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1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of G3100.

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 may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that are resulted 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 this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

1. INTRODUCTION

E. Notice of Radiated Emissions

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

F. Pictures

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

G. Interference and Attenuation

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

H. Electrostatic Sensitive Devices

ATTENTION

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

Following information is ESD handling:

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

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

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

1. INTRODUCTION

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

2. PERFORMANCE

2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-ion, 850 mAh Size: 42.08 × 66.65 × 9.3mm Weight: 29.32g	
Stand by Current	Under the minimum current consumption environment (such as paging period 9), the level of standby current is below 4mA.	
Talk time	Up to 3hours (GSM TX Level 7)	
Stand by time	Up to 200hours (Paging Period: 9, RSSI: -85 dBm)	
Charging time	3hours	
RX Sensitivity	GSM, EGSM: -105dBm, DCS: -105dBm	
TX output power	GSM, EGSM: 32dBm(Level 5), DCS: 29dBm(Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small	
Display	128 × 96 pixel 65K Color	
Status Indicator	Hard icons. Key Pad; 0 ~ 9, #, *, Up/Down Navigation Key Confirm Key, Clear Key, Back Key, Send Key, END/PWR Key	
ANT	Internal	
EAR Phone Jack	Yes	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data and Fax	Yes	
Vibrator	Yes	
Loud Speaker	Yes	
Voice Recoding	Yes	
C-Mike	Yes	
Receiver	Yes	
Travel Adapter	Yes	
Options	Hands-free kit, CLA, Data Kit	

2. PERFORMANCE

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>33dBm</td><td>±2dB</td><td>13</td><td>17dBm</td><td>± 3dB</td></tr>
<tr><td>6</td><td>31dBm</td><td>±3dB</td><td>14</td><td>15dBm</td><td>± 3dB</td></tr>
<tr><td>7</td><td>29dBm</td><td>±3dB</td><td>15</td><td>13dBm</td><td>± 3dB</td></tr>
<tr><td>8</td><td>27dBm</td><td>±3dB</td><td>16</td><td>11dBm</td><td>± 5dB</td></tr>
<tr><td>9</td><td>25dBm</td><td>±3dB</td><td>17</td><td>9dBm</td><td>± 5dB</td></tr>
<tr><td>10</td><td>23dBm</td><td>±3dB</td><td>18</td><td>7dBm</td><td>± 5dB</td></tr>
<tr><td>11</td><td>21dBm</td><td>±3dB</td><td>19</td><td>5dBm</td><td>± 5dB</td></tr>
<tr><td>12</td><td>19dBm</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>30dBm</td><td>±2dB</td><td>8</td><td>14dBm</td><td>± 3dB</td></tr>
<tr><td>1</td><td>28dBm</td><td>±3dB</td><td>9</td><td>12dBm</td><td>± 4dB</td></tr>
<tr><td>2</td><td>26dBm</td><td>±3dB</td><td>10</td><td>10dBm</td><td>± 4dB</td></tr>
<tr><td>3</td><td>24dBm</td><td>±3dB</td><td>11</td><td>8dBm</td><td>± 4dB</td></tr>
<tr><td>4</td><td>22dBm</td><td>±3dB</td><td>12</td><td>6dBm</td><td>± 4dB</td></tr>
<tr><td>5</td><td>20dBm</td><td>±3dB</td><td>13</td><td>4dBm</td><td>± 4dB</td></tr>
<tr><td>6</td><td>18dBm</td><td>±3dB</td><td>14</td><td>2dBm</td><td>± 5dB</td></tr>
<tr><td>7</td><td>16dBm</td><td>±3dB</td><td>15</td><td>0dBm</td><td>± 5dB</td></tr>
</table>

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

2. PERFORMANCE

<table>
<tr><th>Item</th><th>Description</th><th colspan="3">Specification</th></tr>
<tr><td rowspan="6">6</td><td rowspan="6">Output RF Spectrum
(due to switching
transient)</td><td colspan="3">GSM</td></tr>
<tr><td colspan="2">Offset from Carrier (kHz).</td><td>Max. dBm</td></tr>
<tr><td colspan="2">400</td><td>-22</td></tr>
<tr><td colspan="2">600</td><td>-24</td></tr>
<tr><td colspan="2">1,200</td><td>-24</td></tr>
<tr><td colspan="2">1,800</td><td>-27</td></tr>
<tr><td>7</td><td>Spurious Emissions</td><td colspan="3">Conduction, Radiation</td></tr>
<tr><td>8</td><td>Bit Error Rate</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="9">11</td><td rowspan="9">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>12</td><td>RLR</td><td colspan="3">2±3 dB</td></tr>
</table>

<table>
<tr><th>Item</th><th>Description</th><th colspan="3">Specification</th></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>dB to ARL (dB)</td><td colspan="2">Level Ratio (dB)</td></tr>
<tr><td>-35</td><td colspan="2">17.5</td></tr>
<tr><td>-30</td><td colspan="2">22.5</td></tr>
<tr><td>-20</td><td colspan="2">30.7</td></tr>
<tr><td>-10</td><td colspan="2">33.3</td></tr>
<tr><td>0</td><td colspan="2">33.7</td></tr>
<tr><td>7</td><td colspan="2">31.7</td></tr>
<tr><td>10</td><td colspan="2">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>
<tr><td>19</td><td>32.768KHz tolerance</td><td colspan="3">≤ 30 ppm</td></tr>
<tr><td>20</td><td>Ringer Volume</td><td colspan="3">At least 80 dB under below conditions:
1. Ringer set as ringer.
2. Test distance set as 50 cm</td></tr>
</table>

2. PERFORMANCE

Item	Description	Specification	
21	Charge Current	CC Charge : < 500 mA Trickle Charge : < 60 mA	
22	Antenna Display	Antenna Bar Number	Power
		5	-85 dBm ~
		4	-90 dBm ~ -86 dBm
		3	-95 dBm ~ -91 dBm
		2	-100 dBm ~ -96 dBm
		1	-105 dBm ~ -101 dBm
		0	~ -105 dBm
23	Battery Indicator	Battery Bar Number	Voltage
		0	~ 3.62 V
		1	3.62 ~ 3.73 V
		2	3.73 ~ 3.82 V
		3	3.82 V ~
24	Low Voltage Warning	3.5 ± 0.03V (Standby)	
		3.62 ± 0.03V (Call)	
25	Forced shut down Voltage	3.35 ± 0.03V	
26	Battery Type	1 Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 850mAh	
27	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60 Hz Output: 5.2 V, 800 mA	

3. TECHNICAL BRIEF

3.1 Transceiver (CX74017, U401)

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[U401]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.

(1) Receiver Part

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 Fig. 3-1.

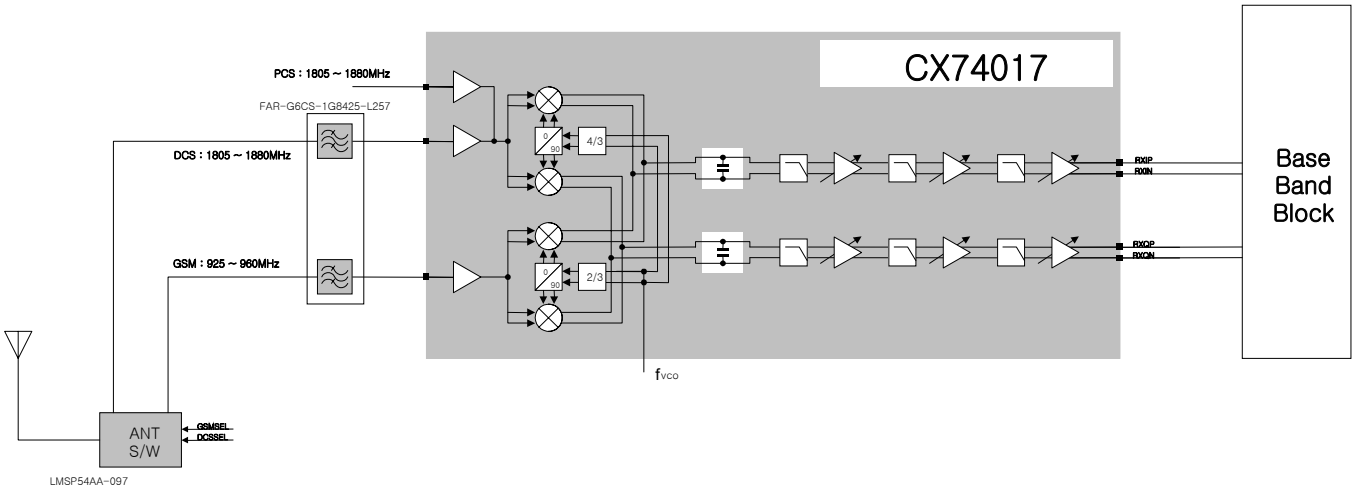


Figure. 3-1 Receiver Block diagram

3. TECHNICAL BRIEF

A. RF Front End

RF front end consists of Antenna Switch(FL401), dual band LNAs integrated in transceiver(U401). 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 (FL401) is used to control the Rx and TX paths. And, the input signals VC1 and VC2 of a FL401 are connected to DCSSEL(GPO_9) and GSMSEL(GPO_11) ports of U101 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 controlled by GSM-RX and DCS-RX respectively. This Rx_900_RF path contains one SAW filter, followed after the Antenna Switch (FL401), 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 LNAGSMIN (#11) and LNADCSIN (#13) of CX74017 (U401), respectively. A low-noise bipolar RF amplifier, contained within the U401, amplifies the RF signal. The RF signals from the front-end pass to the receiver mixers within the U401 device.

B. Demodulator and baseband processing

In direct conversion receiver there is only one mixer that is down-converting received RF signal to BB signal directly. The gain of the 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 DCS1800.

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.

(2) Transmitter Part

The Transmitter part contains CX74017 active parts, power amplifier module (PAM) 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.

