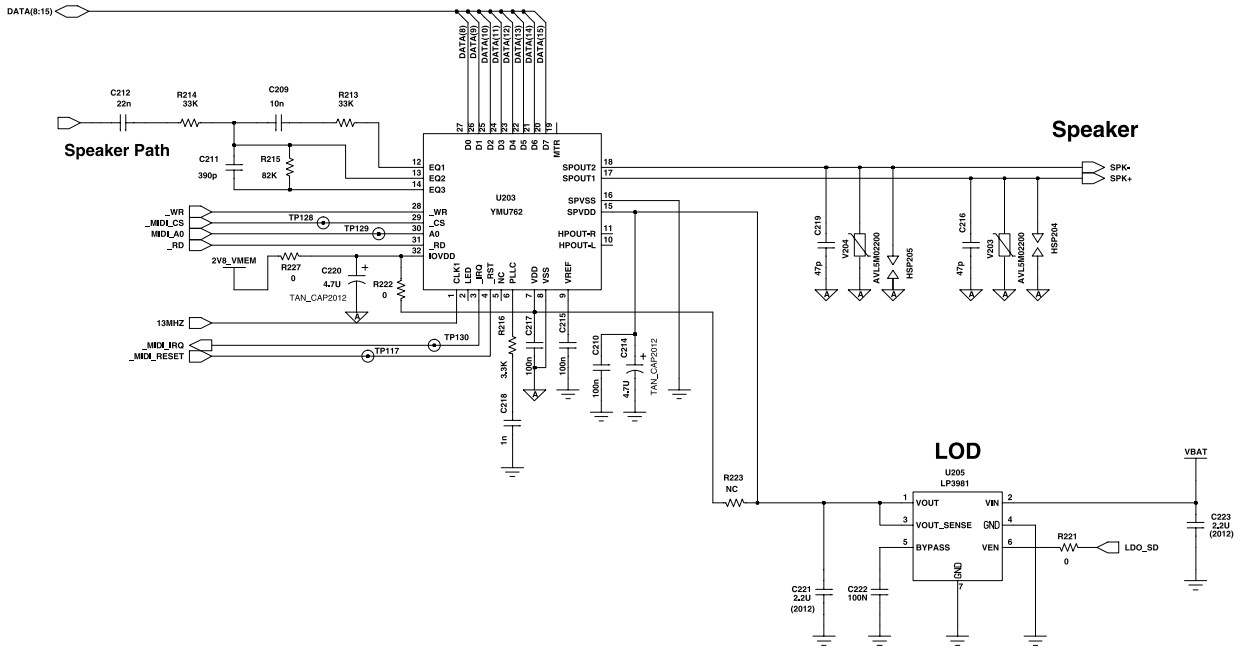
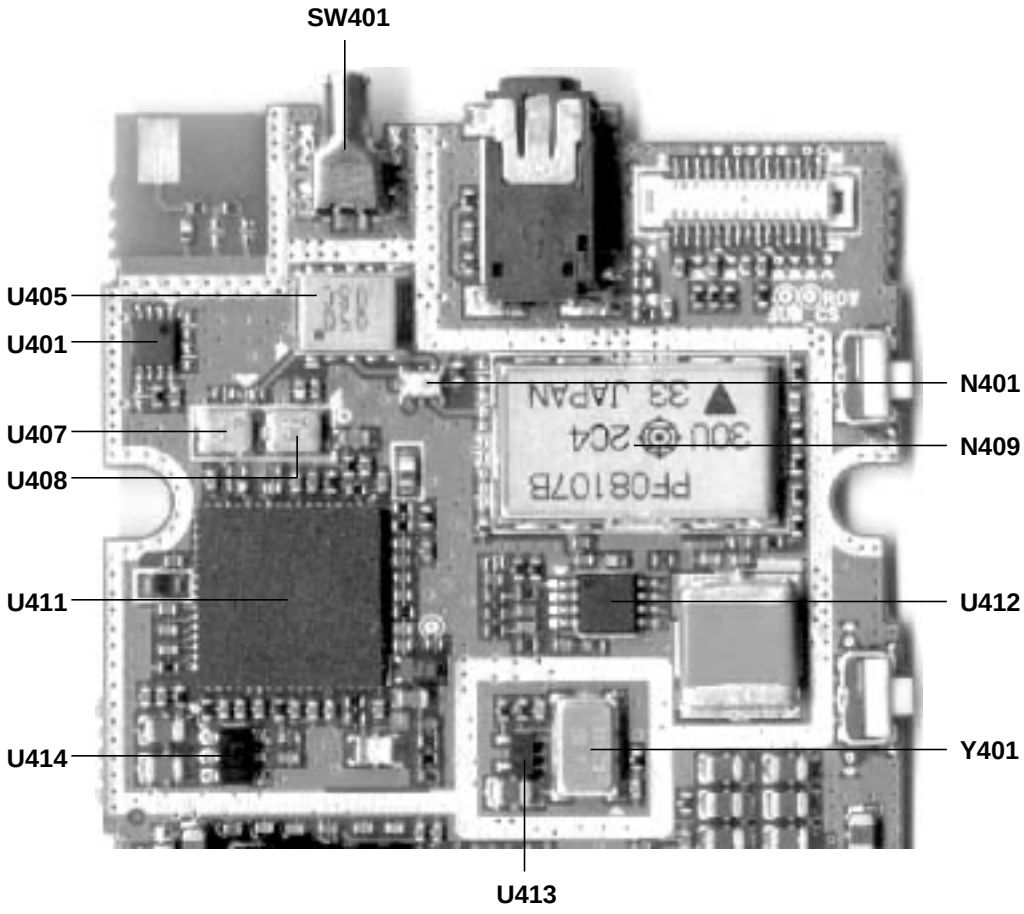


Figure 3-17. Speaker & MIDI IC

MA-3 is a synthesizer LSI for mobile phones that realize advanced game sounds. This LSI has a built-in speaker amplifier, and thus, is an ideal device for outputting sounds that are used by mobile phones in addition to game sounds and ringing melodies that are replayed by a synthesizer.
The synthesizer section adopts “stereophonic hybrid synthesizer system” that are given advantages of both FM synthesizers and Waveform table synthesizers to allow simultaneous generation of up to thirty-two FM tones and eight Waveform table tones.
Since FM synthesizer is able to present countless tones by specifying parameters with only several tens of bytes, memory capacity and communication band can be saved, and thus, the device exhibits the features in operating environment of mobile phones such as allowing distribution of arbitrary melodies with tones. On the other hand , since Waveform table synthesizer complies with downloading of tones from host CPU, arbitrary ADCM/PCM tones can be treated from sequencer in addition to the use of tones that are built-in the LSI.
MA-3 has a built-in circuit for controlling vibrators and LEDs synchronizing with play of music.

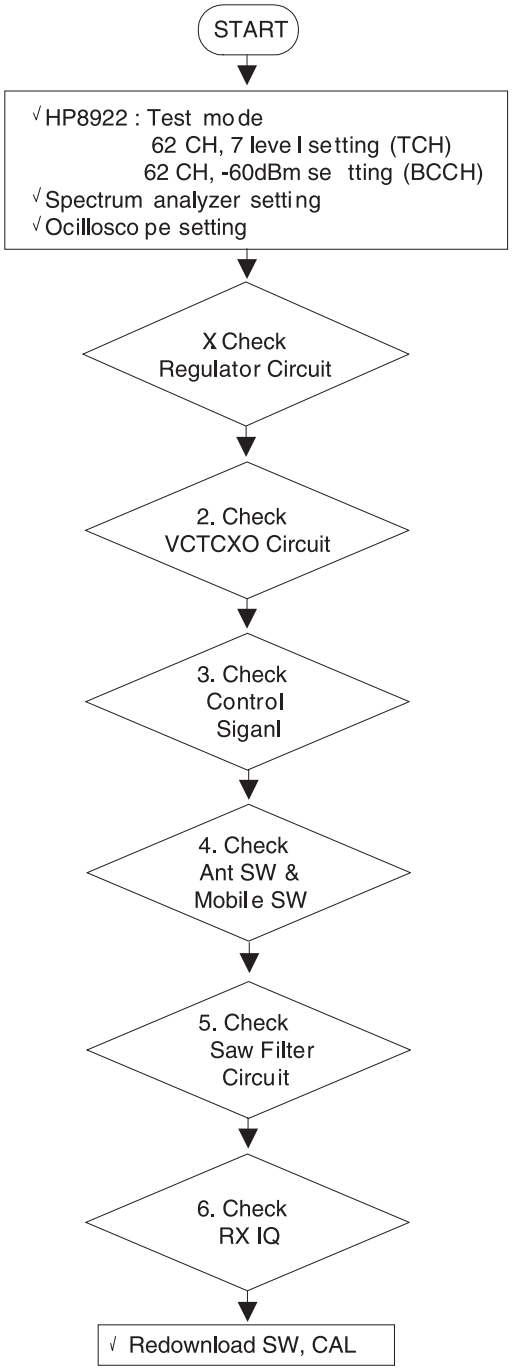
4. TROUBLE SHOOTING

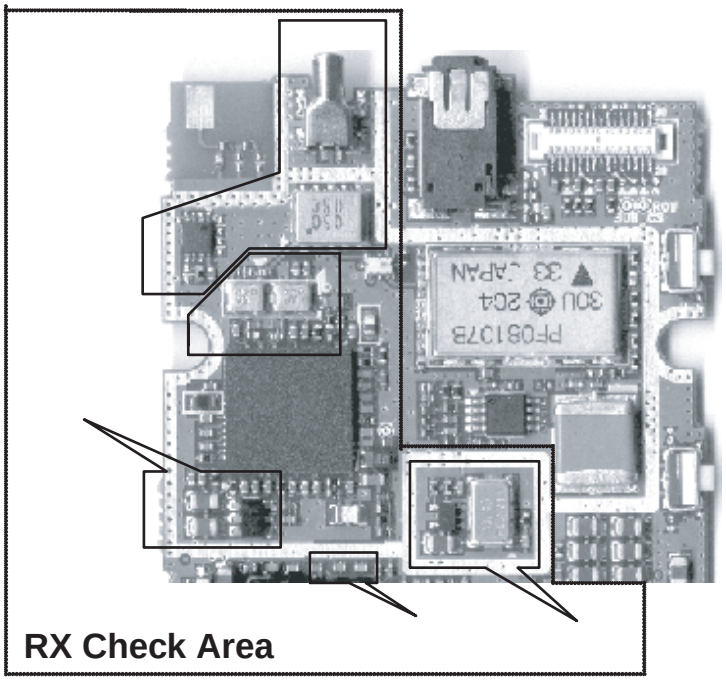
4.1 RF Components

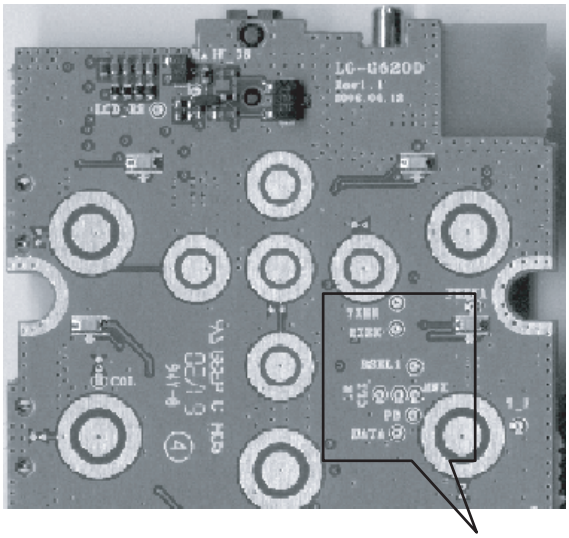


RF components

Reference	Description	Reference	Description
U401	AND Gate	U412	APC IC
U405	Antenna Switch	U413	Inverter
U407	DCS RF SAW Filter	U414	LDO
U408	GSM RF SAW Filter	SW401	Mobile Switch
U409	PAM	Y401	TXVCO
U411	RF Main Chip	N401	Coupler

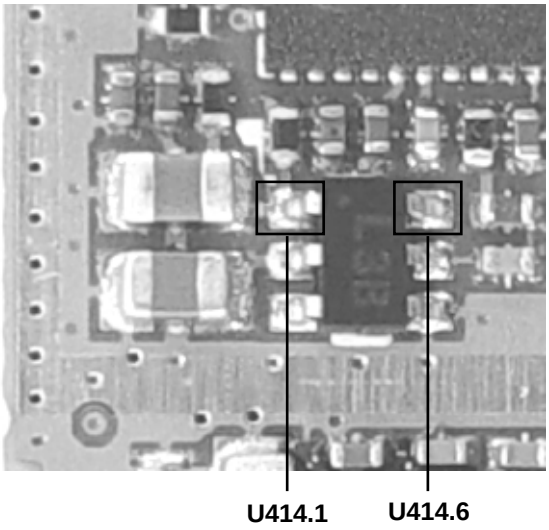


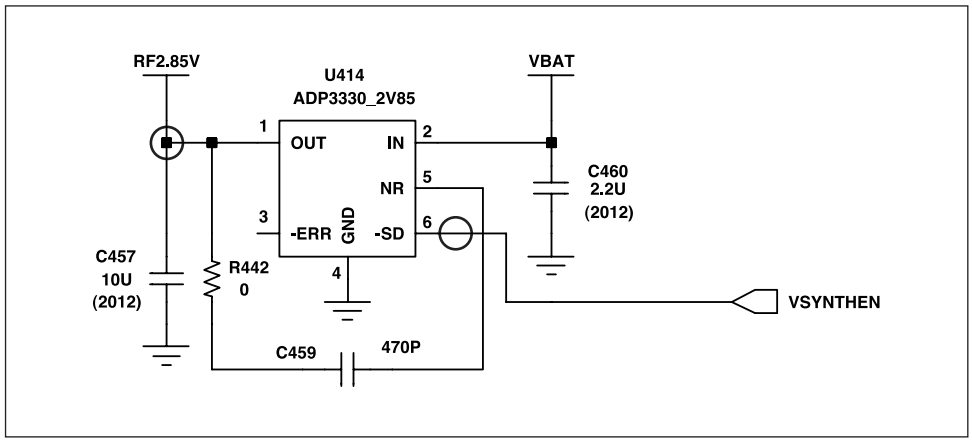


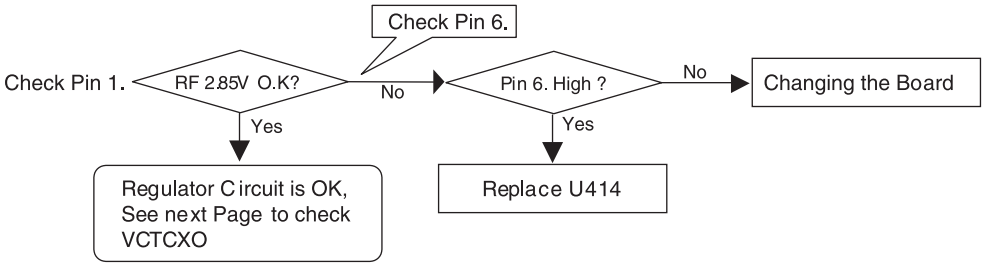


Now See next Page to see
How to check each parts

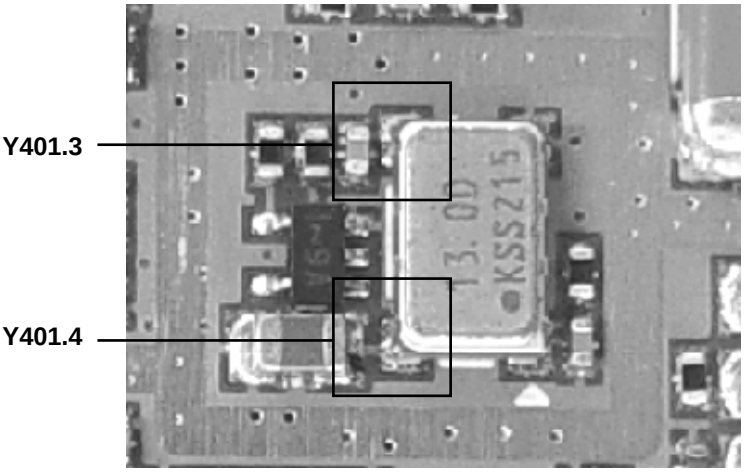
4.1-1 Checking Regulator Circuit

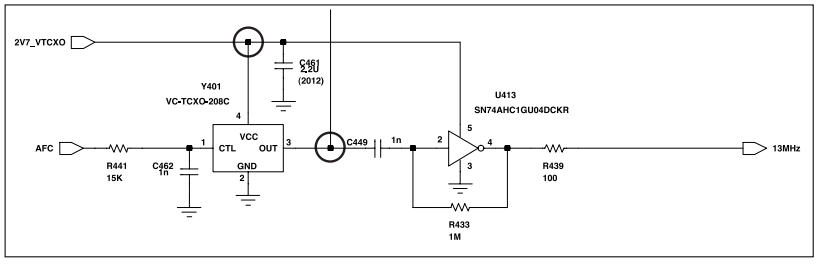


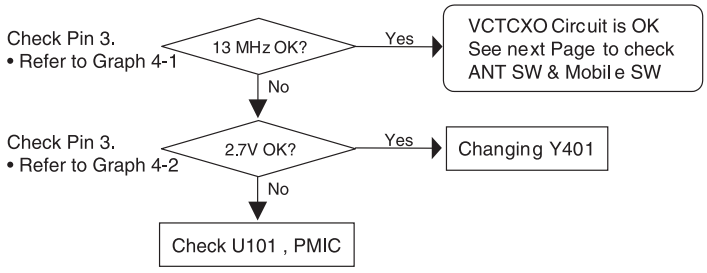


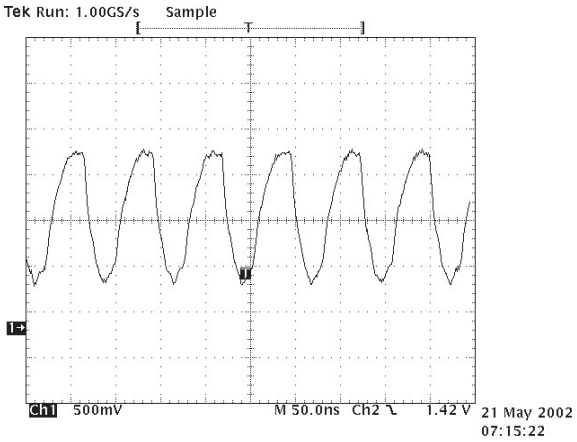


4.1-2 Checking VCTCXO Circuit

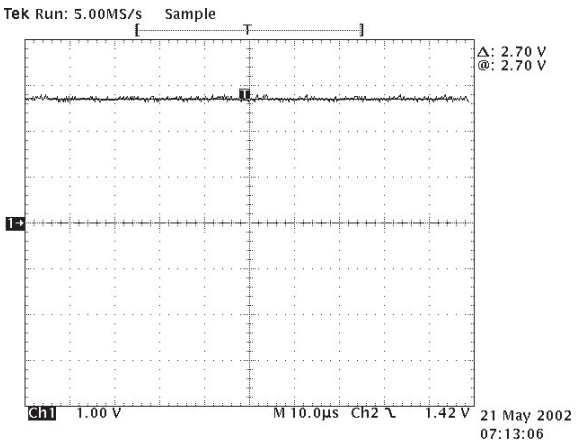






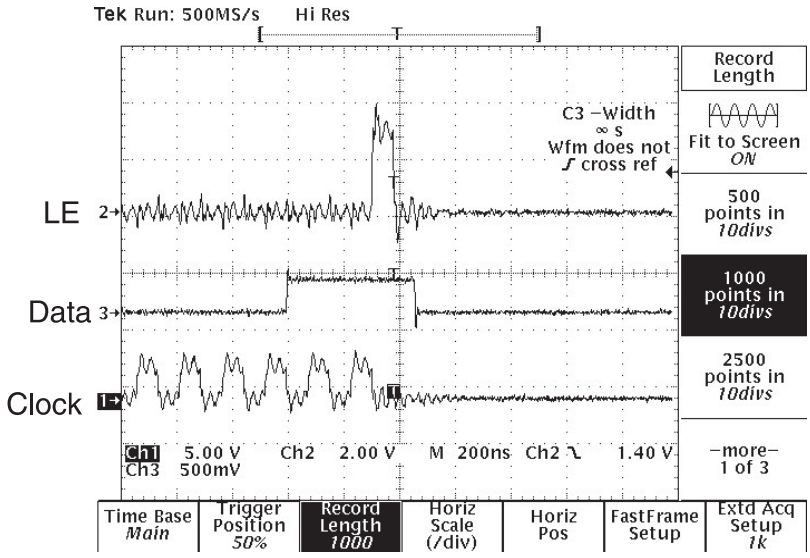


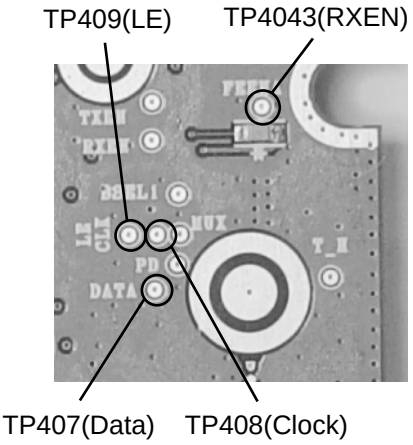
Graph 4-1. VCTCXO 13MHz



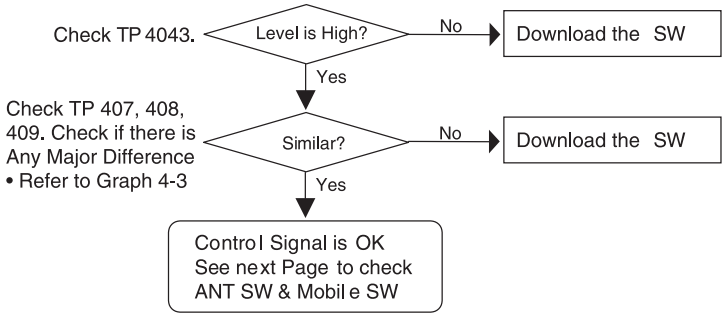
Graph 4-2. VCTCXO 2.7V

4.1-3 Checking Control Signal

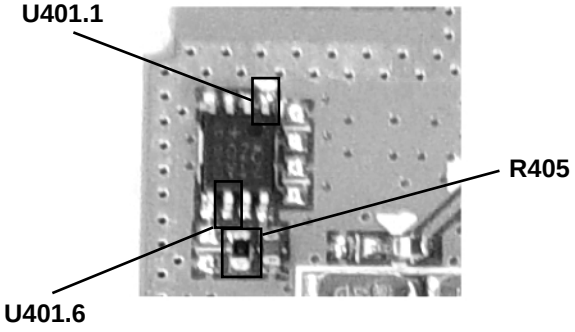


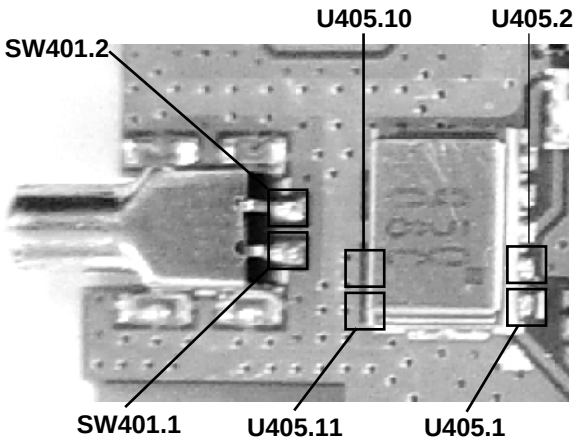


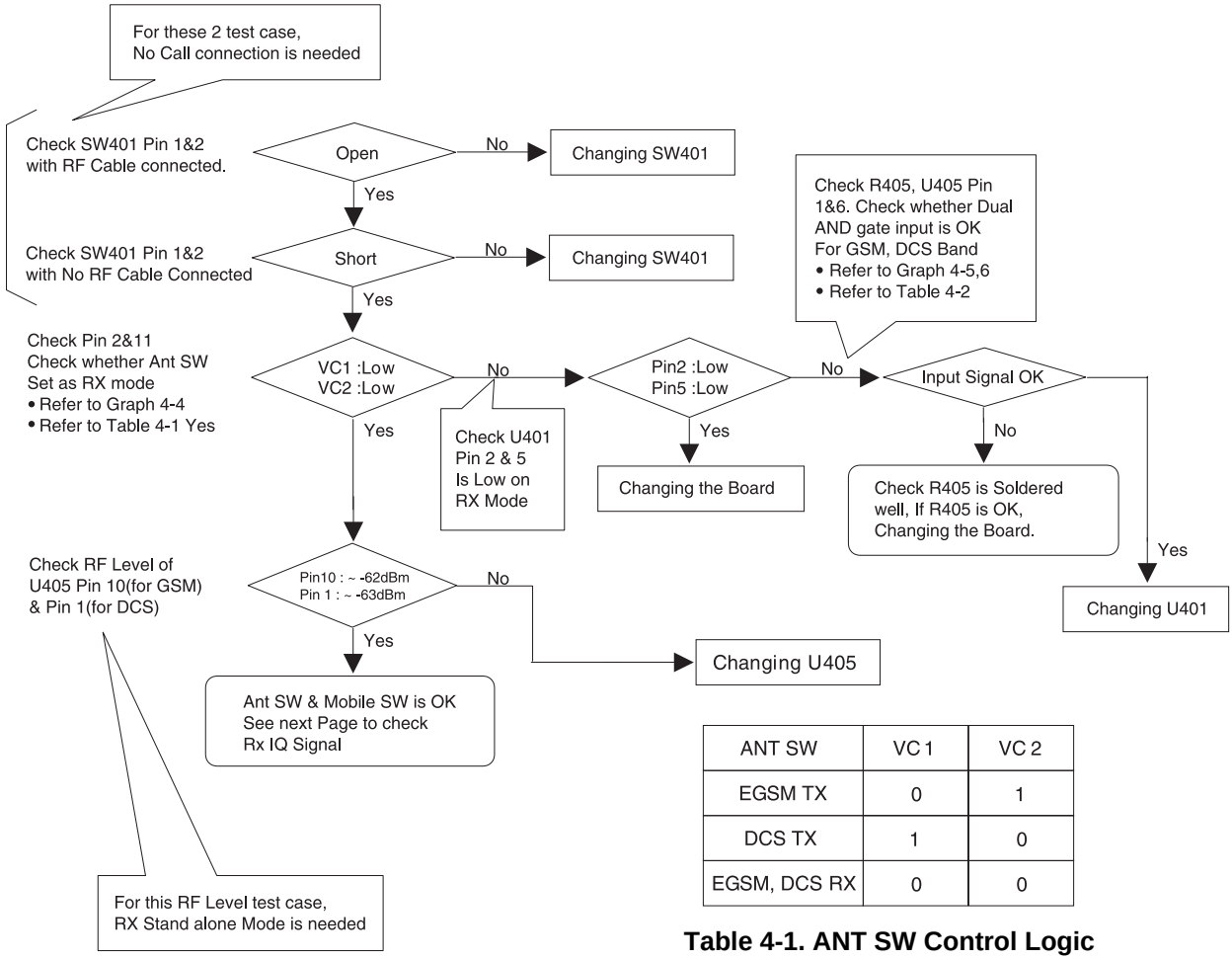
Graph 4-3. RF Control Signal



4-1-4 Checking Ant SW & Mobile SW

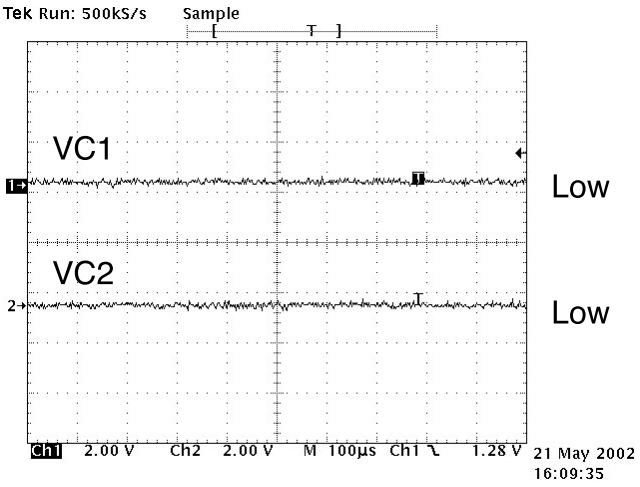




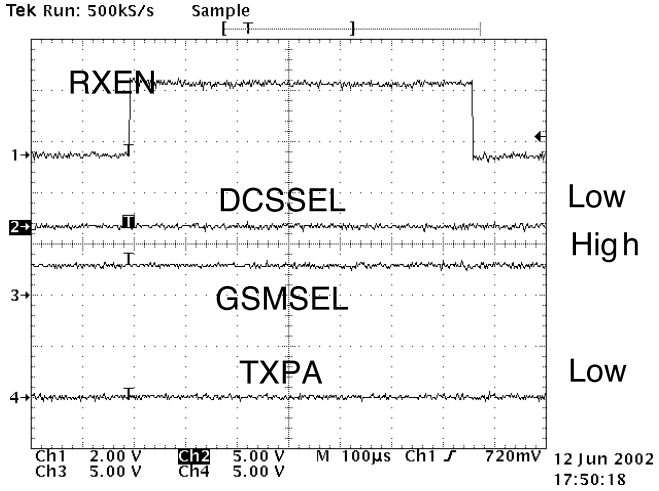


ANT SW	VC 1	VC 2
EGSM TX	0	1
DCS TX	1	0
EGSM, DCS RX	0	0

Table 4-1. ANT SW Control Logic



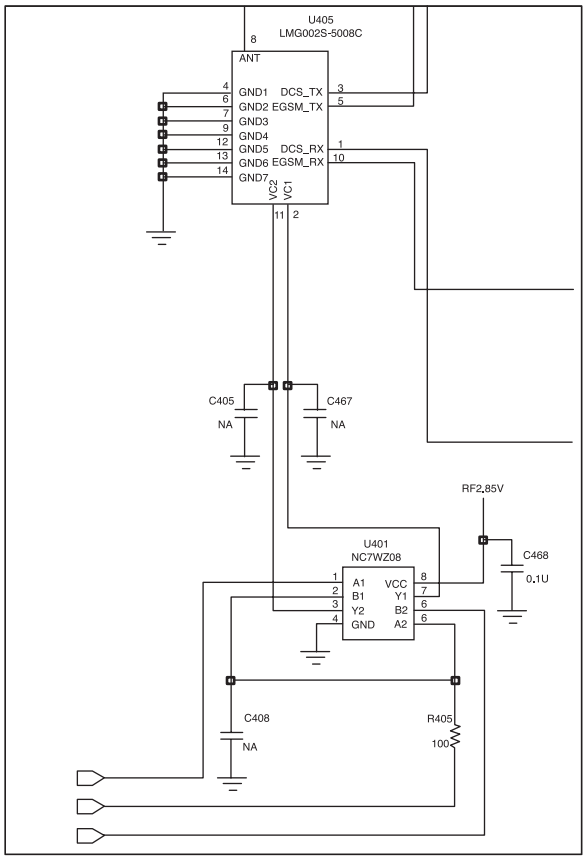
Graph 4-4. ANT SW Control
GSM. DCS RX Mode

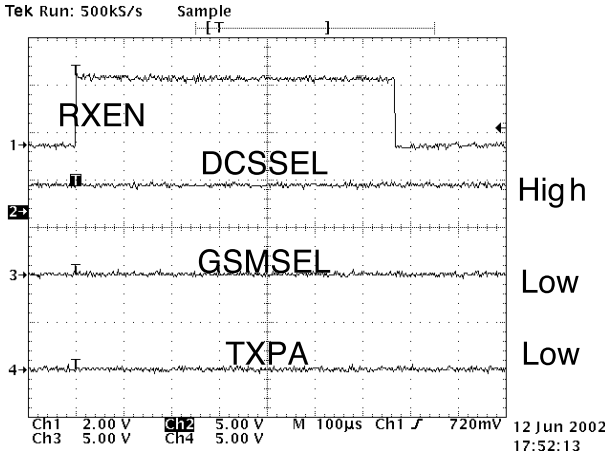


Graph 4-5. Dual AND Gate input
For GSM RX Mode

ANT SW	GSMSEL	DCSSEL	TXPA
EGSM TX	1	0	1
DCS TX	0	1	1
EGSM RX	1	0	0
DCS RX	0	1	0

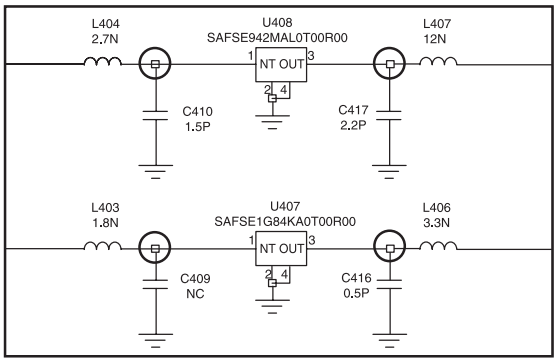
Table 4-2. ANT SW Control Logic

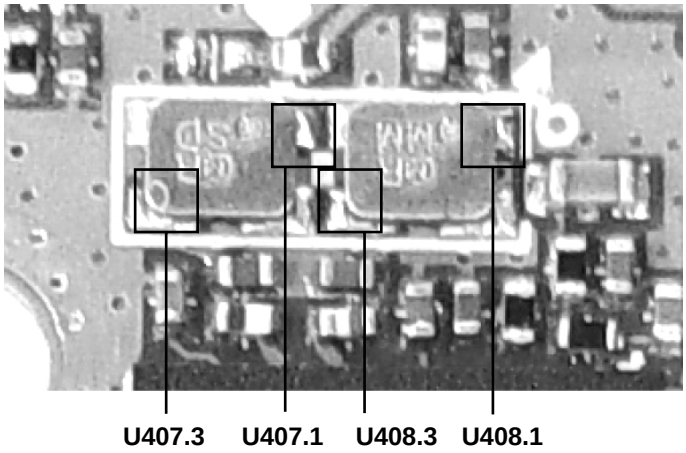


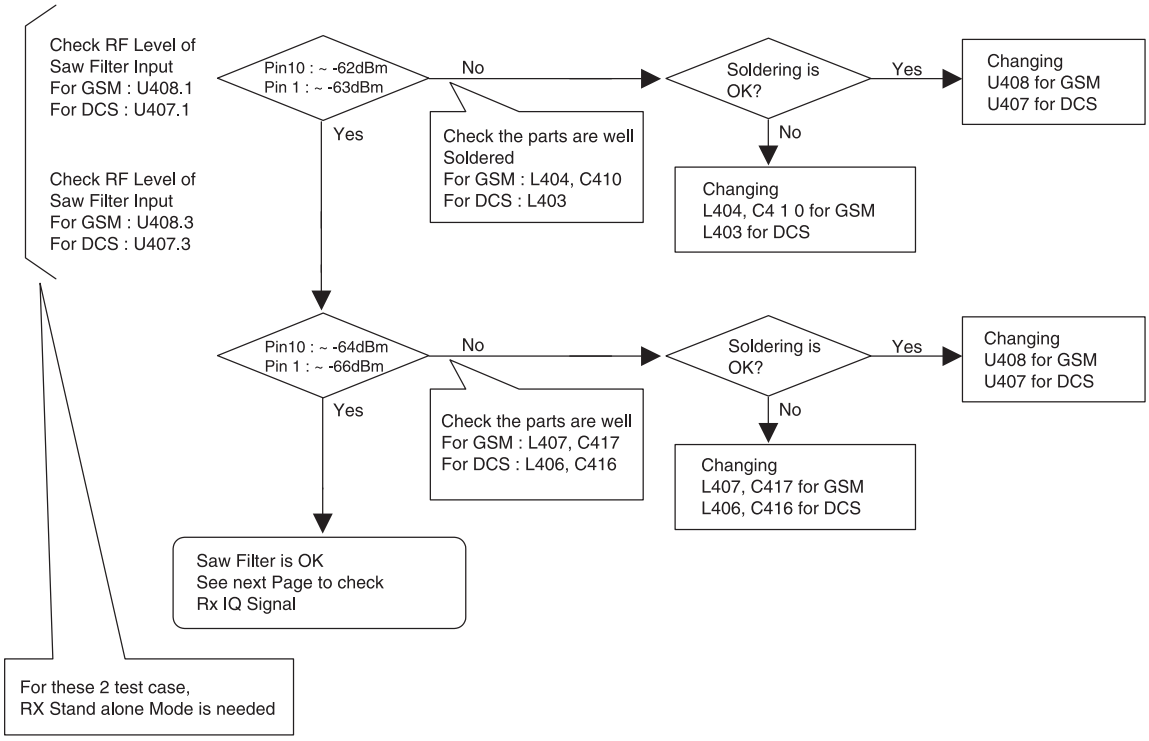


Graph 4-6. Dual AND Gate input
For DCS RX Mode

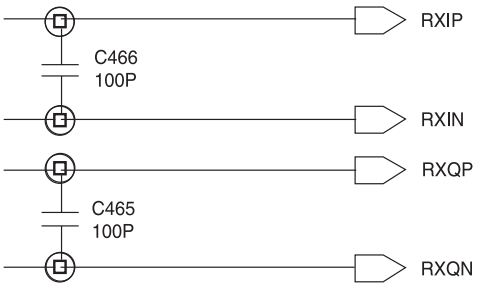
4-1-5 Checking Saw Filter Circuit

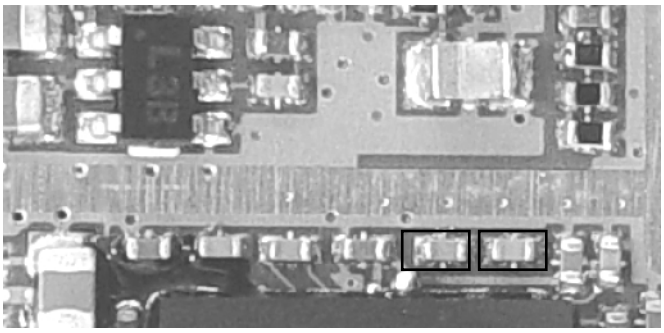




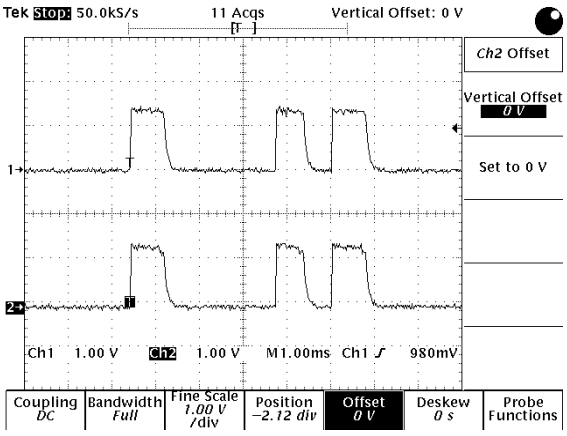


4-1-6 Checking RX IQ

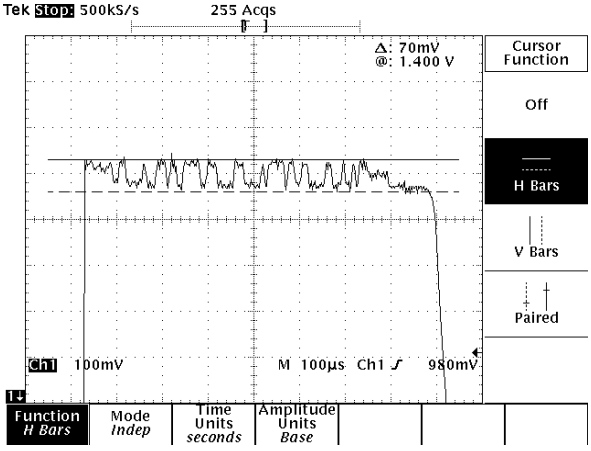




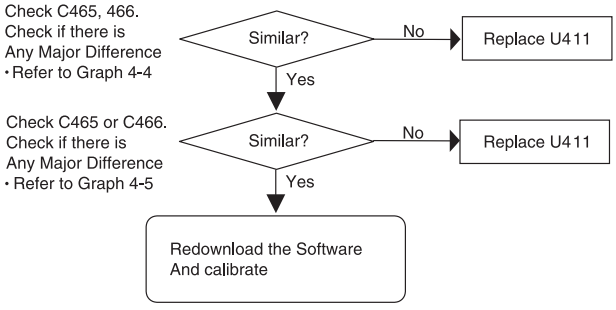
RXIN RXQN
RXIP RXQP



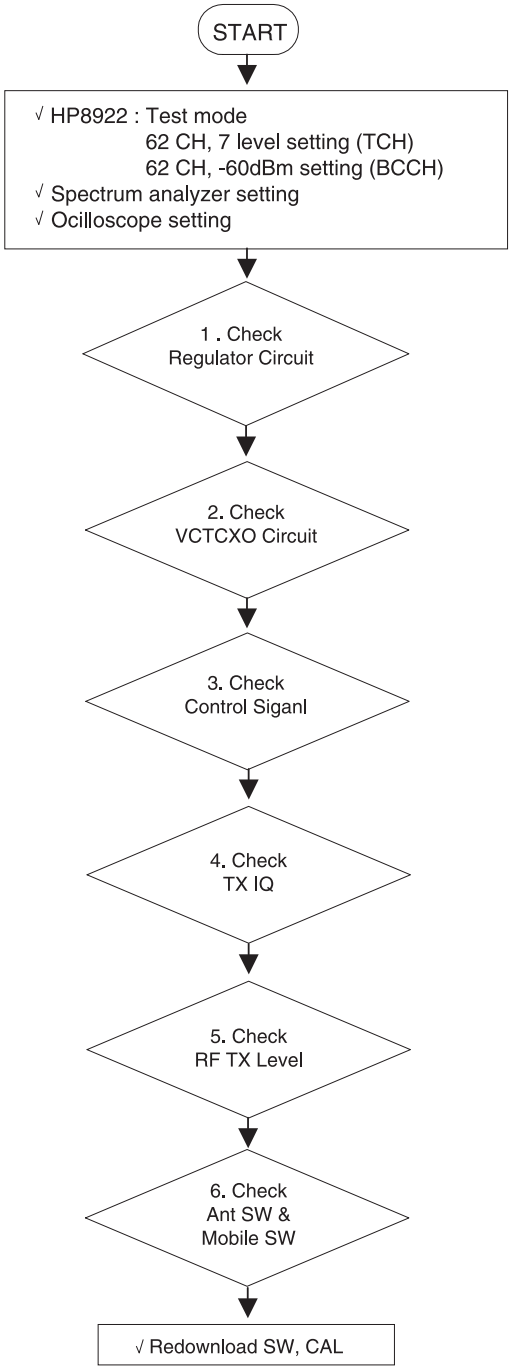
Graph 4-7. RX IQ Signal

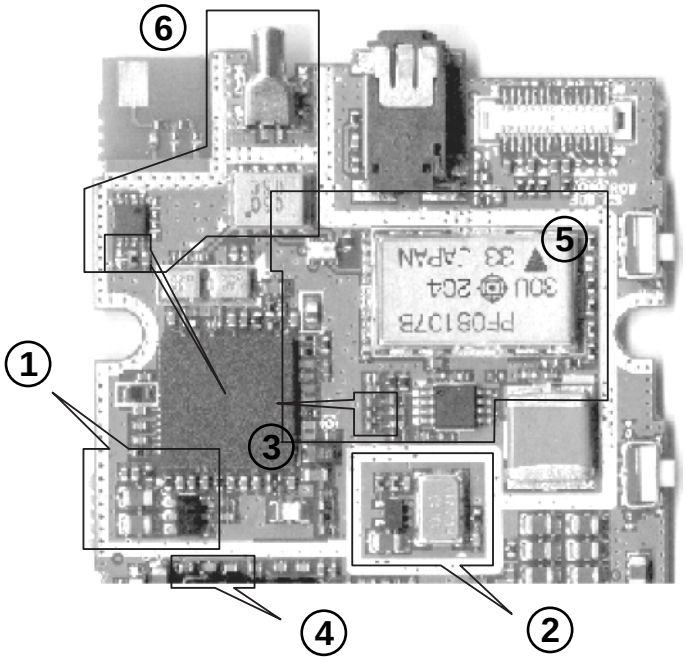


Graph 4-8. RX I Signal (Extended)

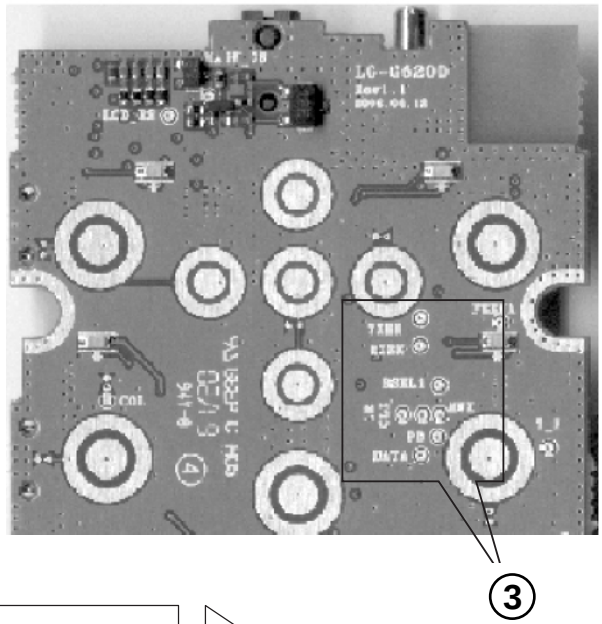


4.2 Tx Trouble





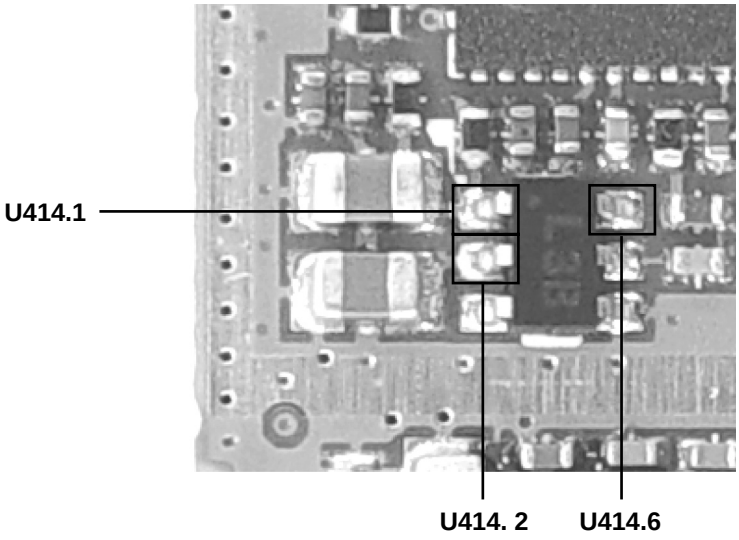
Rx Check Area

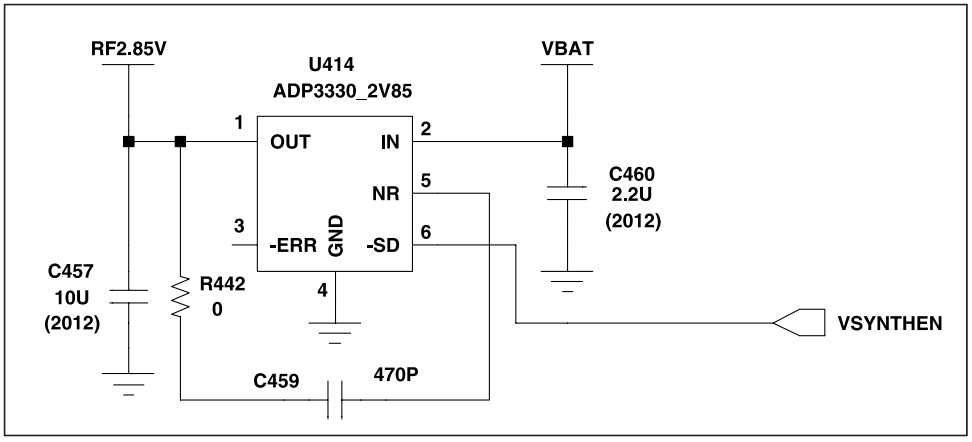


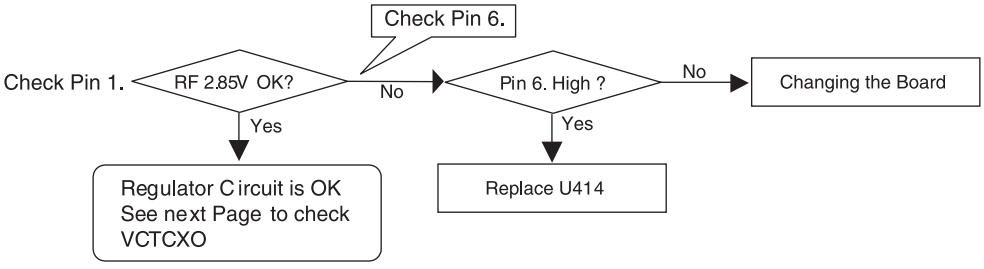
Now See next Page to see
How to check each parts

4-2-1 Checking Regulator Circuit

If you already Check this point while checking RX part, You can Skip this Test

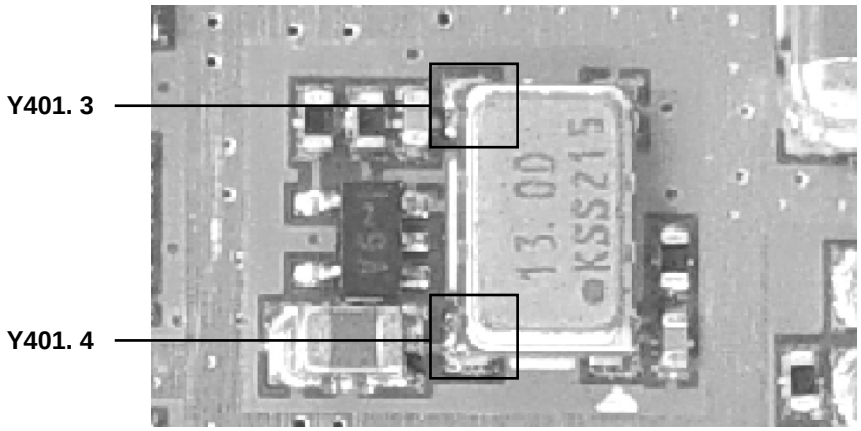


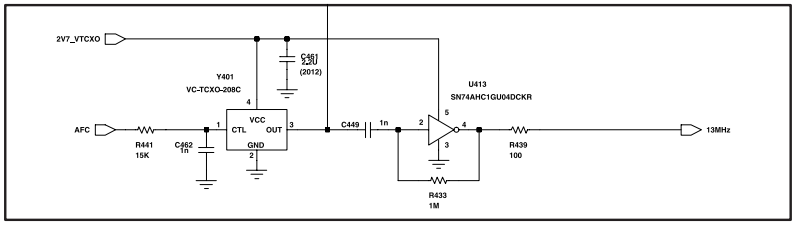


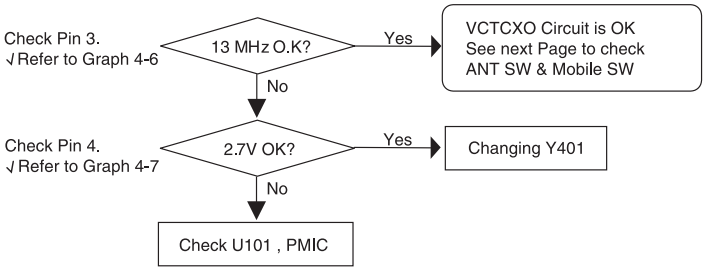


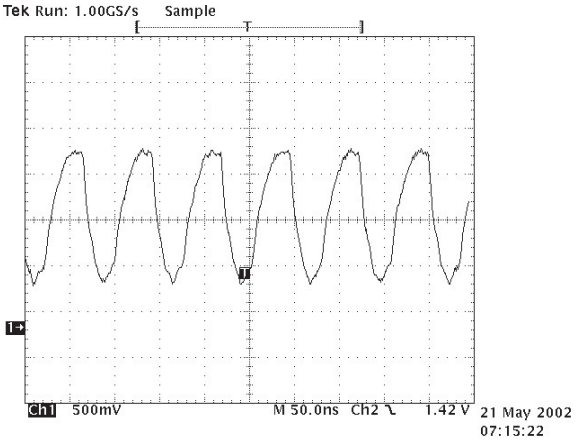
4-2-2 Checking VCTCXO Circuit

If you already Check this point while checking RX part, You can Skip this Test

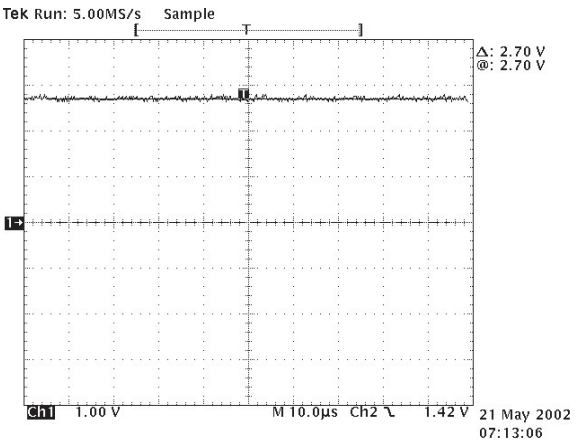






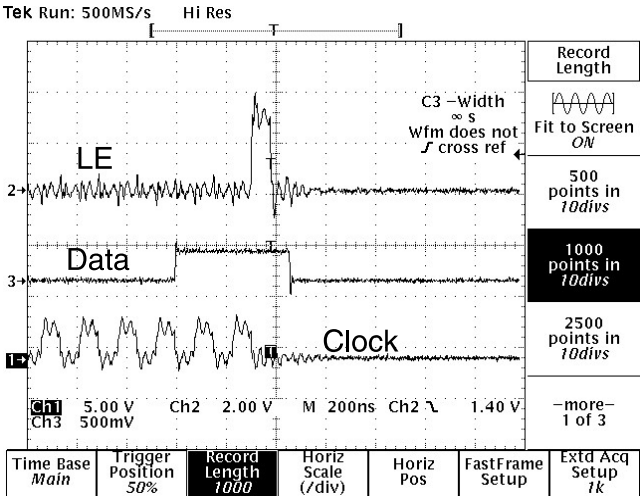


Graph 4-9. VCTCXO 13MHz

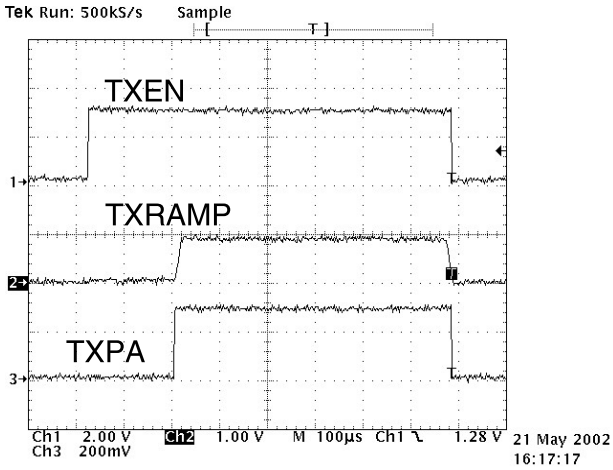


Graph 4-10. VCTCXO 2.7V

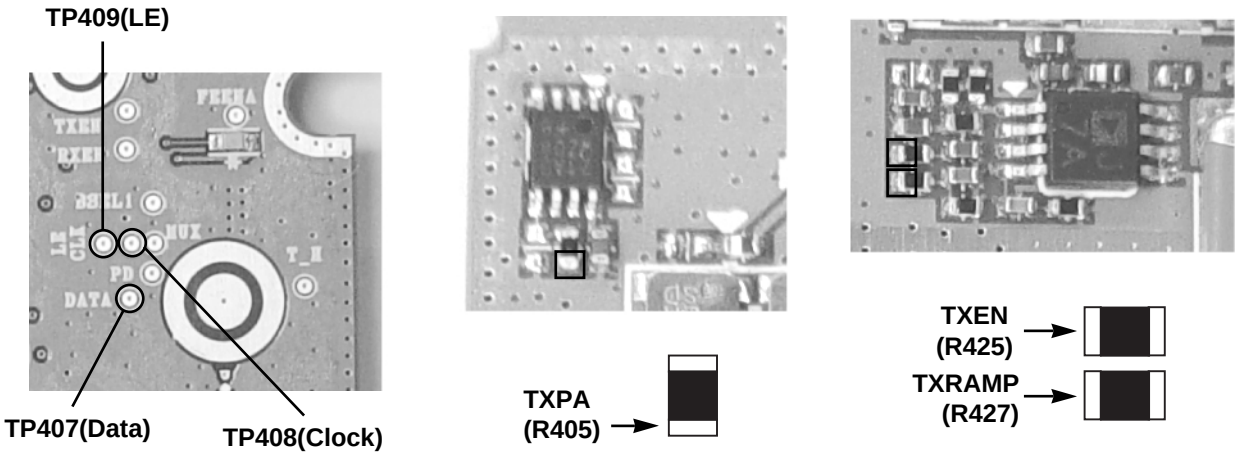
4-2-3 Checking Control Signal.

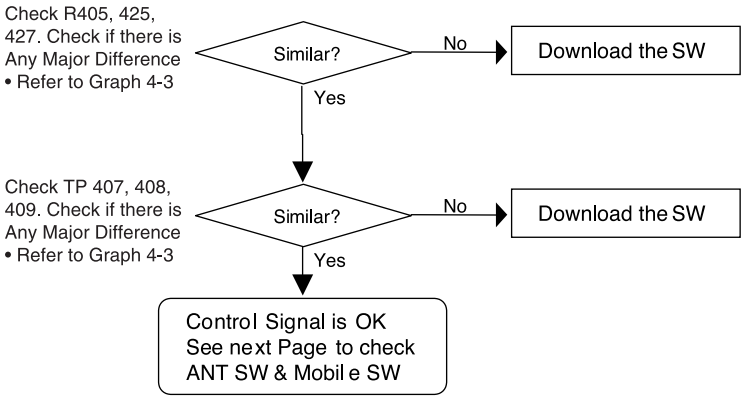


Graph 4-11. RF Control Signal

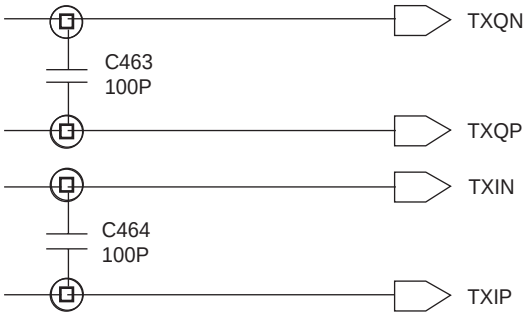


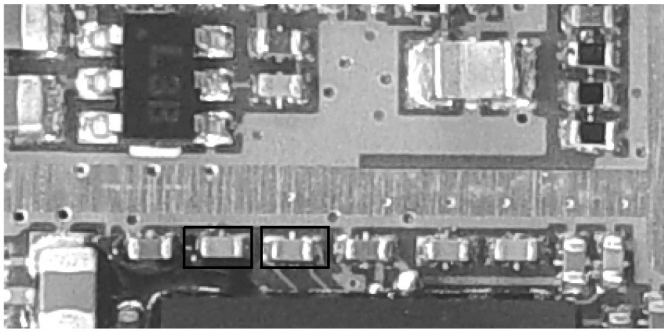
Graph 4-12. TXEN, TXRAMP, TXPA



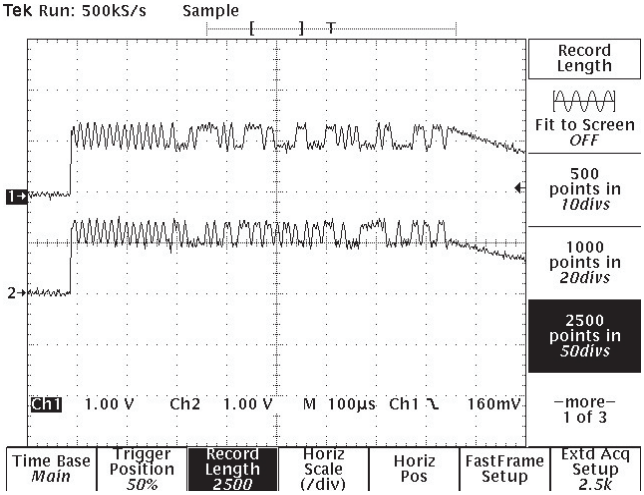


4-2-4 Checking TX IQ

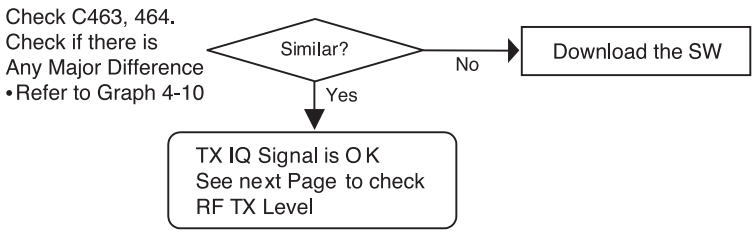




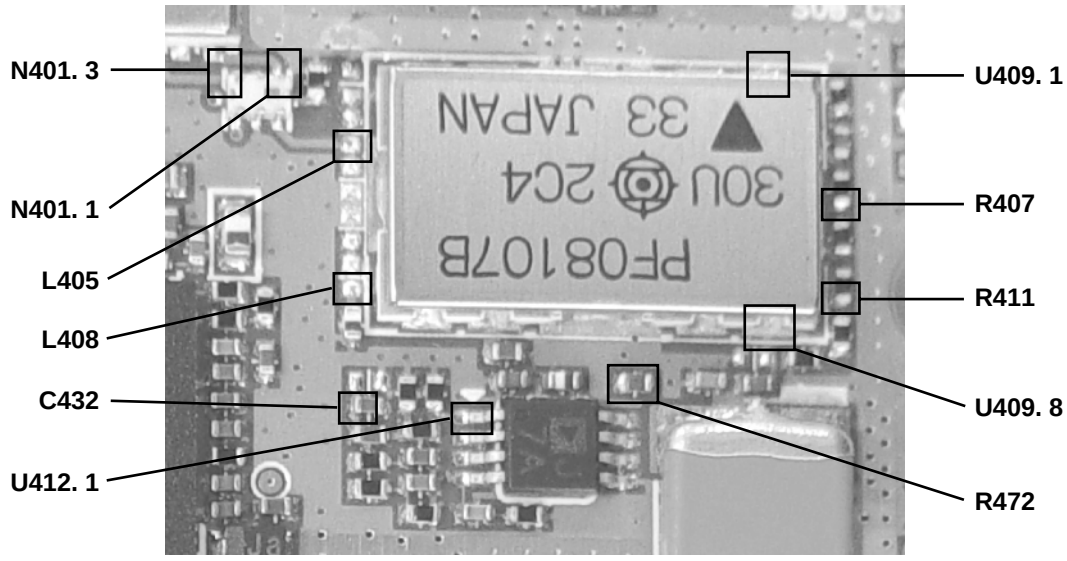
TXQN TXIN
TXQP TXIP

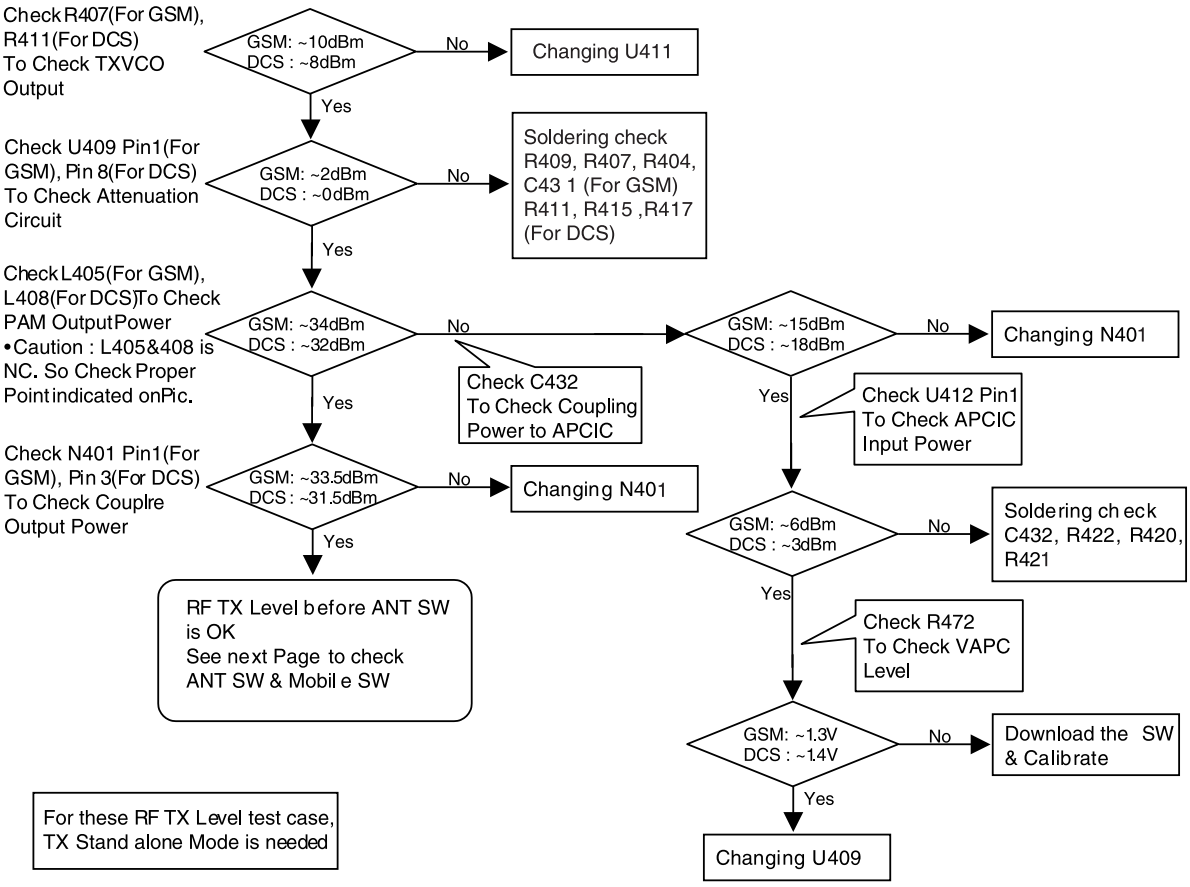


Graph 4-13. TX IQ Signal

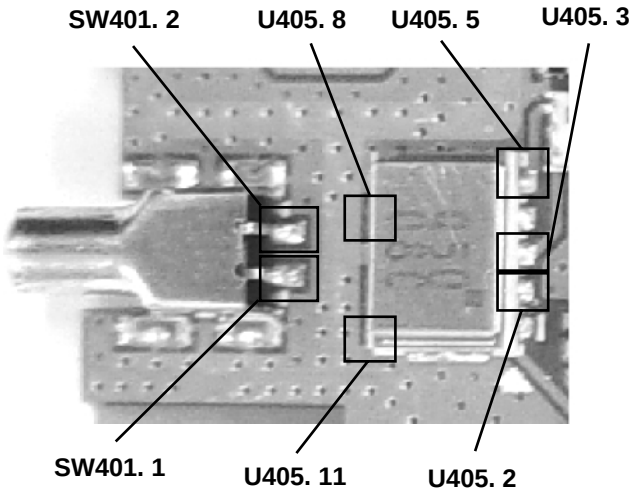


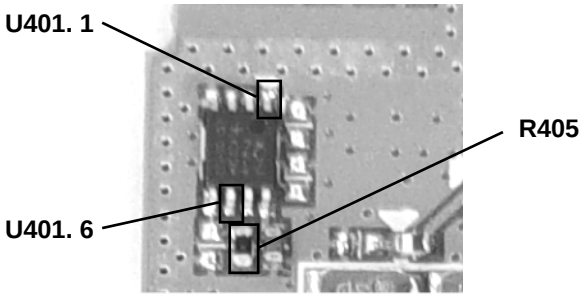
4-2-5 Checking RF TX Level

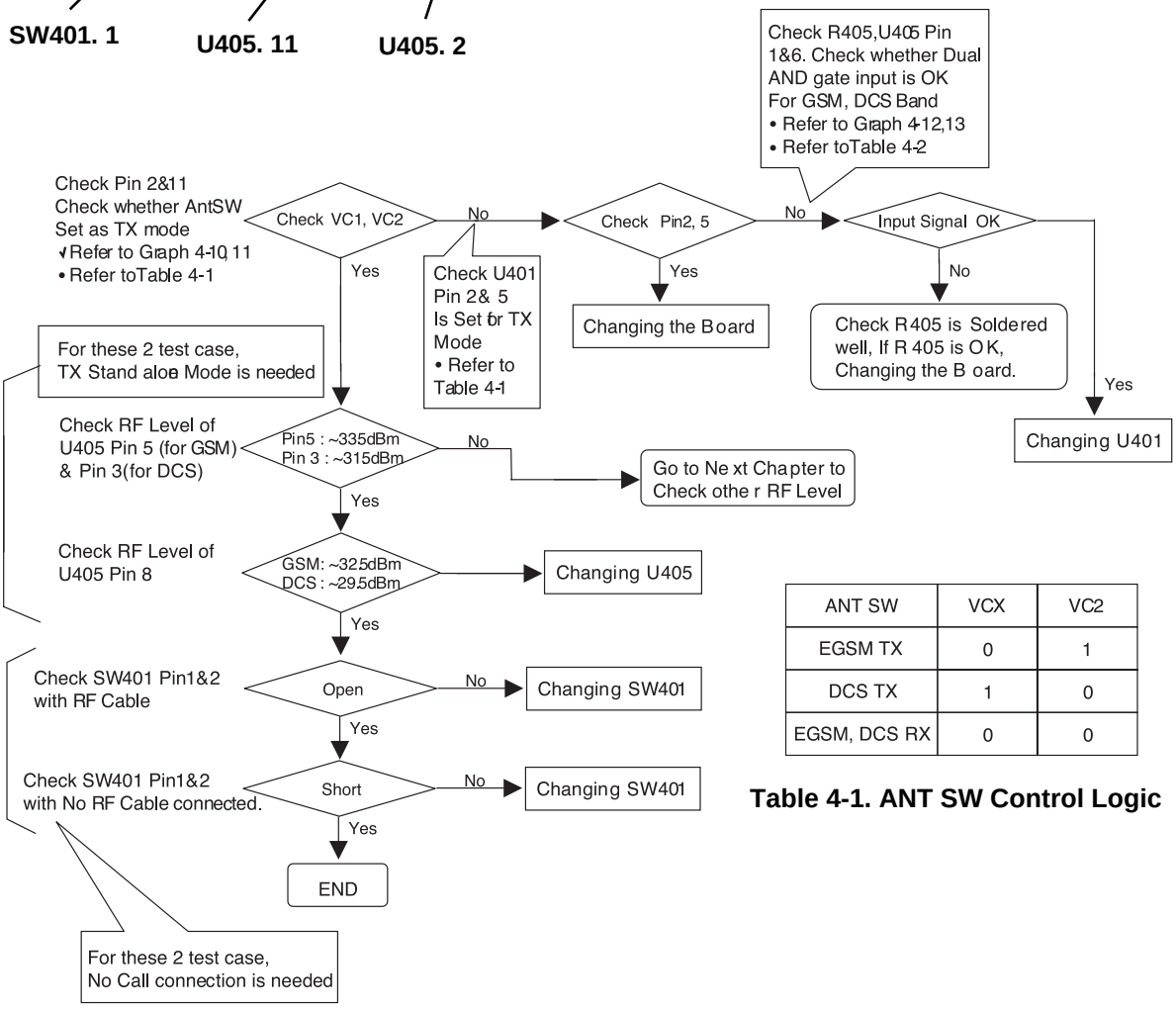




4-2-6 Checking Ant SW & Mobile SW



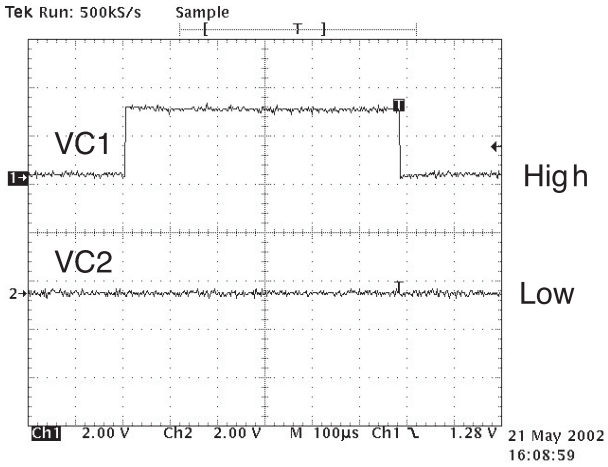




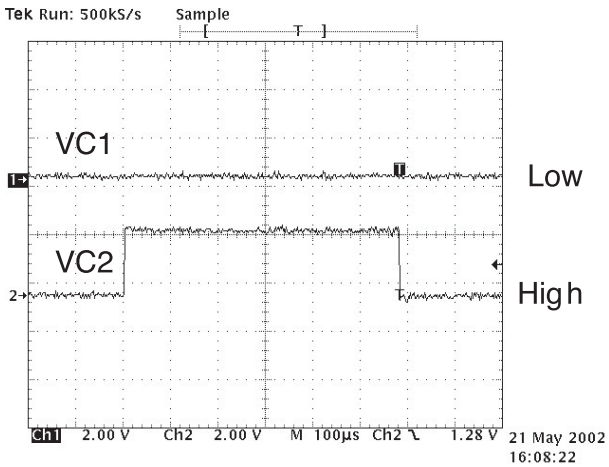
ANT SW	VCX	VC2
EGSM TX	0	1
DCS TX	1	0
EGSM, DCS RX	0	0

Table 4-1. ANT SW Control Logic

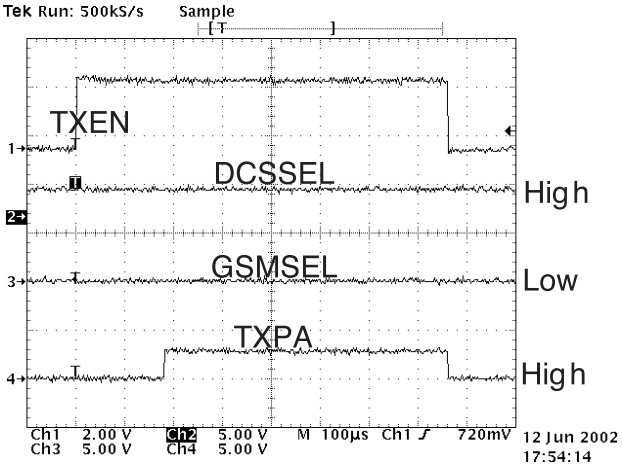
4-2-6 Checking Ant SW & Mobile SW



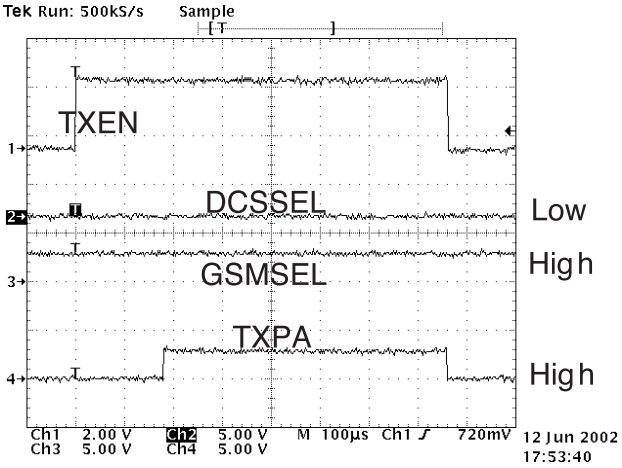
Graph 4-14. ANT SW Control
DCS TX Mode



Graph 4-15. ANT SW Control
GSM TX Mode



Graph 4-16.Dual AND Gate input
For DCS TX Mode



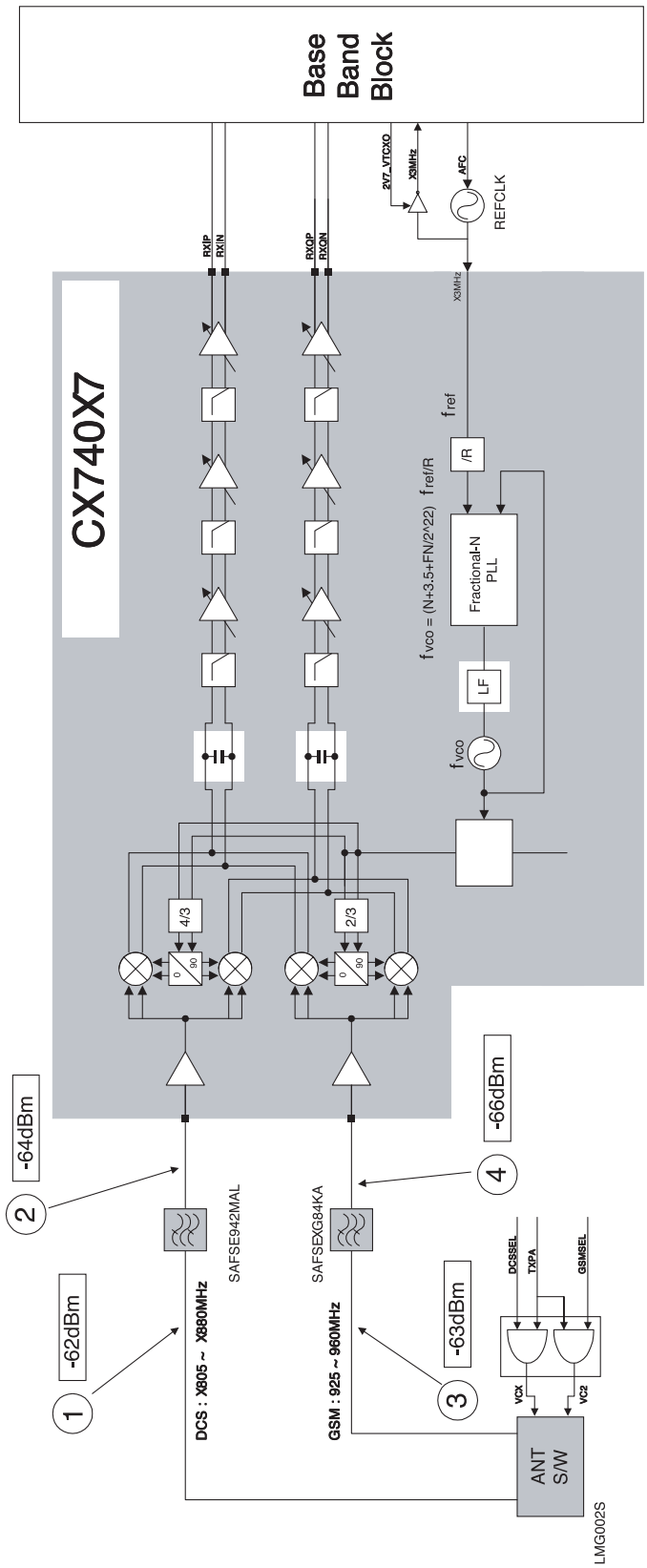
Graph 4-17.Dual AND Gate input
For GSM TX Mode

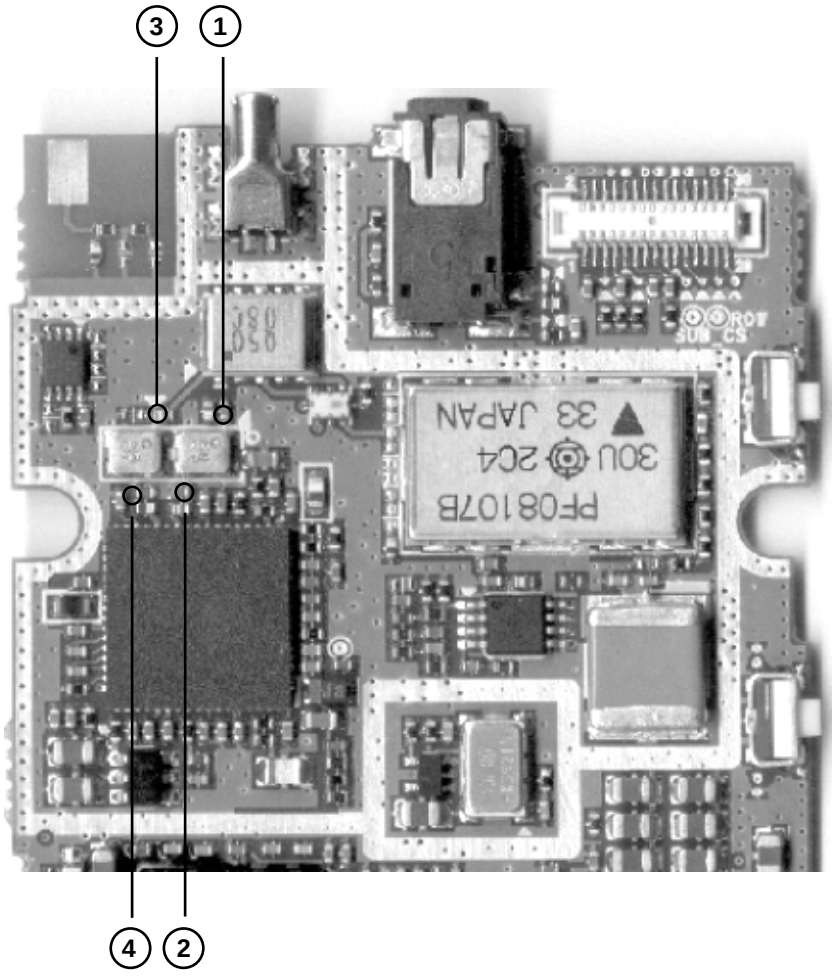
ANT SW	GSMSEL	DCSSEL	TXPA
EGSM TX	1	0	1
DCS TX	0	1	1
EGSM RX	1	0	0
DCS RX	0	1	0