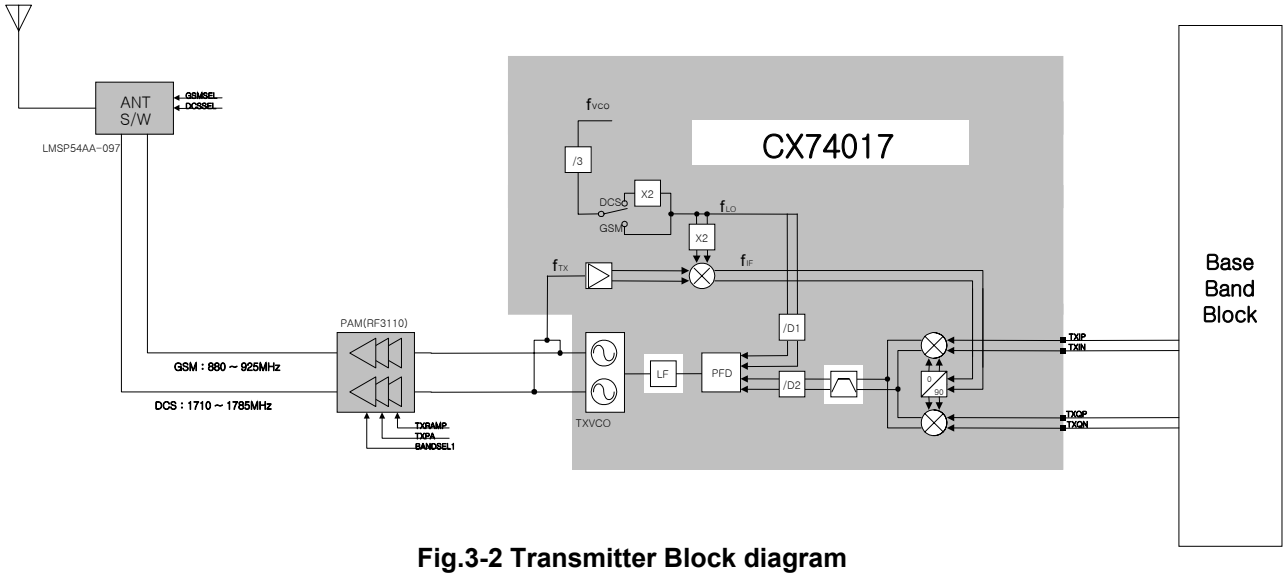


Fig.3-2 Transmitter Block diagram

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 sideband 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.

(3) Synthesizer Part

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 oscillator 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.

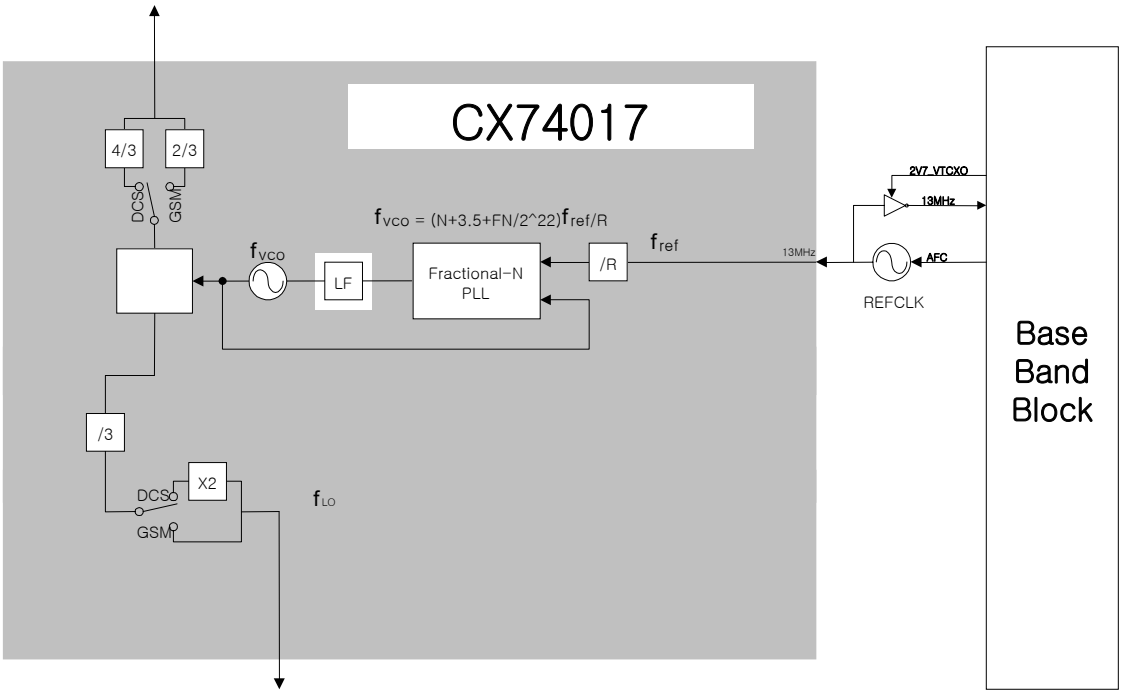


Figure 3-3. Synthesizer Block diagram.

3.2 Power Amplifier Module

The RF3110[U402] is a dual band amplifier module for E-GSM(880 to 915MHz) and DCS1800(1710 to 1785MHz). The efficiency of the module is 50% at nominal output power for E-GSM and 45% 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.
In order 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 should be soldered to ground plane of PCB.

3.3 13 MHz Clock

A VCTCXO (Voltage Controlled Temperature Compensated Crystal Oscillator, X401) is used as a clock and oscillates at a frequency of 13MHz.
The output of the clock is fed to the CX74017 RF Main Chip, analog baseband chipset (AD6521, U102), and digital baseband chipset (AD6522, U101)

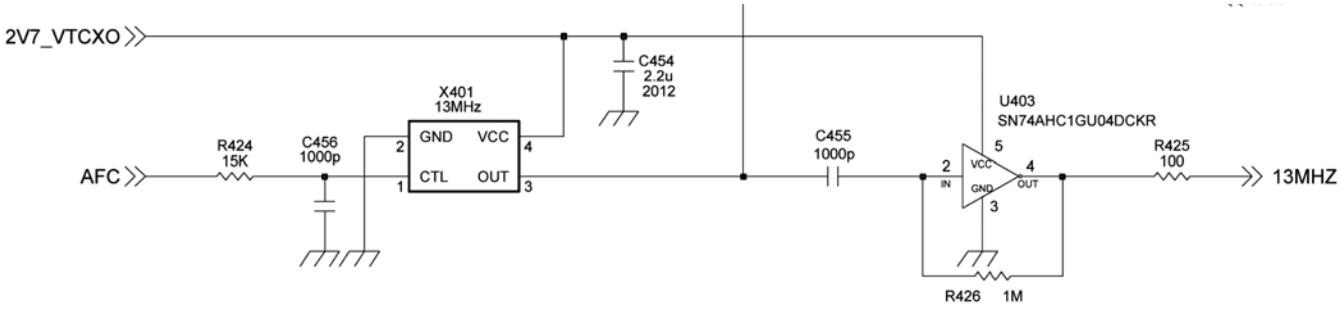


Figure 3-4. VCTCXO Circuit.

3.4 Power Supplies for RF Circuits

Two regulators are used for RF circuits. One is ADP3330 (U404), the other is one port of ADP3408 (U301). ADP3330 (U404) supplies power to all the RF circuits except the VCTCXO(X401) that is supplied power from ADP3408.

Regulator	Voltage	Powers	Enable Signal
Regulator 1(U301,2V7_VTCXO)	2.7V± 0.5V	VCTCXO	
Regulator 2 (U404,RF2V8)	2.85V± 0.5V	RF circuitry	VSYNTHEN

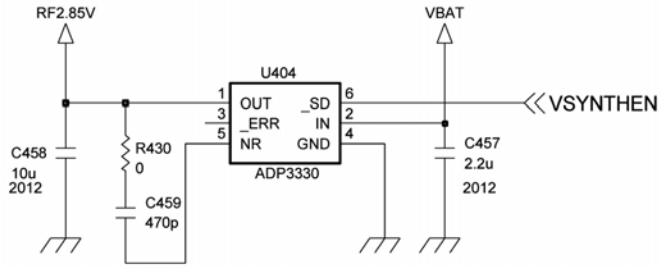


Figure 3-5. Regulator Circuit..

3.5 Testing Set-up and Checking Signals

A. Received RF Power Level and Checks

This section shows the typical RF power levels expected throughout the receiver path. A block diagram shows the locations of the RF measurement points and levels as shown in Fig. 3-11.

Receiver Testing Set-up
To check the receiver the test equipment should be set as the following conditions:
On a signal generator or a GSM/DCS test box, output amplitude of CW sugnal = -60 dBm at either: 947.4 MHz (CH62) when testing the GSM RX path or 1842.6 MHz (CH699) when testing the DCS RX path. Set the DC power supply to 4.0 V.

Note: All RF values shown are only intended as a guide figure and may differ from readings taken with other test equipment and leads. Lead and connector losses should always be taken into account when performing such RF measurements.

Testing Receiver
Measure the RF power levels of the points which is shown in Fig. 3-9. If there are any major difference between your measurement results and the values shown in the figure, then further investigation about the particular point will be required. It will also be necessary to ensure that all the following power supplies and signals which control this part of the receiver circuit are present :

1. The Control Signal of FEM (see Fig. 3-15, 16, 17)
2. RF2V8 (see Fig. 3-12)
3. 2V7_VTCXO (see Fig. 3-13)
4. 13MHz (see Fig. 3-14)
5. PLL_CLK, PLL_DATA, PLL_LE (see Fig. 3-18)
8. RX IP, IN, QP, QN (see Fig. 3-21)

B. Transmitted RF Power Level and Checks

This section shows the typical RF power levels expected throughout the transmitter path. A block diagram shows the locations of the RF measurement points and levels as shown in Fig. 3-8.