Table 4-3. ANT SW Control Logic

4-2-7 Receiver RF Level

GSM : CH.62, -60dBm
DCS :CH.699, -60dBm

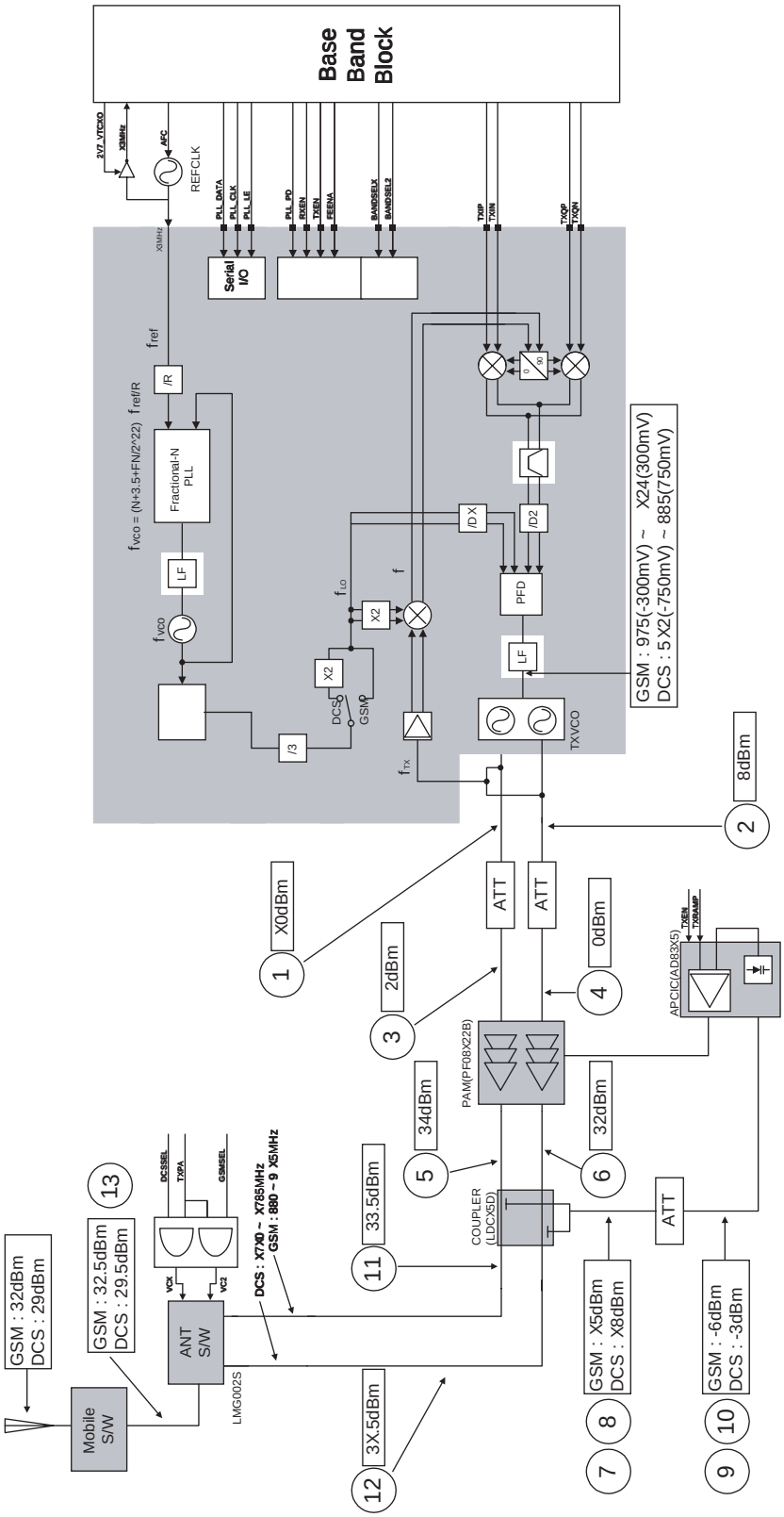




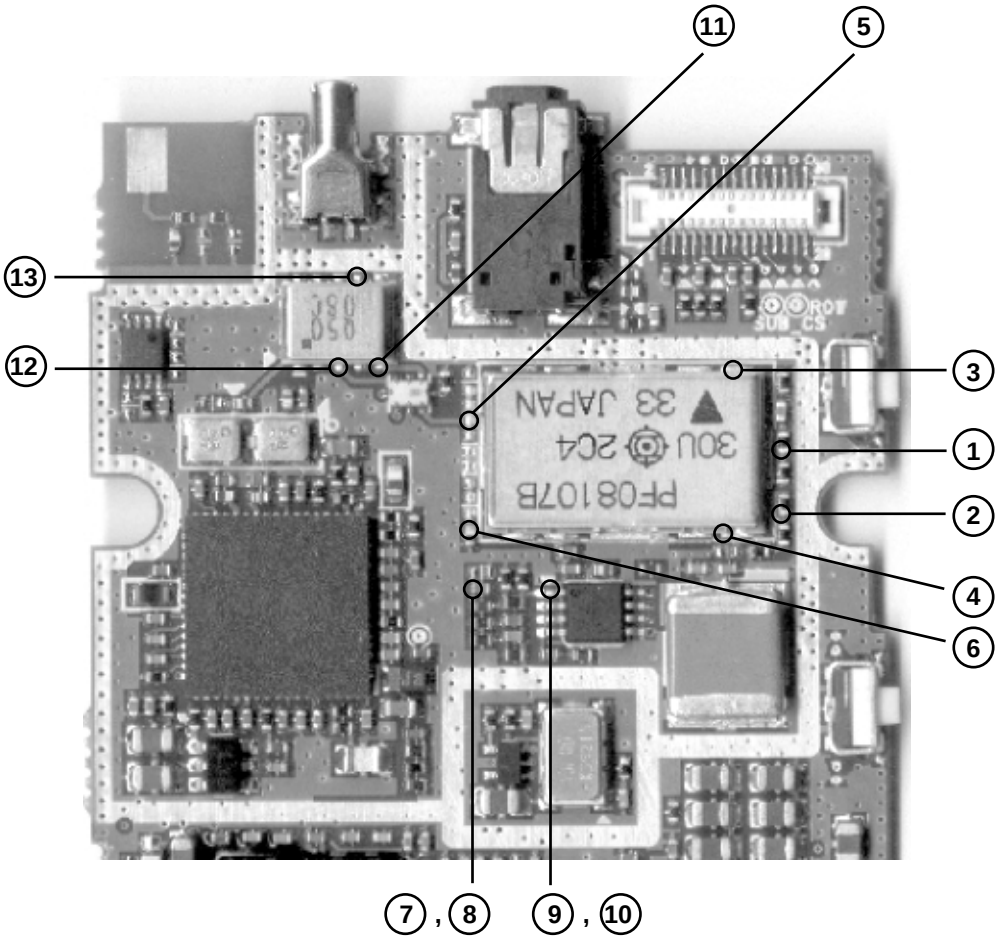
Test Points of Rx Level

4-2-8 Transmitter RF Level

GSM :Pwr Lvl 5,CH.62,32dBm
DCS :Pwr Lvl 5,CH.699, 29dBm

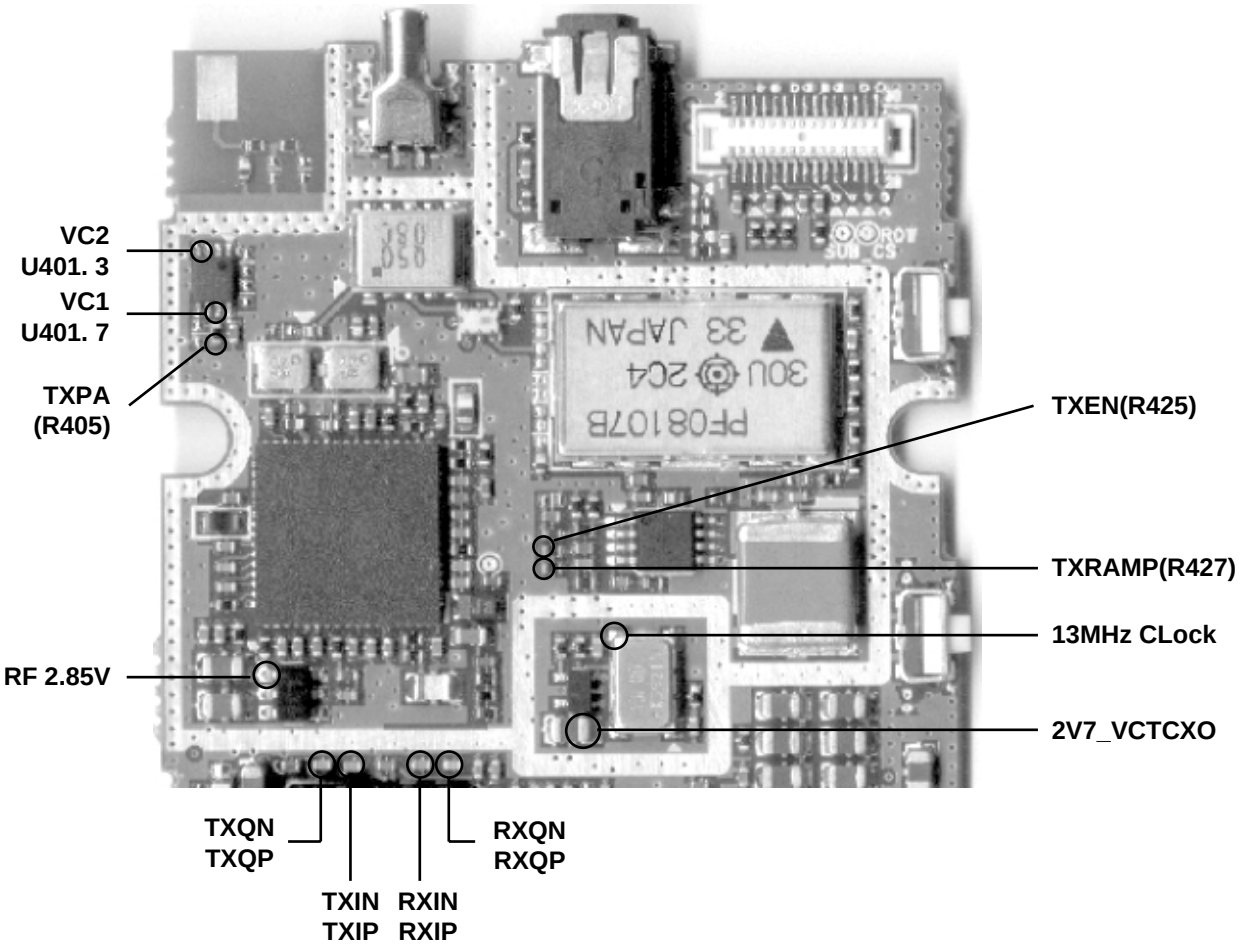


4-2-8 Transmitter RF Level



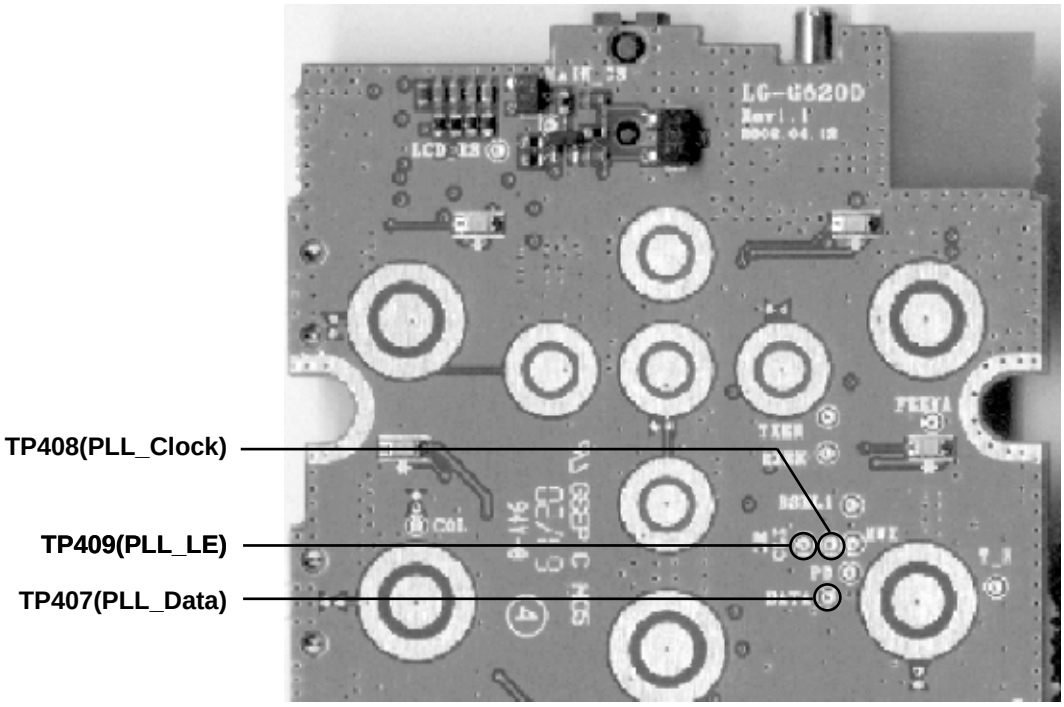
Test Points of Tx Level

4-2-9 Test Points for RF Components



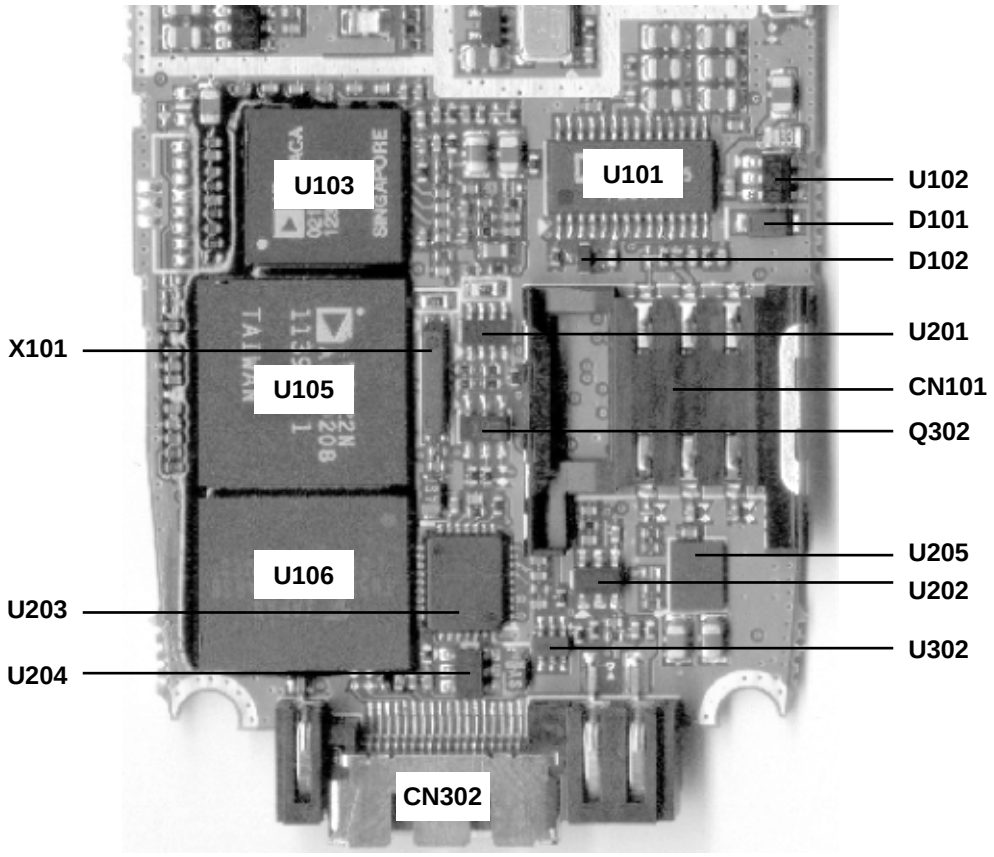
Test Points for RF components

• Test Points for RF Components



Test Points for RF components
(Keypad Side/Lower)

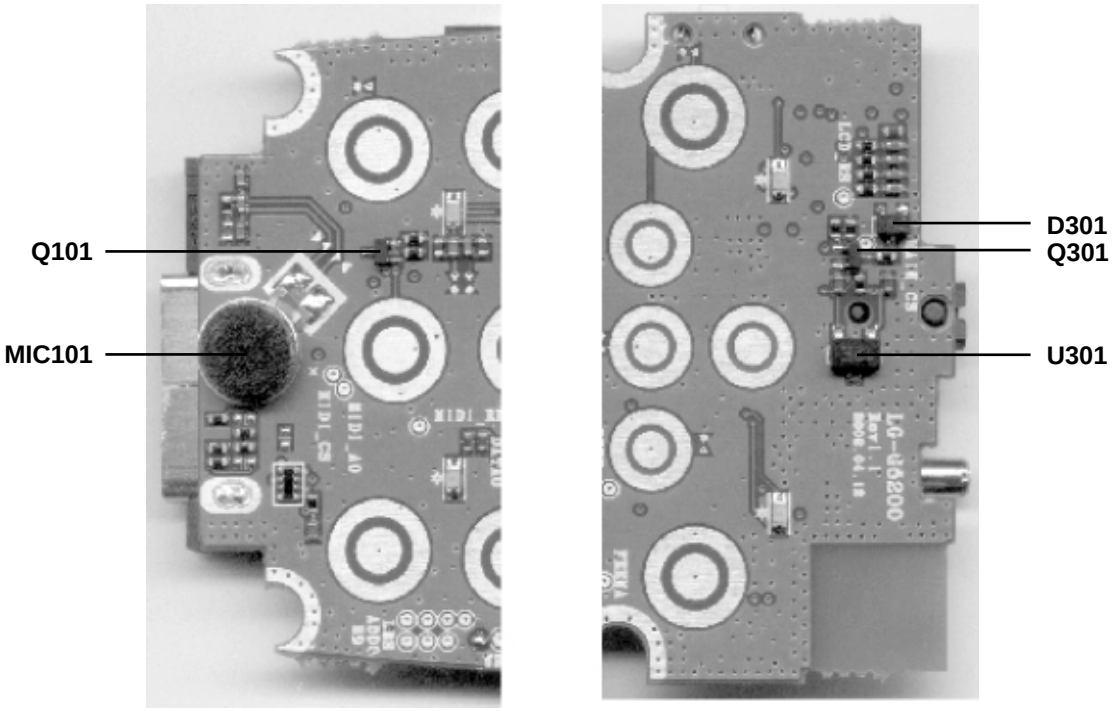
• Baseband components (Component Side)



Baseband components (Component Side)

Reference	Description	Reference	Description
U101	PMIC	U205	LDO
U102	P-Channel FET	U302	Analog Switch
U103	Analog Main Processor	D101	Diode
U105	Digital Main Processor	D102	Dual Diode
U106	Memory	X101	X-TAL
U201	Comparator	Q302	Dual Transistor
U202	Analog Switch	CN101	SIM Connector
U203	MIDI IC	CN301	IO Connector
U204	Analog Switch		

• Baseband components (Keypad Side)

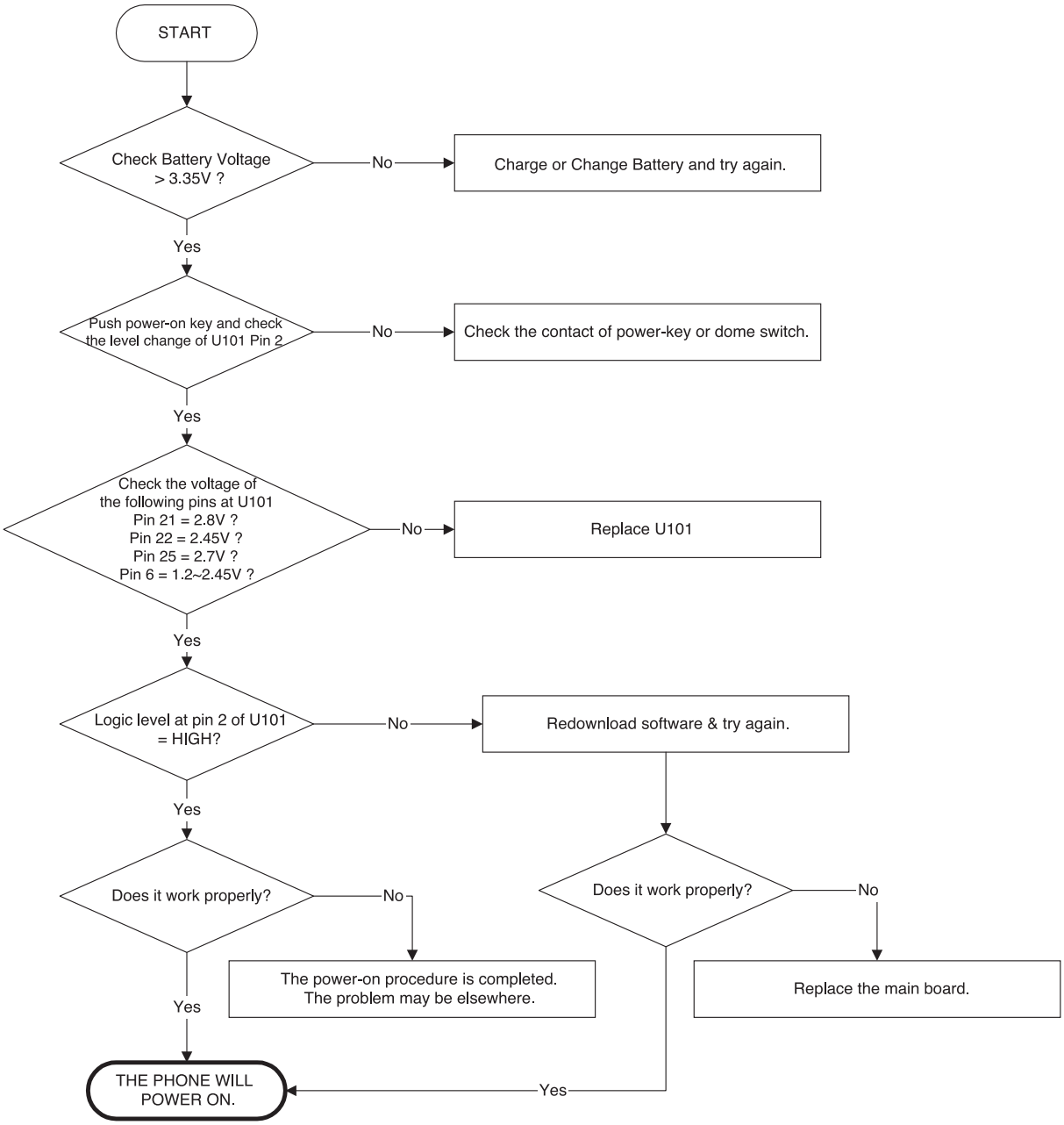


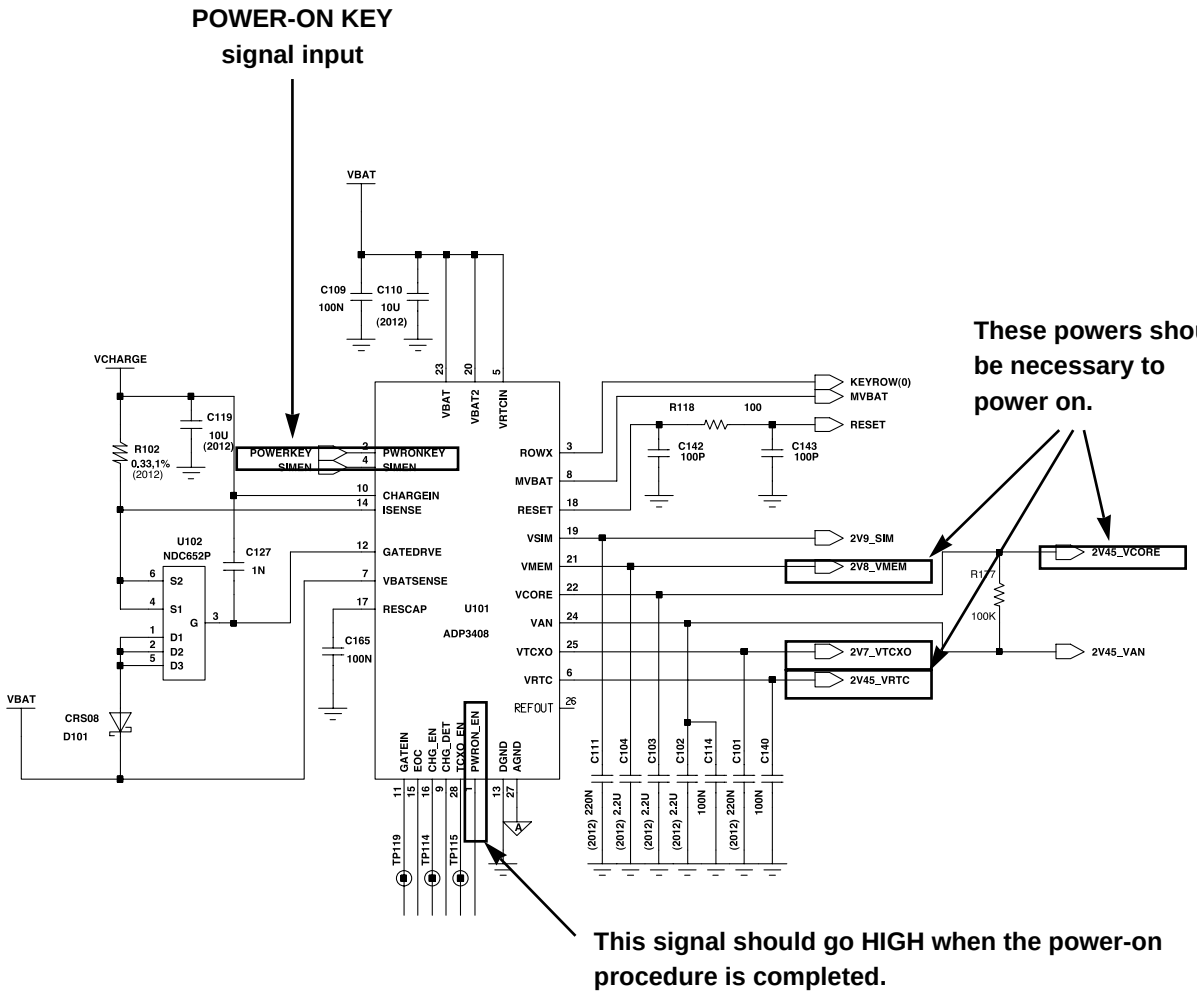
Baseband components (Keypad Side)

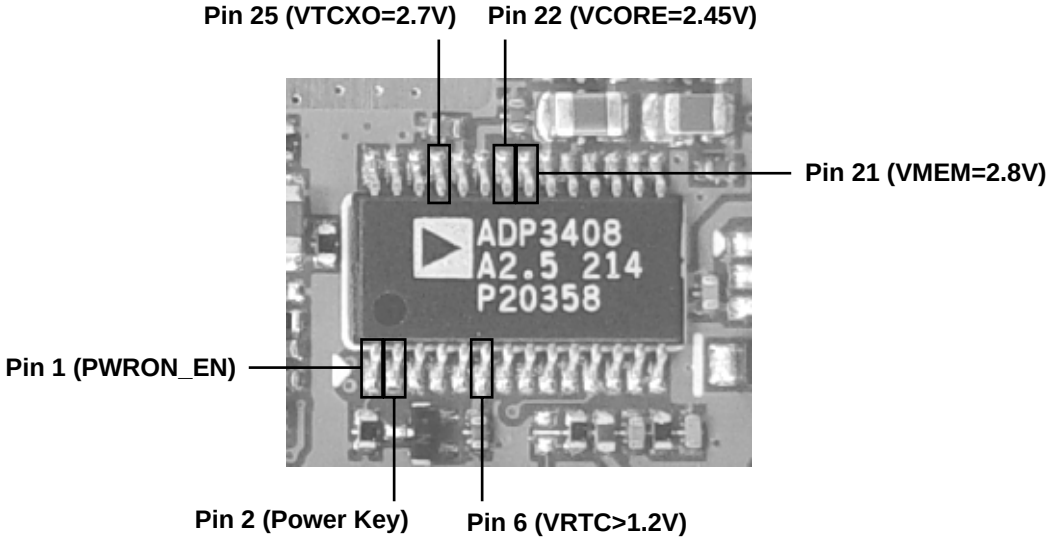
Reference	Description	Reference	Description
U301	Hall Sensor	D301	Dual Diode
Q301	Transistor	MIC101	C-MIC
Q302	Transistor		

4.3 Power on Trouble

Setting : Connect PIF, and set remote switch off at PIF.

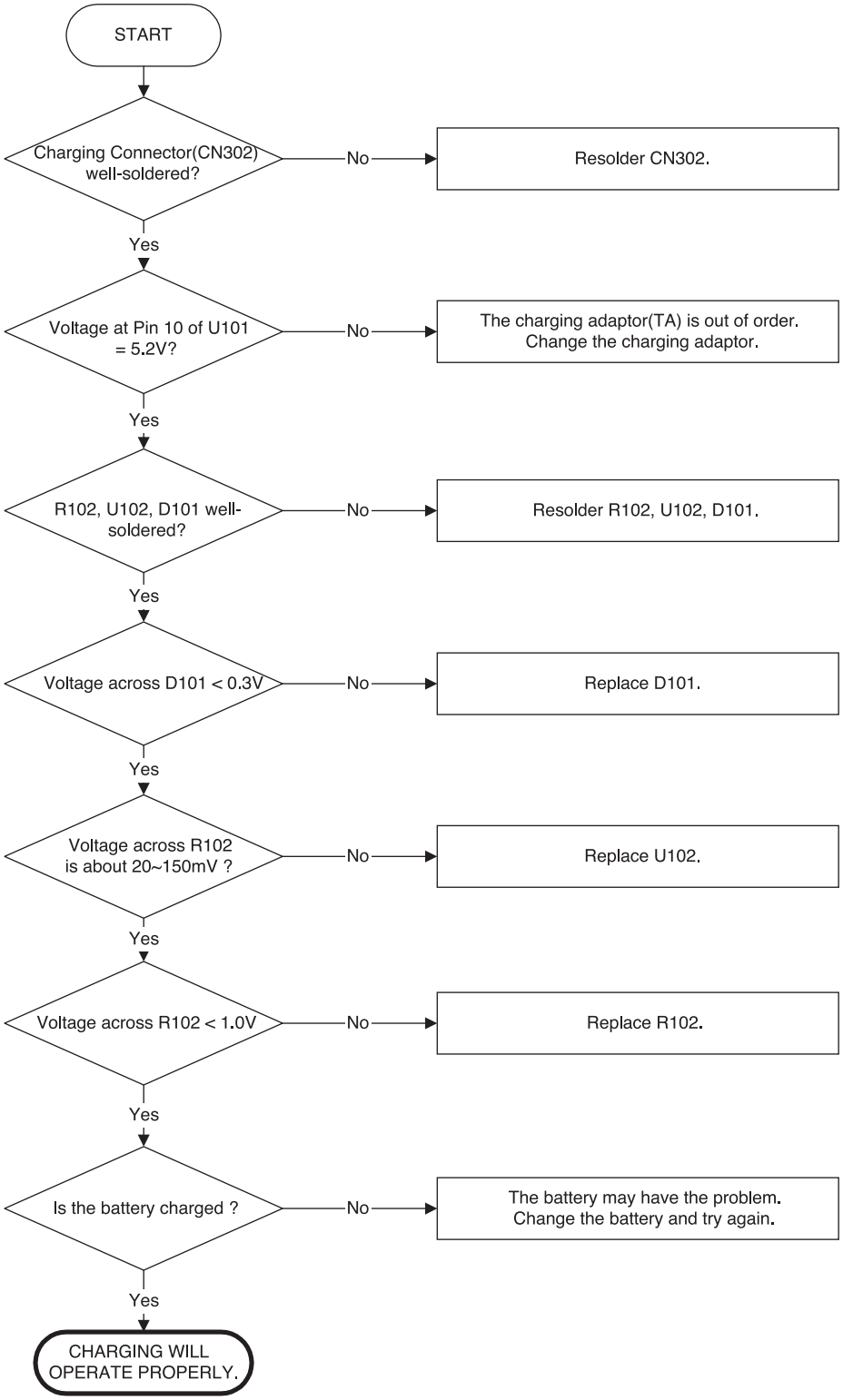



POWER-ON KEY
signal input
These powers should
be necessary to
power on.
This signal should go HIGH when the power-on
procedure is completed.
VBAT
VCHARGE
C109
100N
C110
10U
(2012)
C119
10U
(2012)
R102
0,33,1%
(2012)
POWERKEY
SIMEN
PWRONKEY
SIMEN
CHARGEIN
ISENSE
U102
NDC652P
C127
1N
GATEDRVE
VBATSENSE
RESCAP
U101
ADP3408
C165
100N
CRS08
D101
VBAT
VBAT2
VRTCIN
ROWX
MVBAT
RESET
VSIM
VMEM
VCORE
VAN
VTCXO
VRTC
REFOUT
R118
100
C142
100P
C143
100P
KEYROW(0)
MVBAT
RESET
2V9_SIM
2V8_VMEM
2V45_VCORE
R117
100K
2V45_VAN
2V7_VTCXO
2V45_VRTC
GATEIN
EOC
CHG_EN
CHG_DET
TCXO_EN
PWRON_EN
DGND
AGND
C111
C104
C103
C102
C114
C101
C140
220N
2.2U
100N
TP119
TP114
TP115

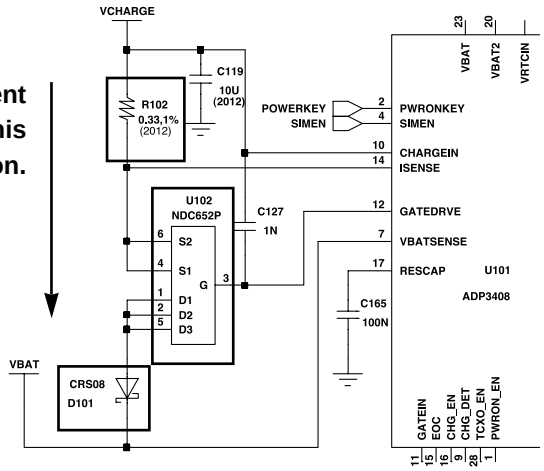

Pin 25 (VTCXO=2.7V)
Pin 22 (VCORE=2.45V)
Pin 21 (VMEM=2.8V)
Pin 1 (PWRON_EN)
Pin 2 (Power Key)
Pin 6 (VRTC>1.2V)
ADP3408
A2.5 214
P20358

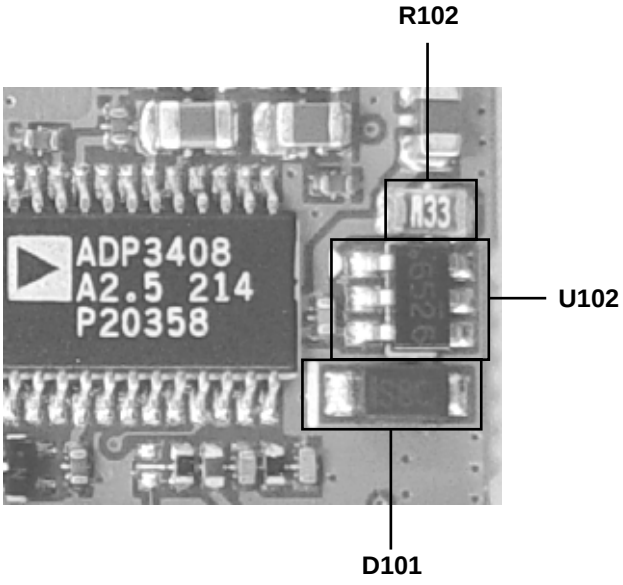
4.4 Charging Trouble

Setting : Connect PIF, and set remote switch off at PIF.



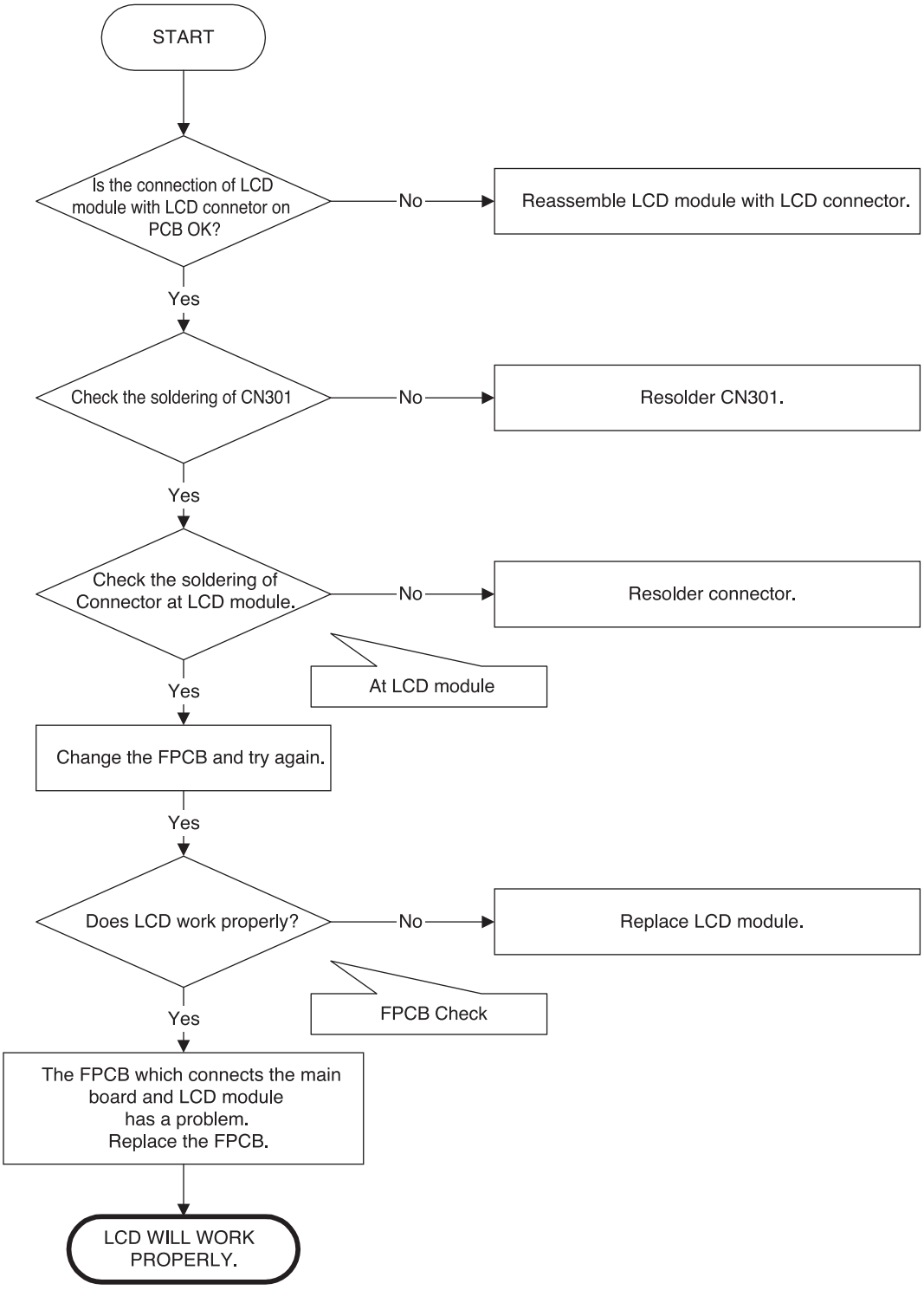
The charging current will flow into this direction.

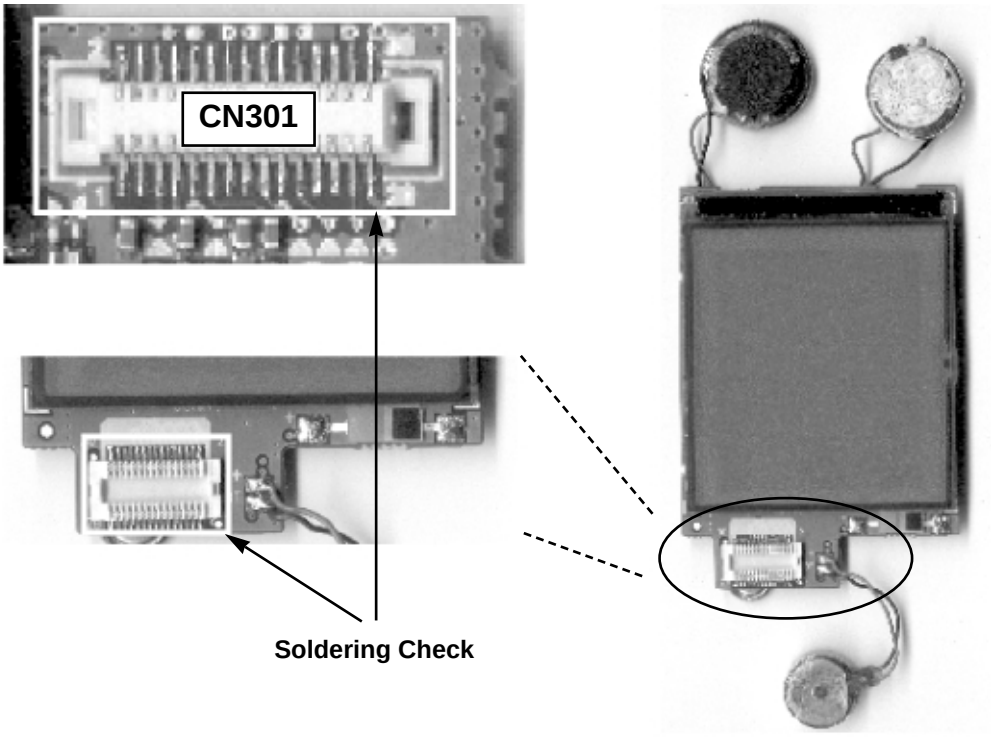


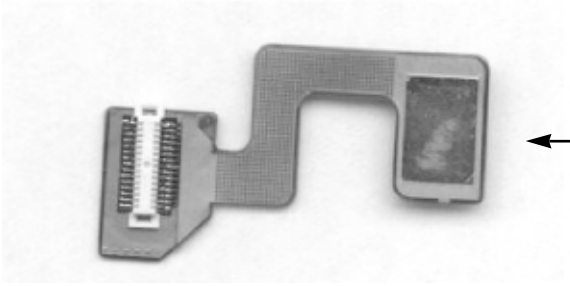


4.5 LCD Trouble

Setting : Connect PIF and power on.



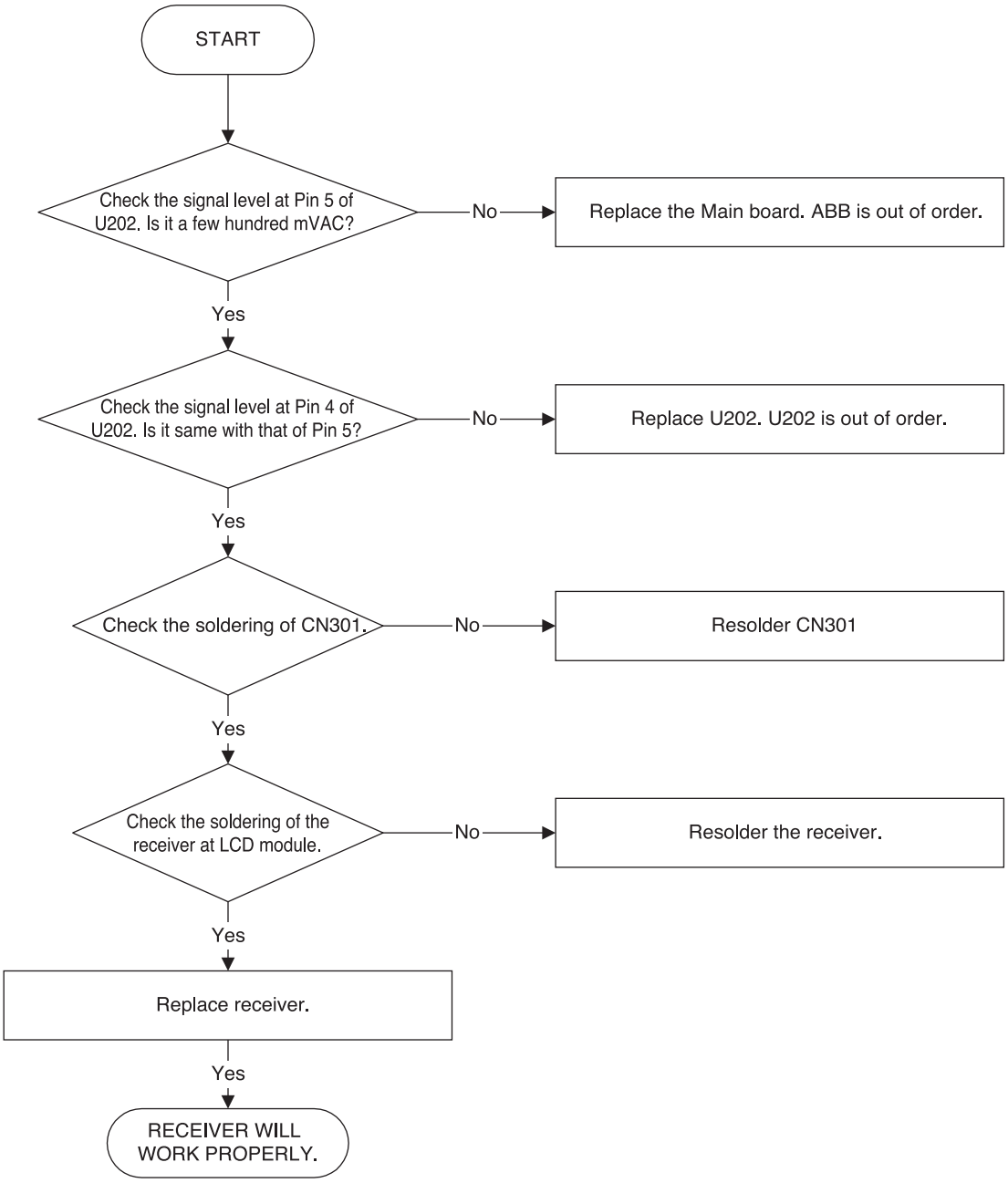


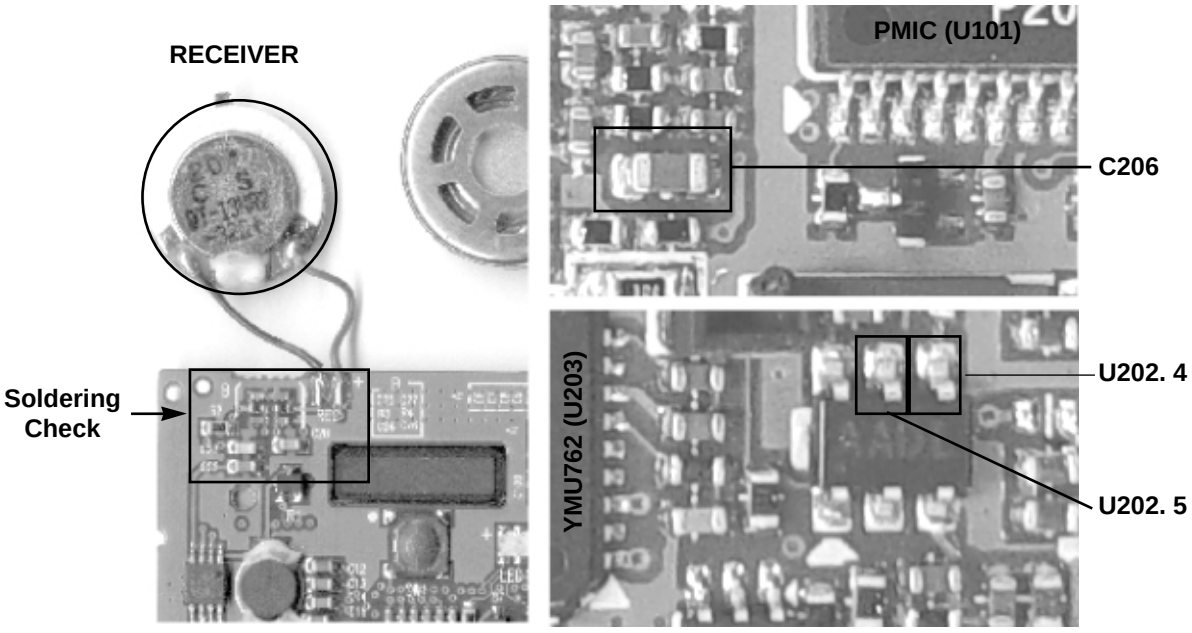


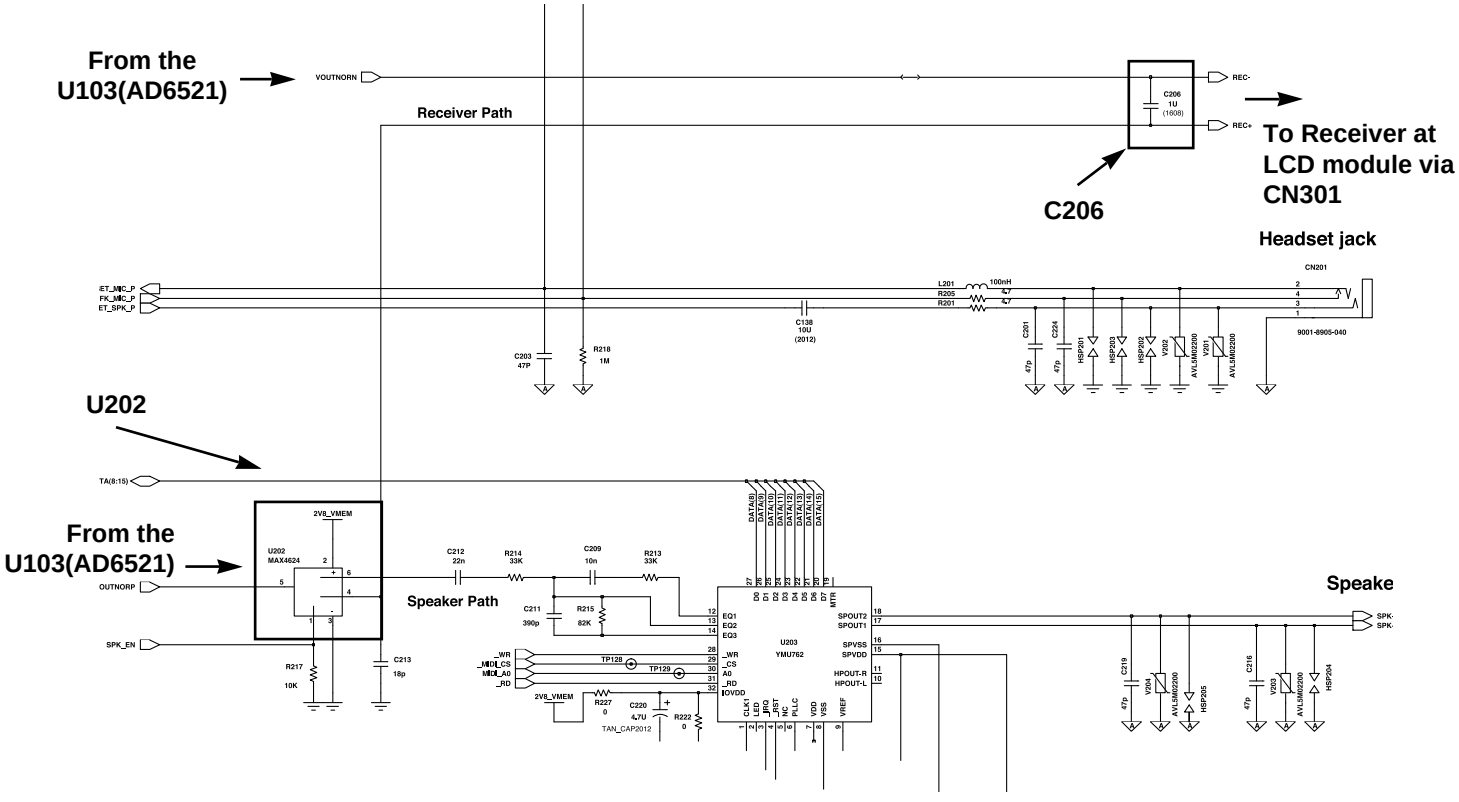
If the FPCB has a problem, the control signals for LCD cannot be transmitted properly.