Transmitter Testing Set-up
To check the transmitter the test equipment should be set as the following conditions:
1. Set the DC Power supply to 4.0 V.
2. Power up the GSM/DCS test set and then establishing a call with an attached mobile on active mode.
3. Select Channel, TX Level and Input Level according to which parameter is required.

Note: All RF values shown are only intended as a guide figure and may differ from readings taken with other test equipment and leads. Lead and connector losses should be always taken into account during the measurement.

Testing Transmitter

Measure the RF power level of the points which are shown in Fig 3-9. If there are any major difference between your measurement results and the values shown in the figure then further investigation of that particular point will be required. It will also be necessary to ensure that all the following power supplies and signals which control this part of the transmitter circuit are present:

1. The Control Signal of FEM (see Fig. 3-15, 16, 17)
2. RF2V8 (see Fig. 3-12)
3. 2V7_VTCXO (see Fig. 3-13)
4. 13 MHz (see Fig. 3-14)
5. TXEN, TXRAMP, TXPA (see Fig. 3-19)
6. TX IP, IN, QP, QN (see Fig. 3-20)

RF components (Component Side)

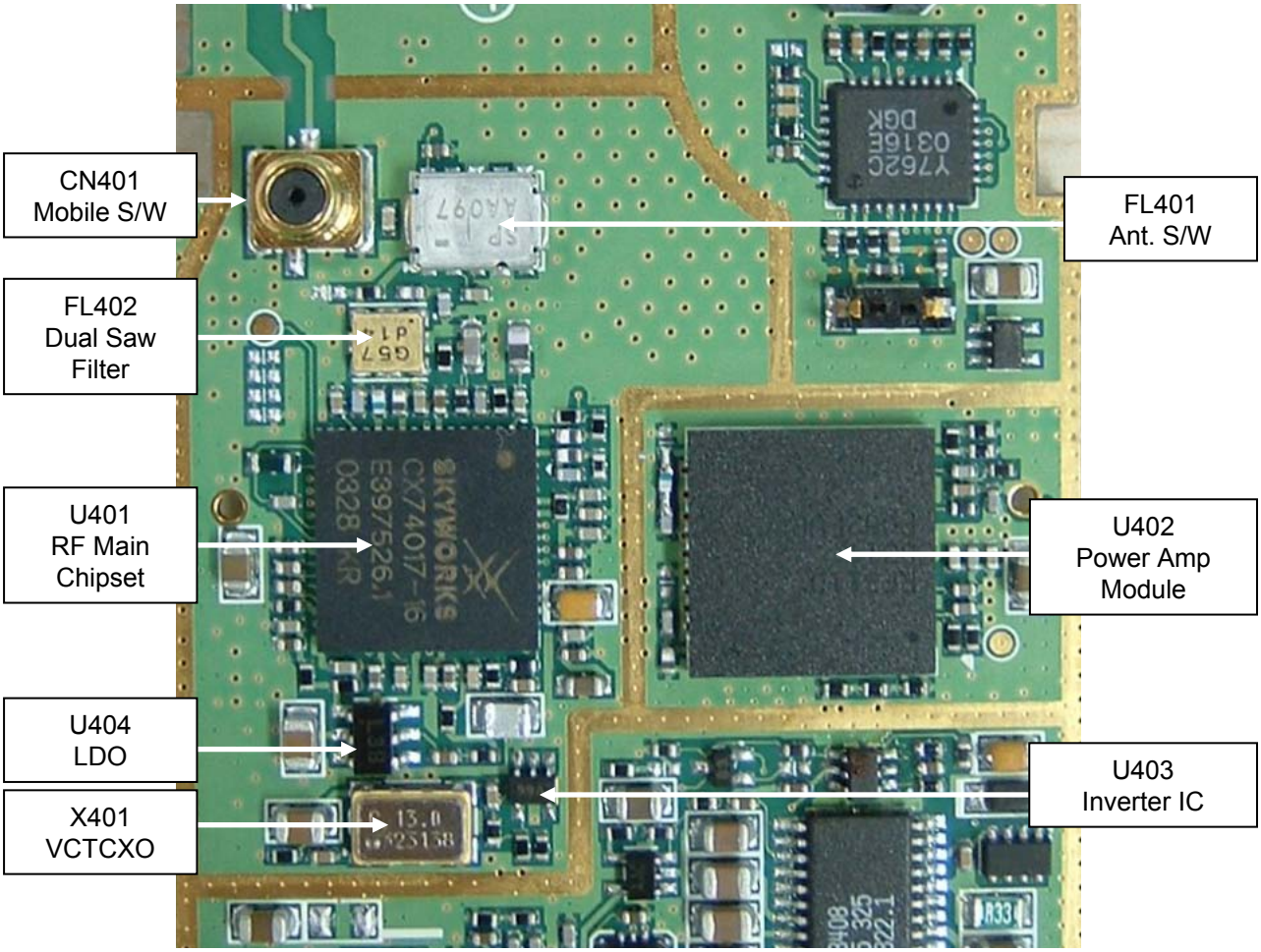


Figure 3-6. RF components (Component Side).

Reference	Description	Reference	Description
U401	RF Main Chipset	FL402	Dual SAW Filter
CN401	Mobile S/W	X401	VCTCXO
FL401	Ant. S/W	U404	LDO
U402	PAM	U403	Inverter IC

Test point of Rx Power Levels

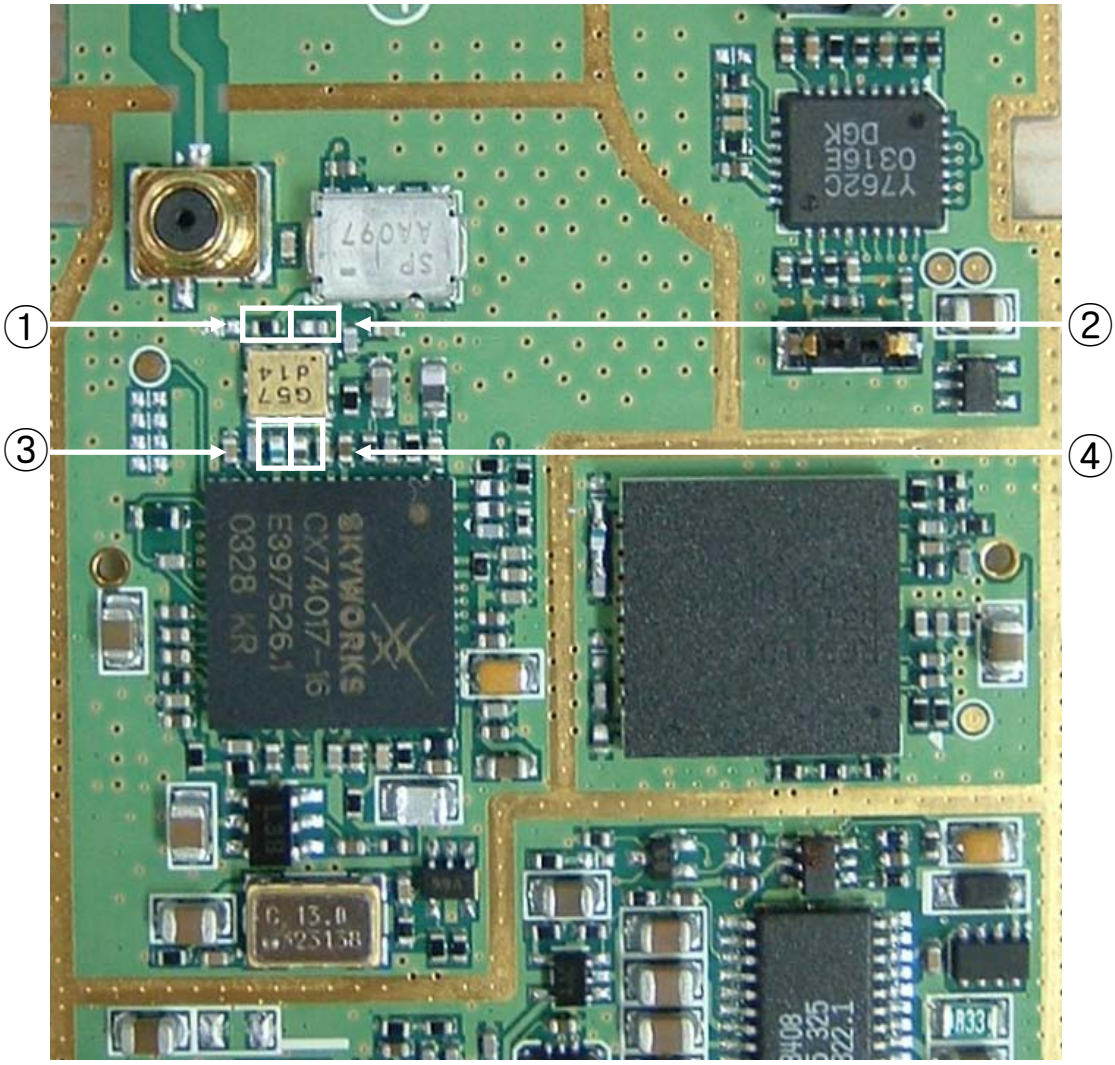


Figure 3-7. Test point of Rx Power Levels.
(Refer to Figure 3-9)