4.6 Receiver Trouble

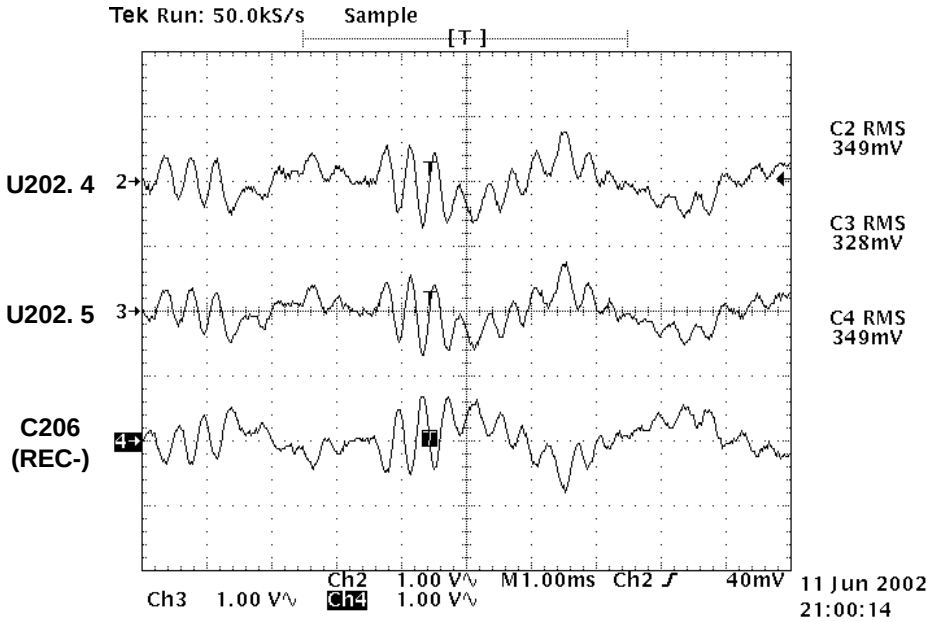
Setting : After initializing GSM MS test equipmemt, connect PIF and power on. Make a test call to 112. Set audio part at test equipment as PRBS or continuous wave, not echo. Set the volumn max.







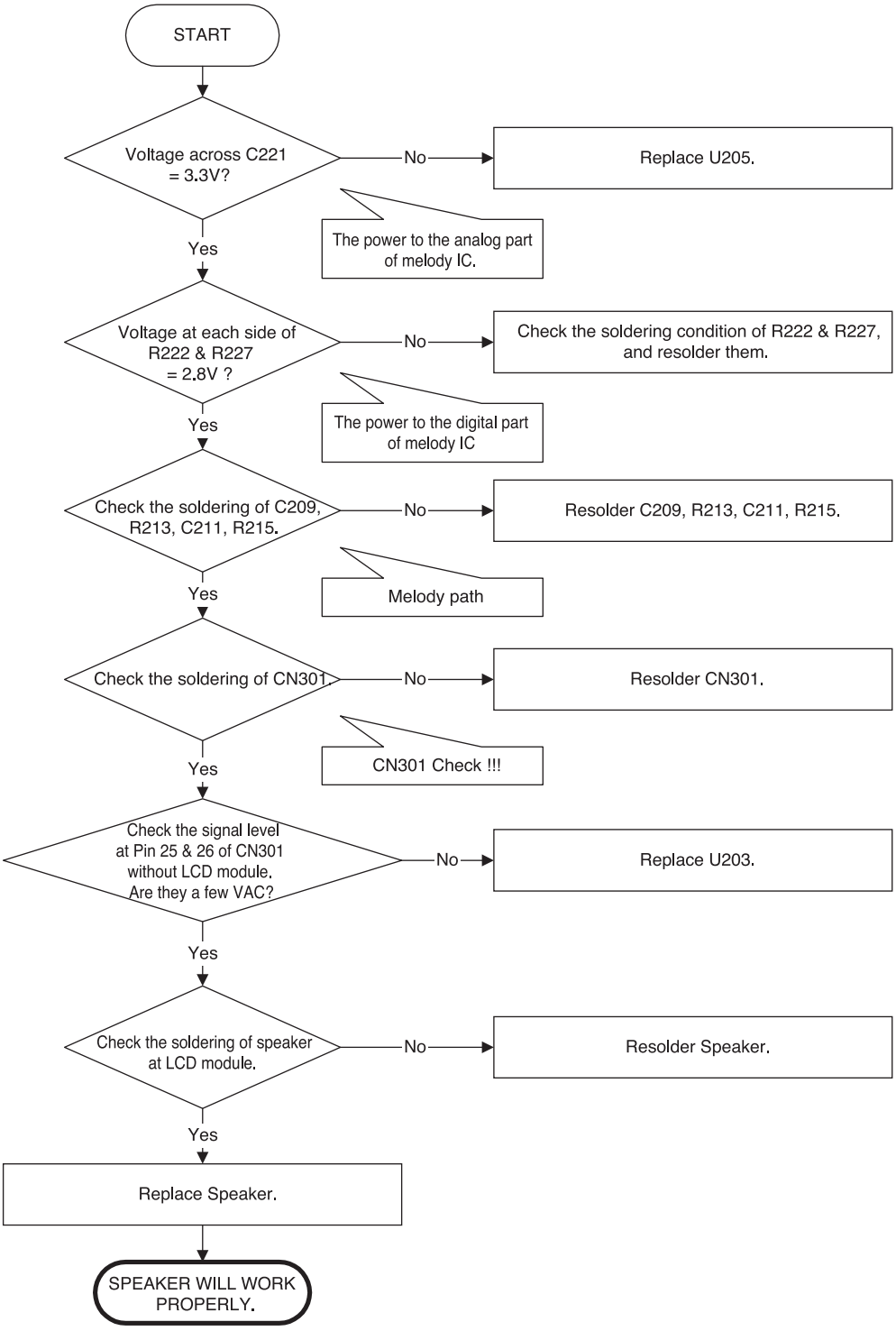
The Circuit Diagram of the receiver path. Refer to page 2 of the complete circuit diagram for detail.

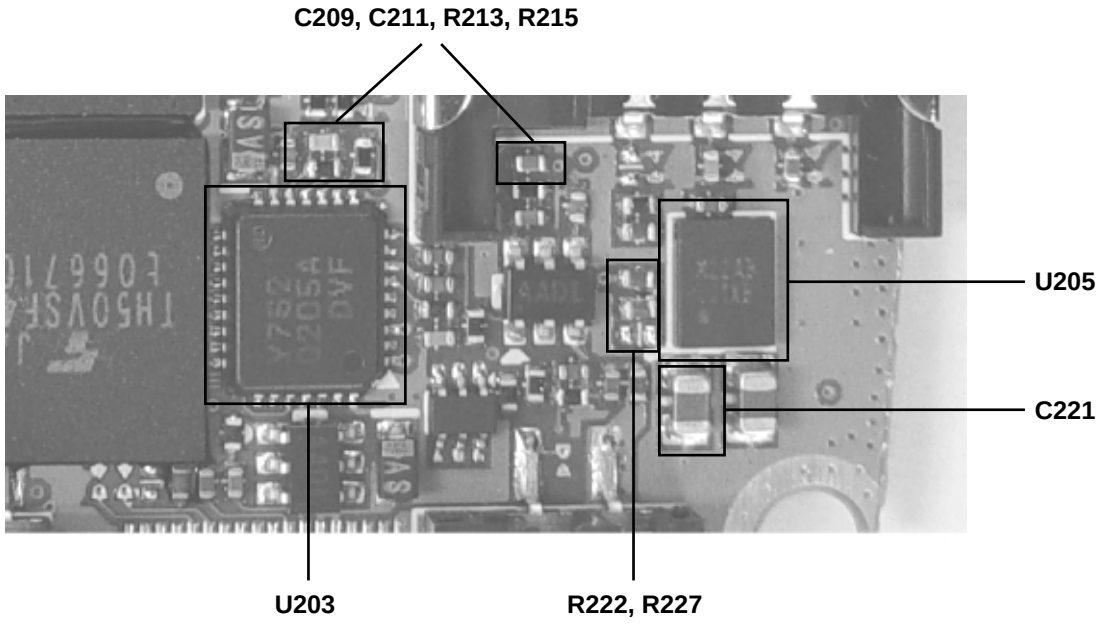


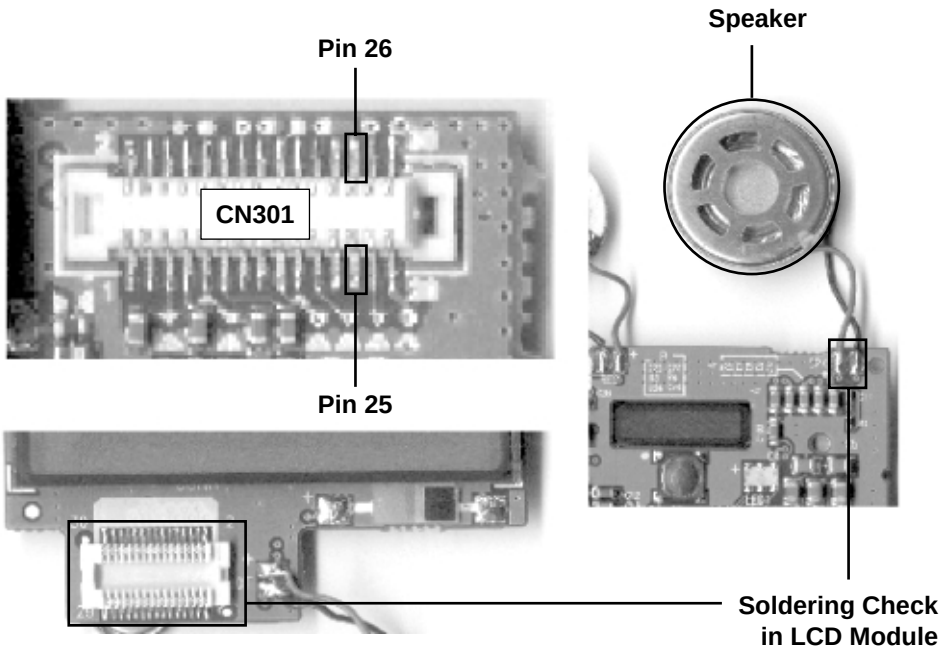
The waveforms of the audio signals at each point

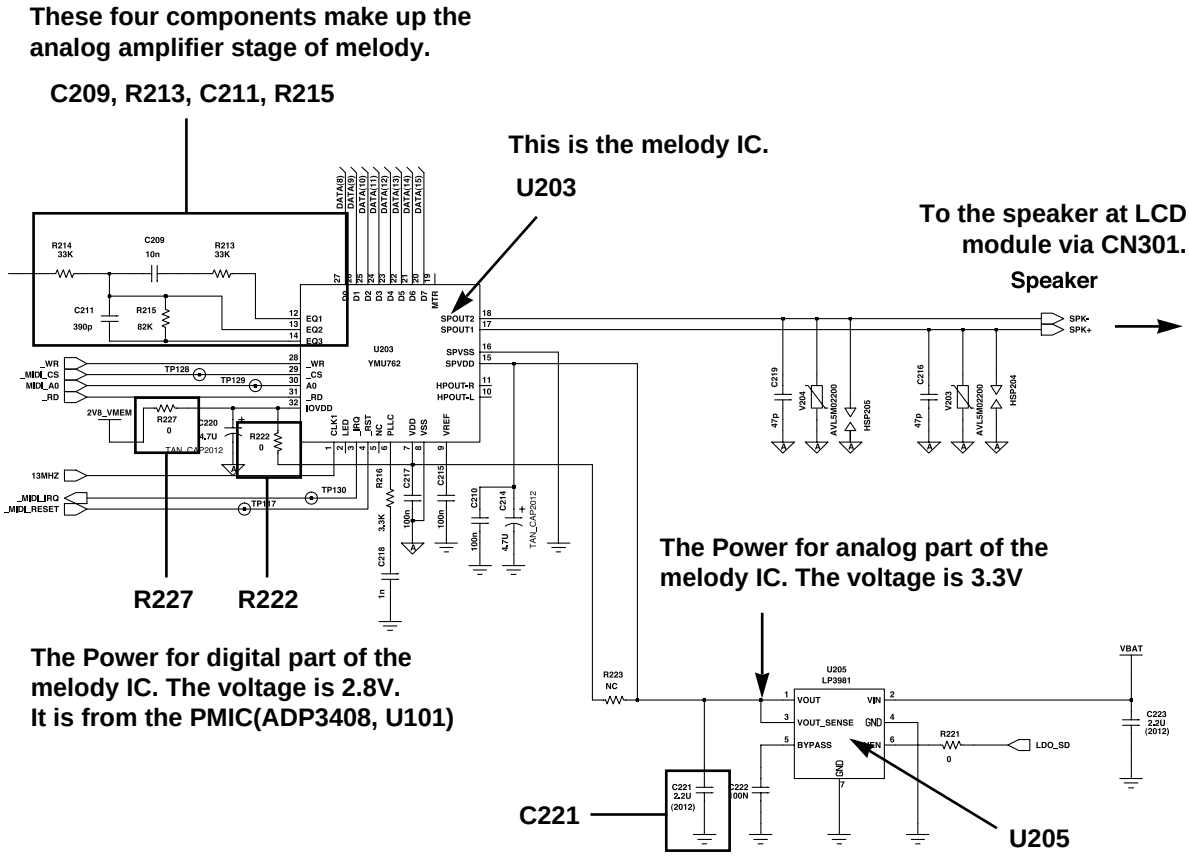
4.7 Speaker Trouble

Setting : Connect PIF to the phone, and power on. Enter the engineering mode, and set "Melody on" at "BB Test-Buzzer" menu.




C209, C211, R213, R215
U205
C221
U203
R222, R227

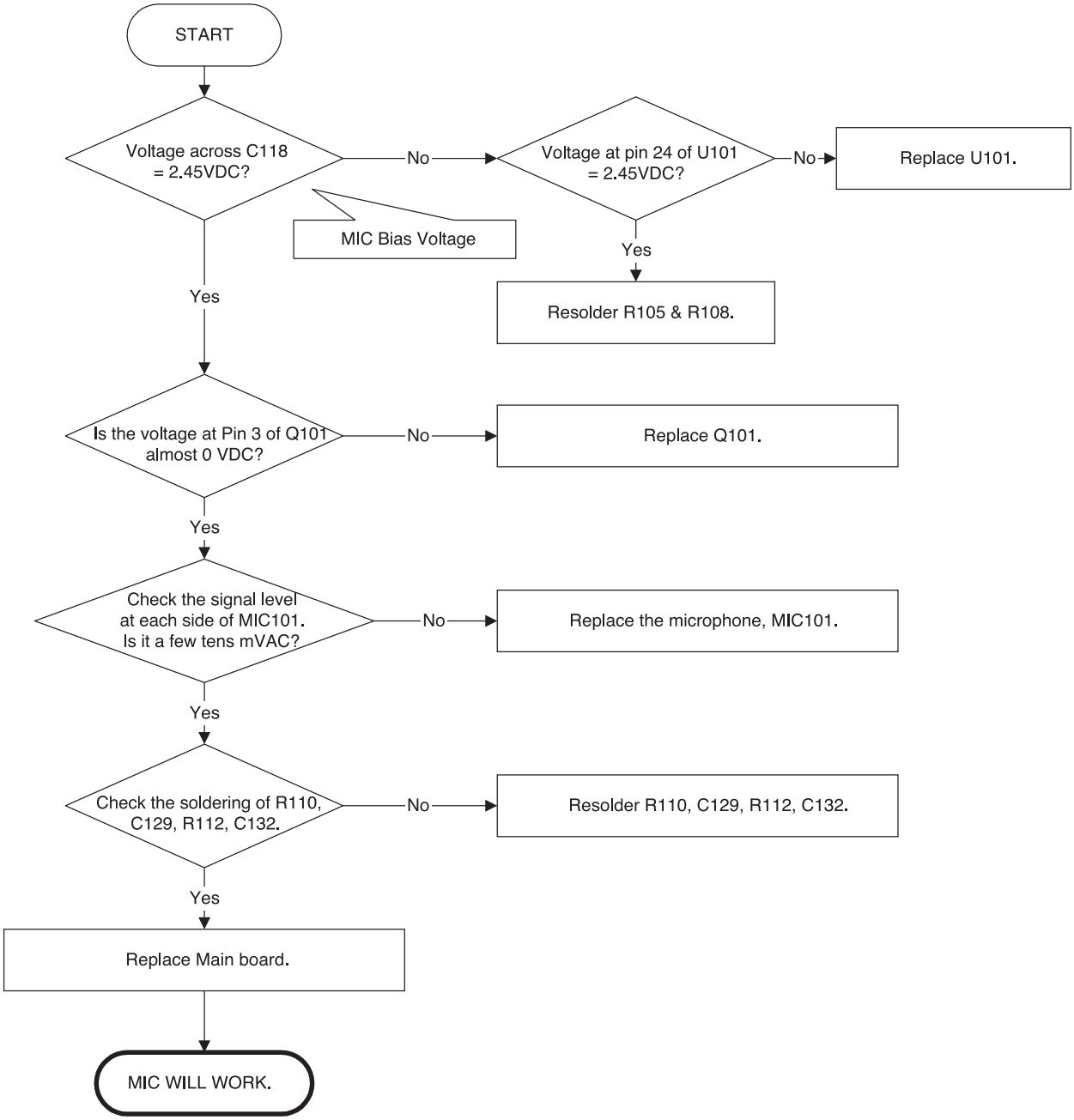

Speaker
Pin 26
CN301
Pin 25
Soldering Check
in LCD Module

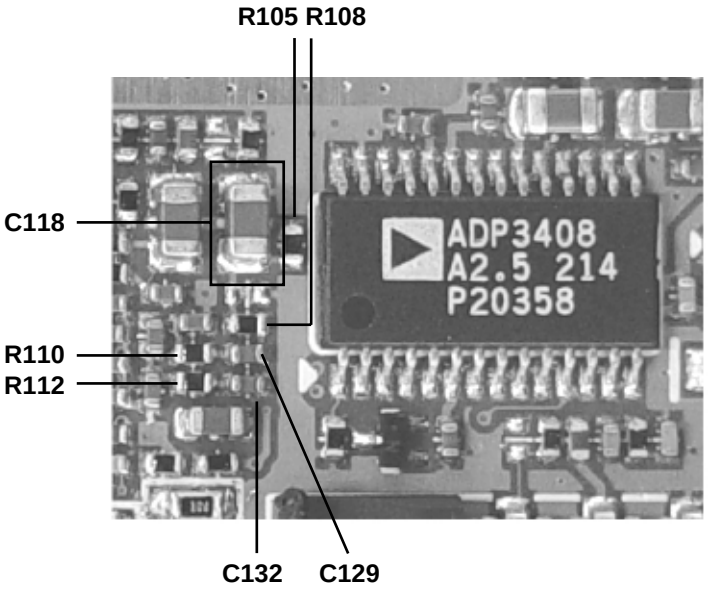


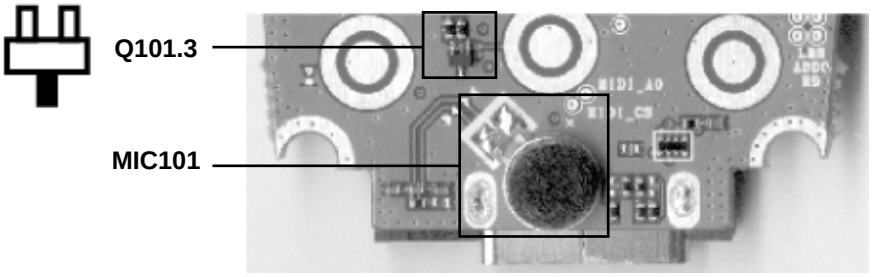
The circuit diagram of the part of the melody IC. Refer to the page 2 of the complete circuit diagram for detail.

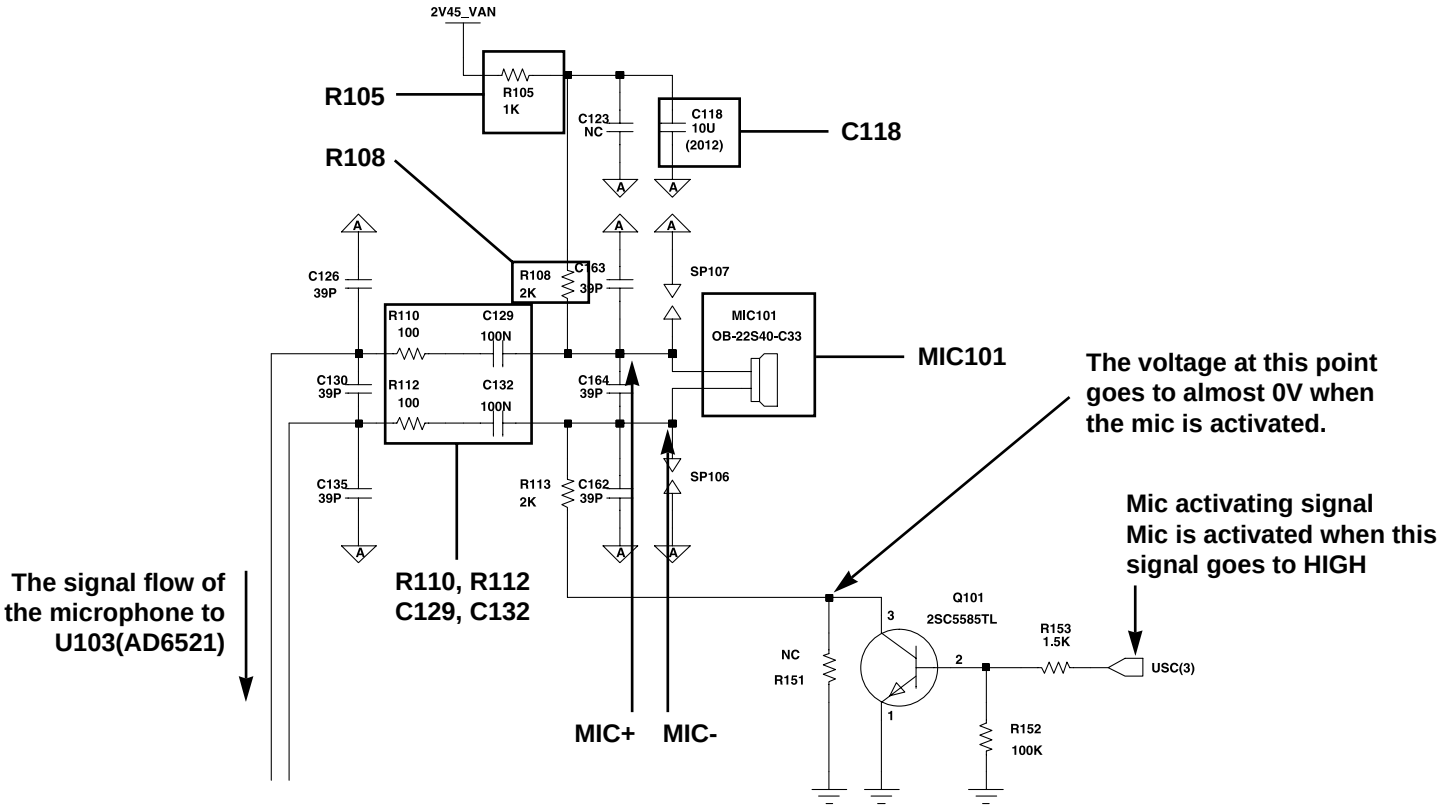
4.8 Mic Trouble

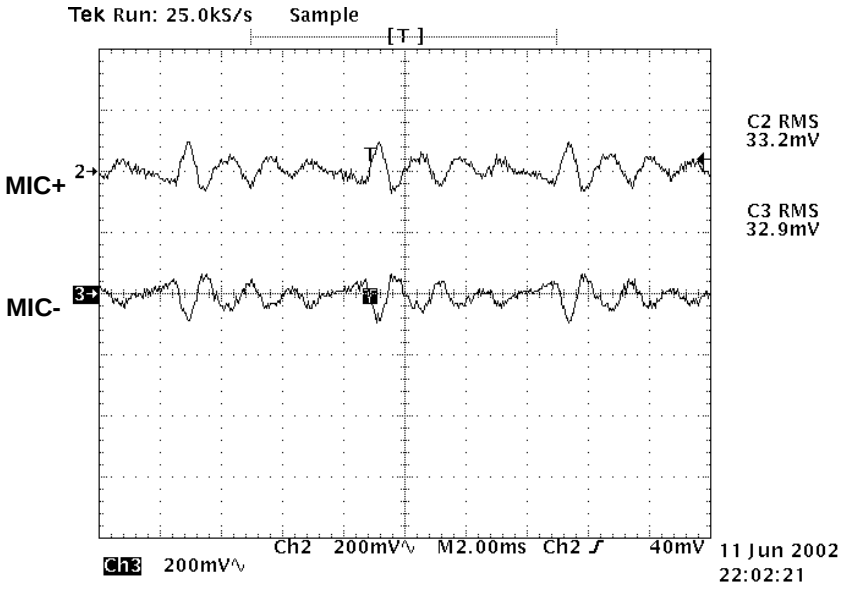
Setting : After initializing GSM MS test equipment, connect PIF to the phone, and power on. Make a test call to 112. Make a sound in front of microphone.




R105 R108
C118
ADP3408
A2.5 214
P20358
R110
R112
C132
C129


Q101.3
MIC101

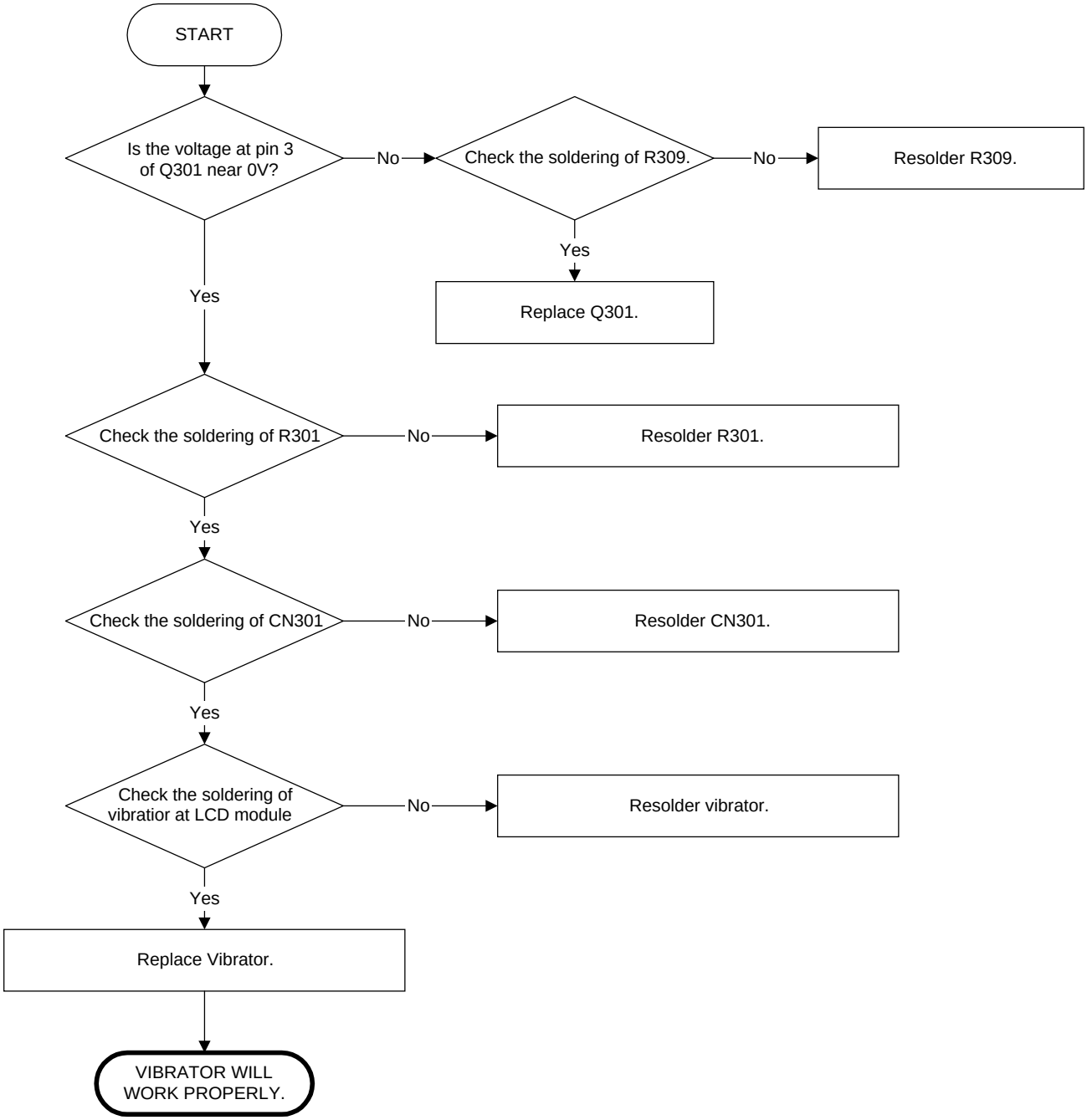


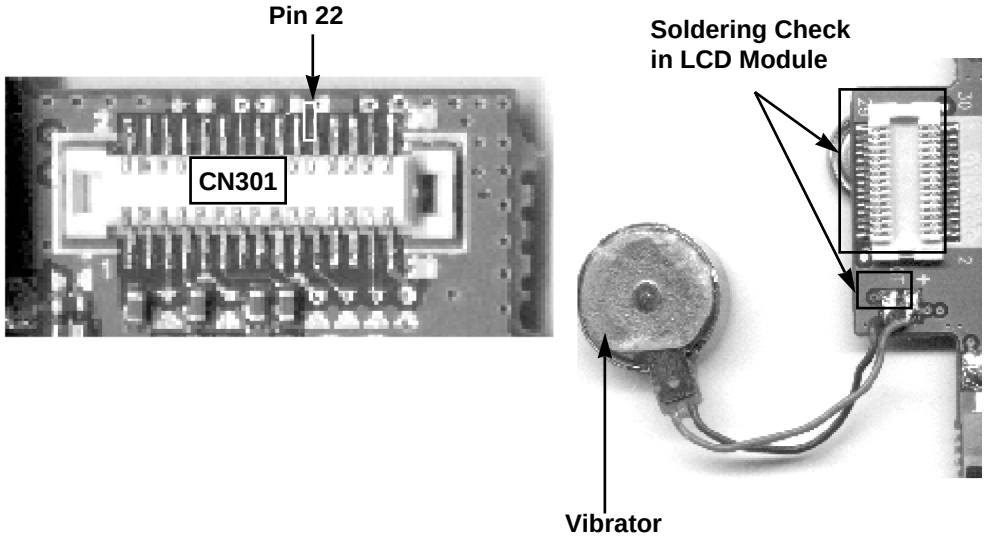


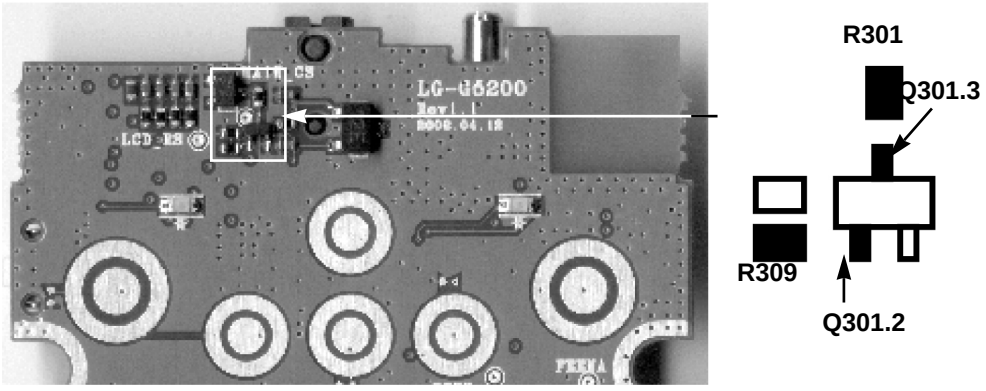
The waveforms at MIC+ and MIC-

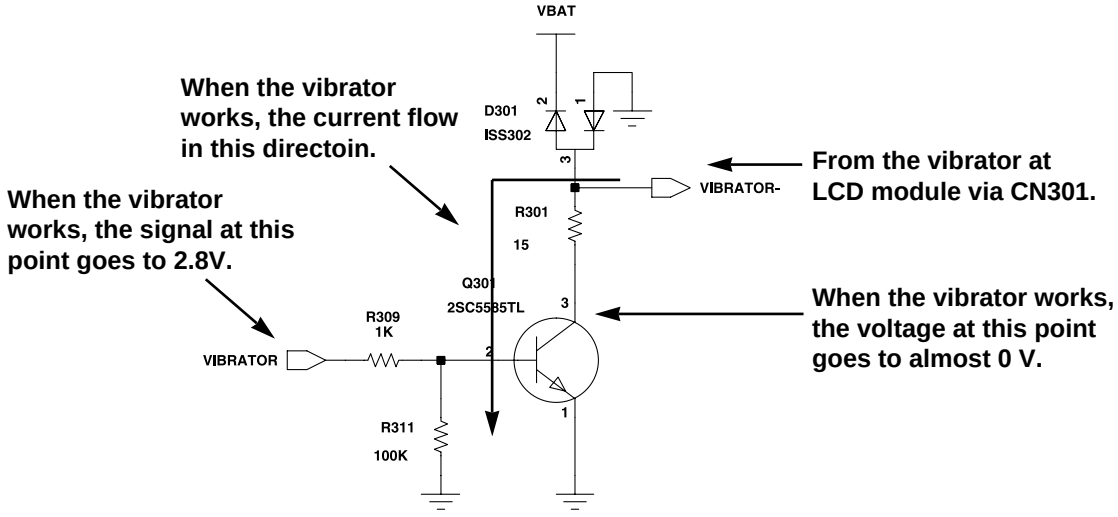
4.9 Vibrator Trouble

Setting : Connect PIF to the phone, and power on. Enter the engineering mode, and set "Vibrator On" at "BB Test-Vibrator" menu.



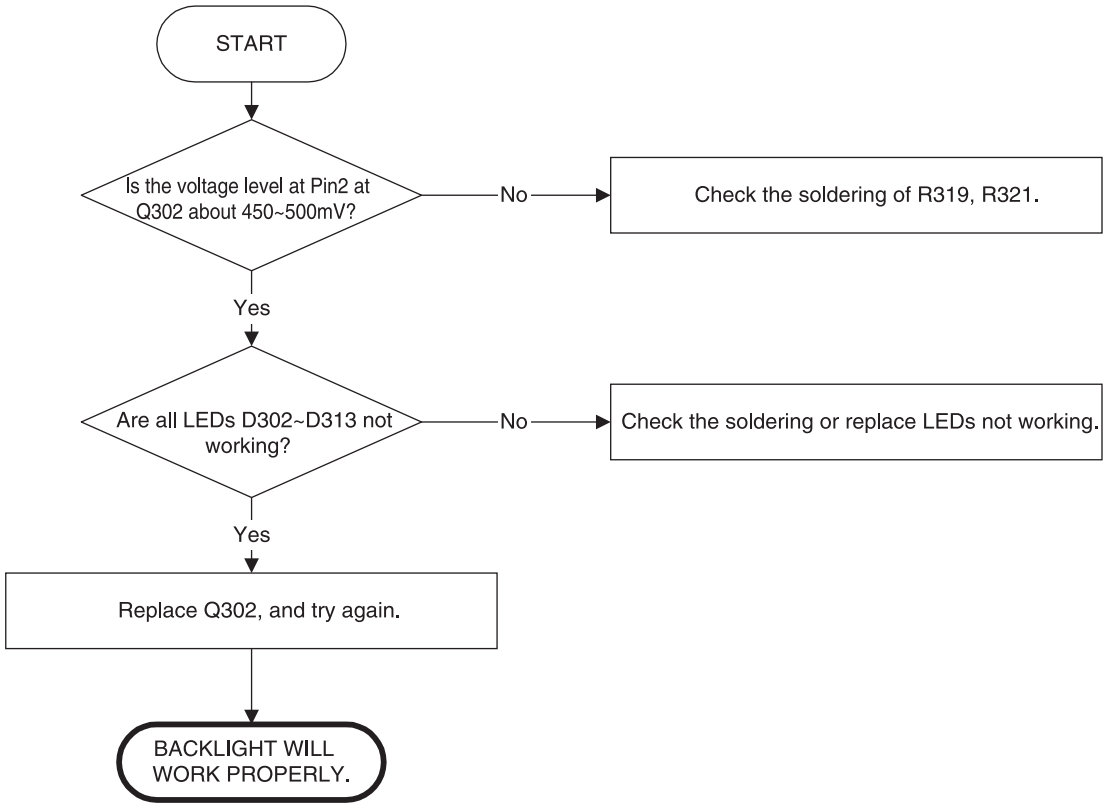

Pin 22
CN301
Soldering Check
in LCD Module
Vibrator

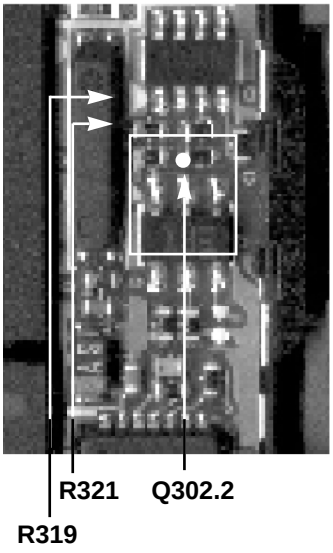

LG-G5200
R301
Q301.3
R309
Q301.2

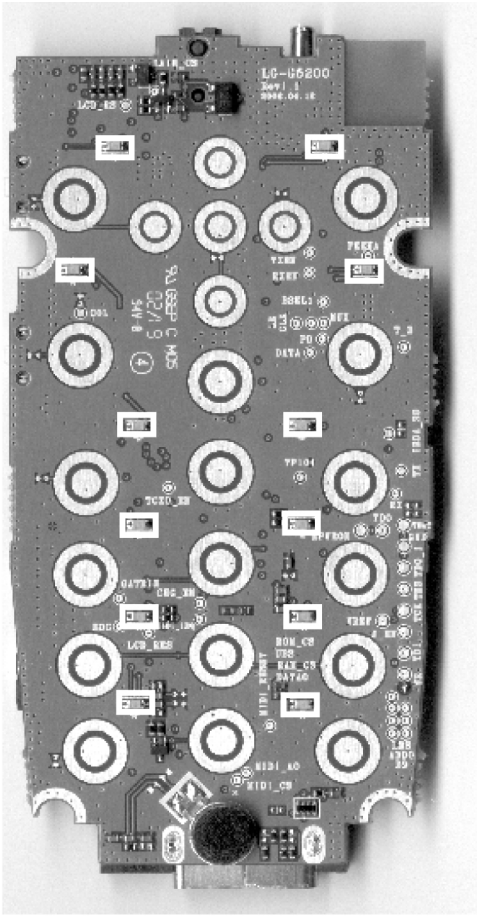

VBAT
When the vibrator works, the current flow in this directoin.
D301
ISS302
From the vibrator at LCD module via CN301.
VIBRATOR-
R301
15
When the vibrator works, the signal at this point goes to 2.8V.
Q301
2SC5585TL
When the vibrator works, the voltage at this point goes to almost 0 V.
R309
1K
VIBRATOR
R311
100K

4.10 Backlight Trouble

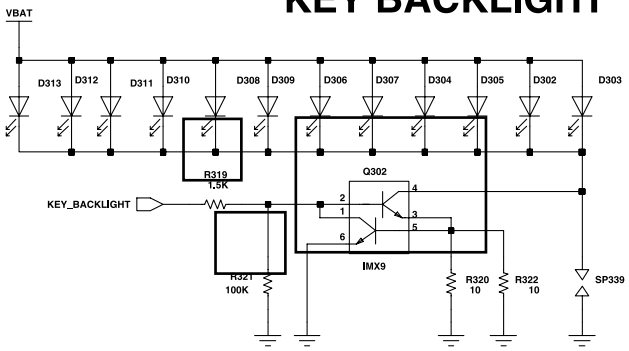
Setting : Connect PIF to the phone, and power on. Enter engineering mode, and set "Backlight on" at "BB test-Backlight" menu.