Test point of Rx Power Levels

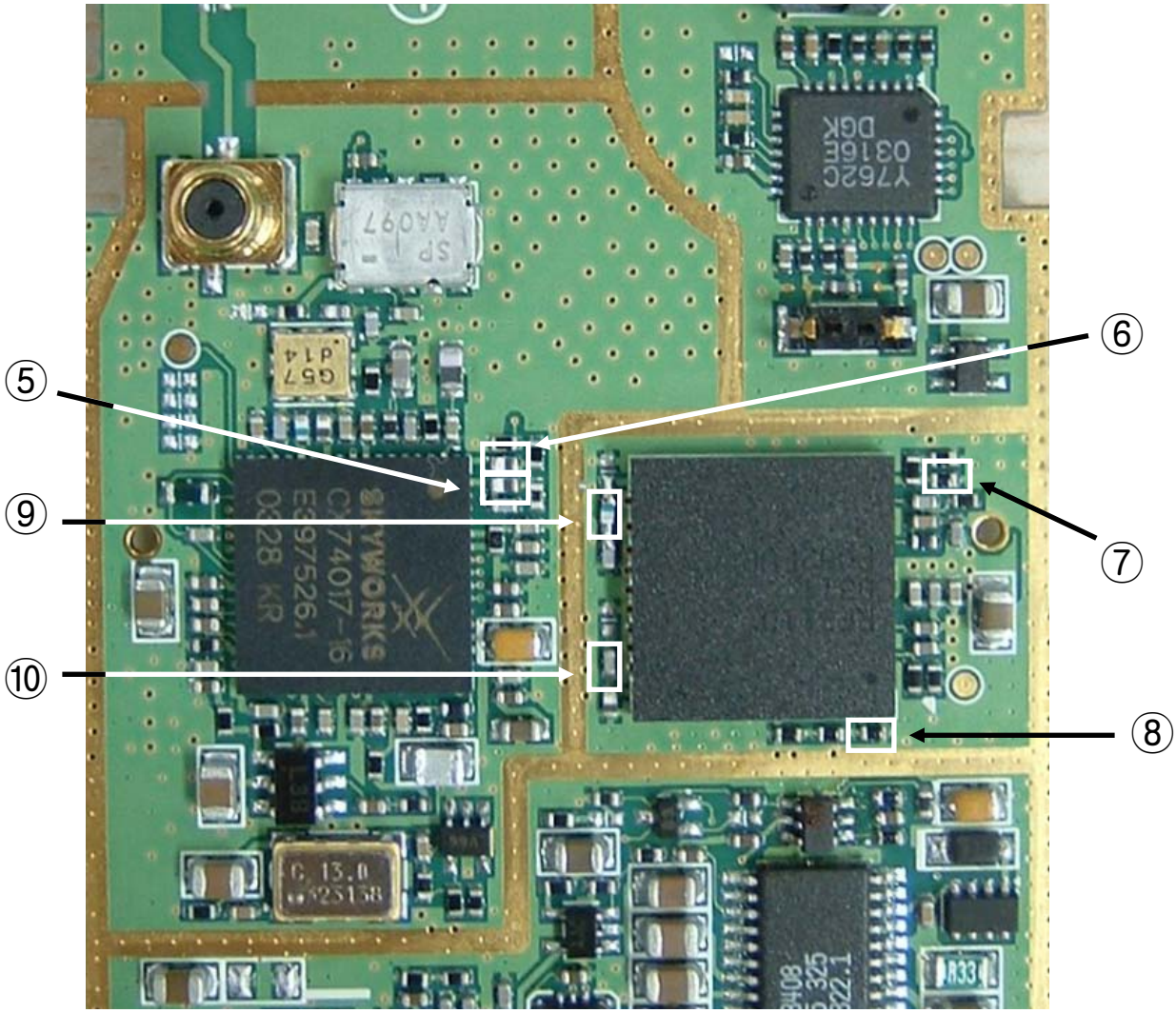


Figure 3-8. Test point of Rx Power Levels.
(Refer to Figure 3-9)

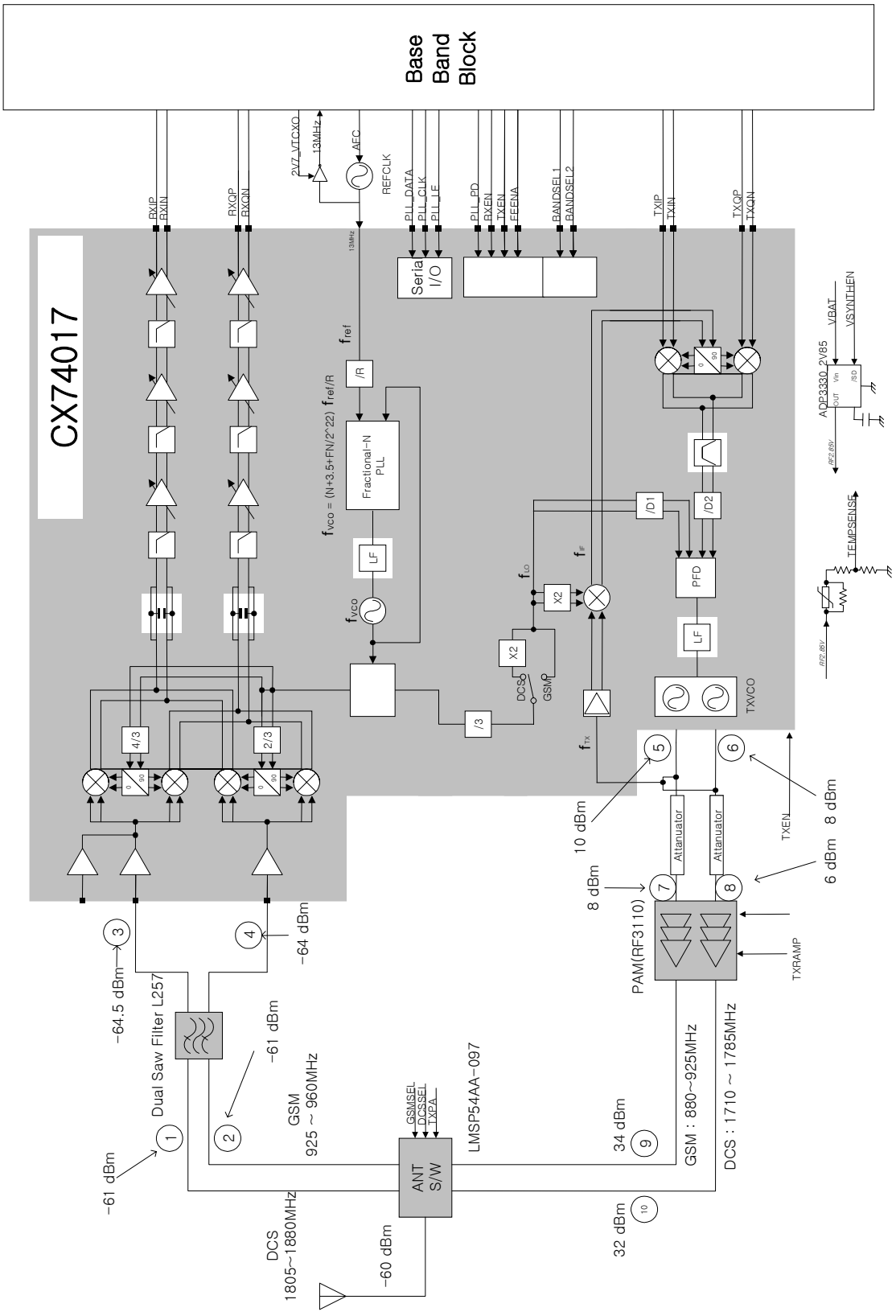


Figure 3-9. Transmitter & Receiver RF Levels

Control signal test points (1)

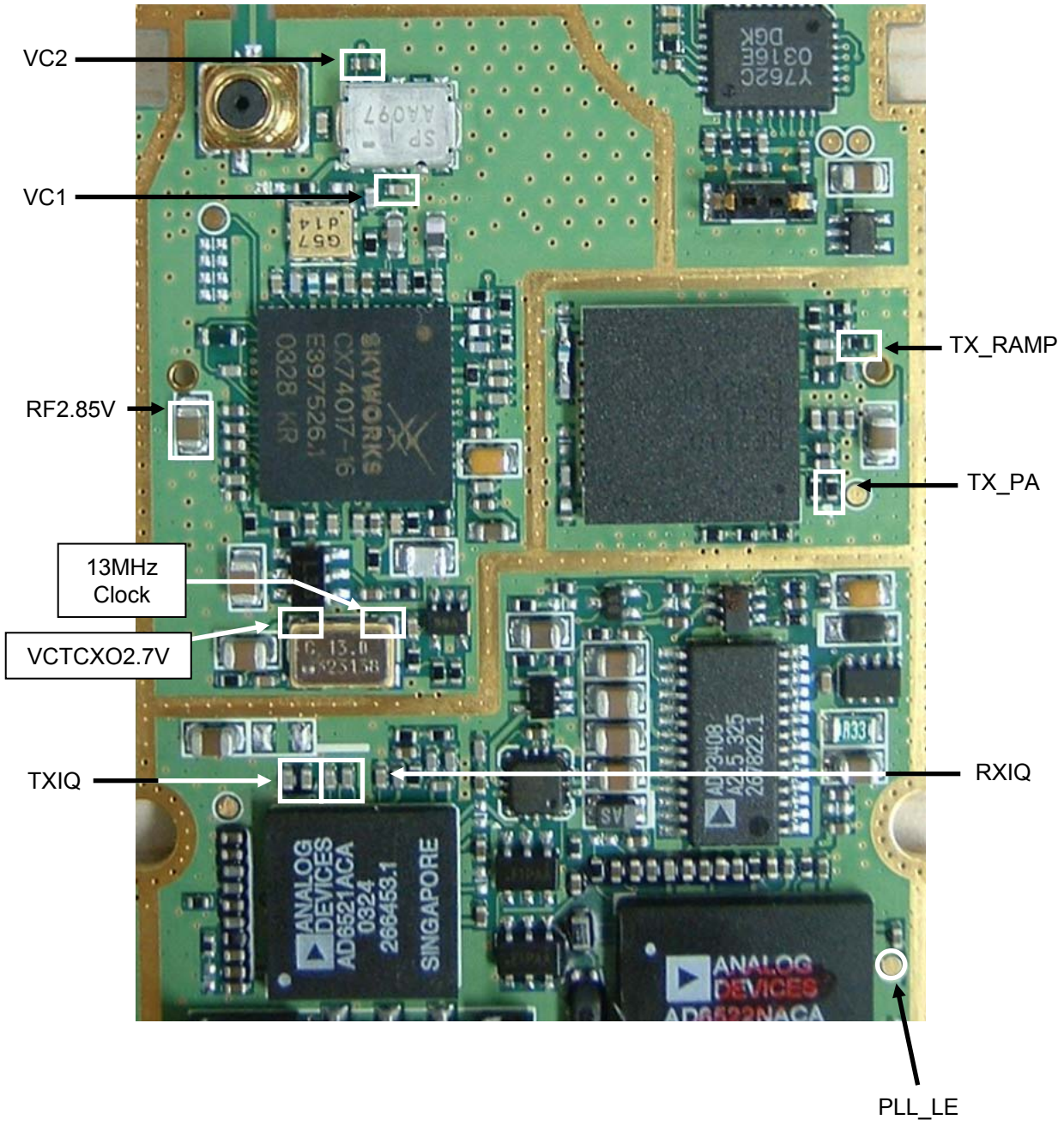


Figure 3-10. Control signal test points (1).
(Refer to Figure 3-12~21)