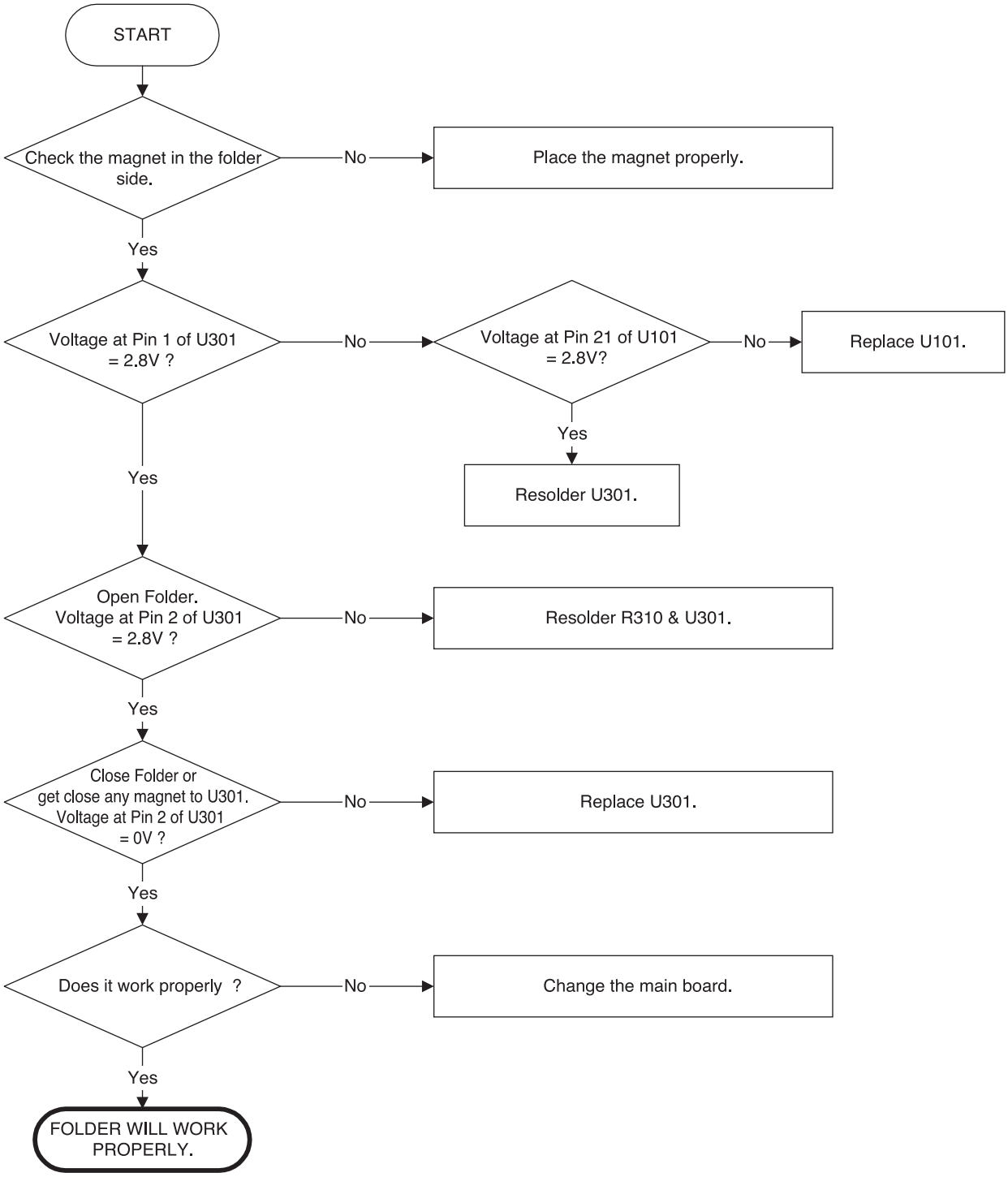


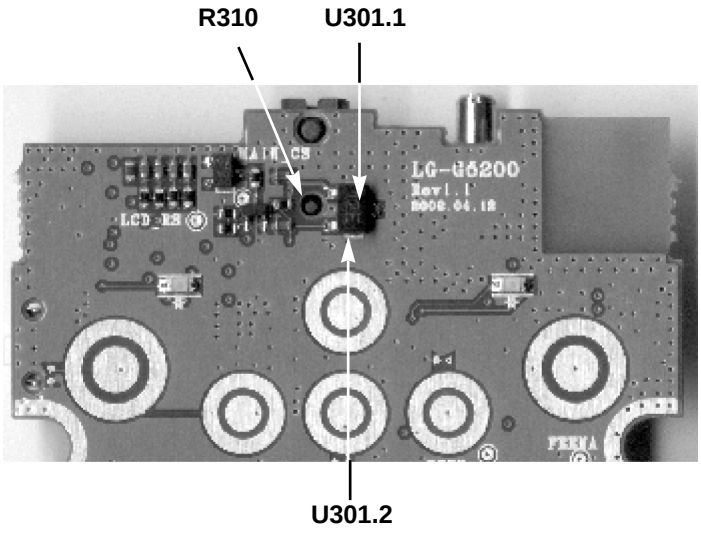
KEY BACKLIGHT

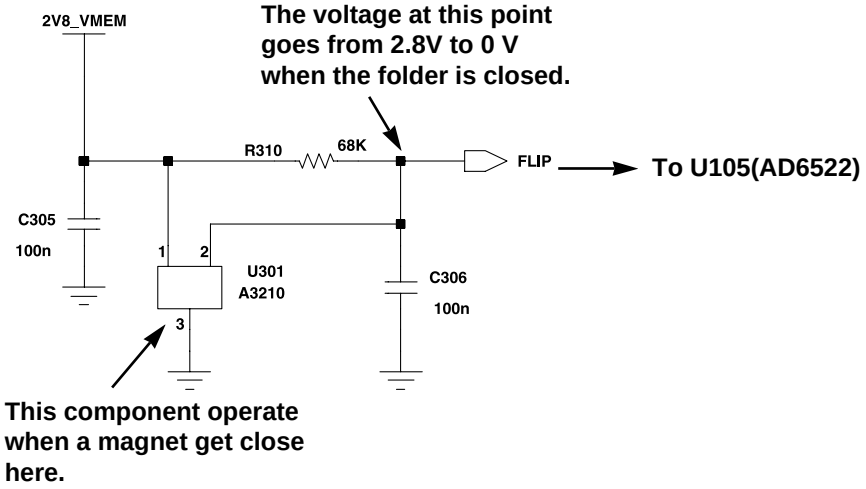


4.11 Folder on/off Trouble

Setting : Connect PIF to the phone, and power on.

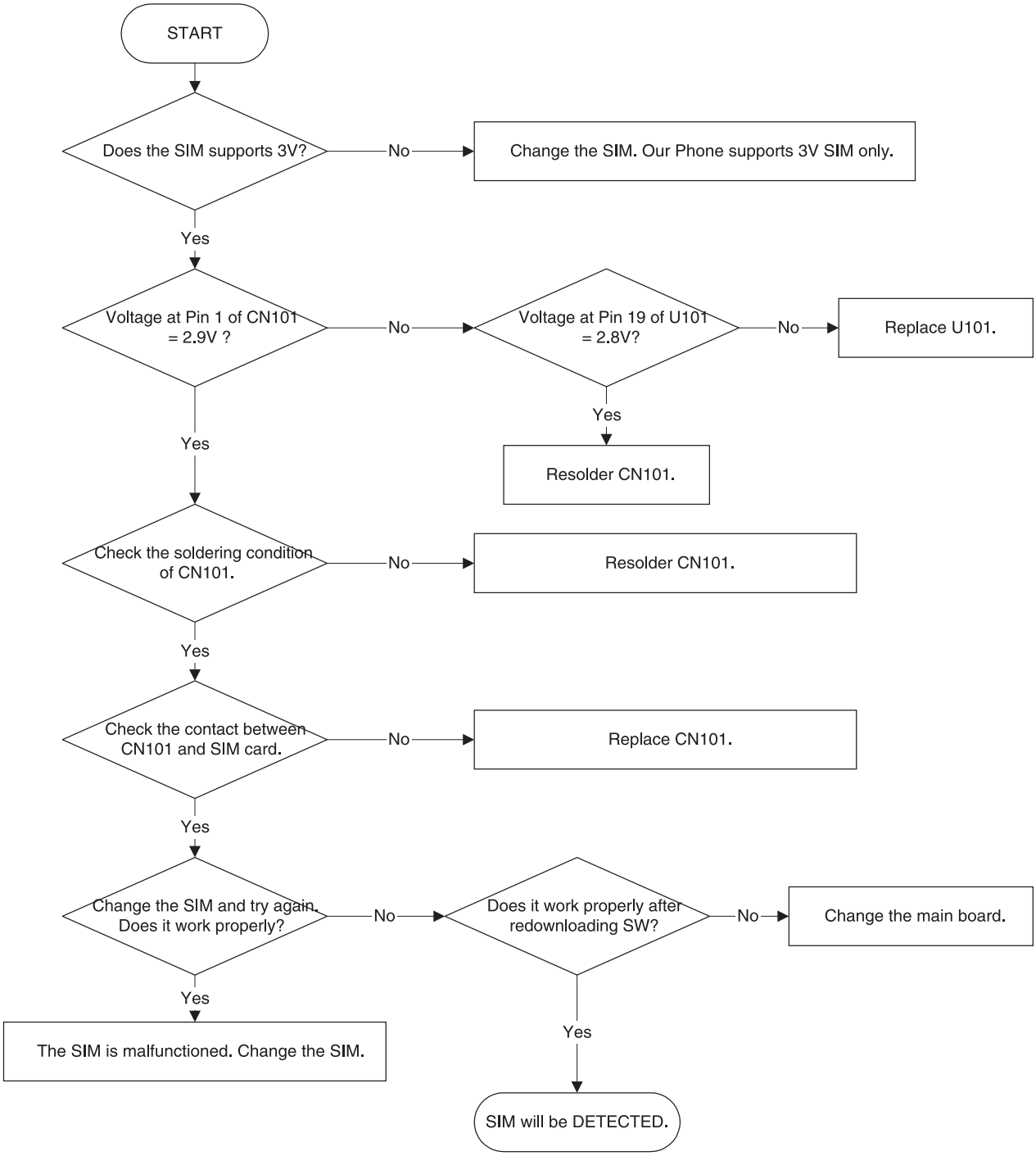


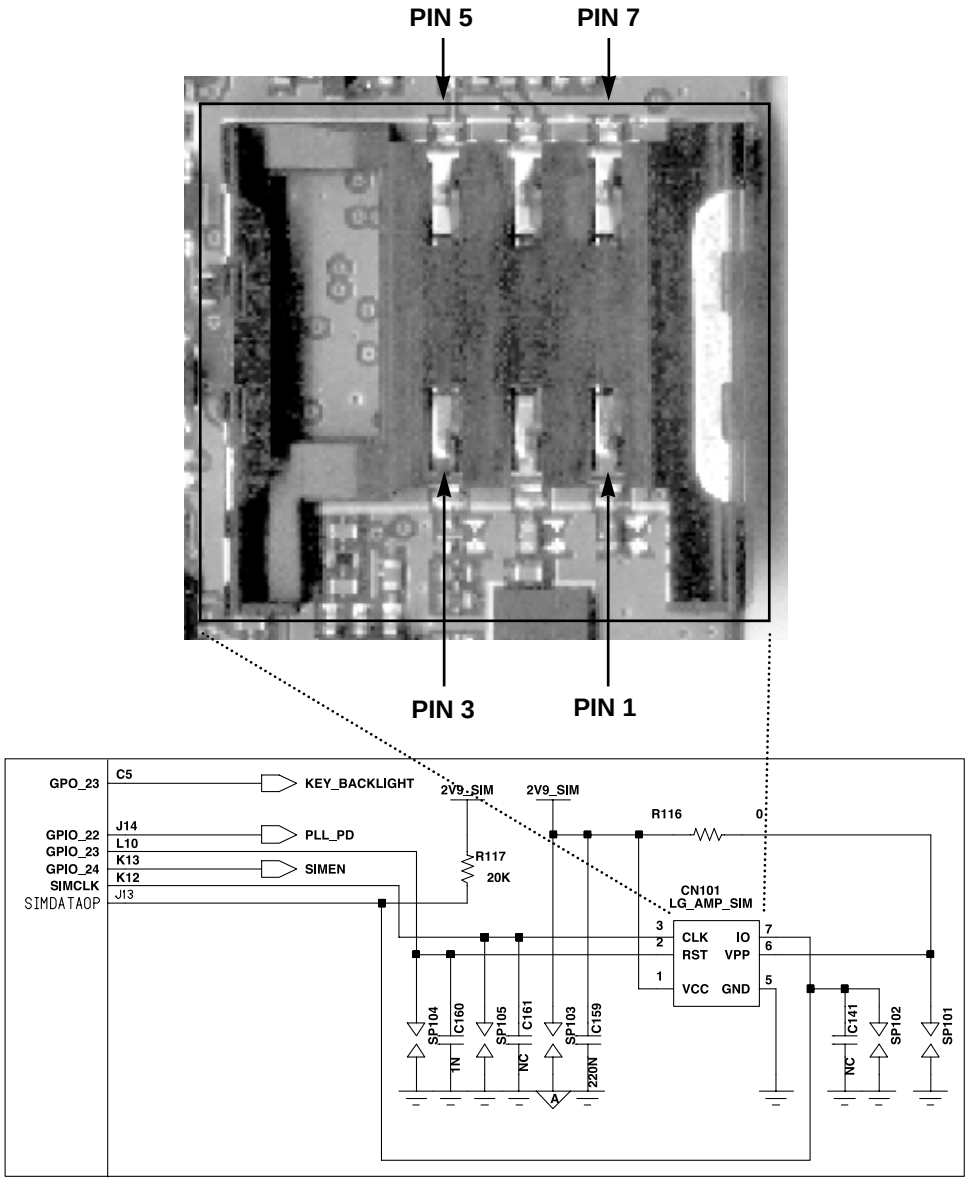

R310
U301.1
LG-U6200
U301.2


2V8_VMEM
The voltage at this point goes from 2.8V to 0 V when the folder is closed.
R310
68K
FLIP
To U105(AD6522)
C305
100n
1
2
U301
A3210
3
C306
100n
This component operate when a magnet get close here.

4.12 SIM Detect Trouble

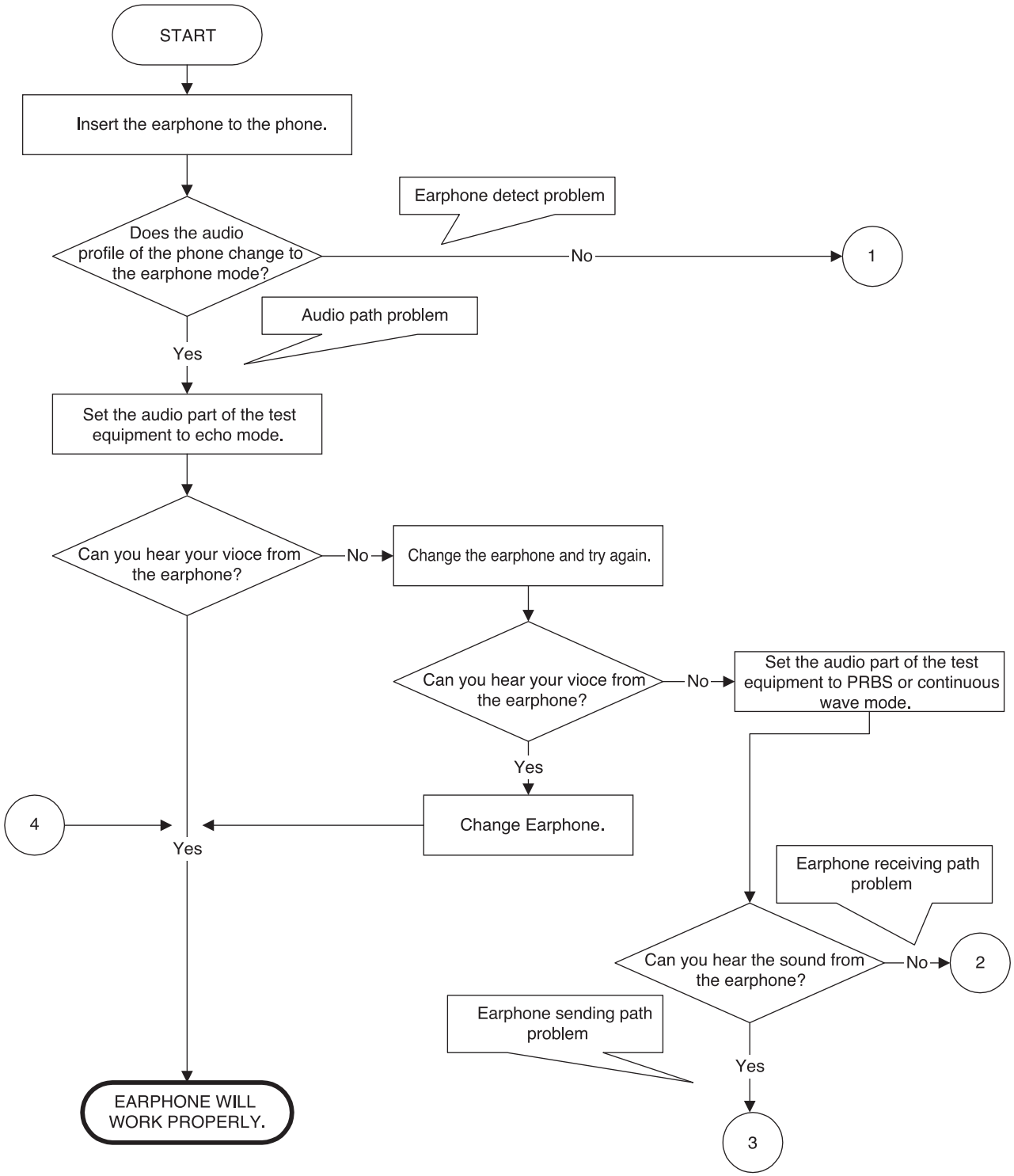
Setting : Insert the SIM into CN101. Connect PIF to the phone, and power on.

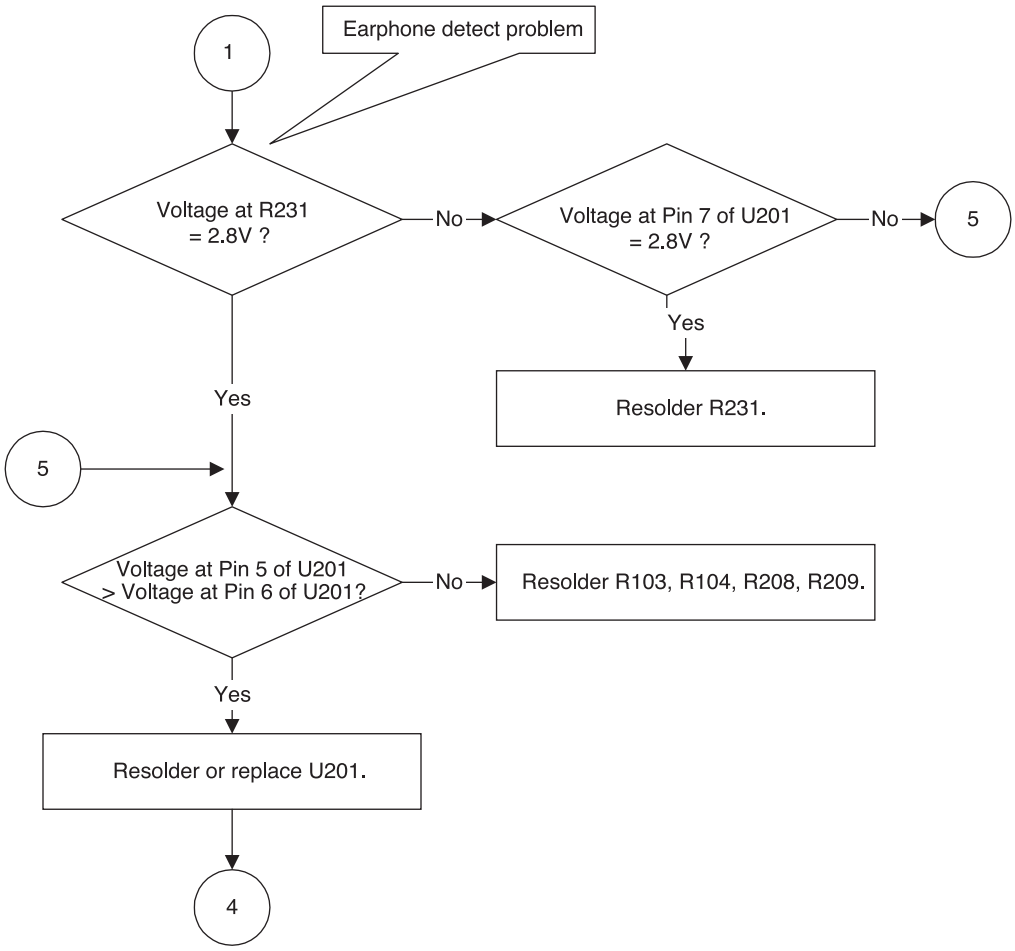


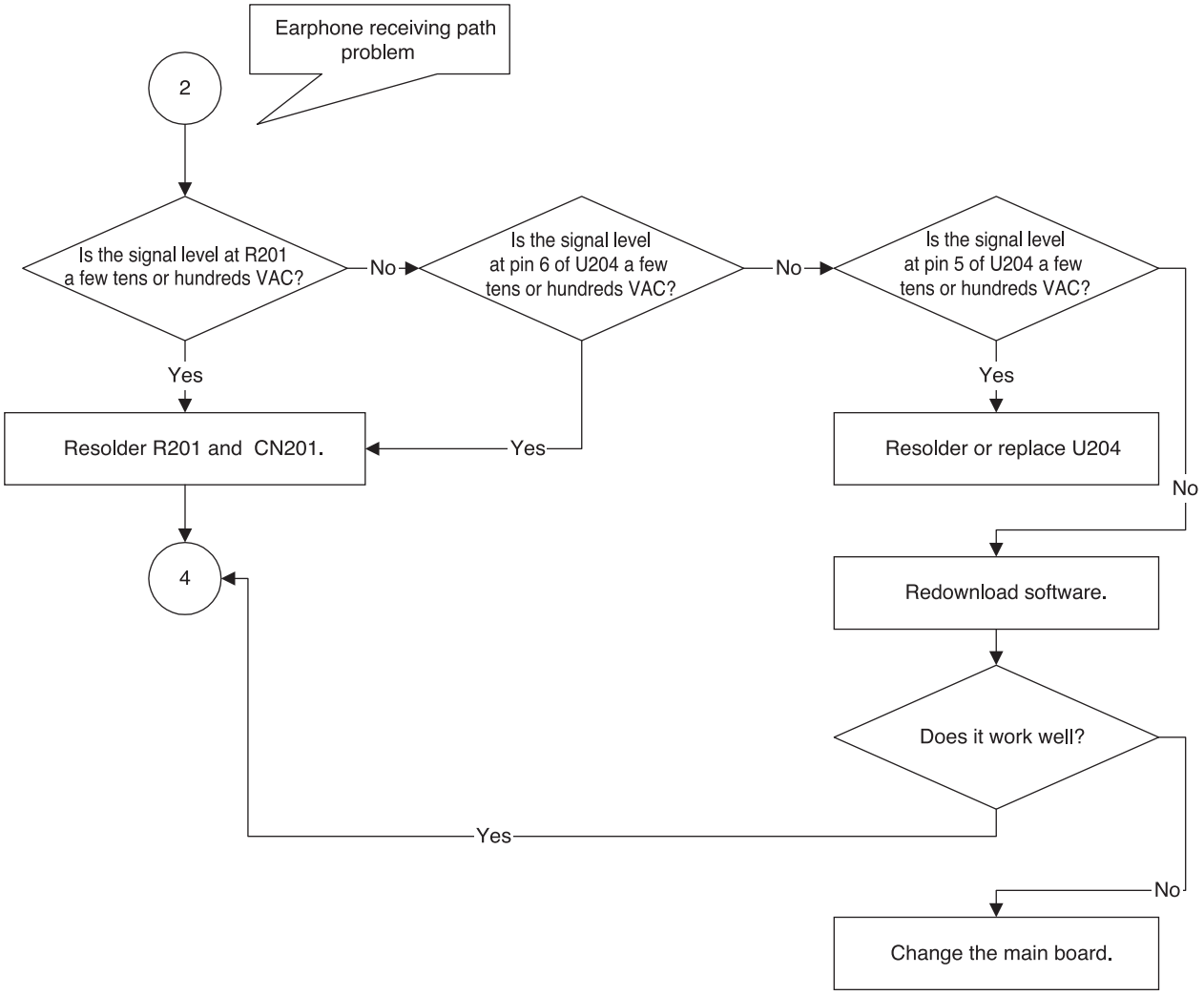

PIN 5
PIN 7
PIN 3
PIN 1
GPO_23
C5
KEY_BACKLIGHT
GPIO_22
J14
PLL_PD
GPIO_23
L10
GPIO_24
K13
SIMEN
SIMCLK
K12
SIMDATAOP
J13
2V9_SIM
2V9_SIM
R117
20K
R116
0
CN101
LG_AMP_SIM
CLK
IO
RST
VPP
VCC
GND
SP104
C160
1N
SP105
C161
NC
SP103
C159
220N
C141
NC
SP102
SP101

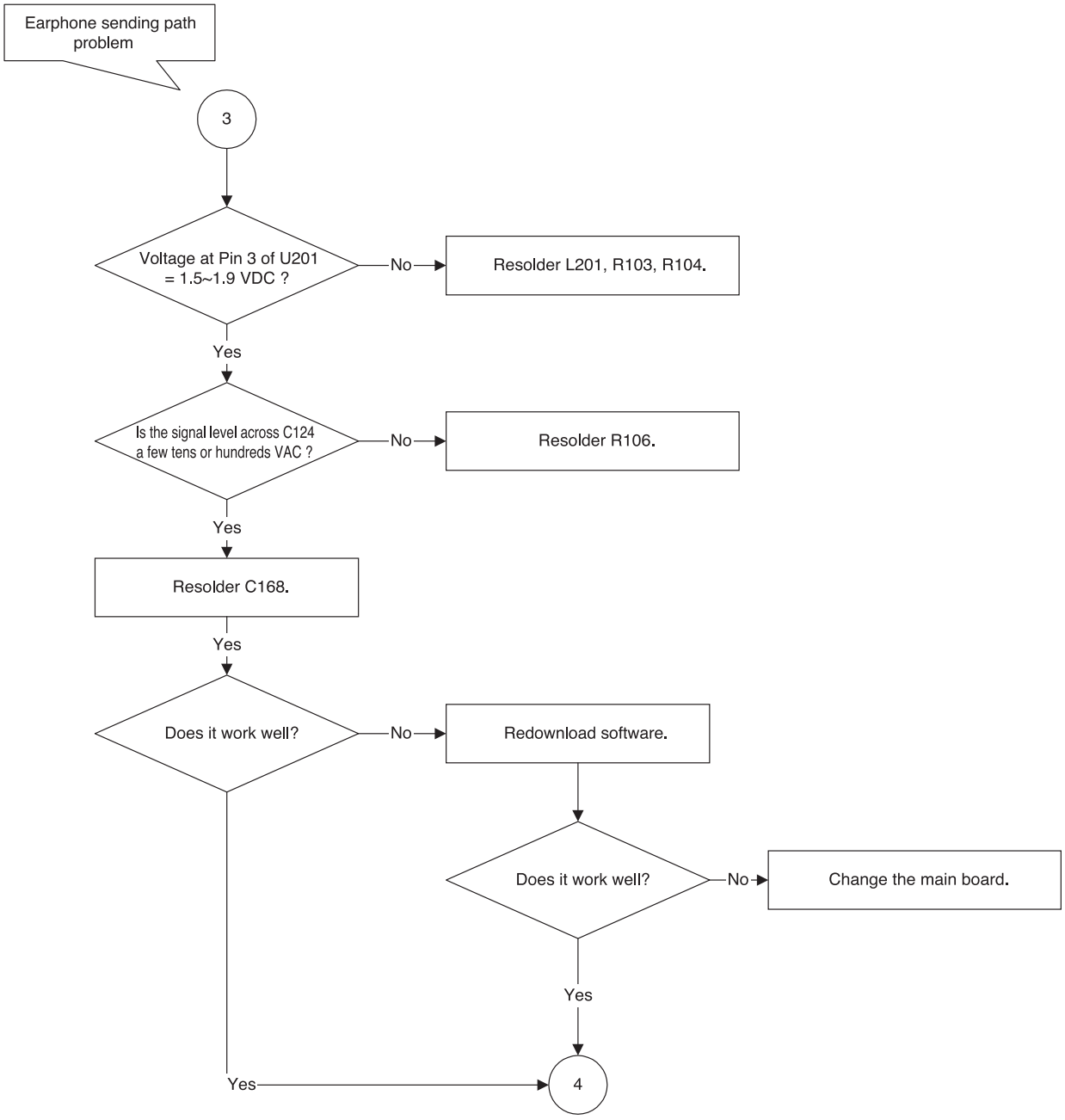
4.13 Earphone Trouble

Setting : After initializing GSM test equipment, connect PIF to the phone and power on.

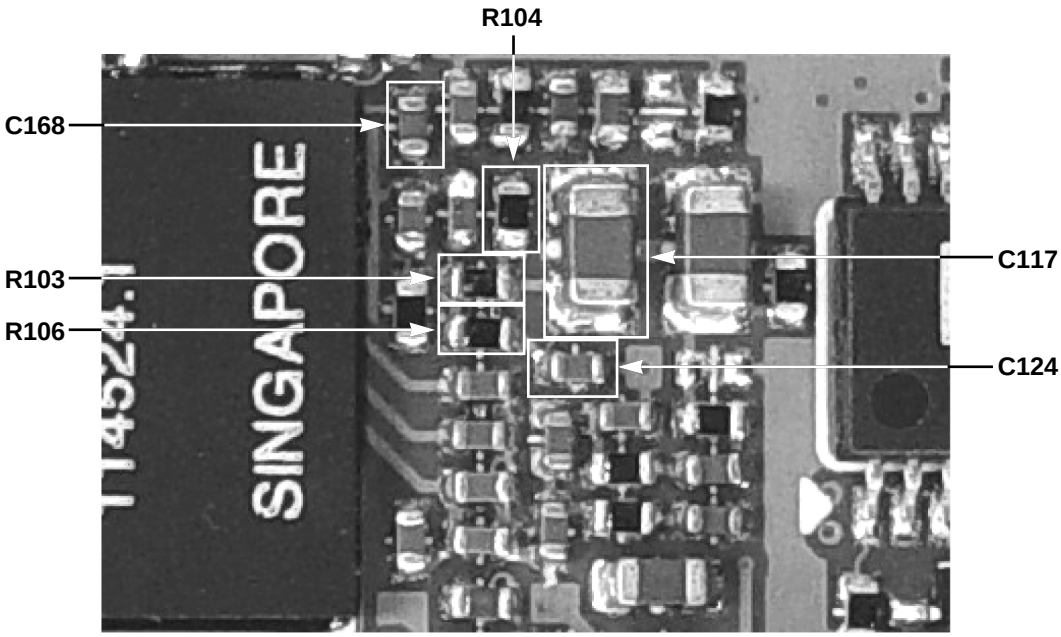


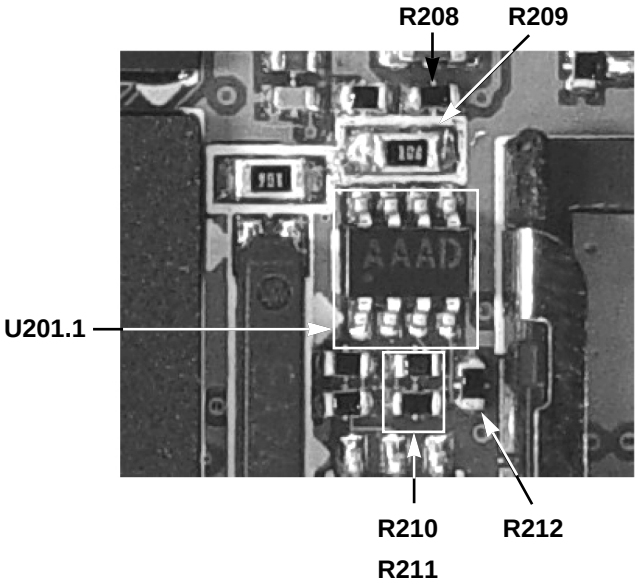

Earphone detect problem
1
Voltage at R231
= 2.8V ?
No
Voltage at Pin 7 of U201
= 2.8V ?
No
5
Yes
Resolder R231.
Yes
5
Voltage at Pin 5 of U201
> Voltage at Pin 6 of U201?
No
Resolder R103, R104, R208, R209.
Yes
Resolder or replace U201.
4

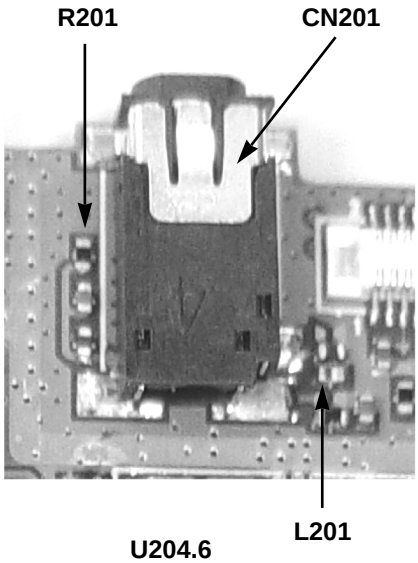

Earphone receiving path problem
2
Is the signal level at R201 a few tens or hundreds VAC?
No
Is the signal level at pin 6 of U204 a few tens or hundreds VAC?
No
Is the signal level at pin 5 of U204 a few tens or hundreds VAC?
Yes
Yes
Yes
Resolder R201 and CN201.
Resolder or replace U204
No
4
Redownload software.
Does it work well?
Yes
No
Change the main board.

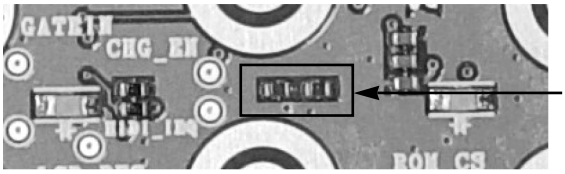

Earphone sending path problem
3
Voltage at Pin 3 of U201 = 1.5~1.9 VDC ?
No
Resolder L201, R103, R104.
Yes
Is the signal level across C124 a few tens or hundreds VAC ?
No
Resolder R106.
Yes
Resolder C168.
Yes
Does it work well?
No
Redownload software.
Does it work well?
No
Change the main board.
Yes
Yes
4

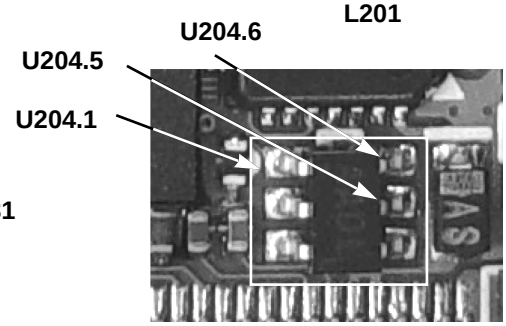
4.14 HFK Trouble

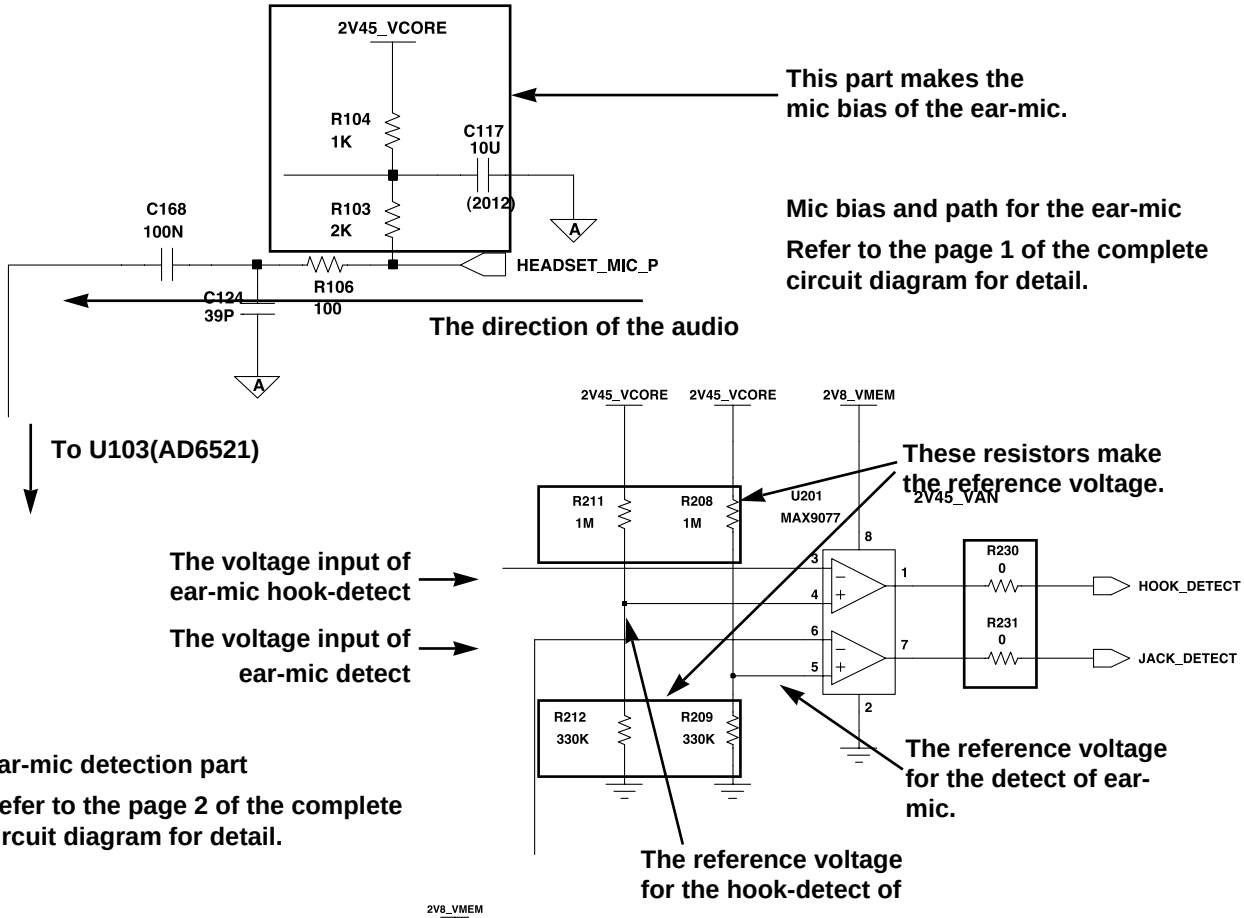


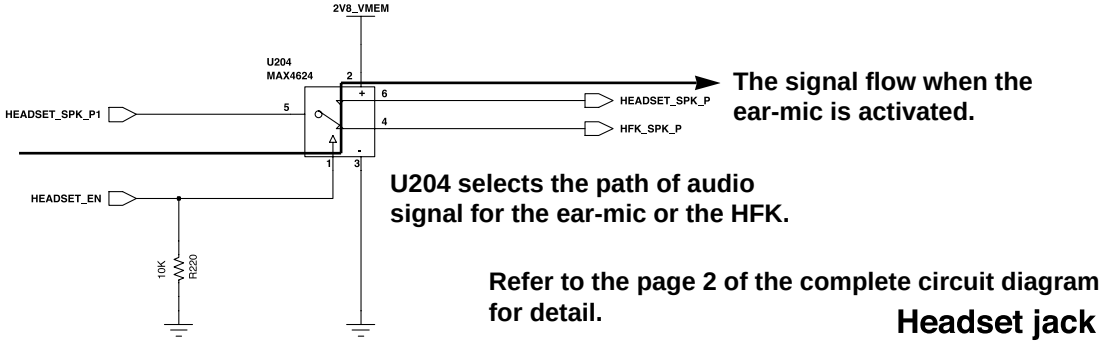






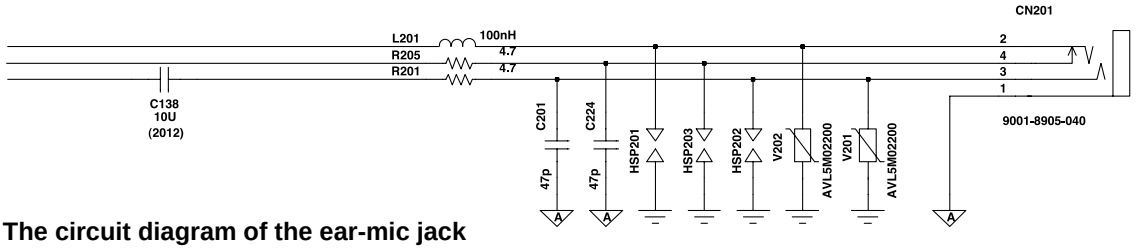






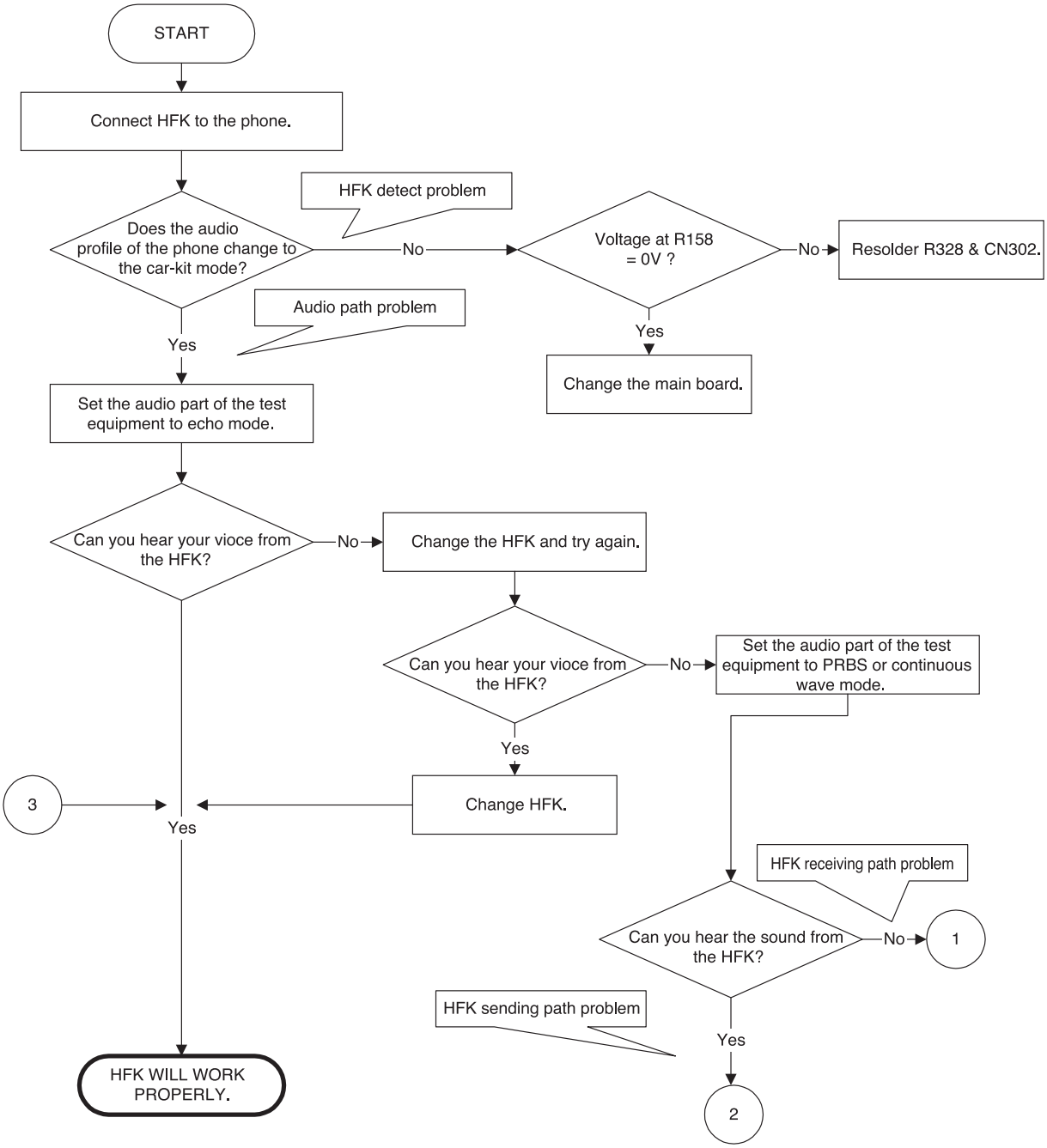
Refer to the page 2 of the complete circuit diagram for detail.

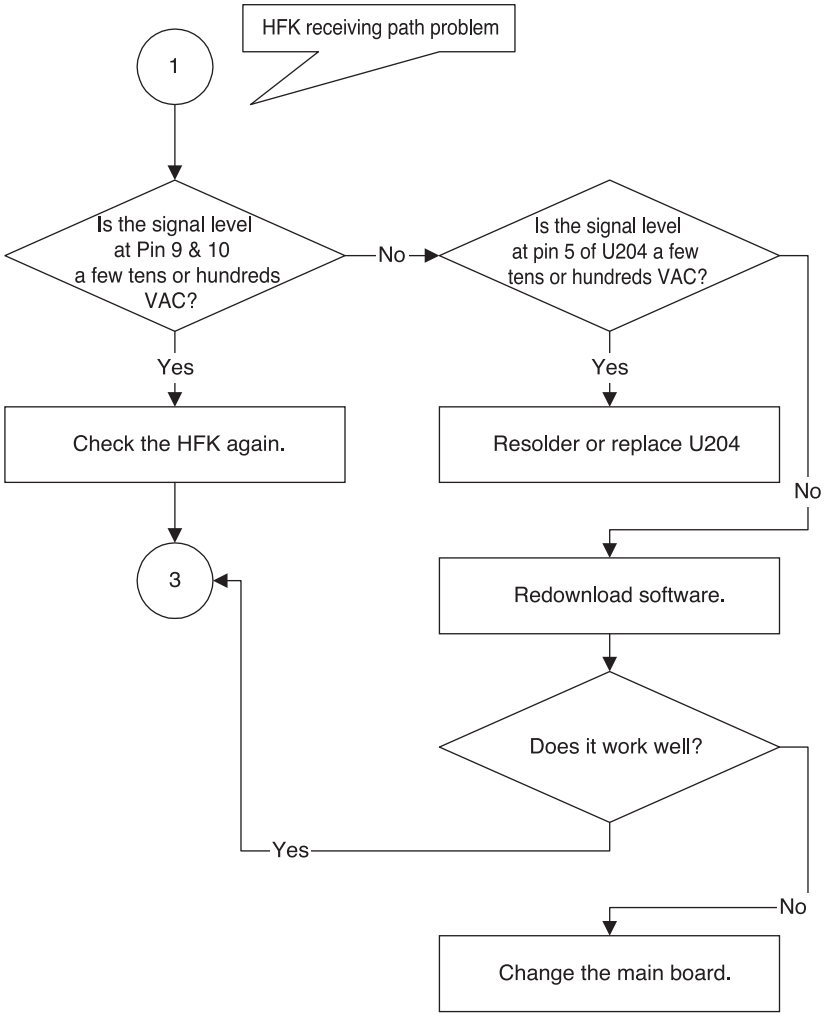
Headset jack

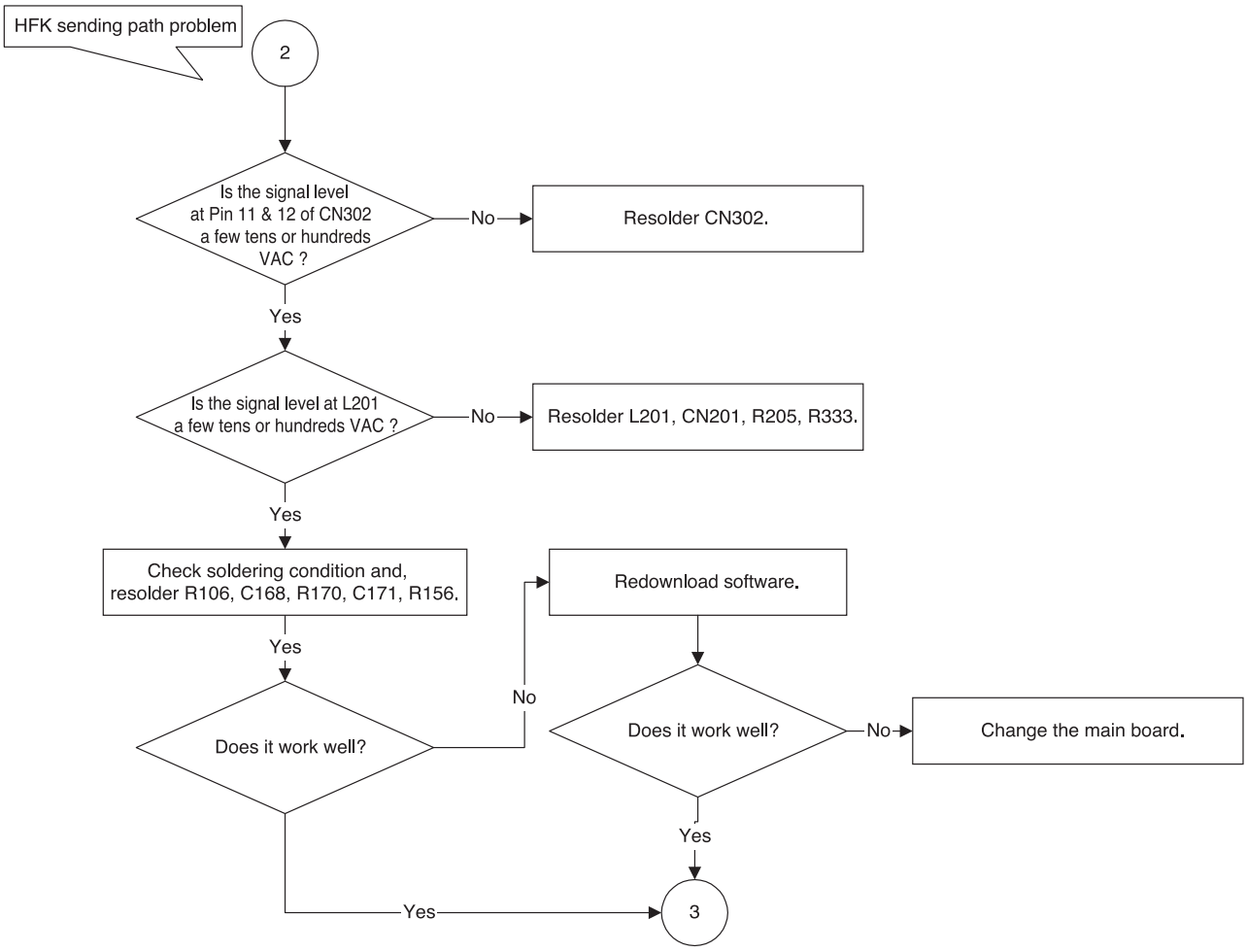


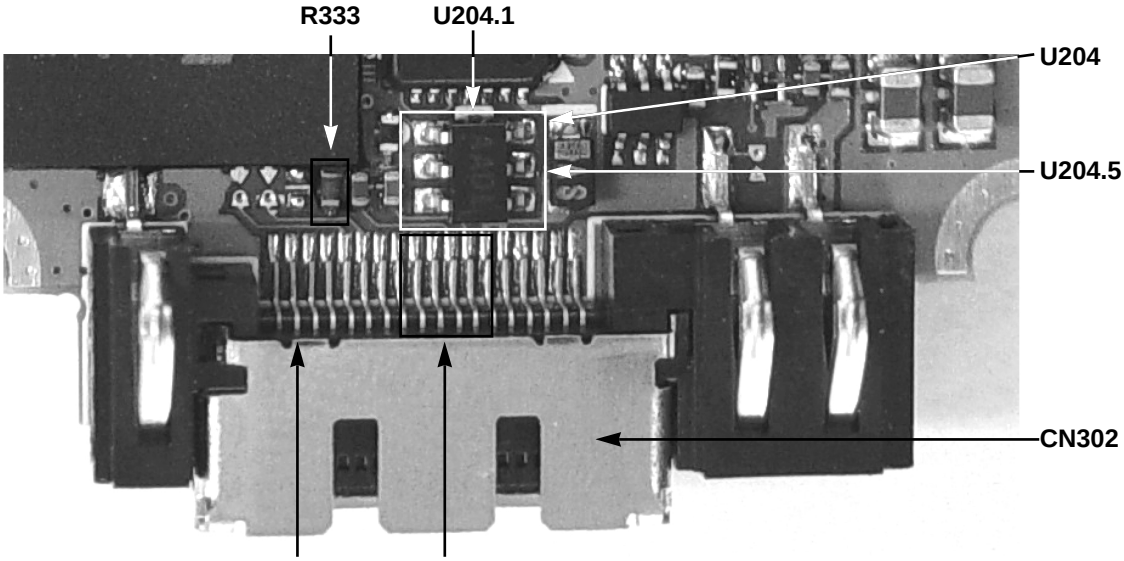
The circuit diagram of the ear-mic jack
Refer to the page 2 of the complete circuit diagram for detail.

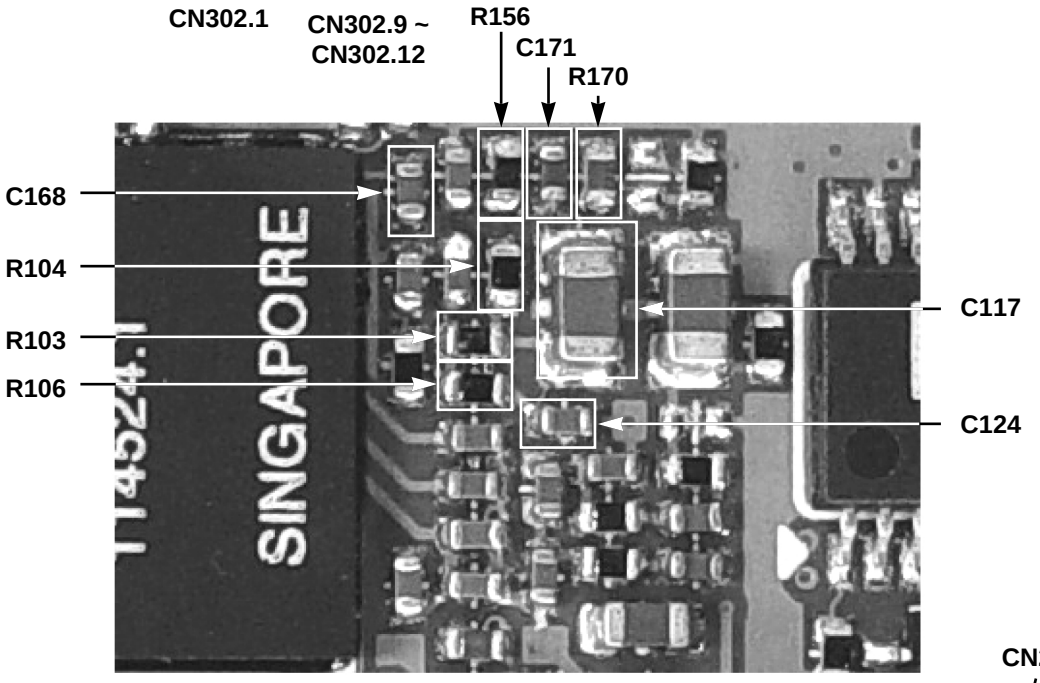
Setting : After initializing GSM test equipment, connect PIF to the phone and power on.

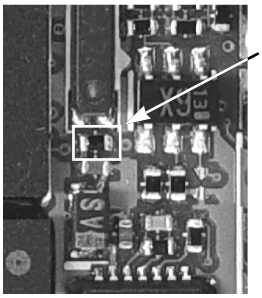


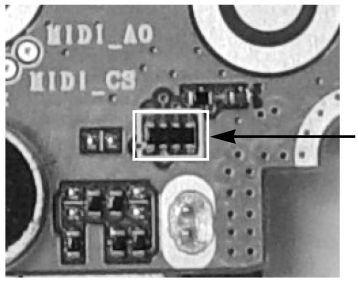

HFK receiving path problem
1
Is the signal level at Pin 9 & 10 a few tens or hundreds VAC?
No
Is the signal level at pin 5 of U204 a few tens or hundreds VAC?
Yes
Yes
Check the HFK again.
Resolder or replace U204
No
3
Redownload software.
Does it work well?
Yes
No
Change the main board.

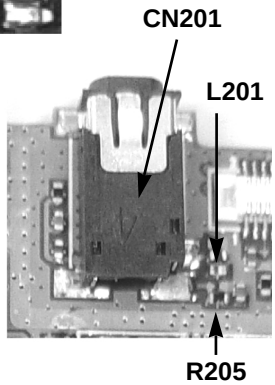

HFK sending path problem
2
Is the signal level at Pin 11 & 12 of CN302 a few tens or hundreds VAC ?
No
Resolder CN302.
Yes
Is the signal level at L201 a few tens or hundreds VAC ?
No
Resolder L201, CN201, R205, R333.
Yes
Check soldering condition and, resolder R106, C168, R170, C171, R156.
Yes
Redownload software.
Does it work well?
No
Yes
Does it work well?
No
Change the main board.
Yes
3


R333
U204.1
U204
U204.5
CN302
CN302.1
CN302.9 ~
CN302.12

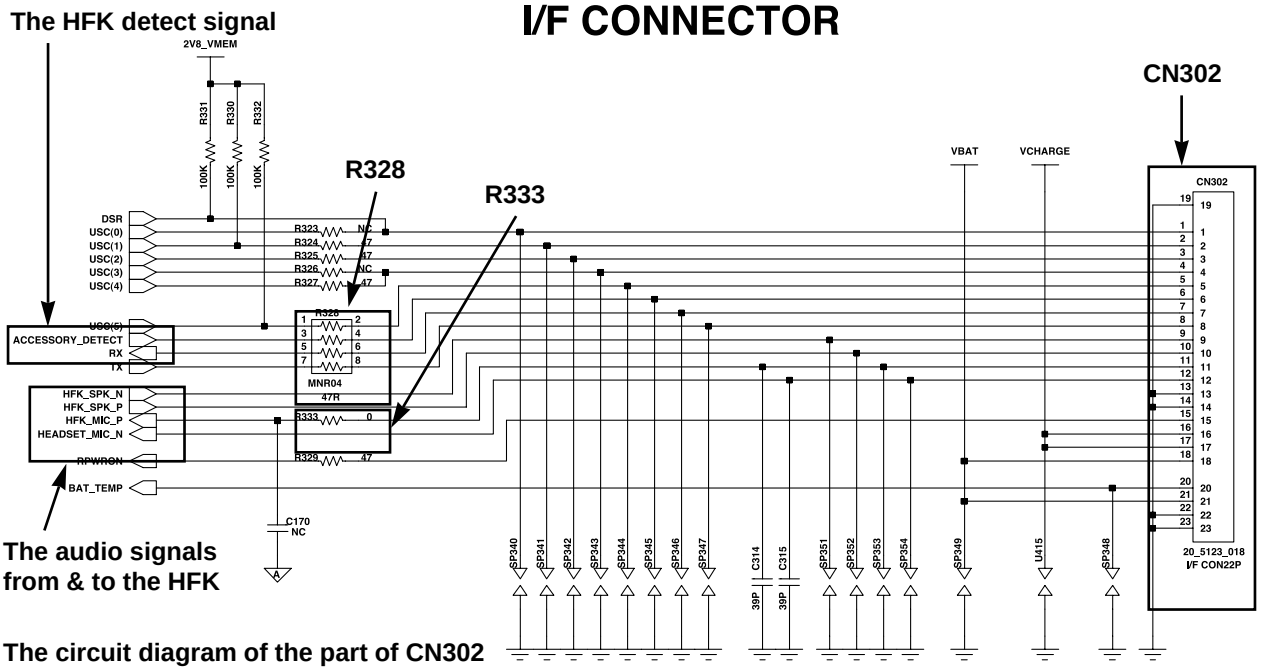

R156
C171
R170
C168
R104
R103
R106
C117
C124
SINGAPORE


R158
2.8V
Check Point
(0V when HFK is
activated.)


MIDI_A0
MIDI_CS
R328


CN201
L201
R205

The HFK detect signal



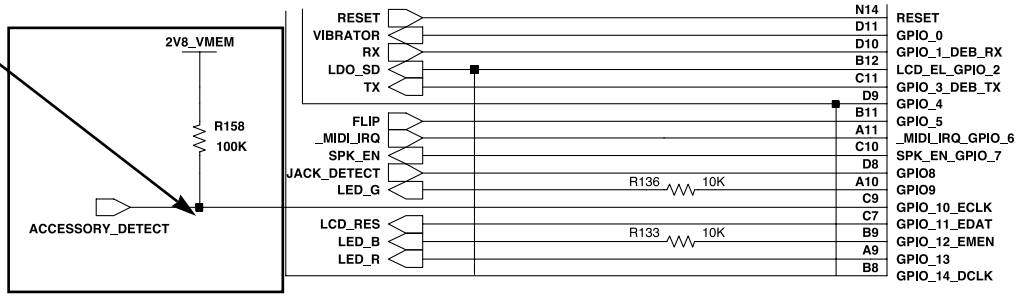
The audio signals from & to the HFK

The circuit diagram of the part of CN302

Refer to the page 3 of the complete circuit diagram.

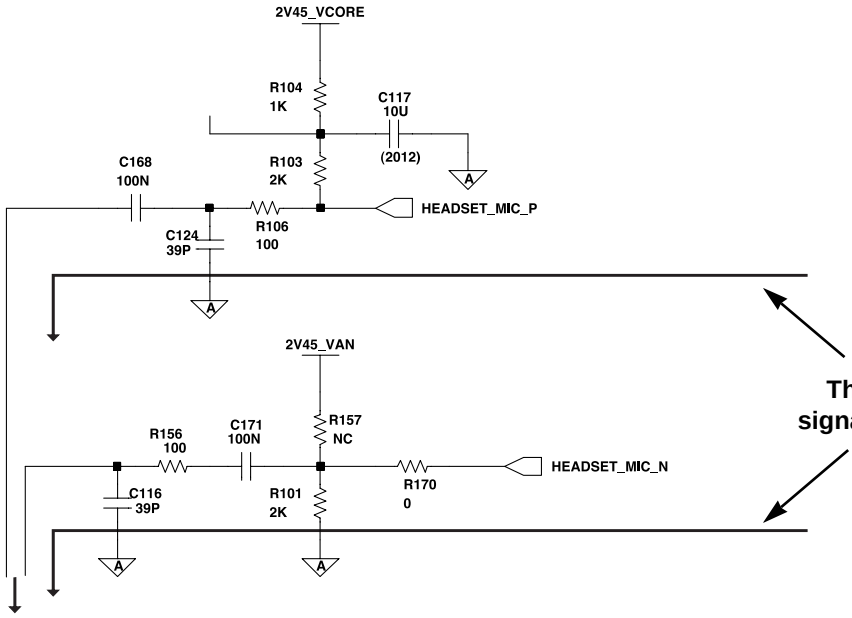
The HFK detect signal

This point goes to 0 V when the HFK is activated.



The HFK detect signal input to U105 (AD6522)

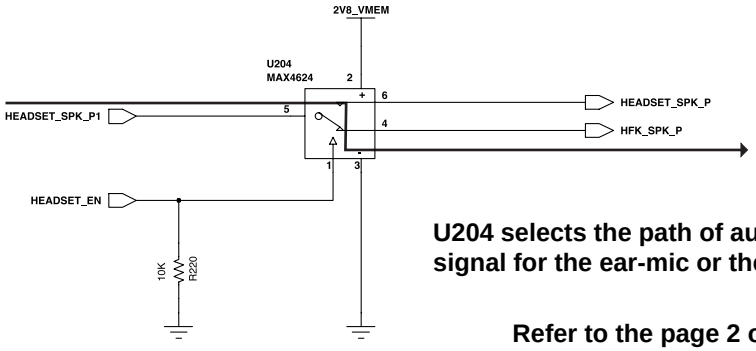
Refer to the page 1 of the complete circuit diagram.



The direction of the audio signal from the mic of the HFK

To U103 (AD6521)

The audio signal from the mic of the HFK to U103(AD6521)
This part is same with that of the ear-mic.
Refer to the page 1 of the complete circuit diagram for detail.



The signal flow when the HFK is activated.

U204 selects the path of audio signal for the ear-mic or the HFK.

Refer to the page 2 of the complete circuit diagram for detail.

5. ASSEMBLY INSTRUCTION

5.1 Disassembly

1. Remove the battery, antenna and screws as shown above.

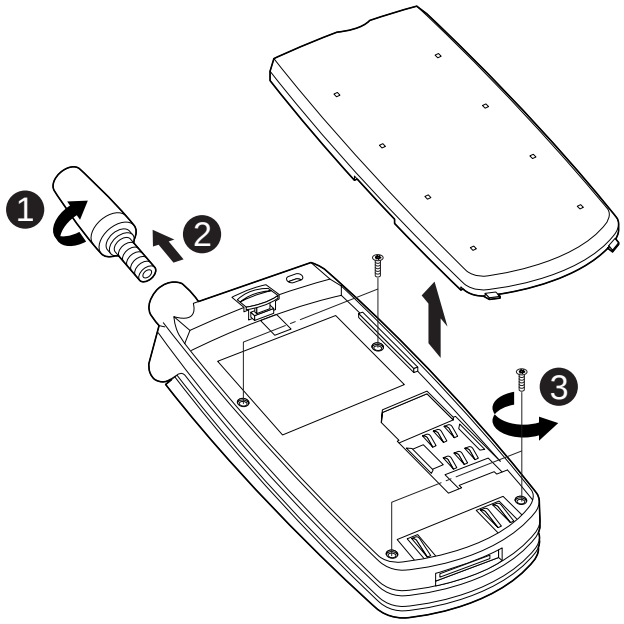


Figure 5-1. Removing Battery pack, screws and Antenna

2. Carefully lift up the bottom of Rare Cover first, then hold the covers and twist them.

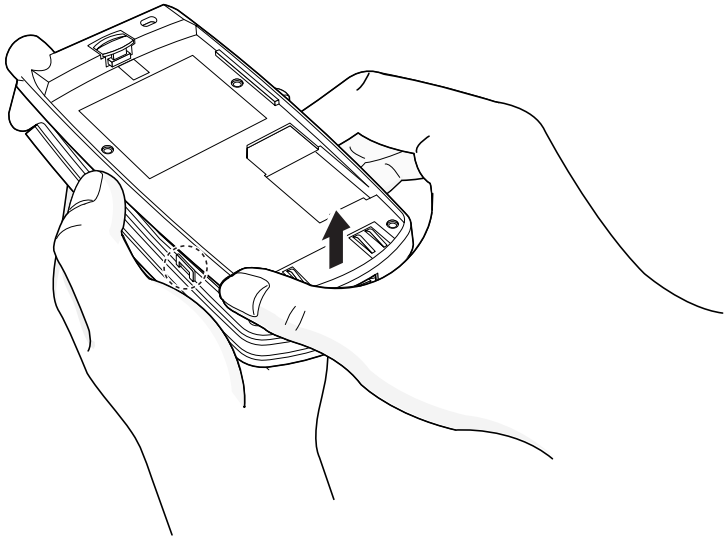


Figure 5-2. Disassembly of Rear cover and Front cover

3.Finally carefully remove the rear-cover from the hooks on the top of front-cover.

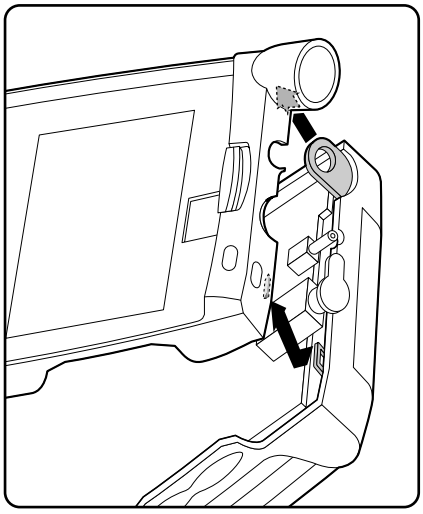


Figure 5-3. Disassembly from the hooks

4. Remove the pin shown below to unlock the PCB.

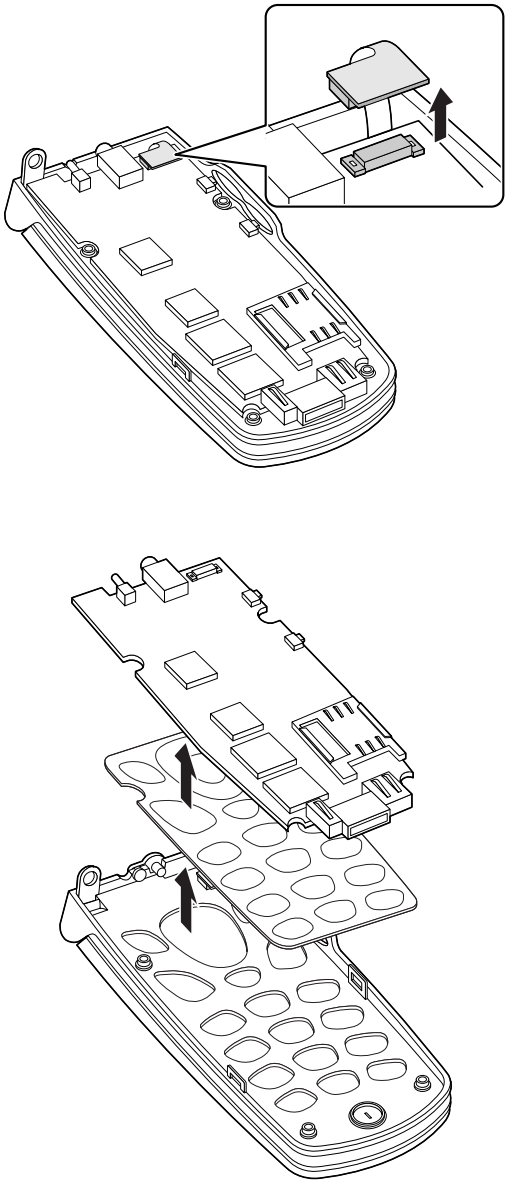


Figure 5-4. Unlocking and removing the PCB

5. Use a sharp awl to push away the antenna-bushing.

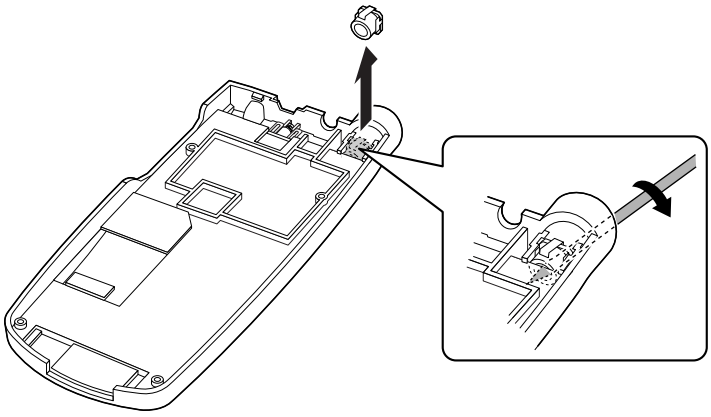


Figure 5-5. Removing Antenna-bushing

6. Use a tweezers to remove the Battery Locker.

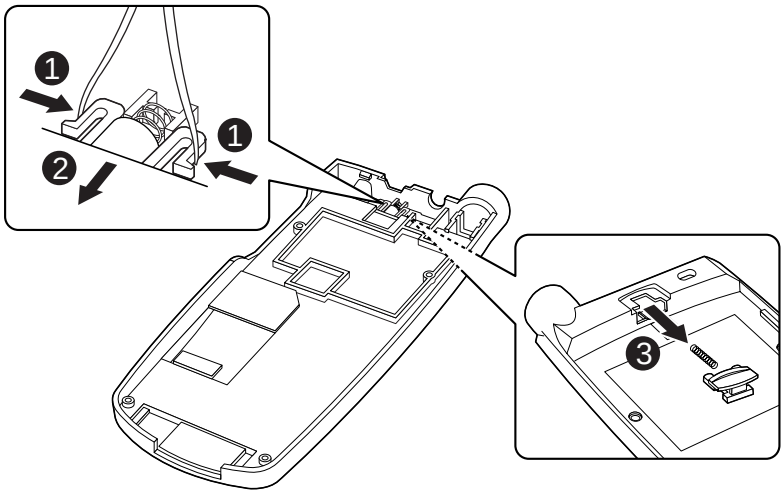


Figure 5-6. Removing battery locker

7. Remove the buttons.

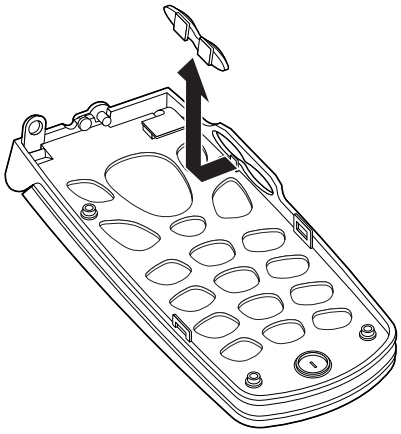


Figure 5-7. Removing buttons

8. Push away the hinge to remove the folder.

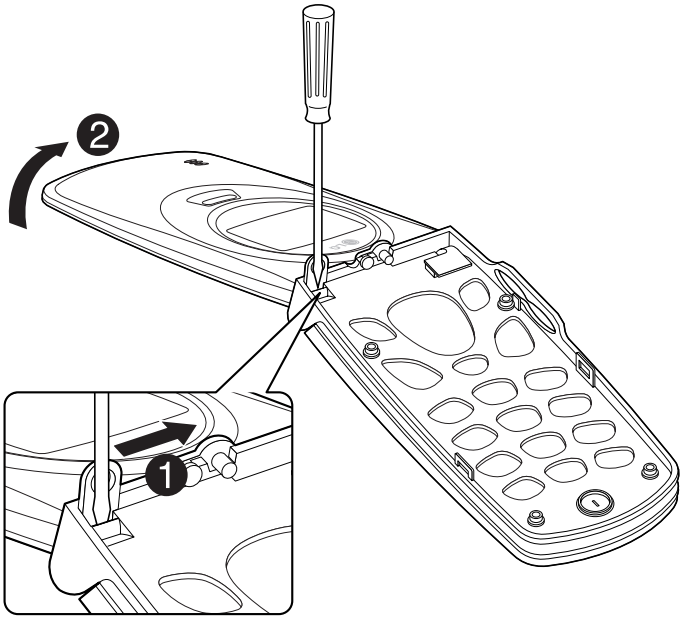


Figure 5-8. Detaching Folder

9. Remove a hinge from the folder. Then detach screw caps and screws

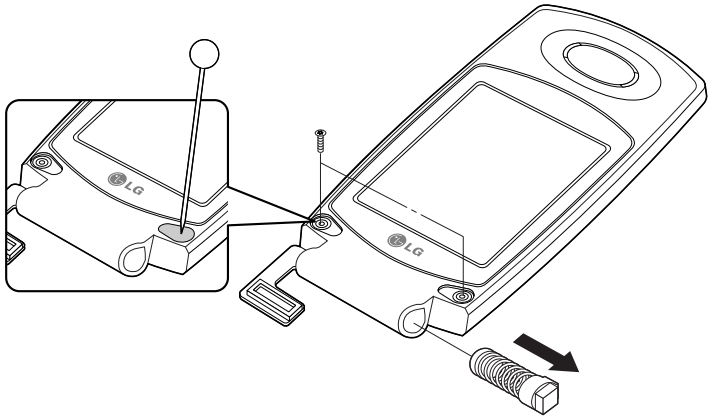
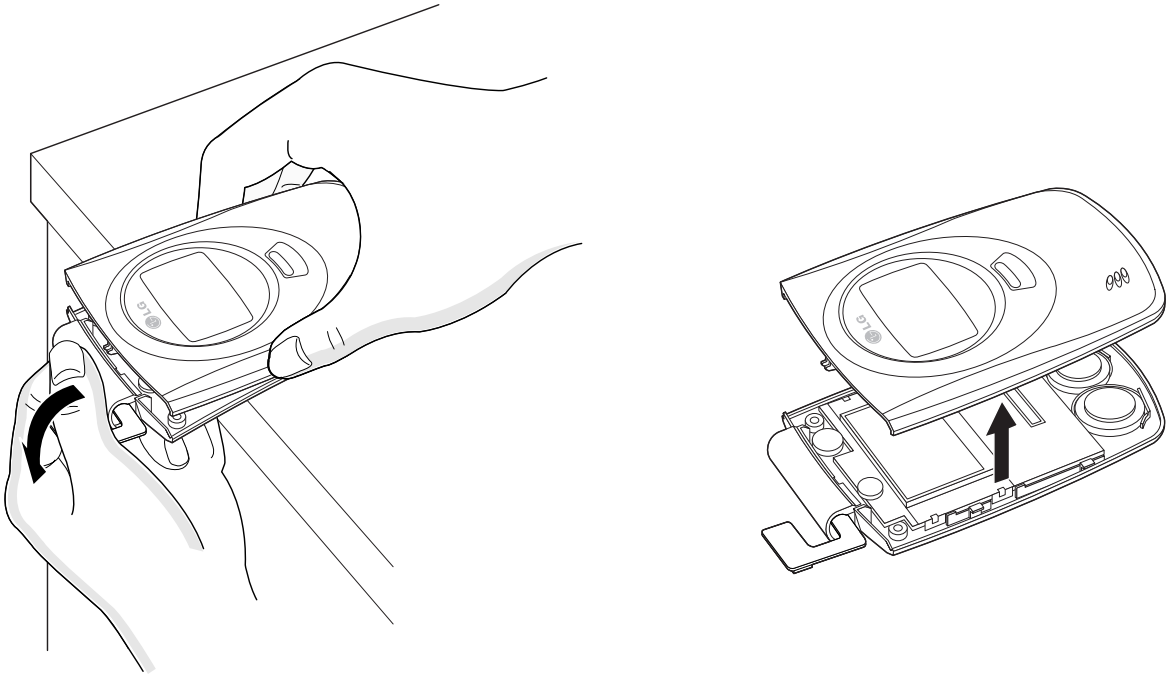


Figure 5-9. Removing hinge and screws

10. Place the folder on a desk. Then hold the hinge and push it down carefully. Finally, detach it from the rest hooks shown above.



Firure 5-10. Disassembly of Folder

11. Detach the rest components as shown below.

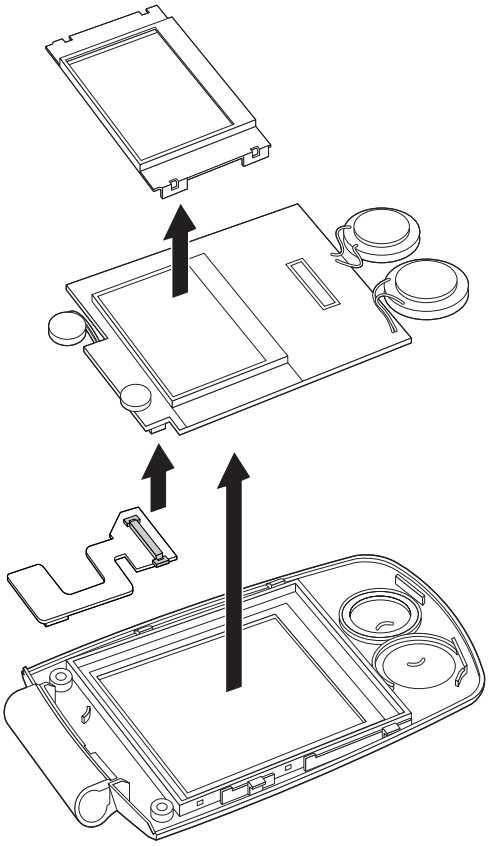


Figure 5-11. Disassembly of Rest components

12. Use a ‘ - ’ driver to lift up the end-side of sub-window.

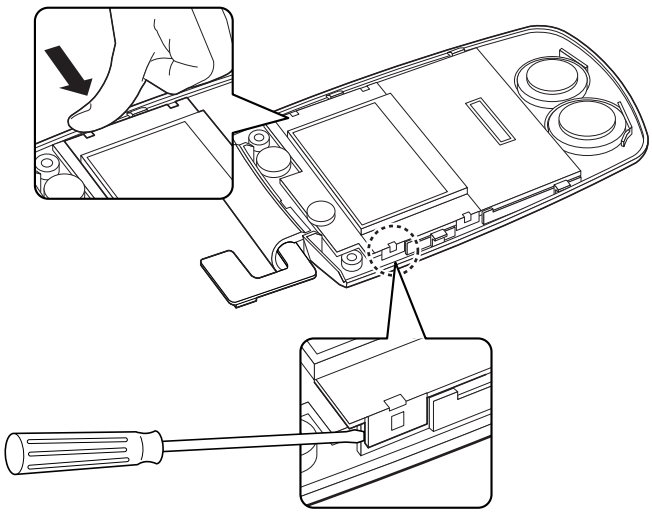


Figure 5-12. Detaching sub-window.

6. DOWNLOAD

6.1 Download Setup

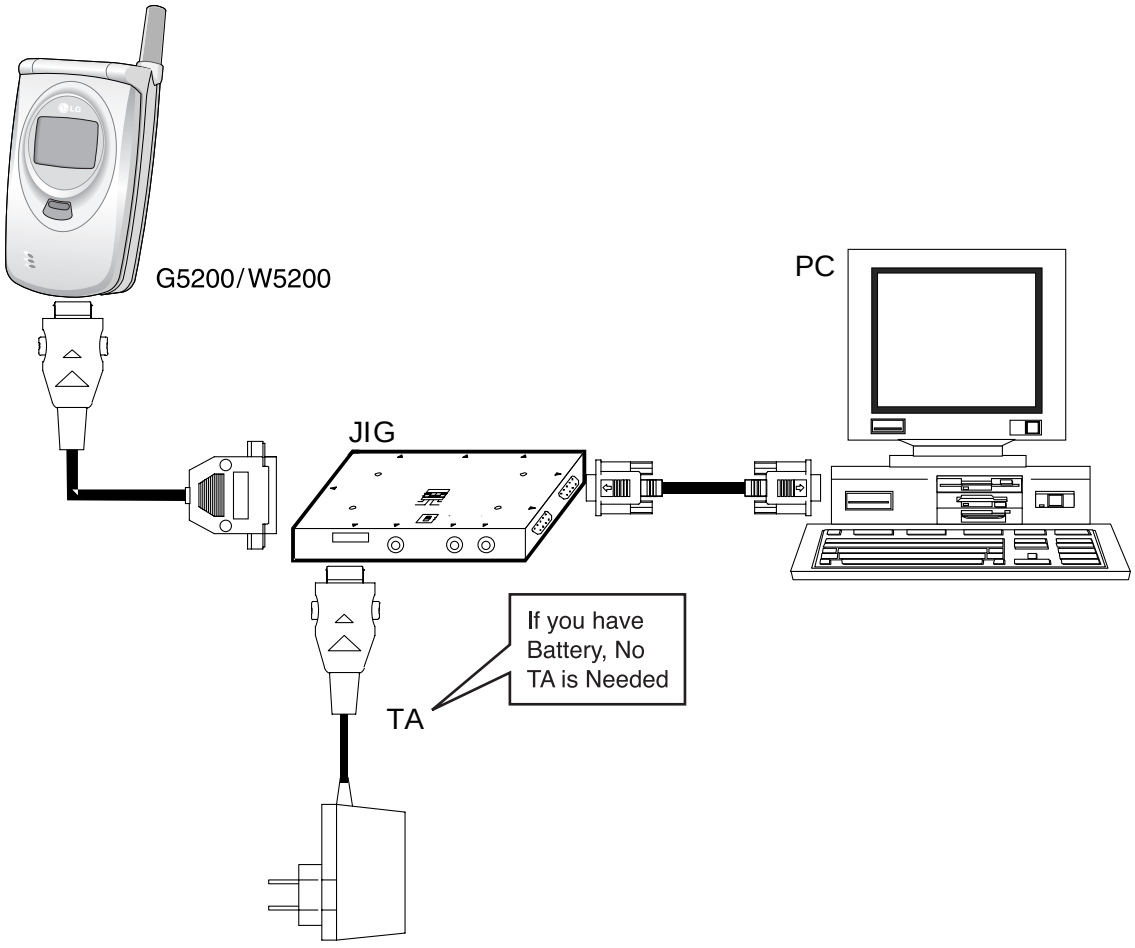


Figure 6-1. Download Setup

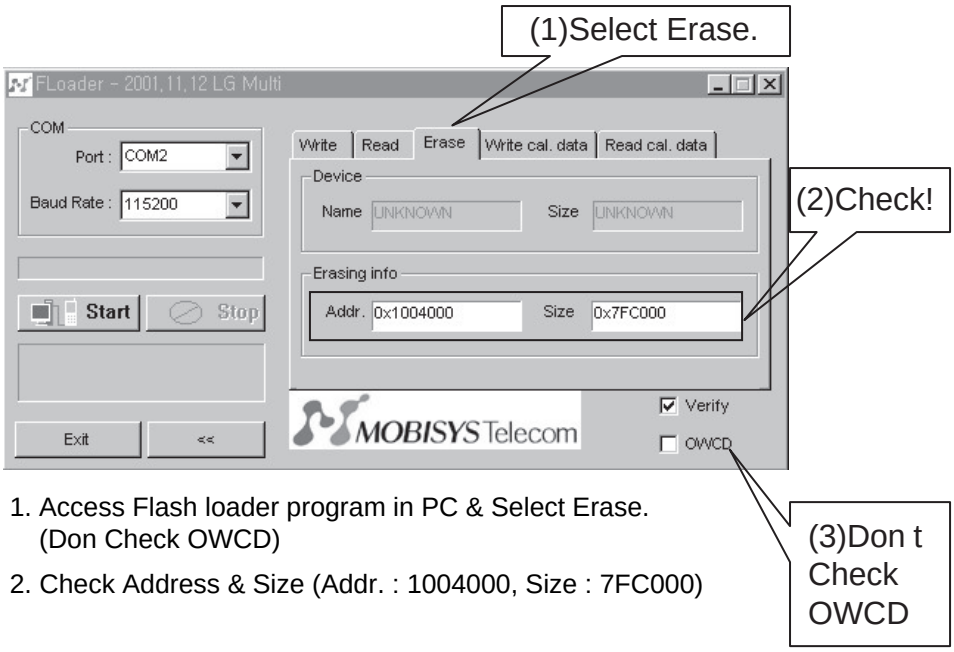
Condition.