Control signal test points (2)

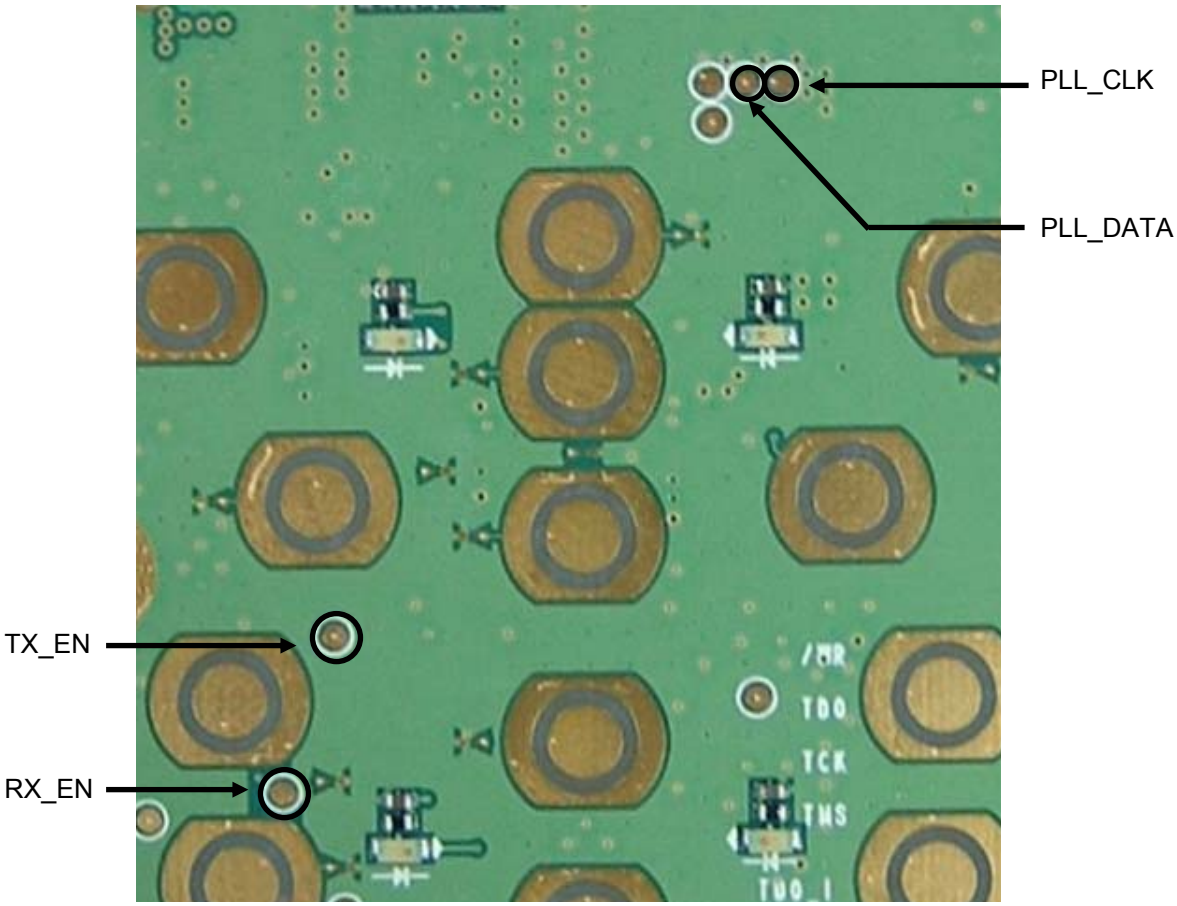


Figure 3-11. Control signal test points (2).
(Refer to Figure 3-18)

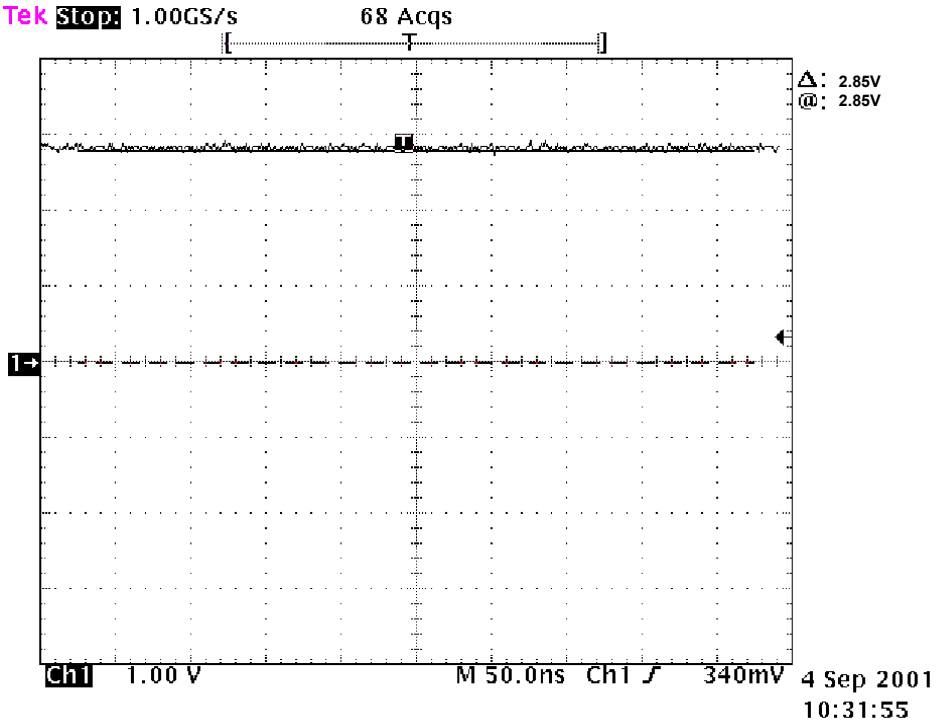


Figure 3-12. Regulator Output (RF2V85)

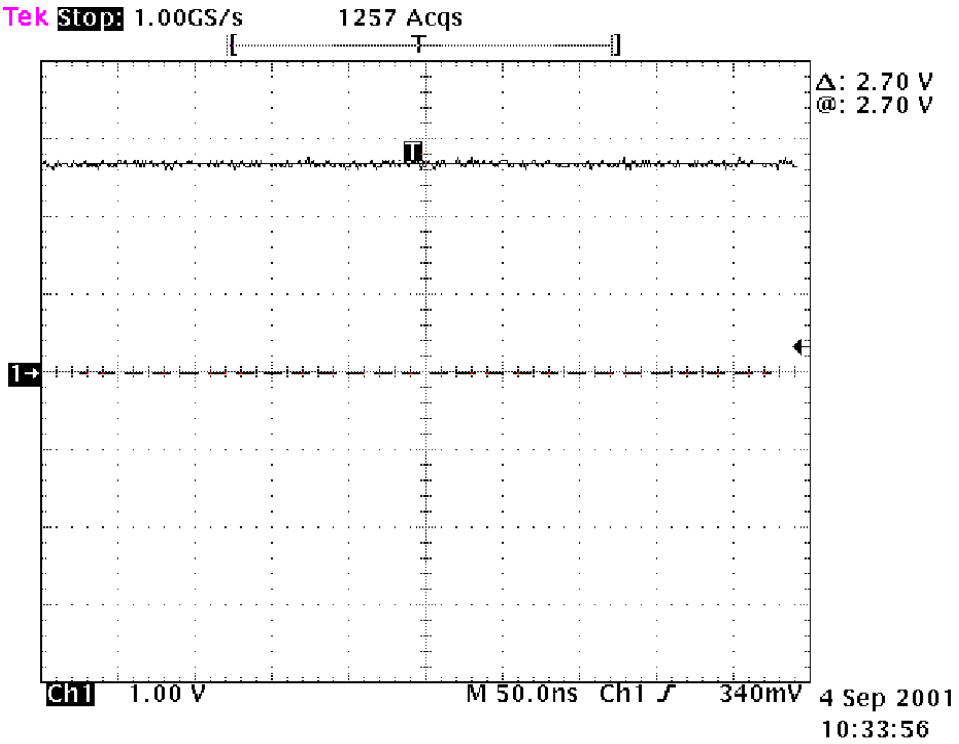


Figure 3-13. VCTCXO Power Supply (2V7_VTCXO).

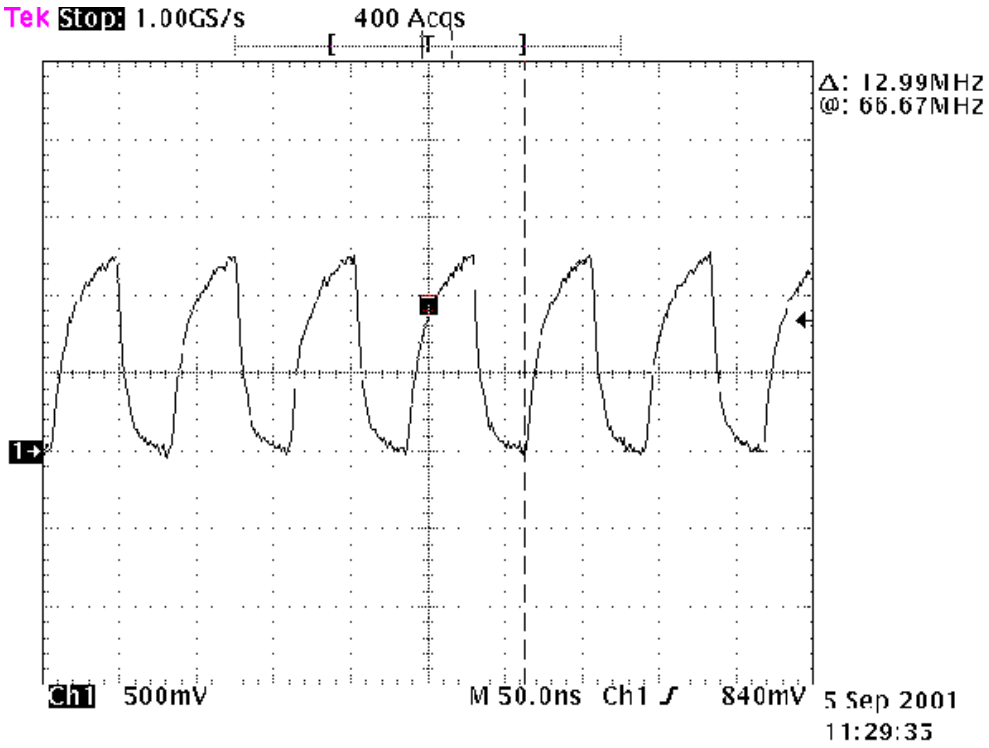


Figure 3-14. 13MHz Clock.

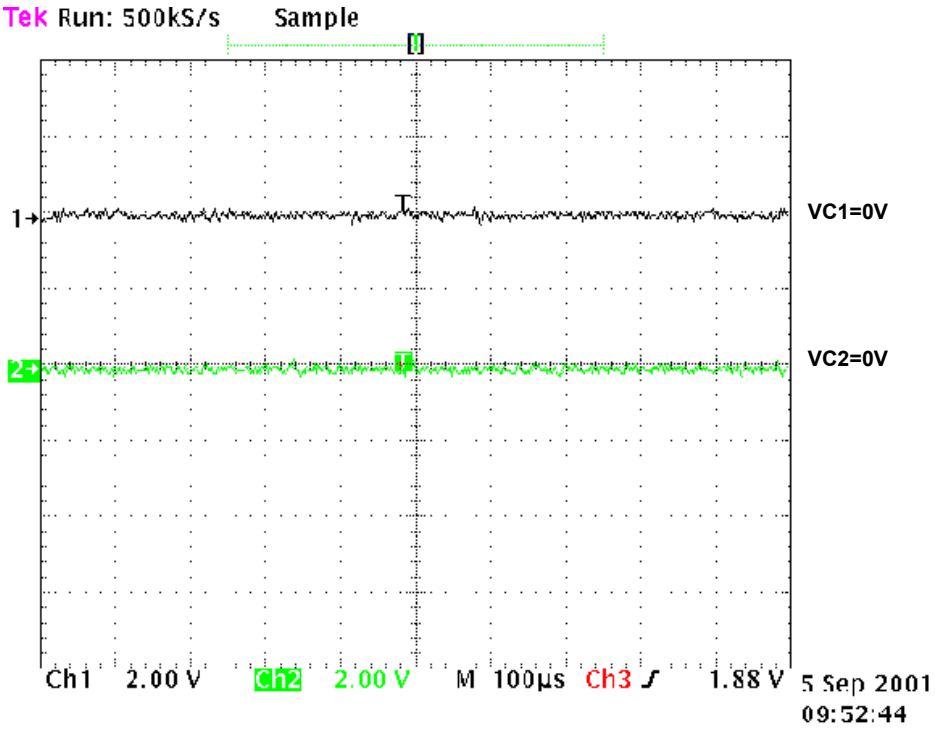


Figure 3-15. Control Signal (VC1,VC2) in Rx mode (GSM, DCS both).

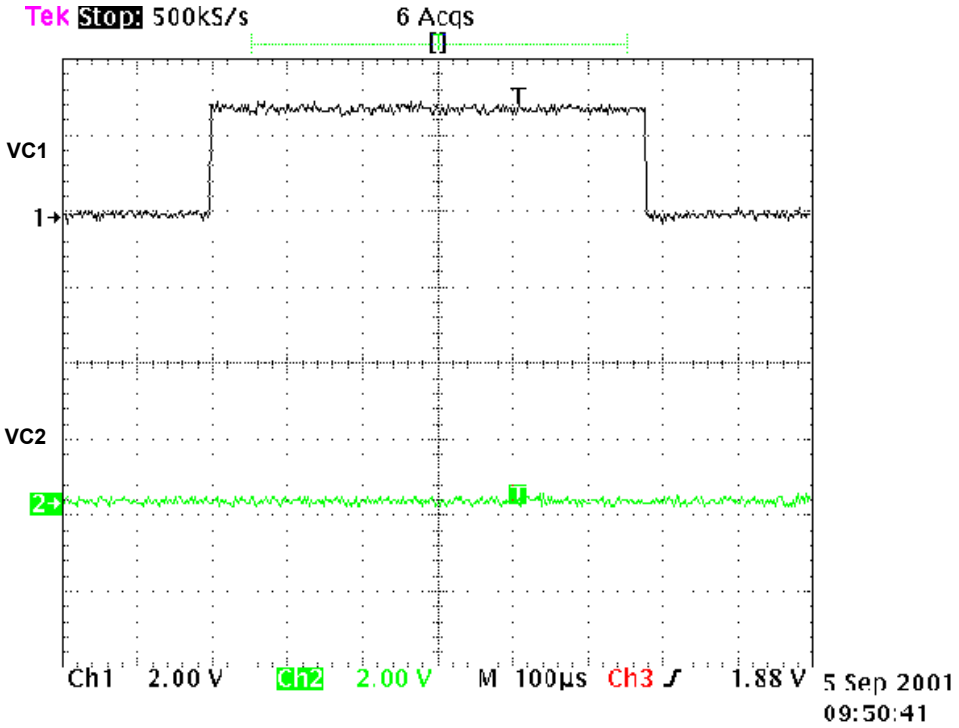


Figure 3-16. Control Signal (VC1,VC2) in DCS TX mode.

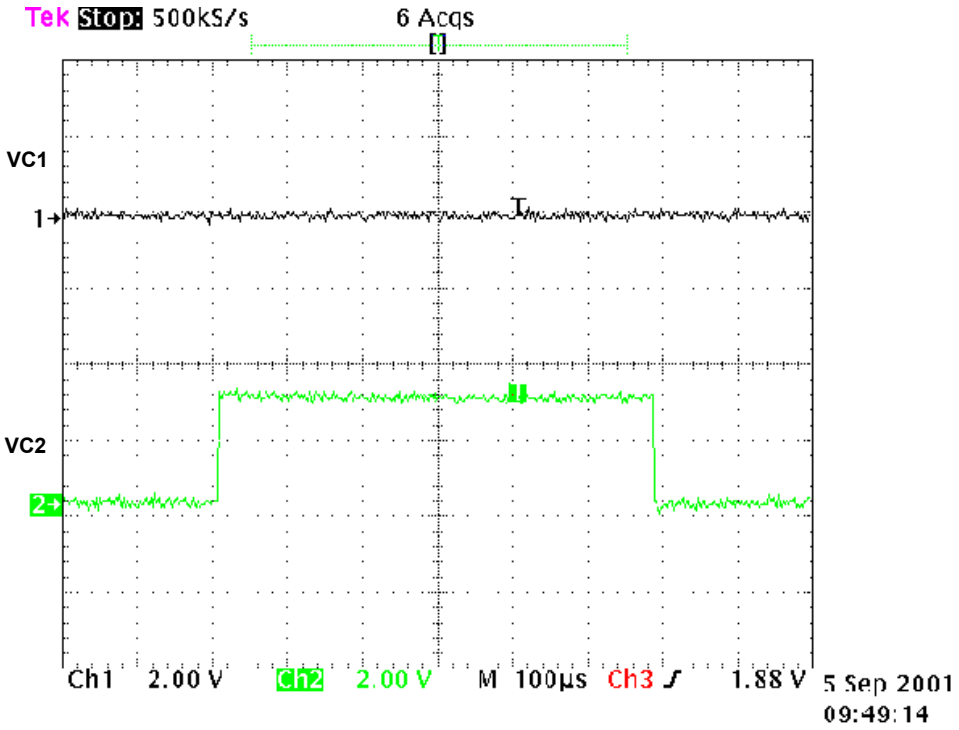


Figure 3-17. Control Signal (VC1,VC2) in GSM TX mode.