Disconnect TA to the Jig and phone have a battery

→ Check the Battery up to two blocks more

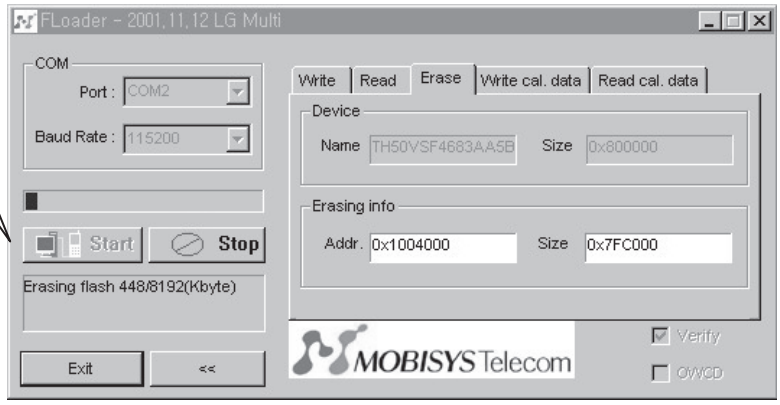
6.2 Download Procedure

OWCD
= Overwrite
Cal Data

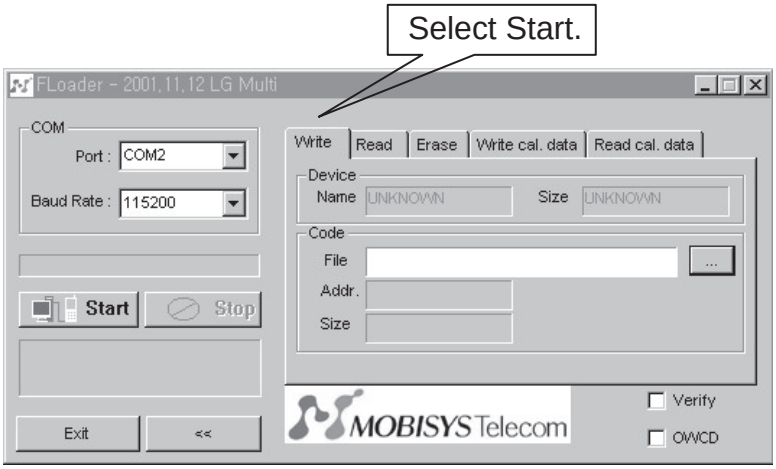


1. Access Flash loader program in PC & Select Erase.
   (Don Check OWCD)
2. Check Address & Size (Addr. : 1004000, Size : 7FC000)

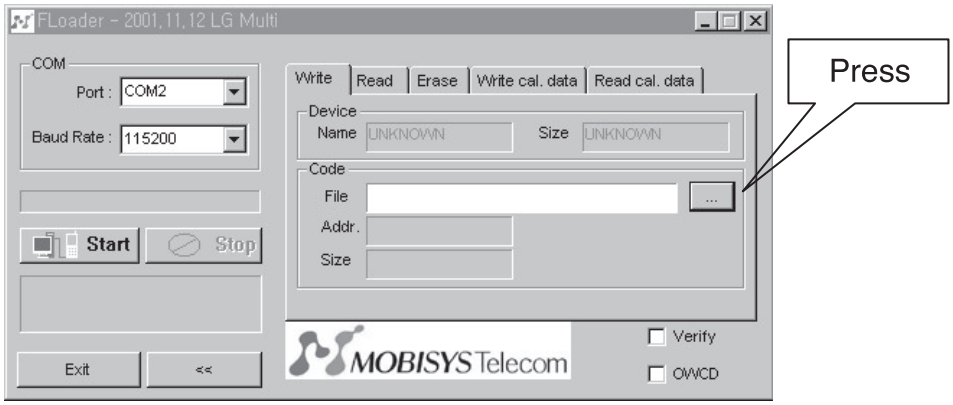
Press Start
& wait



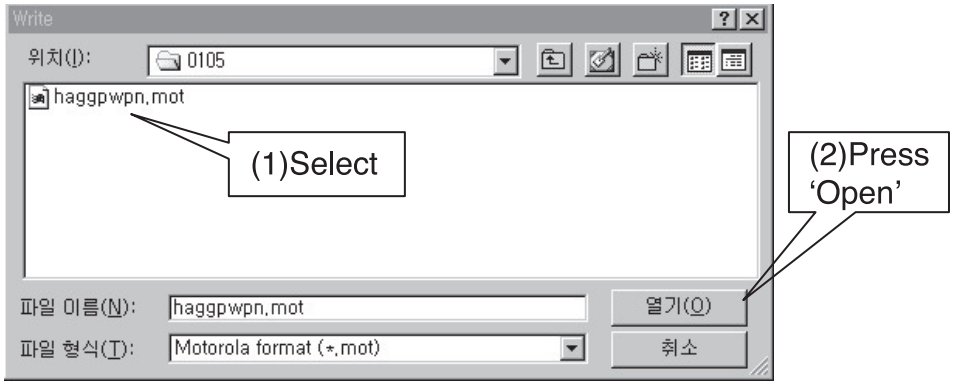
3. Press Start & Wait Until Erase Completed



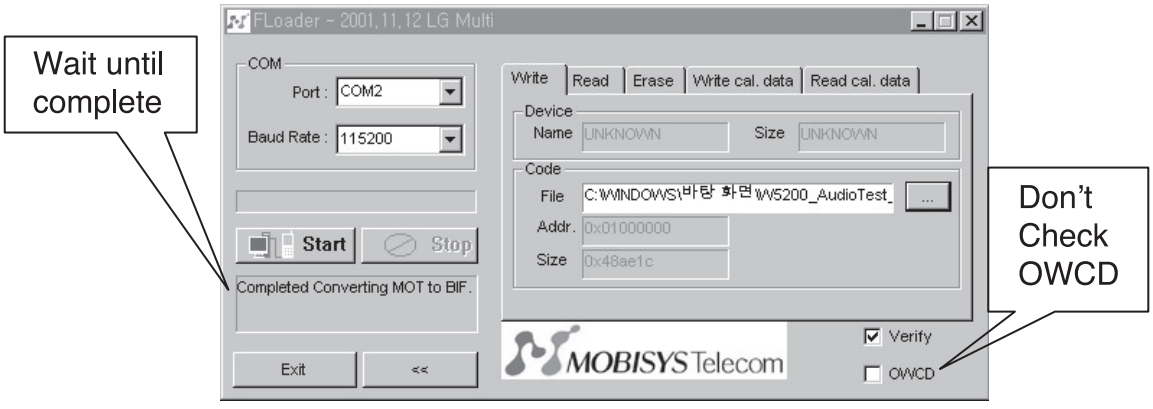
4. Press Write to start Download



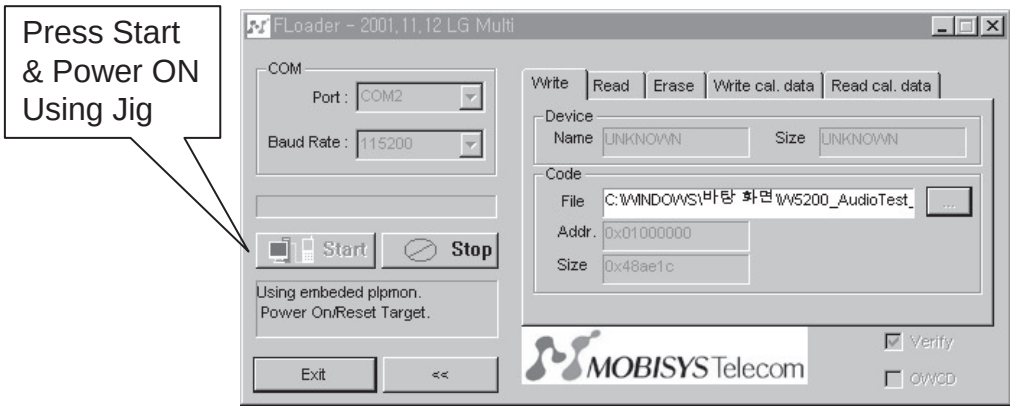
5. Select [...] Key to Choose Mot. File



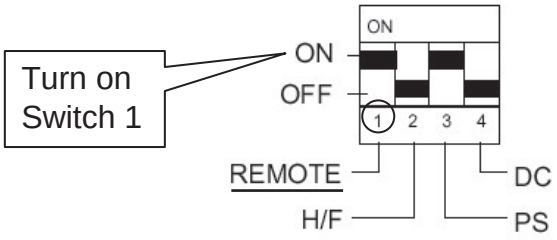
6. Select Mot. File & Press Open

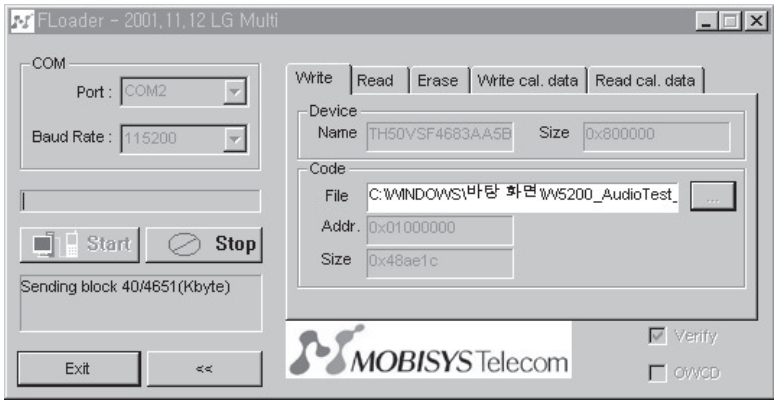


7. Wait until MOT. To BIF. Converting is completed
(Just Check Verify. Don't Check OWCD)



8. Press Start & Power on the phone Using Jig Remote Power On (Switch1)





9. Wait until Sending Block end

7. BLOCK DIAGRAM

7.1 Main Board

The G5200 is made up of two PCBs. In lower part of the folder, there is a main board. And in the upper part of the folder, there is a FPCB. Below you can see the block diagram of both PCBs.

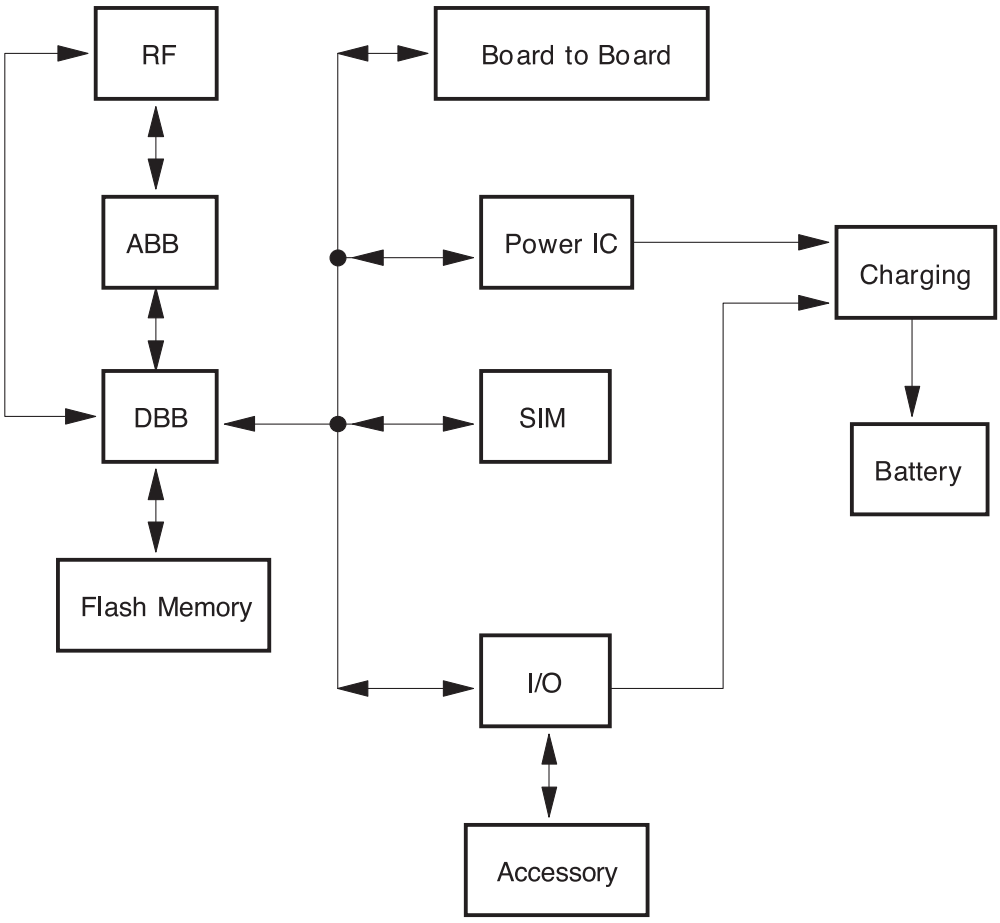


Figure 7-1. Main Blockdiagram.

7.2 FPCB

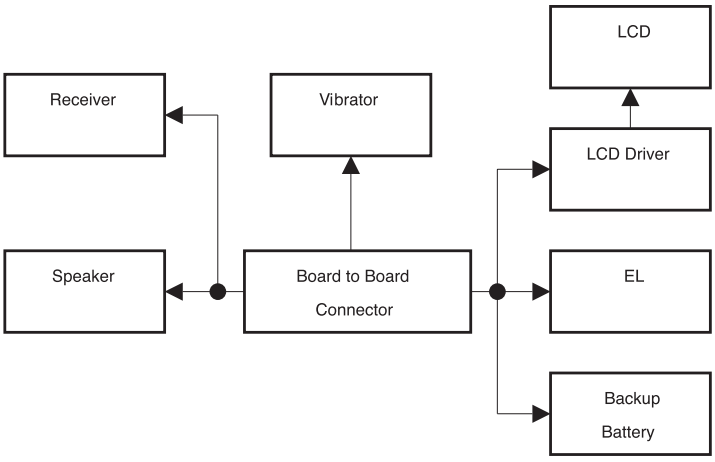


Figure 7-2. FPCB Blockdiagram.

7.3 RF

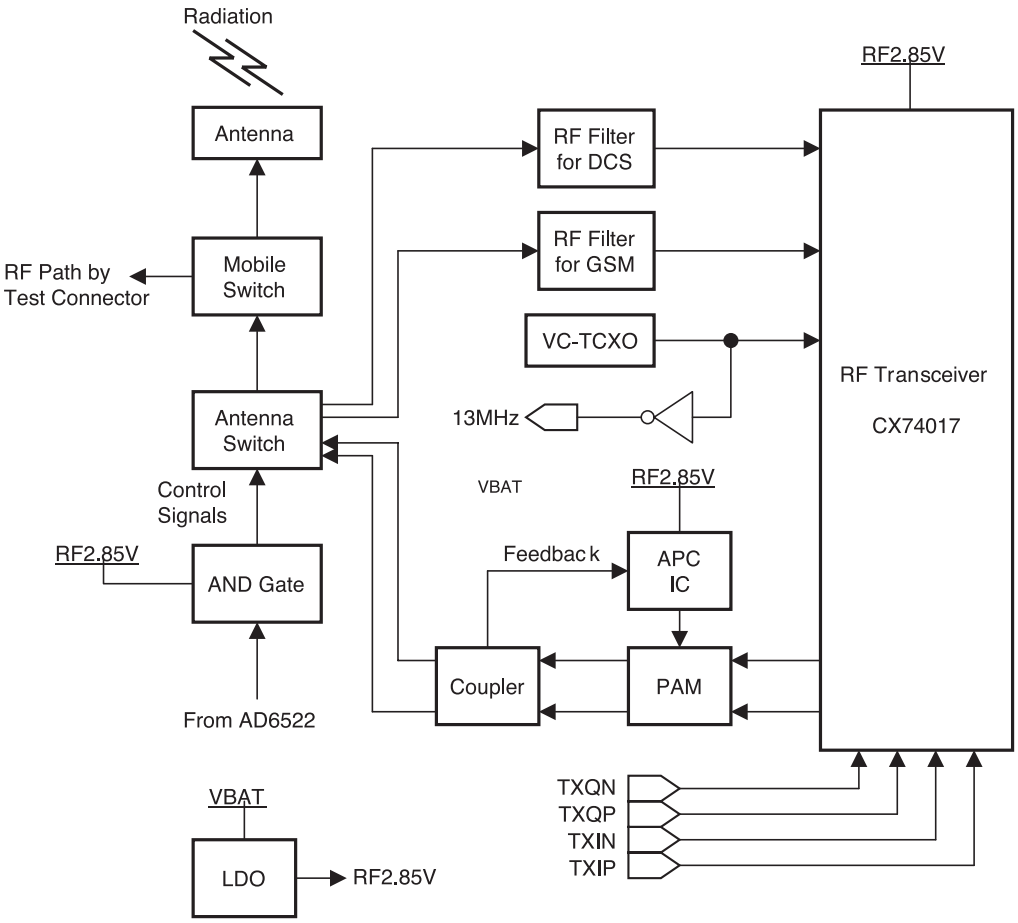


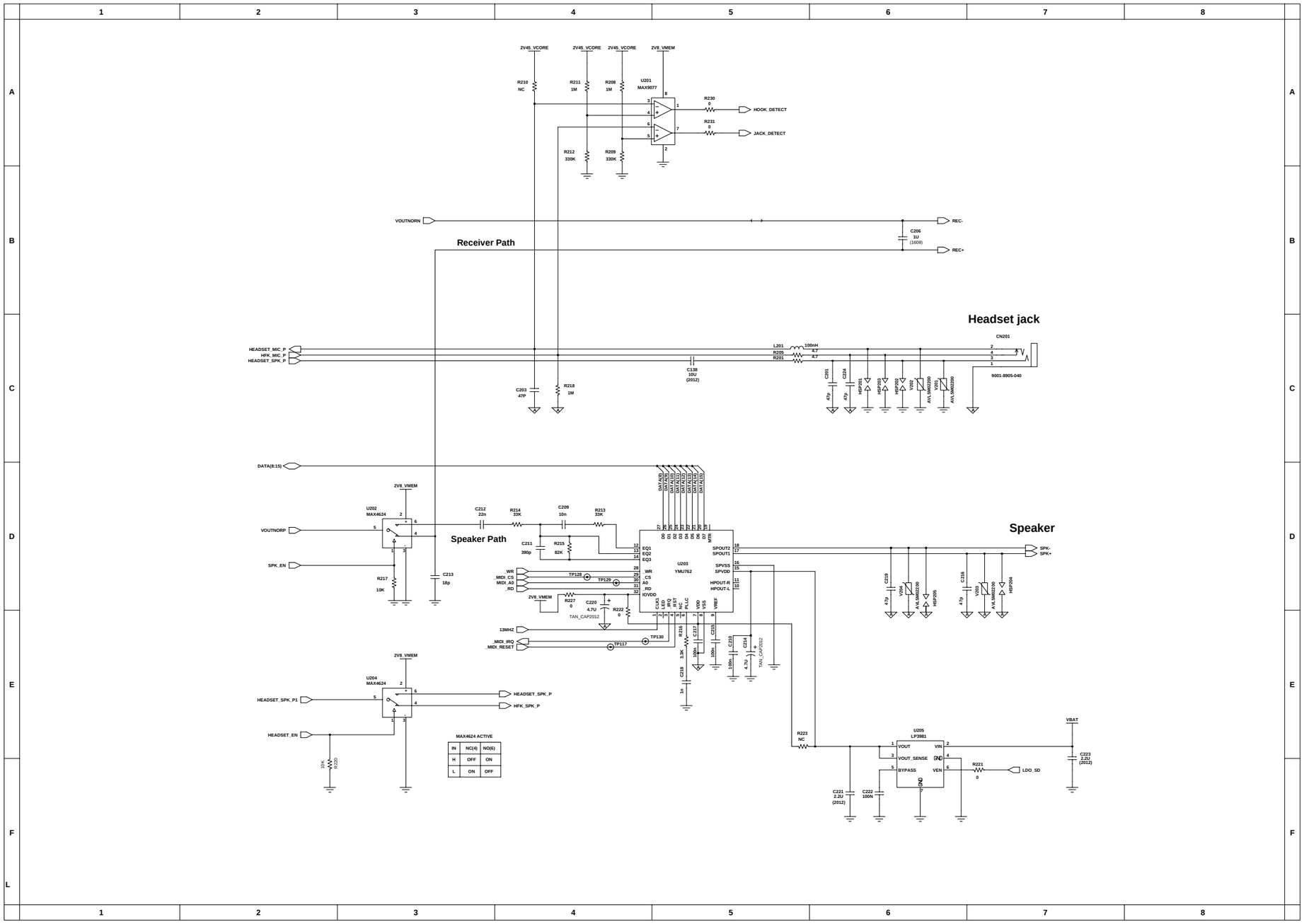
Figure 7-3. RF Blockdiagram.

7. BLOCK DIAGRAM

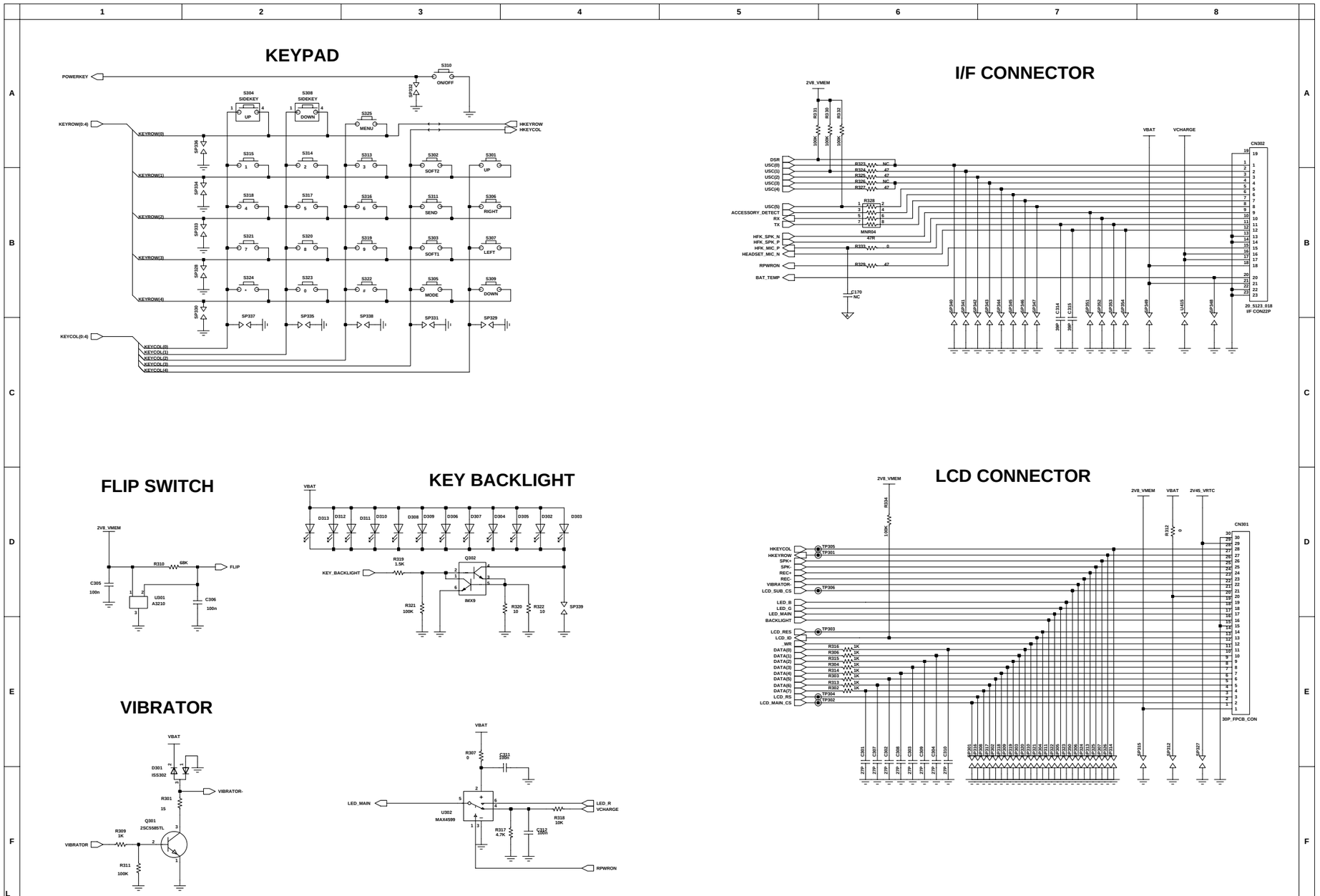
8. CIRCUIT DIAGRAM

8.1 Baseband Interface

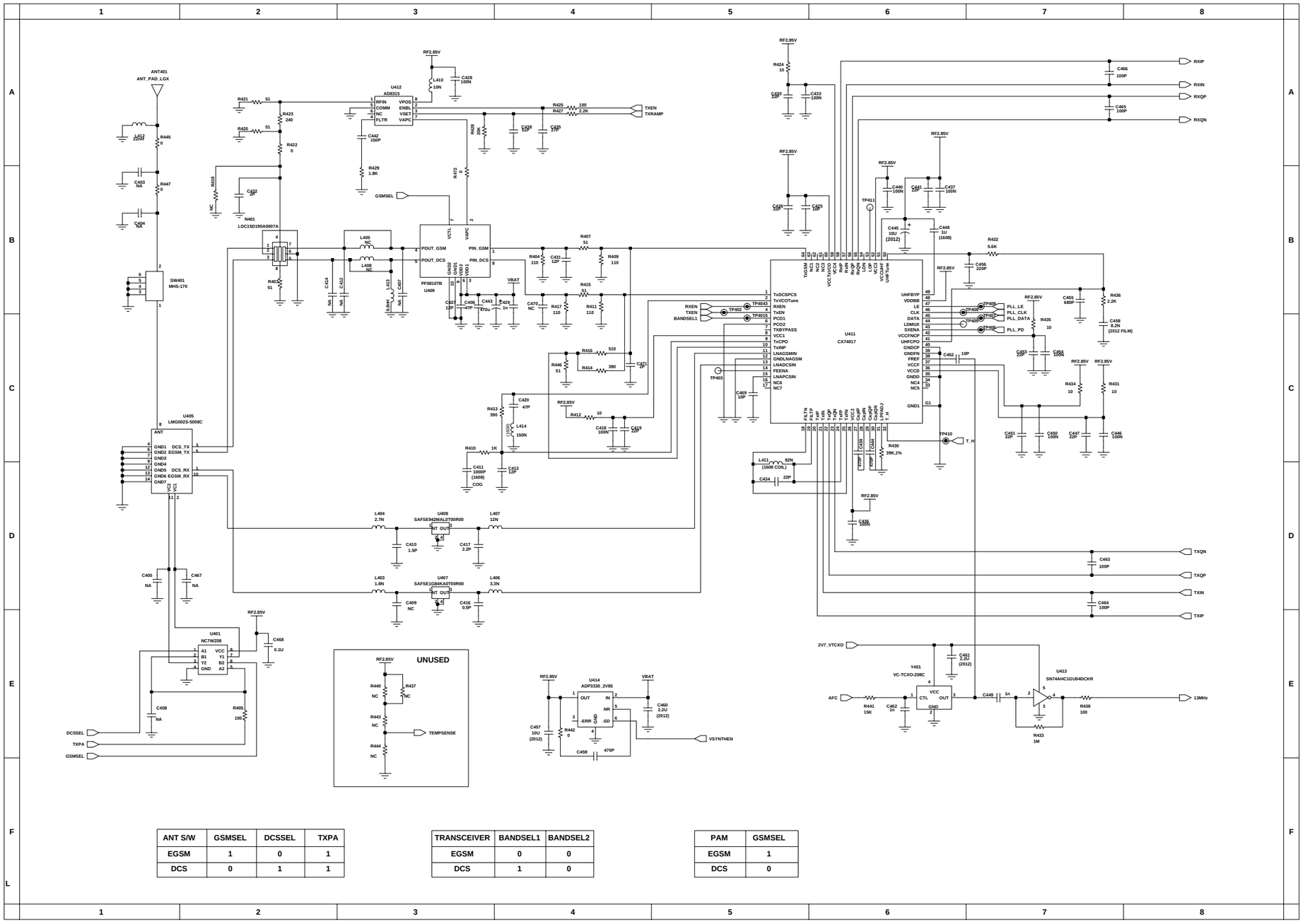
8.2 MIDI


Receiver Path
Headset jack
Speaker Path
Speaker
2V45_VCORE
2V8_VMEM
U201 MAX9077
HOOK_DETECT
JACK_DETECT
VOUTNORN
REC-
REC+
HEADSET_MIC_P
HFK_MIC_P
HEADSET_SPK_P
CN201
9001-8905-040
DATA(8:15)
VOUTNORP
SPK_EN
U202 MAX4624
U203 YMU762
SPK-
SPK+
HEADSET_SPK_P1
HFK_SPK_P
HEADSET_EN
U204 MAX4624
MAX4624 ACTIVE
IN | NC(4) | NO(5)
H | OFF | ON
L | ON | OFF
U205 LP3981
VBAT
LDO_SD

8.3 KEY, I/F & LCD CON



8.4 RF

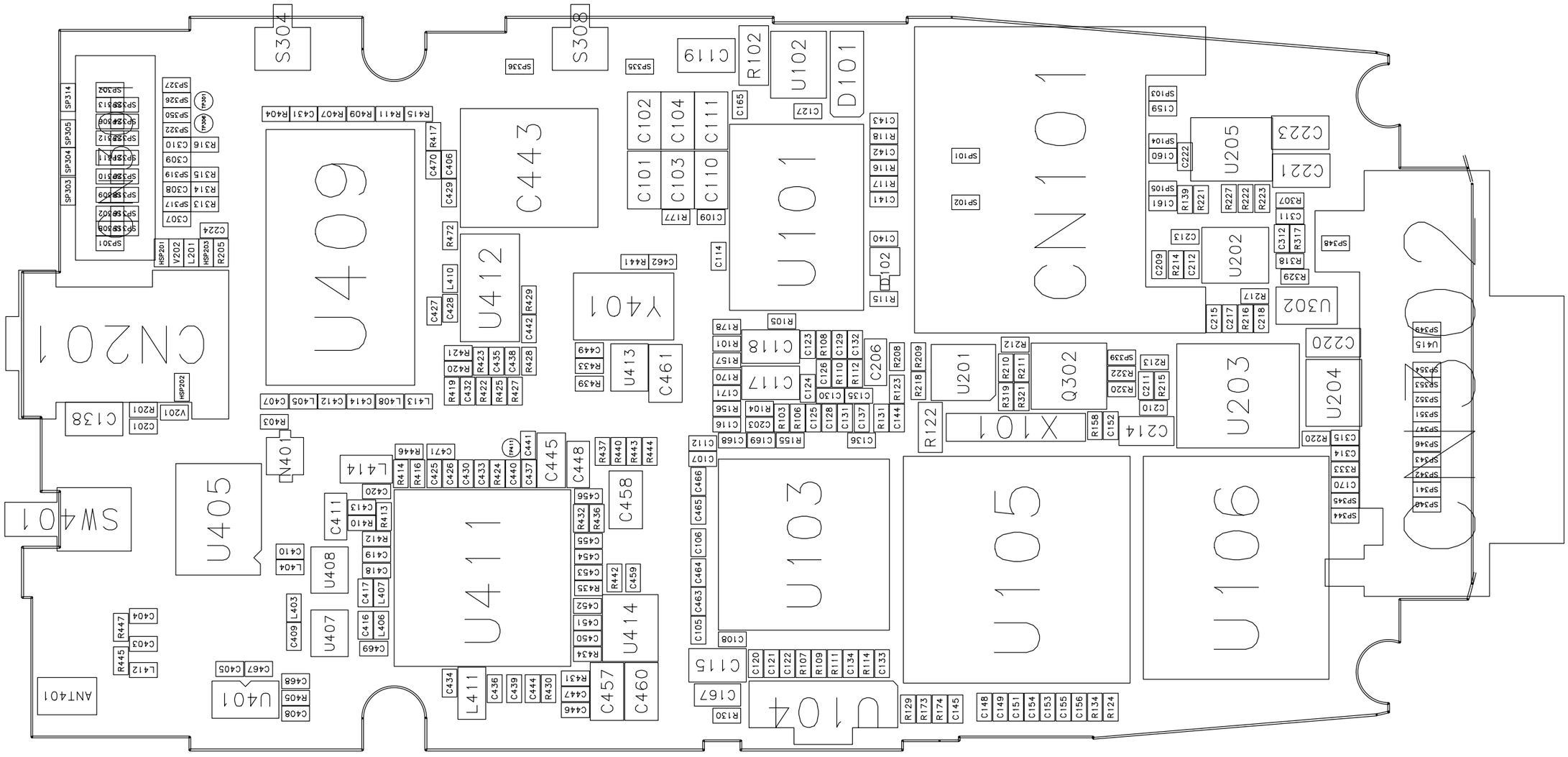


ANT S/W	GSMSEL	DCSSEL	TXPA
EGSM	1	0	1
DCS	0	1	1

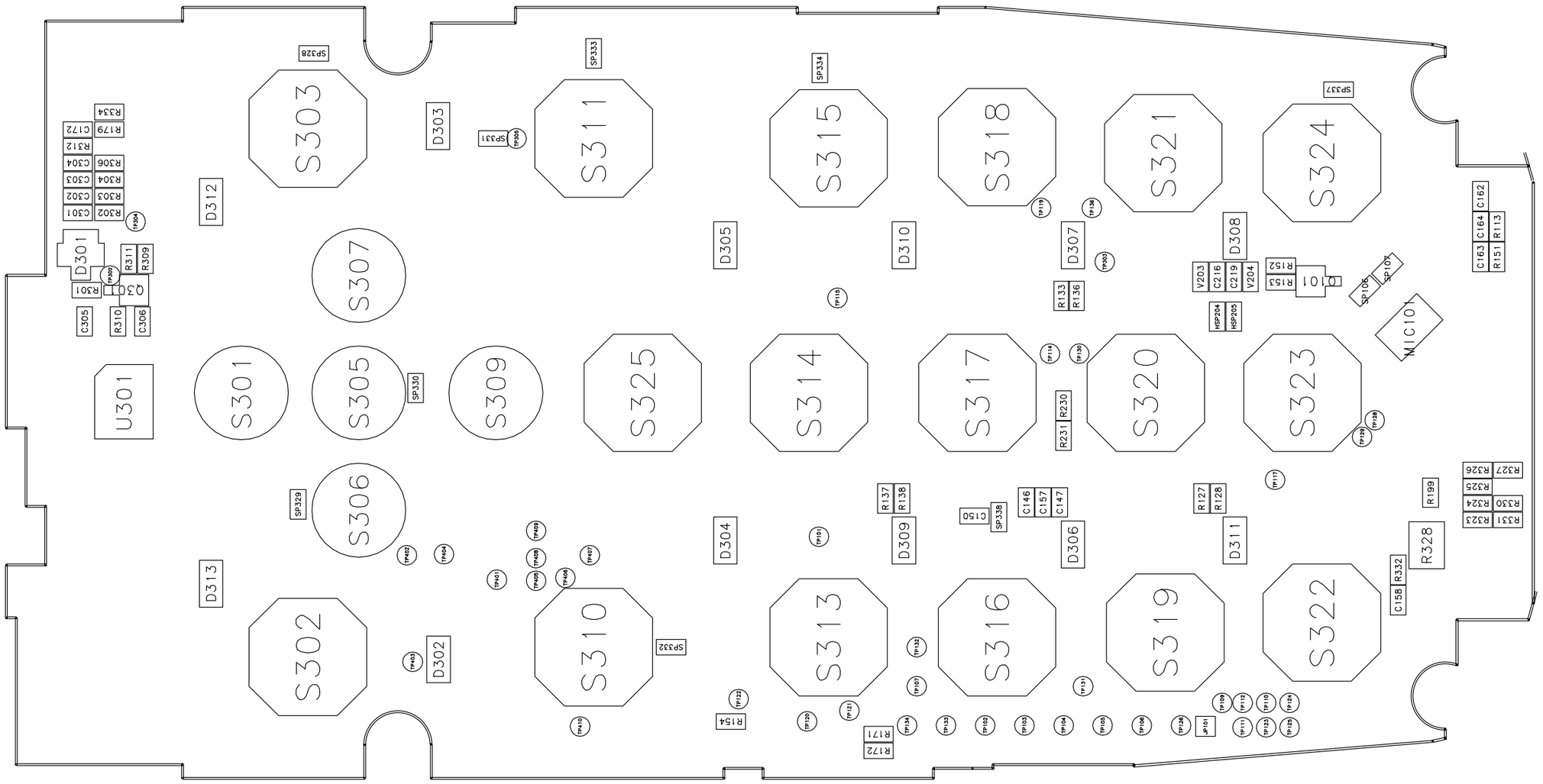
TRANSCEIVER	BANDSEL1	BANDSEL2
EGSM	0	0
DCS	1	0

PAM	GSMSEL
EGSM	1
DCS	0

9. PCB LAYOUT


S304
S308
U409
C443
U412
Y401
U413
C461
U102
D101
C119
R102
U101
CN101
CN201
C138
U405
SW401
U411
C458
U414
C457
C460
U408
U407
U401
ANT401
U103
U105
U106
U104
U201
Q302
X101
U205
U202
U203
U204
C223
C221
U302
C220
C222
C213
C209
R214
C212
C215
C217
R216
C218
R217
R307
C311
C312
R317
R318
R329
C161
R139
R221
R227
R222
R223
C159
C160
SP103
SP104
SP105
SP101
SP102
SP348
SP349
U415
SP350
SP351
SP352
SP353
SP354
SP355
SP356
SP357
SP358
SP359
SP360
SP361
SP362
SP363
SP364
SP365
SP366
SP367
SP368
SP369
SP370
SP371
SP372
SP373
SP374
SP375
SP376
SP377
SP378
SP379
SP380
SP381
SP382
SP383
SP384
SP385
SP386
SP387
SP388
SP389

9. PCB LAYOUT


S303
S311
S315
S318
S321
S324
S307
S301
S305
S309
S325
S314
S317
S320
S323
S306
S310
S313
S316
S319
S322
S302
U301
D301
Q301
D312
D303
D305
D310
D307
D308
D313
D302
D304
D309
D306
D311
R328
M1C101
SP328
SP333
SP334
SP337
SP330
SP329
SP331
SP332
SP338
SP107
SP108
C162
C164
C163
R113
R151
R152
R153
V203
V204
C216
C219
HSP204
HSP205
R133
R136
R231
R230
R137
R138
C150
C146
C157
C147
R127
R128
R199
R327
R326
R325
R324
R330
R323
R331
C158
R332
R154
R171
R172
R179
C172
R312
R302
R303
R304
R306
C301
C302
C303
C304
R301
R311
R309
R310
C305
C306
TP304
TP305
TP306
TP307
TP308
TP309
TP310
TP311
TP312
TP313
TP314
TP315
TP316
TP317
TP318
TP319
TP320
TP321
TP322
TP323
TP324
TP325
TP326
TP327
TP328
TP329
TP330
TP331
TP332
TP333
TP334
TP335
TP336
TP337
TP338
TP339
TP340
TP341
TP342
TP343
TP344
TP345
TP346
TP347
TP348
TP349
TP350
TP351
TP352
TP353
TP354
TP355
TP356
TP357
TP358
TP359
TP360
TP361
TP362
TP363
TP364
TP365
TP366
TP367
TP368
TP369
TP370
TP371
TP372
TP373
TP374
TP375
TP376
TP377
TP378
TP379
TP380
TP381
TP382
TP383
TP384
TP385
TP386
TP387
TP388
TP389
TP390
TP391
TP392
TP393
TP394
TP395
TP396
TP397
TP398
TP399
TP400
TP401
TP402
TP403
TP404
TP405
TP406
TP407
TP408
TP409
TP410
JP101

10. 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.

10.1 BB Test [MENU 1]

Baseband Test

A. LED [1-1]

This menu is to test the indicator LED on the folder of a handset.

- **Red [1-1-1]** : Red light turns on
- **Blue [1-1-2]** : Blue light turns on
- **Yellow [1-1-3]** : Yellow light turns on
- **Orange [1-1-4]** : Orange light turns on
- **Pink [1-1-5]** : Pink light turns on
- **Green [1-1-6]** : Green turns on
- **Violet [1-1-7]** : Violet light turns on

B. LCD [1-2]

This menu is to test the LCD contrast.

- **Contrast Value [1-2-1]** : Change this value by up and down key.

C. Backlight [1-3]

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

- **Backlight On [1-3-1]** : LCD Backlight and Keypad Backlight light on at the same time.
- **Backlight Off [1-3-2]** : LCD Backlight and Keypad Backlight light off at the same time.
- **Backlight value [1-3-3]** : 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.

D. Buzzer [1-4]

This menu is to test the melody sound.

- **Melody on [1-4-1]**: Melody sound is played through the speaker.
- **Melody off [1-4-1]**: Melody sound is off.

E. Vibrator [1-5]

This menu is to test the vibration mode.

- **Vibrator On [1-5-1]** : Vibration mode is on.
- **Vibrator Off [1-5-2]** : Vibration mode is off.

F. ADC (Analog to Digital Converter) [1-6]

This displays the value of each ADC.

- **MVBAT ADC (Main Voltage Battery ADC) [1-6-1]**
- **AUX ADC (Auxiliary ADC) [1-6-2]**
- **TEMPER ADC(Temperature ADC) [1-6-3]**

G. BATTERY [1-7]

- **Bat Cal [1-7-1] :**
  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_LI MIT,
  BAT_INCALL_LIMIT,SHUT_DOWN_VOLTAGE, BAT_RECHARGE_LMT
- **TEMP Cal [1-7-2] :**
  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

H. Audio [1-8]

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.

- **VbControl1 [1-8-1**] : VbControl1 bit Register Value Setting
- **VbControl2 [1-8-2]** : VbControl2 bit Register Value Setting
- **VbControl3 [1-8-3]** : VbControl3 bit Register Value Setting
- **VbControl4 [1-8-4]** : VbControl4 bit Register Value Setting
- **VbControl5 [1-8-5]** : VbControl5 bit Register Value Setting
- **VbControl6 [1-8-6]** : VbControl6 bit Register Value Setting

I. DAI (Digital Audio Interface) [1-9]

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

- **DAI AUDIO [1-9-1]** : DAI audio mode
- **DAI UPLINK [1-9-2]** : Speech encoder test
- **DAI DOWNLINK [1-9-3]** : Speech decoder test
- **DAI OFF [1-9-4]** : DAI mode off

10.2 RF Test [MENU 2]

Radio Frequency Test

A. SAR Test [2-1]

This menu is to test the Specific Absorption Rate.

- **SAR Test On [2-1-1]** : Phone continuously process TX only. Call-setup equipment is not required.
- **SAR Test Off [2-1-2]** : TX process off

10.3 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.

A. All auto test [3-1]

LCD, LED, Backlight, Vibrator, Buzzer, and Key Pad are tested in order for a certain time.

B. LED [3-2]

From red LED to Violet LED are turned on one by one for about 1 second, then off.

C. Backlight [3-3]

LCD Backlight and LED Backlight are on for about 1.5 seconds at the same time, then off.

D. Buzzer [3-4]

This menu is to test the volume of Melody. It rings in the following sequence.
Volume1 . Volmue2 . Volume3 .Volume0 (mute) . Volume4 . Volume5

E. Vibrator [3-5]

Vibrator is on for about 1.5 seconds.

F. LCD [3-6]

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

G. Key pad [3-7]

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 minutes automatically and the screen displays the previous one.

H. Sub LCD [3-8]

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

10.4 Trace option [MENU 4]

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

10.5 Call Timer [MENU 5]

A. All calls [5-1]

This displays total conversation time. User cannot reset this value.

B. Reset settings [5-2]

This resets total conversation time to this, [00:00:00].

10.6 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.

10.7 S/W version [MENU 7]

This displays software version stored in the phone.

Attention

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

11. STAND ALONE TEST

11.1 Introduction

This manual explains how to examine the status of RX and TX of G5200/W5200 model.

A. Tx Test

TX test- this is to see if the transmitter of G5200/W5200 is activating normally

B. Rx Test

RX test- this is to see if the receiver of G5200/W5200 is activating normally.

11.2 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
- Baudrate : 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.

11.3 Means of Test

a. Select a COM port
b. Set the values in Tx or Rx
c. After setting them all above, press Start button of Signal.

12. AUTO CALIBRATION

12.1 Overview

AutoCal (Auto Calibration) is the PC side calibration tool that perform Rx and Tx calibration with Agilent 8960 or other equipment. AutoCal generate calibration data by communicating with phone and measuring equipment and write it into calibration data block of flash memory in GSM phone.

12.2 Requirements

- Microsoft Windows98/ME
- AutoCal.exe
- GSM phone
- Agilent 8960 (or other equipment)

12.3 Menu and settings

- **Edit → Ramp** : Show reference power ramp window. Reference ramp is used in APC procedure. You can open or save reference ramp data and edit it on notepad.

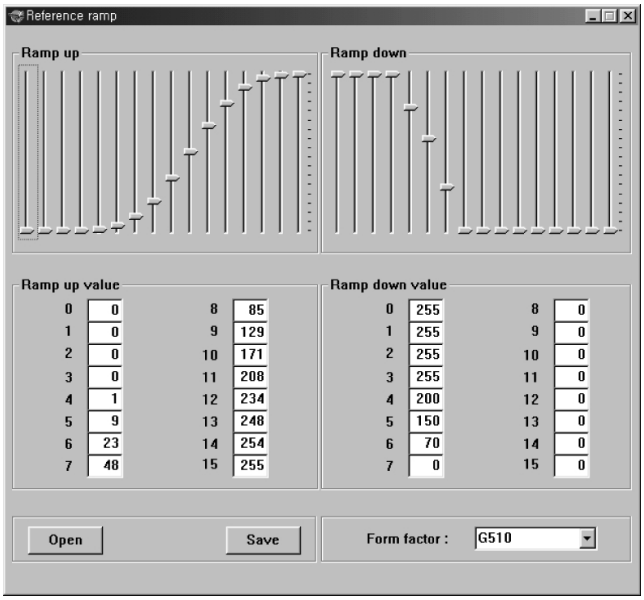


Figure 12-1. Reference ramp window.