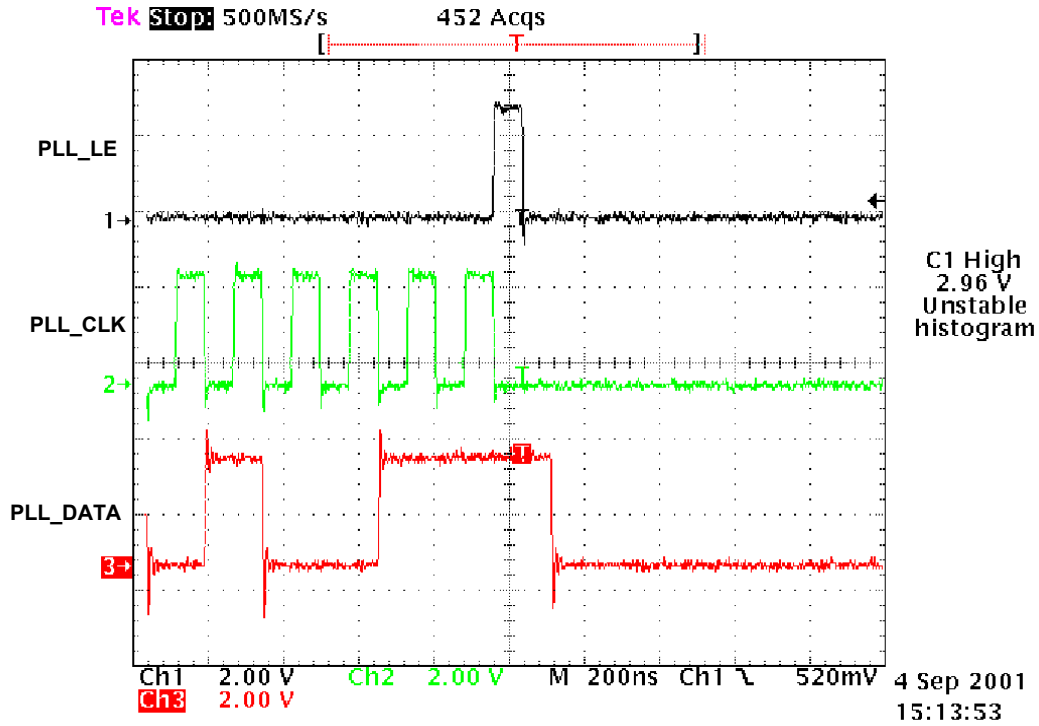


Figure 3-18. PLL_LE, PLL_CLK, PLL_DATA.

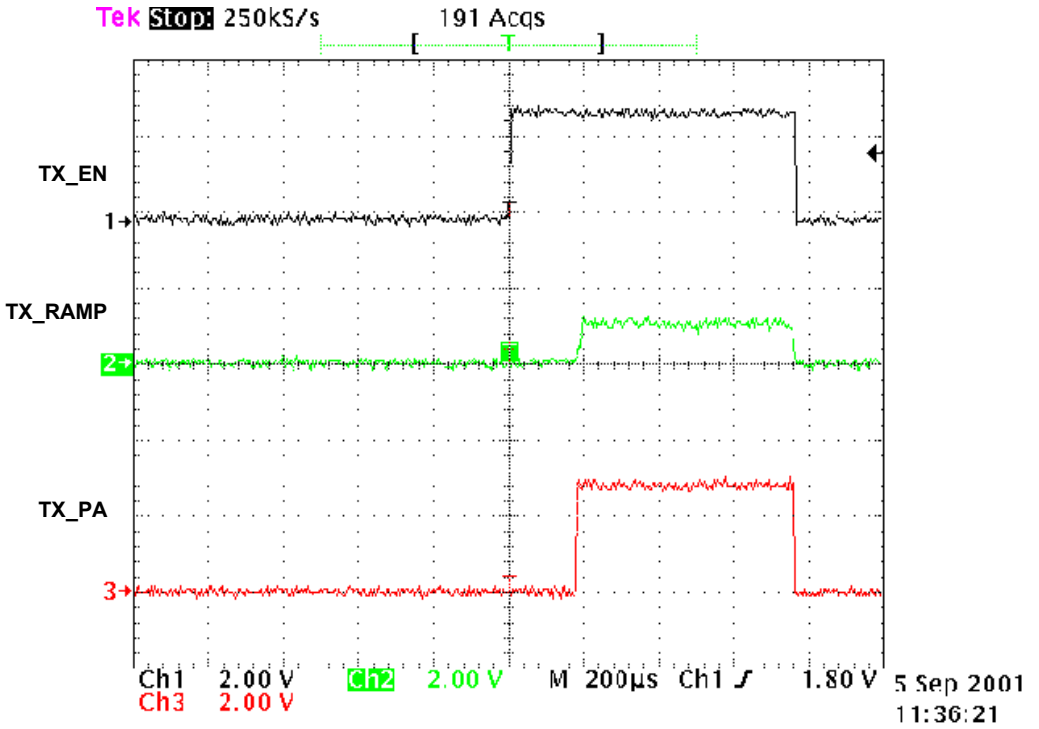


Figure 3-19. TX_EN, TX_RAMP, TX_PA.

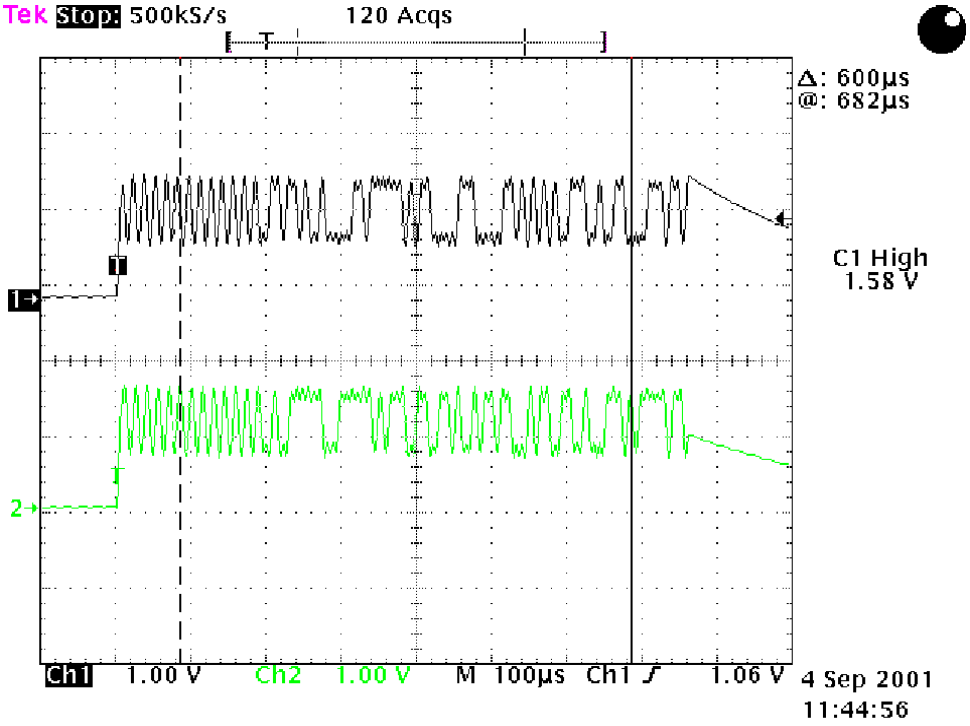


Figure 3-20. TX IQ Signal.

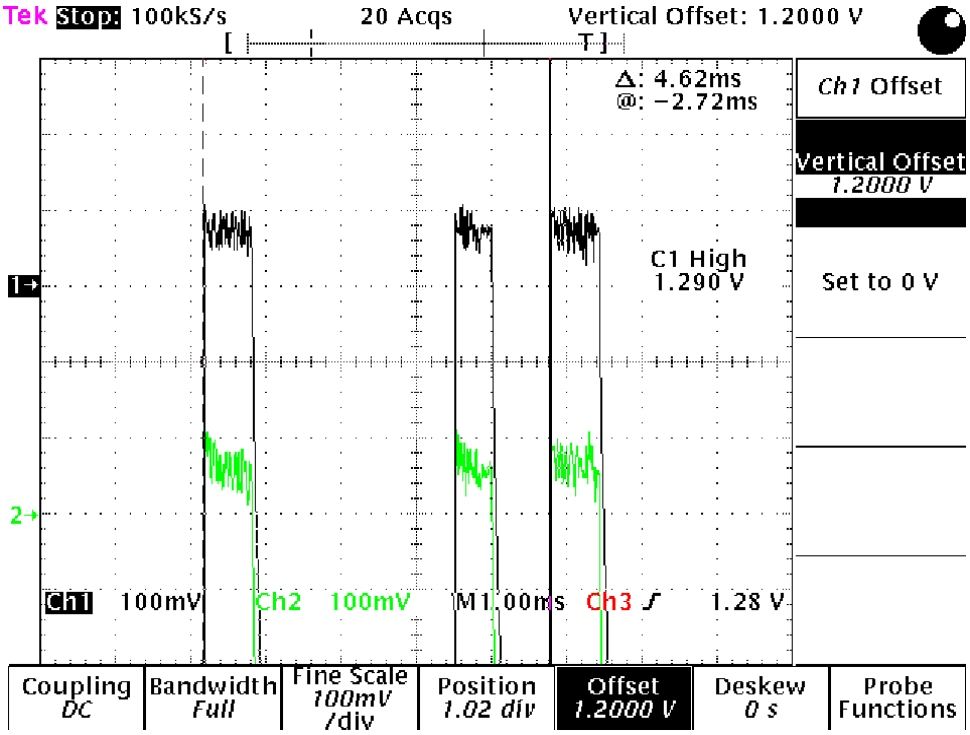


Figure 3-21. RX IQ Signal.

3.6 Digital Main Processor

The AD6522 is an digital processor made by ADI.