- **Edit → Make bin & write** : Make binary file from measured calibration data and write to the phone. The name of binaryfile is cal.bin by default. You can change it at Option → Settings → Bin files tab.
- **Edit → Make bin as** : Make binary file as the other name.
- **Edit- → Make RF & BB bin** : Make RF(AGC, APC) bin and BB(ADC) bin separately.

- **Connection → Connect to phone** : Connect to the phone which you want to measure. This procedure checks whether the PC is connected to “Ag8960” or not. If not connected to “Ag8960” try to connect to “Ag8960”. After that it performs sync. procedure with phone. If the sync. procedure is successful state column on statusbar changed to SETUP else you should disconnect phone and try it again from the beginning. All measurement is performed at state SETUP
- **Connection → Disconnect phone** : Disconnect phone.
- **Connection → Port setting** : Show COM port setting dialog you can change port number, baud rate etc.
- **Connection → Connect to Ag8960** : Connect to Agilent 8960.
- **Connection → Disconnect Ag8960** :Disconnect Agilent 8960.
- **Option → Settings → Gpib state** : Show current primary Gpib state.
- **Option → Settings → MPL** : Set max Tx power level used in APC procedure.
- **Option → Settings → CL** : Set cable loss value.
- **Option- → Settings → Bin file** : Set default binary file name.

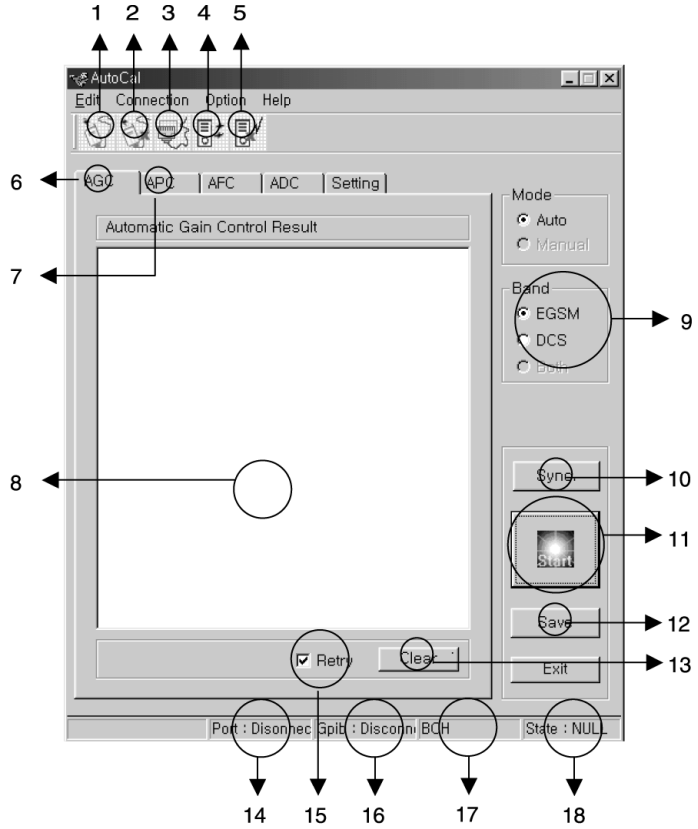


Figure 12-2. Buttons and status bar

1. Connect to phone
2. Disconnect phone
3. Port setting
4. Connect to Ag8960
5. Disconnect Ag8960
6. AGC tab
7. APC tab
8. Result window
9 . Band setting
10 . Sync. Button (button 2 + button 1)
11. Start measure
12. Save result
13. Clear result window
14. Port connection state
15. Retry button
16. Ag8960 connection state
17. Informations.
18. Current state.

12.4 AGC

This procedure is for Rx calibration.
In this procedure, We can get RSSI correction value. Set band EGSM and press Start button the result window will show correction values per every power level and gain code and the same measure is performed per every frequency.

12.5 APC

This procedure is for Tx calibration.
In this procedure you can get proper scale factor value and measured power level.

12.6 ADC

This procedure is for battery calibration.
You can get mainBatteryConfigTable and temperatureConfigTable

12.7 Setting

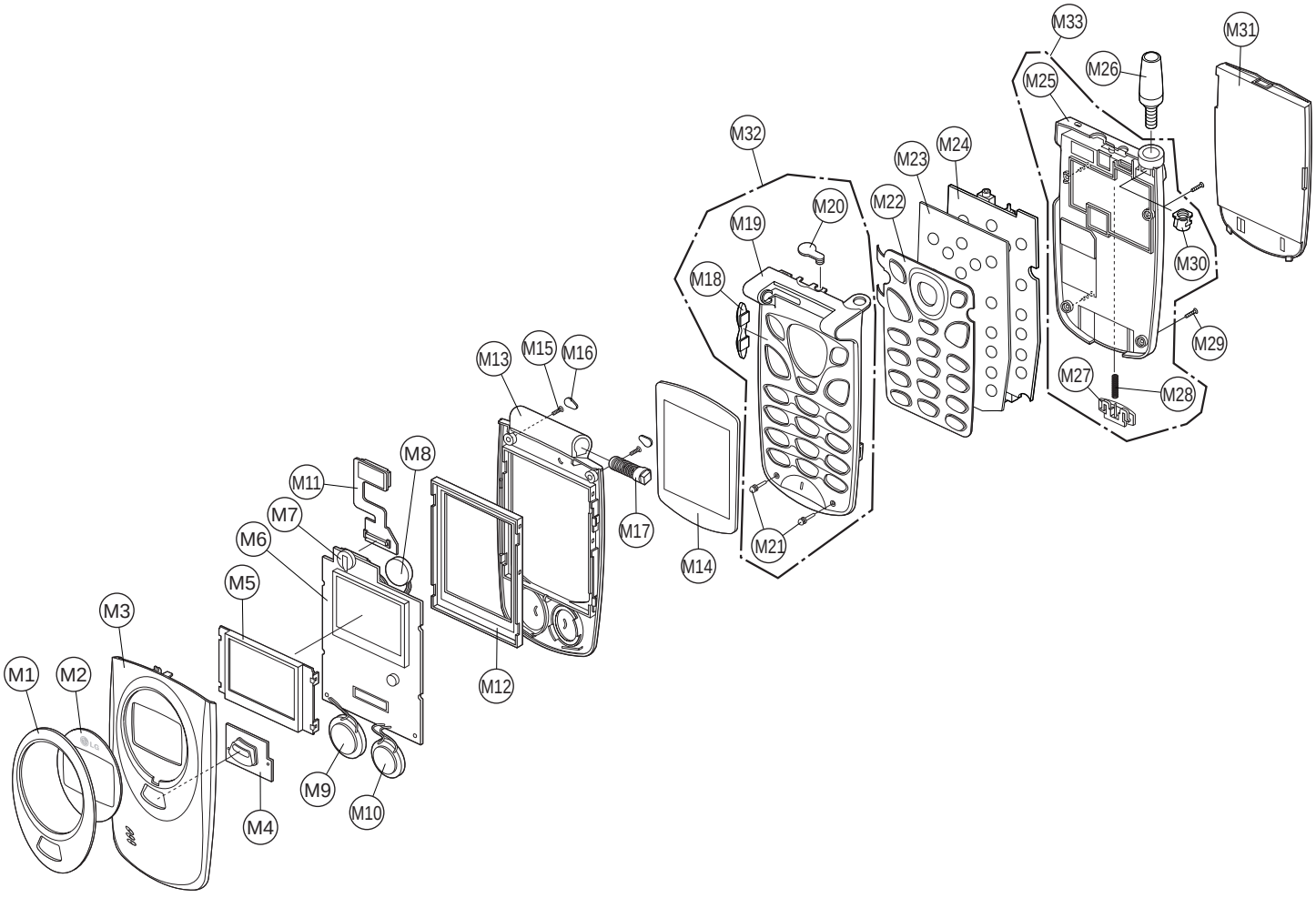
Select automatic calibration item. If you uncheck one item calibration will stop from the unchecked item. This is useful when you want to process only one item.

12.8 How to do calibration

A. Connect cable between phone and serial port of PC.
B. Connect Ag8960 equipment and phone.
C. Set correct port and baud rate.
D. Press “Connect to phone” button so that the state change to SETUP.
E. Set band to EGSM.
F. Select AGC tab.
G. Press Start button. AutoCal process all calibration procedure
   i. AGC EGSM
   ii. AGC DCS
   iii. APC EGSM
   iv. APC DCS
   v. ADC
H. After finished all measurement. The state is return to SETUP.
I. Select Edit → Make bin & write then cal.bin file will be generated and then the calibration data will be written into phone.

13. EXPLODED VIEW & REPLACEMENT PART LIST

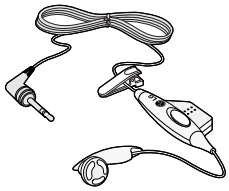
13.1 Exploded View



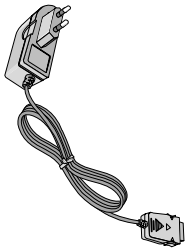
< Parts List of Exploded View >

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
M1	MDAE00	MDAE0004002	DECO,FOLDER(UPPER)	1	BLUE	Cobalt Blue	Yes
		MDAE0004001	DECO,FOLDER(UPPER)	1	Cool Gray	Metal Silver	Yes
M2	MWAF00	MWAF0002601	WINDOW,LCD(SUB)	1	SUB		Yes
M3	ACGJ00	ACGJ0010302	COVER ASSY,FOLDER(UPPER)	1	COBALT BLUE	Cobalt Blue	Yes
		ACGJ0010301	COVER ASSY,FOLDER(UPPER)	1	METAL SILVER	Metal Silver	Yes
M4	ABGB00	ABGB0000401	BUTTON ASSY,FUNCTION	1	METAL SILVER BUTTON		Yes
M5	MHGD01	MHGD0001101	HOLDER,LCD	1	SUB, 26.7X38.5		Yes
M6	SVLM00	SVLM0003001	LCD MODULE	1	128*128 , 96*64 , ,DUAL LCD, 4GRAY FSTN		Yes
M7	SBCL00	SBCL0000901	BATTERY,CELL,LITHIUM	1	2.00 V,4.0 mAh,COIN ,BACKUP BATTERY		Yes
M8	SJMY00	SJMY0003601	VIBRATOR,MOTOR	1	3.0 V,0.085 A,10 * 25 ,G5200 VIBRATOR		Yes
M9	SUSY00	SUSY0006201	SPEAKER	1	ASSY ,8 ohm,86 dB,15 mm,G5200 SPEAKER		Yes
M10	SURY00	SURY0005401	RECEIVER	1	ASSY ,99 dB,32 ohm,13 * 2.7 ,G5200 REEIVER		Yes
M11	SACY00	SACY0005501	PCB ASSY,FLEXIBLE	1	G5200 LCD, LCD Connector(Header, Socket)		Yes
M12	MHGD00	MHGD0001001	HOLDER,LCD	1	MAIN , 37.8X44.9		Yes
M13	ACGH00	ACGH0005602	COVER ASSY,FOLDER(LOWER)	1	COBALT BLUE	Cobalt Blue	Yes
		ACGH0005601	COVER ASSY,FOLDER(LOWER)	1	METAL SILVER	Metal Silver	Yes
M14	MWAC00	MWAC0015801	WINDOW,LCD	1	MAIN		Yes
M15	GMZZ00	GMZZ0003201	SCREW MACHINE	2	3.5 mm,3.5 mm,MSWR3(FN) ,N ,STR ,- , M1.7X3.5 DIA3.5		Yes
M16	MCCH00	MCCH0003907	CAP,SCREW	2	COBALT BLU	Cobalt Blue	Yes
		MCCH0003906	CAP,SCREW	2	METAL SILVER	Metal Silver	Yes
M17	MHFD00	MHFD0000401	HINGE,FOLDER	1	LG-510,511,512 •' 5.7(+0/-0.05) X 16.4		Yes
M18	MBJL00	MBJL0003201	BUTTON,SIDE	1	Ni , Silver		Yes
M19	MCJK00	MCJK0006302	COVER,FRONT	1	COBALT BLUE	Cobalt Blue	Yes
		MCJK0006301	COVER,FRONT	1	METAL SILVER	Metal Silver	Yes
M20	MCCC00	MCCC0004902	CAP,EARPHONE JACK	1	COBALT BLUE	Cobalt Blue	Yes
		MCCC0004901	CAP,EARPHONE JACK	1	METAL SILVER	Metal Silver	Yes
M21	MBHY00	MBHY0003502	BUMPER	2	LG-510,511,512 COBALT BLUE DIA 2.4	Cobalt Blue	Yes
		MBHY0003501	BUMPER	2	LG-510,511,512 SILVER DIA 2.4	Metal Silver	Yes
M22	ABGA00	ABGA0000301	BUTTON ASSY,DIAL	1	English		Yes
M23	ADCA00	ADCA0005801	DOME ASSY,METAL	1			Yes
M24	SAFY00	SAFY0049502	PCB ASSY,MAIN	1	W5200 RUSSIA, WAP PHONE, BLUE LED		Yes
M25	MCJN00	MCJN0005202	COVER,REAR	1	COBALT BLUE01	Cobalt Blue	Yes
		MCJN0005201	COVER,REAR	1	METAL SILVER	Metal Silver	Yes
M26	SNGF00	SNGF0000802	ANTENNA,GSM,FIXED	1	1.5 ,-2.5 dBd,CB ,G5200 ANTENNA	Cobalt Blue	Yes
		SNGF0000801	ANTENNA,GSM,FIXED	1	1.5 ,-2.5 dBd,P427C ,G5200 ANTENNA	Metal Silver	Yes
M27	MLEA00	MLEA0003602	LOCKER,BATTERY	1	COBALT BLUE	Cobalt Blue	Yes
		MLEA0003601	LOCKER,BATTERY	1	METAL SILVER	Metal Silver	Yes
M28	MSDC00	MSDC0001901	SPRING,LOCKER	1	5X1.6		Yes
M29	GMZZ00	GMZZ0003201	SCREW MACHINE	4	3.5 mm,3.5 mm,MSWR3(FN) ,N ,STR ,- , M1.7X3.5 DIA3.5		Yes
M30	ACFY00	ACFY0000501	CONTACT ASSY,ANTENNA	1	LG-G510,511,512, MAIN REAR		Yes
M31	SBPL00	SBPL0064001	BATTERY PACK,LI-ION	1	3.7 V,820 mAh,1 CELL,PRISMATIC ,G5200 BATTERY PACK		Yes
M32	ACGK00	ACGK0013402	COVER ASSY,FRONT	1	COBALT BLUE	Cobalt Blue	Yes
		ACGK0013401	COVER ASSY,FRONT	1	METAL SILVER	Metal Silver	Yes
M33	ACGM00	ACGM0010102	COVER ASSY,REAR	1	COBALT BLUE	Cobalt Blue	Yes
		ACGM0010101	COVER ASSY,REAR	1	METAL SILVER	Metal Silver	Yes

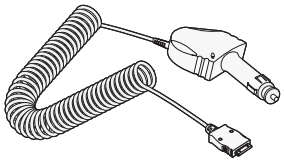
13.2 Accessories



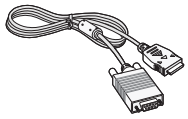
Portable Handsfree



Travel Adapter



Cigar Lighter Adapter



Data-cable

< Accessories >

Level	Location No	Part No	Description	QTY	Specification	Color	Service	Remark
2	SGDY00	SGDY0003003	DATA CABLE	1	LG-510W/G510, CABLE W/O POWER BULK (DK-16G)		Yes	
2	SGEY00	SGEY0002901	EAR PHONE/EAR MIKE SET	1	G7000, G5200 3P EAR MIC (EM-LG412GS)		Yes	
2	SGCC00	SGCC0001803	CIGARETTE LIGHT ADOPTER	1	CLA (CLA-16G)		Yes	
2	SSAD00	SSAD0007803	ADAPTOR, AC-DC	1	100-240V, 50 Hz, 5.2 V, 850 mA, (RUSSIA(CIS) : TA-15GR)		Yes	
		SSAD0007801	ADAPTOR, AC-DC	1	100-240V, 50 Hz, 5.2 V, 850 mA, (Europe : TA-15G)		Yes	

13.3 Replacement Part List

< Mechanic components >

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
3	ABGA00	-	BUTTON ASSY, DIAL	1	Please refer to the 'Exploded View'	Yes	M22
3	ACGG00	ACGG0014602	COVER ASSY, FOLDER	1	COBALT BLUE	No	
3	ACGG00	ACGG0014601	COVER ASSY, FOLDER	1	METAL SILVER	No	
4	ABGB00	-	BUTTON ASSY, FUNCTION	1	Please refer to the 'Exploded View'	Yes	M4
4	ACGH00	-	COVER ASSY, FOLDER(LOWER)	1	Please refer to the 'Exploded View'	Yes	M13
5	MCJH00	MCJH0003902	COVER, FOLDER(LOWER)	1	COBALT BLUE	Yes	
5	MCJH00	MCJH0003901	COVER, FOLDER(LOWER)	1	METAL SILVER	Yes	
5	MFBZ00	MFBZ0000501	FILTER	1	Diameter 1.2X0.2t	Yes	
5	MGAD00	MGAD0008101	GASKET, SHIELD FORM	1	4.8X10.8X0.3t	Yes	
5	MMAA00	MMAA0000601	MAGNET, SWITCH	1	LG-G510, 511, 512, Diameter : 3.0mm+1.5t	Yes	
5	MPBM00	MPBM0001001	PAD, RECEIVER	1	Diameter13X1.2t	Yes	
4	ACGJ00	-	COVER ASSY, FOLDER(UPPER)	1	Please refer to the 'Exploded View'	Yes	M3
5	MCJJ00	MCJJ0006202	COVER, FOLDER(UPPER)	1	COBALT BLUE	Yes	
5	MCJJ00	MCJJ0006201	COVER, FOLDER(UPPER)	1	METAL SILVER	Yes	
5	MGAD00	MGAD0008201	GASKET, SHIELD FORM	2	2X26.5X2t	Yes	
5	MICA00	MICA0001201	INSERT, FRONT	2	LG-G510, 511, 512, Diameter = 1.7mm+2.3t	No	
5	MPBN00	MPBN0001301	PAD, SPEAKER	1	Diameter15X0.8t	Yes	
5	MTAA00	MTAA0006301	TAPE, DECO	1		Yes	
4	ACGK00	-	COVER ASSY, FRONT	1	Please refer to the 'Exploded View'	Yes	M32
5	MBHY00	-	BUMPER	2	Please refer to the 'Exploded View'	Yes	M21
5	MBJL00	-	BUTTON, SIDE	1	Please refer to the 'Exploded View'	Yes	M18
5	MCCC00	-	CAP, EARPHONE JACK	1	Please refer to the 'Exploded View'	Yes	M20
5	MCJK00	-	COVER, FRONT	1	Please refer to the 'Exploded View'	Yes	M19
5	MICA00	MICA0001201	INSERT, FRONT	4	LG-G510, 511, 512, Diameter = 1.7mm+2.3t	No	
4	GMZZ00	-	SCREW MACHINE	2	Please refer to the 'Exploded View'	Yes	M15
4	MCCH00	-	CAP, SCREW	2	Please refer to the 'Exploded View'	Yes	M16
4	MDAE00	-	DECO, FOLDER(UPPER)	1	Please refer to the 'Exploded View'	Yes	M1
4	MHFD00	-	HINGE, FOLDER	1	Please refer to the 'Exploded View'	Yes	M17
4	MHGD00	-	HOLDER, LCD	1	Please refer to the 'Exploded View'	Yes	M12
4	MHGD01	-	HOLDER, LCD	1	Please refer to the 'Exploded View'	Yes	M5
4	MPBG00	MPBG0004601	PAD, LCD	1	37X44X0.4t	Yes	
4	MPBQ00	MPBQ0002601	PAD, LCD(SUB)	1	25.8X27.1X0.4t	Yes	
4	MTAB00	MTAB0001401	TAPE, PROTECTION	1	LG-G510, FOLDER UPPER	No	
4	MWAC00	-	WINDOW, LCD	1	Please refer to the 'Exploded View'	Yes	M14
4	MWAF00	-	WINDOW, LCD(SUB)	1	Please refer to the 'Exploded View'	Yes	M2
4	SACY00	-	PCB ASSY, FLEXIBLE	1	Please refer to the 'Exploded View'	Yes	M11
5	CN1	ENBY0011001	CONNECTOR, BOARD TO BOARD	1	30 PIN, 0.5 mm, STRAIGHT, B to B CNT (SOCKET)	Yes	
5	CN2	ENBY0010901	CONNECTOR, BOARD TO BOARD	1	30 PIN, 0.5 mm, STRAIGHT, B to B CNT (HEAER)	Yes	
5	SPCY00	SPCY0010201	PCB, FLEXIBLE	1	POLYI , 0.3 mm, DOUBLE, G5200 LCD G5200 LCD	No	
4	SVLM00	-	LCD MODULE	1	Please refer to the 'Exploded View'	Yes	M6
3	SBCL00	-	BATTERY, CELL, LITHIUM	1	Please refer to the 'Exploded View'	Yes	M7
3	SJMY00	-	VIBRATOR, MOTOR	1	Please refer to the 'Exploded View'	Yes	M8
3	SUMY00	SUMY0004101	MICROPHONE	1	FPCB , -42 dB, 6 * 1.3 , G5200 C-MIC	Yes	
3	SURY00	-	RECEIVER	1	Please refer to the 'Exploded View'	Yes	M10
3	SUSY00	-	SPEAKER	1	Please refer to the 'Exploded View'	Yes	M9
2	SBPL00	-	BATTERY PACK, LI-ION	1	Please refer to the 'Exploded View'	Yes	M31
3	ACGM00	-	COVER ASSY, REAR	1	Please refer to the 'Exploded View'	Yes	M33
4	ACFY00	-	CONTACT ASSY, ANTENNA	1	Please refer to the 'Exploded View'	Yes	M30
4	MCJN00	-	COVER, REAR	1	Please refer to the 'Exploded View'	Yes	M25
4	MGAD00	MGAD0008101	GASKET, SHIELD FORM	1	4.8X10.8X0.3t	Yes	
4	MLEA00	-	LOCKER, BATTERY	1	Please refer to the 'Exploded View'	Yes	M27
4	MSDC00	-	SPRING, LOCKER	1	Please refer to the 'Exploded View'	Yes	M28
3	ADCA00	-	DOME ASSY, METAL	1	Please refer to the 'Exploded View'	Yes	M23
3	GMZZ00	-	SCREW MACHINE	4	Please refer to the 'Exploded View'	Yes	M29
3	MCCF00	MCCF0002002	CAP, MOBILE SWITCH	1	LG-510, 511, 512 COBALT BLUE	Yes	
3	MCCF00	MCCF0002003	CAP, MOBILE SWITCH	1	LG-510, 511, 512 METALIC SILVER	Yes	
2	SNGF00	-	ANTENNA, GSM, FIXED	1	Please refer to the 'Exploded View'	Yes	M26

< Main PCB >

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
3	SAFY00	-	PCB ASSY, MAIN	1	Please refer to the 'Exploded View'	Yes	M24
5	C101	ECCH0000371	CAP, CERAMIC, CHIP	1	0.22 uF, 50V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C102	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C103	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C104	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C105	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C106	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C107	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C108	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C109	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C110	ECCH0003401	CAP, CERAMIC, CHIP	1	10 uF, 6.3V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C111	ECCH0000371	CAP, CERAMIC, CHIP	1	0.22 uF, 50V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C112	ECCH0000110	CAP, CERAMIC, CHIP	1	10 pF, 50V, D, NP0, TC, 1005, R/TP	Yes	
5	C114	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C115	ECCH0000378	CAP, CERAMIC, CHIP	1	1 uF, 16V, K, X7R, HD, 2012, R/TP	Yes	
5	C116	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C117	ECCH0003401	CAP, CERAMIC, CHIP	1	10 uF, 6.3V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C118	ECCH0003401	CAP, CERAMIC, CHIP	1	10 uF, 6.3V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C119	ECCH0003401	CAP, CERAMIC, CHIP	1	10 uF, 6.3V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C120	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C121	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C122	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C124	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C125	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C126	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C127	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C128	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C129	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C130	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C131	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C132	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C134	ECCH0001811	CAP, CERAMIC, CHIP	1	0.22 uF, 50V, Z, Y5V, HD, 1005, R/TP	Yes	
5	C135	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C136	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C137	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C140	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C142	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C143	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C144	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C145	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C146	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C147	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C148	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C149	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C150	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C151	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C152	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C153	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C155	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C156	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C157	ECCH0000163	CAP, CERAMIC, CHIP	1	47 nF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C158	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C159	ECCH0001811	CAP, CERAMIC, CHIP	1	0.22 uF, 50V, Z, Y5V, HD, 1005, R/TP	Yes	
5	C160	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C162	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C163	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C164	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C165	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C168	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
5	C169	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C171	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C201	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C203	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C206	ECCH0000276	CAP, CERAMIC, CHIP	1	1 uF, 10V, Z, Y5V, HD, 1608, R/TP	Yes	
5	C209	ECCH0000155	CAP, CERAMIC, CHIP	1	10 nF, 16V, K, X7R, HD, 1005, R/TP	Yes	
5	C210	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C211	ECCH0000138	CAP, CERAMIC, CHIP	1	390 pF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C212	ECCH0000159	CAP, CERAMIC, CHIP	1	22 nF, 16V, K, X7R, HD, 1005, R/TP	Yes	
5	C213	ECCH0000113	CAP, CERAMIC, CHIP	1	18 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C214	ECTH0001702	CAP, TANTAL, CHIP	1	4.7 uF, 10V, M, STD, 2012, R/TP	Yes	
5	C215	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C216	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C217	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C218	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C219	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C220	ECTH0001702	CAP, TANTAL, CHIP	1	4.7 uF, 10V, M, STD, 2012, R/TP	Yes	
5	C221	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C222	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C223	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C224	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C301	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C302	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C303	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C304	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C305	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C306	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C307	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C308	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C309	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C310	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C311	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C312	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C314	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C315	ECCH0000120	CAP, CERAMIC, CHIP	1	39 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C406	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C410	ECCH0000103	CAP, CERAMIC, CHIP	1	1.5 pF, 50V, C, NP0, TC, 1005, R/TP	Yes	
5	C411	ECCH0000247	CAP, CERAMIC, CHIP	1	1 nF, 50V, J, NP0, TC, 1608, R/TP	Yes	
5	C413	ECCH0000111	CAP, CERAMIC, CHIP	1	12 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C416	ECCH0000101	CAP, CERAMIC, CHIP	1	0.5 pF, 50V, C, NP0, TC, 1005, R/TP	Yes	
5	C417	ECCH0000901	CAP, CERAMIC, CHIP	1	2.2 pF, 50V, C, NP0, TC, 1005, R/TP	Yes	
5	C418	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C419	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C420	ECCH0000122	CAP, CERAMIC, CHIP	1	47 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C425	ECCH0000110	CAP, CERAMIC, CHIP	1	10 pF, 50V, D, NP0, TC, 1005, R/TP	Yes	
5	C426	ECCH0000186	CAP, CERAMIC, CHIP	1	33 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C427	ECCH0000111	CAP, CERAMIC, CHIP	1	12 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C428	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C429	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C430	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C431	ECCH0000111	CAP, CERAMIC, CHIP	1	12 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C432	ECCH0000174	CAP, CERAMIC, CHIP	1	2 pF, 50V, C, NP0, TC, 1005, R/TP	Yes	
5	C433	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C434	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C435	ECCH0000117	CAP, CERAMIC, CHIP	1	27 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C436	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C437	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C438	ECCH0000123	CAP, CERAMIC, CHIP	1	51 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C439	ECCH0000139	CAP, CERAMIC, CHIP	1	470 pF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C440	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
5	C441	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C442	ECCH0000130	CAP, CERAMIC, CHIP	1	150 pF, 50V, J, SL, TC, 1005, R/TP	Yes	
5	C443	ECTZ0003801	CAP, TANTAL, CHIP, MAKER	1	470 uF, 6.3V, M, L_ESR, ETC, R/TP	Yes	
5	C444	ECCH0000139	CAP, CERAMIC, CHIP	1	470 pF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C445	ECTH0001701	CAP, TANTAL, CHIP	1	10 uF, 6.3V, M, L_ESR, 2012, R/TP	Yes	
5	C446	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C447	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C448	ECCH0000276	CAP, CERAMIC, CHIP	1	1 uF, 10V, Z, Y5V, HD, 1608, R/TP	Yes	
5	C449	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C450	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C451	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C452	ECCH0000110	CAP, CERAMIC, CHIP	1	10 pF, 50V, D, NP0, TC, 1005, R/TP	Yes	
5	C453	ECCH0000115	CAP, CERAMIC, CHIP	1	22 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C454	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C455	ECCH0000189	CAP, CERAMIC, CHIP	1	680 pF, 50V, J, X7R, HD, 1005, R/TP	Yes	
5	C456	ECCH0000133	CAP, CERAMIC, CHIP	1	220 pF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C457	ECCH0003401	CAP, CERAMIC, CHIP	1	10 uF, 6.3V, Z, Y5V, HD, 2012, R/TP	Yes	
5	C458	ECFD0000101	CAP, FILM, MPP	1	8200 pF, 16V, J, NI, SMD, 2.0 mm, R/TP	Yes	
5	C459	ECCH0000139	CAP, CERAMIC, CHIP	1	470 pF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C460	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C461	ECCH0000379	CAP, CERAMIC, CHIP	1	2.2 uF, 6.3V, K, X5R, HD, 2012, R/TP	Yes	
5	C462	ECCH0000143	CAP, CERAMIC, CHIP	1	1 nF, 50V, K, X7R, HD, 1005, R/TP	Yes	
5	C463	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C464	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C465	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C466	ECCH0000128	CAP, CERAMIC, CHIP	1	100 pF, 50V, J, NP0, TC, 1005, R/TP	Yes	
5	C468	ECCH0000182	CAP, CERAMIC, CHIP	1	0.1 uF, 10V, K, X5R, HD, 1005, R/TP	Yes	
5	C469	ECCH0000110	CAP, CERAMIC, CHIP	1	10 pF, 50V, D, NP0, TC, 1005, R/TP	Yes	
5	C471	ECCH0000174	CAP, CERAMIC, CHIP	1	2 pF, 50V, C, NP0, TC, 1005, R/TP	Yes	
5	CN101	ENSY0007602	CONN, SOCKET	1	6 PIN, ETC, , mm, Height 2.7mm	Yes	
5	CN201	ENJE0002301	CONN, JACK/PLUG, EARPHONE	1	3, 5 PIN, G7000 EAR JACK 3pole 5pin KSD	Yes	
5	CN301	ENBY0010901	CONNECTOR, BOARD TO BOARD	1	30 PIN, 0.5 mm, STRAIGHT, , B to B CNT (HEAER)	Yes	
5	CN302	ENEY0002501	CONN, RECEPTACLE	1	18 PIN, 3, 0, 0.5 PITCH / 18 PIN I/O + POWER	Yes	
5	D101	EDSY0005201	DIODE, SWITCHING	1	SMD, 30 V, 1.5 A, R/TP	Yes	
5	D102	EDSY0005701	DIODE, SWITCHING	1	EMT3, 80 V, 4 A, R/TP	Yes	
5	D301	EDSY0005301	DIODE, SWITCHING	1	SC-70, 80 V, 0.1 A, R/TP	Yes	
5	D302	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D303	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D304	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D305	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D306	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D307	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D308	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D309	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D310	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D311	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D312	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	D313	EDLH0004401	DIODE, LED, CHIP	1	BLUE,1608,R/TP,HIGH BRIGHTNESS BLUE COLOR LED	Yes	
5	L201	ELCH0005009	INDUCTOR, CHIP	1	100 nH, J, 1005, R/TP	Yes	
5	L403	ELCH0005010	INDUCTOR, CHIP	1	1.8 nH, S, 1005, R/TP	Yes	
5	L404	ELCH0005002	INDUCTOR, CHIP	1	2.7 nH, S, 1005, R/TP	Yes	
5	L406	ELCH0001405	INDUCTOR, CHIP	1	3.3 nH, S, 1005, R/TP	Yes	
5	L407	ELCH0005003	INDUCTOR, CHIP	1	12 nH, J, 1005, R/TP	Yes	
5	L410	ELCH0001001	INDUCTOR, CHIP	1	10 nH, J, 1005, R/TP	Yes	
5	L411	ELCH0003806	INDUCTOR, CHIP	1	82 nH, G, 1608, R/TP, CDMA	Yes	
5	L412	ELCH0005004	INDUCTOR, CHIP	1	22 nH, J, 1005, R/TP	Yes	
5	L413	ELCH0001003	INDUCTOR, CHIP	1	6.8 nH, J, 1005, R/TP	Yes	
5	L414	ELCH0000718	INDUCTOR, CHIP	1	150 nH, J, 1608, R/TP	Yes	
5	N401	SCHY0000101	COUPLER, RF HYBRID	1	19.0 dB, 0.35 dB, 24.0 dB, 2.0*1.25*0.95, SMD, DUAL COUPLER	Yes	
5	Q101	EQBN0007101	TR, BJT, NPN	1	EMT3, 0.15 W, R/TP, LOW FREQUENCY	Yes	

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
5	Q301	EQBN0007101	TR, BJT, NPN	1	EMT3, 0.15 W, R/TP, LOW FREQUENCY	Yes	
5	Q302	EQBN0004801	TR, BJT, NPN	1	SMT6, 0.2 W, R/TP,	Yes	
5	R101	ERHY0000246	RES, CHIP	1	2K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R102	ERHY0001103	RES, CHIP	1	0.33 ohm, 1/4W, F, 2012, R/TP	Yes	
5	R103	ERHY0000246	RES, CHIP	1	2K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R104	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R105	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R106	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R107	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R108	ERHY0000246	RES, CHIP	1	2K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R109	ERHY0000278	RES, CHIP	1	82K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R110	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R111	ERHY0000282	RES, CHIP	1	120K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R112	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R113	ERHY0000246	RES, CHIP	1	2K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R114	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R115	ERHY0000286	RES, CHIP	1	200K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R116	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R117	ERHY0000265	RES, CHIP	1	20K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R118	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R122	ERHY0000512	RES, CHIP	1	10M ohm, 1/16W, J, 1608, R/TP	Yes	
5	R123	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R124	ERHY0000213	RES, CHIP	1	47 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R126	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R127	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R128	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R131	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R133	ERHY0000261	RES, CHIP	1	10K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R134	ERHY0000261	RES, CHIP	1	10K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R136	ERHY0000261	RES, CHIP	1	10K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R137	ERHY0000188	RES, CHIP	1	430 Kohm, 1/16W, F, 1005, R/TP	Yes	
5	R138	ERHY0000147	RES, CHIP	1	56K ohm, 1/16W, F, 1005, R/TP	Yes	
5	R152	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R153	ERHY0000244	RES, CHIP	1	1.5K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R155	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R156	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R158	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R170	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R177	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R201	ERHY0000202	RES, CHIP	1	4.7 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R205	ERHY0000202	RES, CHIP	1	4.7 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R208	ERHY0000198	RES, CHIP	1	1 Mohm, 1/16W, F, 1005, R/TP	Yes	
5	R209	ERHY0000512	RES, CHIP	1	10M ohm, 1/16W, J, 1608, R/TP	Yes	
5	R210	ERHY0000296	RES, CHIP	1	1M ohm, 1/16W, J, 1005, R/TP	Yes	
5	R211	ERHY0000198	RES, CHIP	1	1 Mohm, 1/16W, F, 1005, R/TP	Yes	
5	R212	ERHY0000199	RES, CHIP	1	680 Kohm, 1/16W, F, 1005, R/TP	Yes	
5	R213	ERHY0000138	RES, CHIP	1	33K ohm, 1/16W, F, 1005, R/TP	Yes	
5	R214	ERHY0000138	RES, CHIP	1	33K ohm, 1/16W, F, 1005, R/TP	Yes	
5	R215	ERHY0000278	RES, CHIP	1	82K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R216	ERHY0000250	RES, CHIP	1	3.3K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R217	ERHY0000261	RES, CHIP	1	10K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R220	ERHY0000261	RES, CHIP	1	10K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R221	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R222	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R223	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R230	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R231	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R301	ERHY0000205	RES, CHIP	1	15 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R302	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R303	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
5	R304	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R306	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R307	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R309	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R310	ERHY0000276	RES, CHIP	1	68K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R311	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R312	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R313	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R314	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R315	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R316	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R317	ERHY0000254	RES, CHIP	1	4.7K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R318	ERHY0000261	RES, CHIP	1	10K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R319	ERHY0000244	RES, CHIP	1	1.5K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R320	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R321	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R322	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R324	ERHY0000213	RES, CHIP	1	47 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R325	ERHY0000213	RES, CHIP	1	47 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R327	ERHY0000213	RES, CHIP	1	47 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R328	ERNR0000401	RES, ARRAY, R	1	47 ohm, ohm, 8 PIN, J, 1/32 W, SMD, R/TP	Yes	
5	R329	ERHY0000213	RES, CHIP	1	47 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R330	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R331	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R332	ERHY0000280	RES, CHIP	1	100K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R333	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R403	ERHY0000214	RES, CHIP	1	51 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R404	ERHY0000221	RES, CHIP	1	110 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R405	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R407	ERHY0000214	RES, CHIP	1	51 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R409	ERHY0000221	RES, CHIP	1	110 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R410	ERHY0000241	RES, CHIP	1	1K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R411	ERHY0000221	RES, CHIP	1	110 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R412	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R413	ERHY0000231	RES, CHIP	1	390 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R414	ERHY0000231	RES, CHIP	1	390 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R415	ERHY0000214	RES, CHIP	1	51 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R416	ERHY0000234	RES, CHIP	1	510 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R417	ERHY0000221	RES, CHIP	1	110 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R420	ERHY0000214	RES, CHIP	1	51 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R421	ERHY0000214	RES, CHIP	1	51 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R422	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R423	ERHY0000227	RES, CHIP	1	240 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R424	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R425	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R427	ERHY0000247	RES, CHIP	1	2.2K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R428	ERHY0000265	RES, CHIP	1	20K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R429	ERHY0000245	RES, CHIP	1	1.8K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R430	ERHY0000141	RES, CHIP	1	39K ohm, 1/16W, F, 1005, R/TP	Yes	
5	R431	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R432	ERHY0000255	RES, CHIP	1	5.6K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R433	ERHY0000296	RES, CHIP	1	1M ohm, 1/16W, J, 1005, R/TP	Yes	
5	R434	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R435	ERHY0000203	RES, CHIP	1	10 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R436	ERHY0000247	RES, CHIP	1	2.2K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R437	SETY0001201	THERMISTOR	1	NTC, 22 Kohm, SMD, 1.0*0.5 / NSM4 SERIES	Yes	
5	R439	ERHY0000220	RES, CHIP	1	100 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R440	ERHY0000289	RES, CHIP	1	270K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R441	ERHY0000263	RES, CHIP	1	15K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R442	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	

Level	Location No.	Part No.	Description	QTY	Specification	Service	Remark
5	R443	ERHY0000237	RES, CHIP	1	680 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R444	ERHY0000254	RES, CHIP	1	4.7K ohm, 1/16W, J, 1005, R/TP	Yes	
5	R445	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R446	ERHY0000214	RES, CHIP	1	51 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R447	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	R472	ERHY0000201	RES, CHIP	1	0 ohm, 1/16W, J, 1005, R/TP	Yes	
5	S304	ESCY0002501	SWITCH, TACT	1	12 V, 0.05 A, HORIZONTAL, 220 G, G5200 TACK S/W	Yes	
5	S308	ESCY0002501	SWITCH, TACT	1	12 V, 0.05 A, HORIZONTAL, 220 G, G5200 TACK S/W	Yes	
5	SW401	ENWY0001901	CONN, RF SWITCH	1	ANGLE, SMD, 0.5 dB, H: 2.6 mm, •'1.8	Yes	
5	U101	EUSY0100401	IC	1	TSSOP, 28 PIN, R/TP, GSM POWER MANAGEMENT SYSTEM	Yes	
5	U102	EQFP0003301	TR, FET, P-CHANNEL	1	SOT-6, 1.6 W, 30 V, 2.4 A, R/TP, Charging P-CHANNEL FET	Yes	
5	U201	EUSY0077702	IC	1	SOT23-8, 8 PIN, R/TP, DUAL COMPARATOR / +2.1 ~ +5.5 SINGLE SUPPLY	Yes	
5	U202	EUSY0077401	IC	1	SOT23-6, 6 PIN, R/TP, SPDT ANALOG SWITCH	Yes	
5	U203	EUSY0111601	IC	1	32-PIN QFN, 32 PIN, R/TP, MA-3 / 40 TONES / FM + WAVEFORM TABLE	Yes	
5	U204	EUSY0077401	IC	1	SOT23-6, 6 PIN, R/TP, SPDT ANALOG SWITCH	Yes	
5	U205	EUSY0122501	IC	1	LLP-6, 6 PIN, R/TP, 300mA CMOS LDO / 3.3V	Yes	
5	U301	EUSY0129501	IC	1	SC-74A FIT, 3 PIN, R/TP, HALL EFFECT SWITCH	Yes	
5	U302	EUSY0077301	IC	1	SC70-6/SOT23-6, 6 PIN, R/TP	Yes	
5	U401	EUSY0100502	IC	1	8-LEAD US8, 8 PIN, R/TP, UHS DUAL 2-INPUT AND GATE	Yes	
5	U405	SFAY0001301	FILTER, SEPERATOR	1	880/960, 1710/1880, 1.3 dB, 1.4 dB, 30 dB, 25 dB, ETC, 5.4*4.0*1.8 Antenna switch	Yes	
5	U407	SFSY0011201	FILTER, SAW	1	1842.5 MHz, 2*2.5*1.0, SMD	Yes	
5	U408	SFSY0011301	FILTER, SAW	1	942.5 MHz, 2*2.5*1.0, SMD	Yes	
5	U409	EUSY0100101	IC	1	RF-K, 12 PIN, R/TP, RF POWER AMPLIFIER	Yes	
5	U411	EUSY0129801	IC	1	Land Grid Array(LGA), 64 PIN, R/TP, 9 x 9 mm	Yes	
5	U412	EUSY0100001	IC	1	8-LEAD MICRO SO, 8 PIN, R/TP, 50 DB GSM PA CONTROLLER	Yes	
5	U413	EUSY0077201	IC	1	SOT(DCK), 5 PIN, R/TP	Yes	
5	U414	EUSY0076701	IC	1	SOT-23-6, 6 PIN, R/TP	Yes	
5	V201	ERVZ0000101	RES, VARIABLE, ETC	1	ohm, PIN, , SMD, R/TP, 1005 SIZE CHIP VARISTOR	Yes	
5	V202	ERVZ0000101	RES, VARIABLE, ETC	1	ohm, PIN, , SMD, R/TP, 1005 SIZE CHIP VARISTOR	Yes	
5	V203	ERVZ0000101	RES, VARIABLE, ETC	1	ohm, PIN, , SMD, R/TP, 1005 SIZE CHIP VARISTOR	Yes	
5	V204	ERVZ0000101	RES, VARIABLE, ETC	1	ohm, PIN, , SMD, R/TP, 1005 SIZE CHIP VARISTOR	Yes	
5	X101	EXXY0004601	X-TAL	1	0.32768 MHz, 20 PPM, 12.5 pF, 65000 ohm, SMD, 6.9*1.4*1.3	Yes	
5	Y401	EXSK0000801	VCTCXO	1	13.0 MHz, PPM, 10 pF, SMD, 5.0*3.2*1.5	Yes	