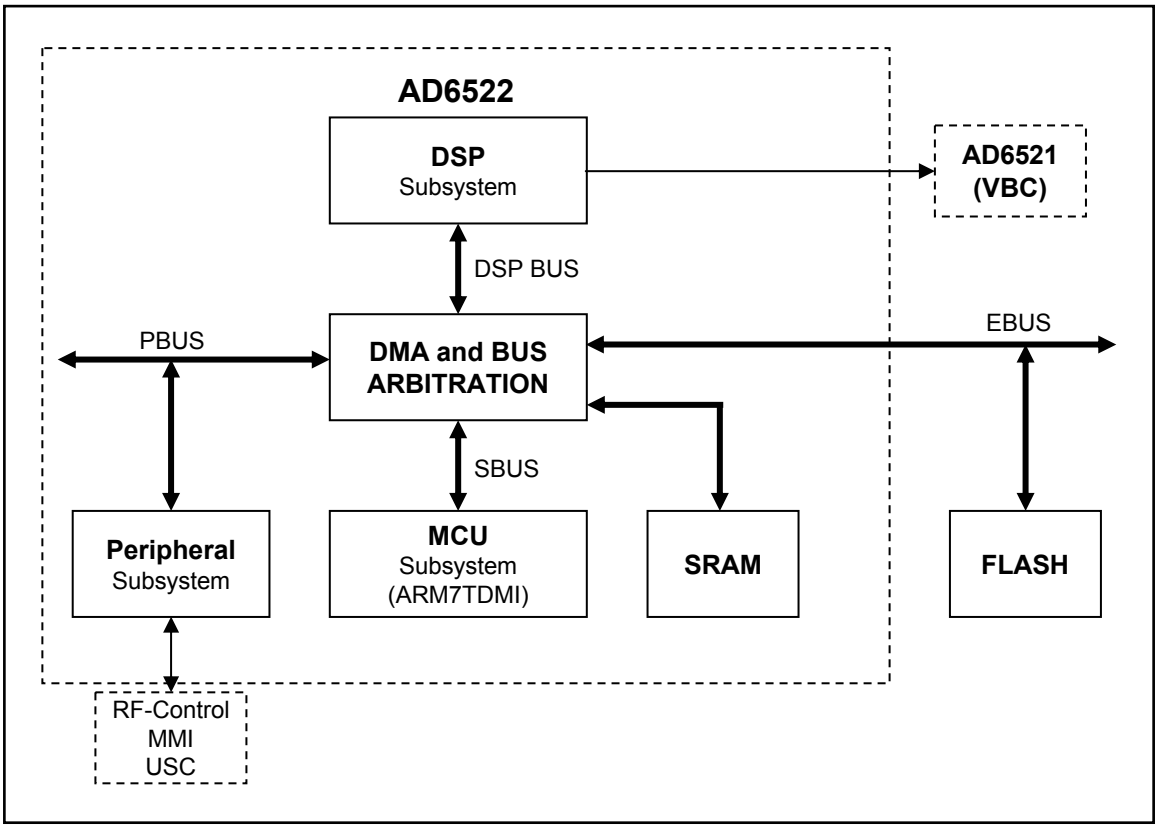


Figure 3-22. Top level block diagram of the AD6522 internal architecture.

BUS Arbitration Subsystem

- It is to work as a cross point for data accesses between the three main buses.
- 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 buses, 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 78MHz at 2.45V.
- The Viterbi and ciphering accelerators enable a very efficient implementation of the channel equalization, encryption and decryption tasks.

3. TECHNICAL BRIEF

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 39MHz at 2.45V.
- 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.

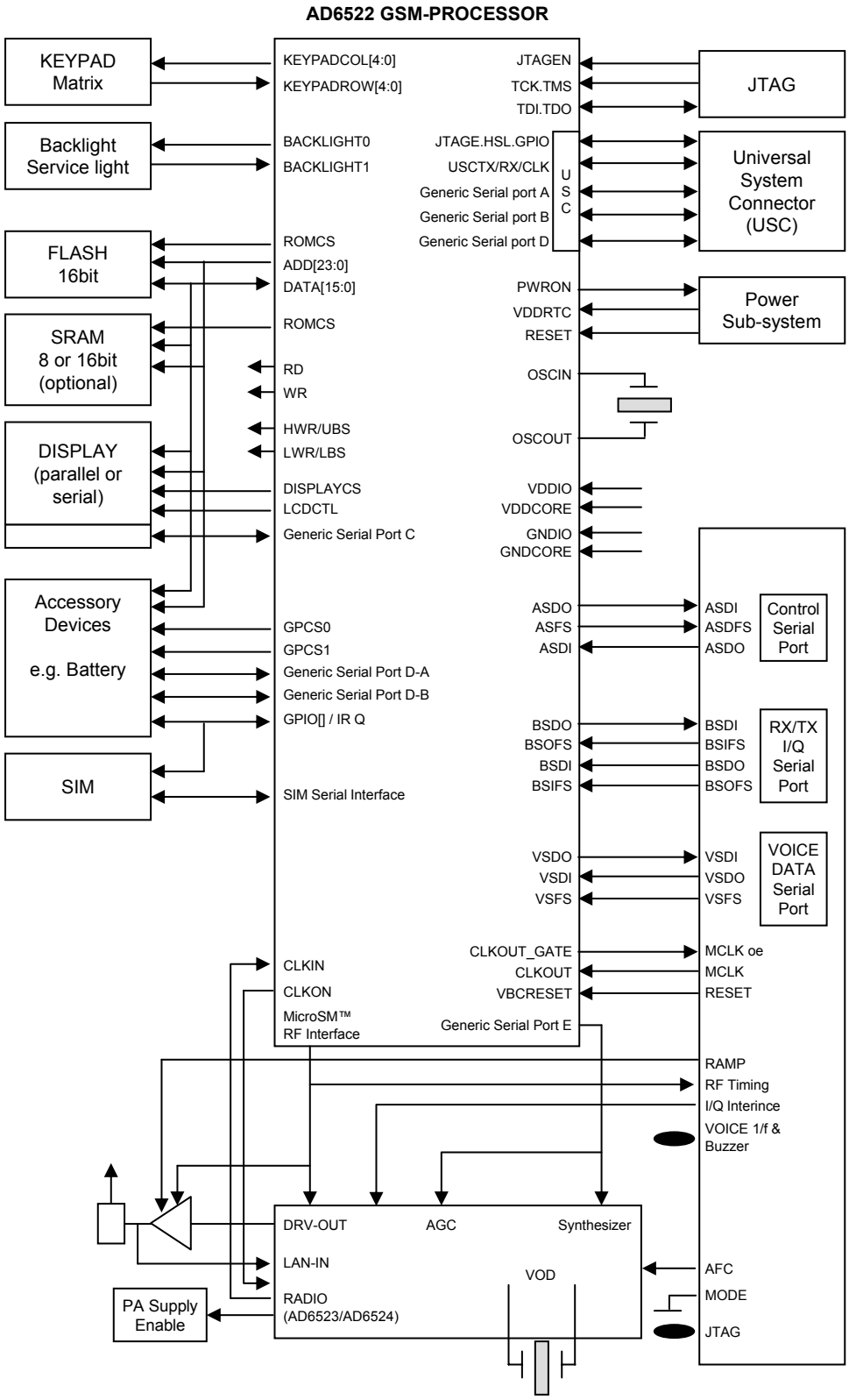


Figure 3-23. System interconnection of AD6522 external interfaces.

Interconnection with external devices

RTC block interface
Countered by external X-TAL
The X-TAL oscillates 32.768KHz.

LCD module interface
Mainly controlled by _LCD_MAIN_CS, LCD_RES, LCD_RS, _WR, DATA [00...15] signals.

Table 3-3.

	Description
_LCD_MAIN_CS	LCD driver chip enable. LCD driver IC has own CS pin
LCD_RES	This pin resets LCD module.
LCD_RS (ADD1)	This pin determines whether the data to LCD module are display data or control data. ADD1 can select 16 bit parallel bus. ADD1 is also used to address flash memory.
__WR	Write control. The phone do not read data from LCD chip.
DATA [00...15]	Parallel data lines. Color LCD driver chip uses the 16-bit data interface.
3V0_VLCD	Regulated 3V voltage is supplied to white colored LED driver for backlighting.
LCD_BACKLIGHT _CTL	Control signal of white LED driver IC.

RF interface
The AD6522 control RF parts through TXEN, RXON1, RXON2, AGCEN, PLL_DATA, PLL_CLK, PLL_LE etc.

Table 3-4.

Signal Name	Description
TXEN	TX Enable/Disable
RXON1	LNA, Mixer 1 On/Off
RXON2	Mixer 2 On/Off
AGCEN	AGC Enable/Disable
PLL_DATA	Serial Data to PLL
PLL_CLK	Clock to PLL
PLL_LE	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 SIMDATAOP, SIMCLK, SIM_RST(GPIO_23)

Table 3-5.

	Description
SIMDATAOP	This pin receives and sends data to SIM card. This model supports only 3.0 volt interface SIM card.
SIMCLK	Clock 3.25MHz frequency.
SIM_RST(GPIO_23)	Reset SIM block.

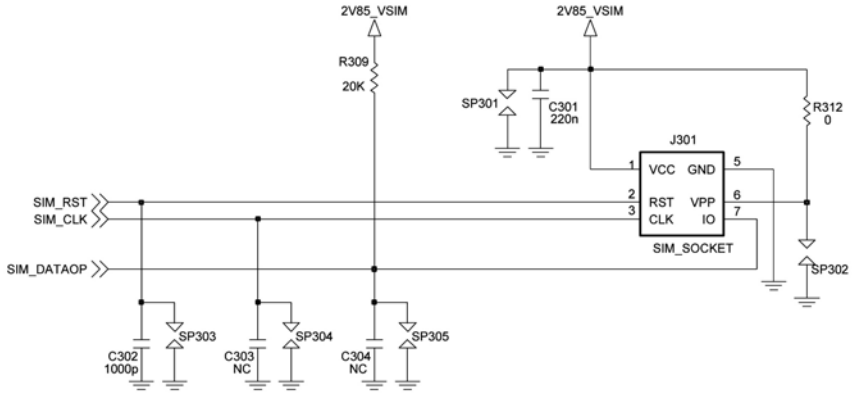


Figure 3-24. SIM Interface of AD6522.

Key interface

Include 5 column and 5 row. The AD6522 detect key press by interrupt.

ADP3408 interrupt

There are two interrupts EOC and CHARGEDET

EOC: End of Charge. AD6522 makes charging operation stop when high signal is inputted.

CHARGEDET: This pin is activated when the charger is inserted.

3.7 Analog Main Processor

AD6521

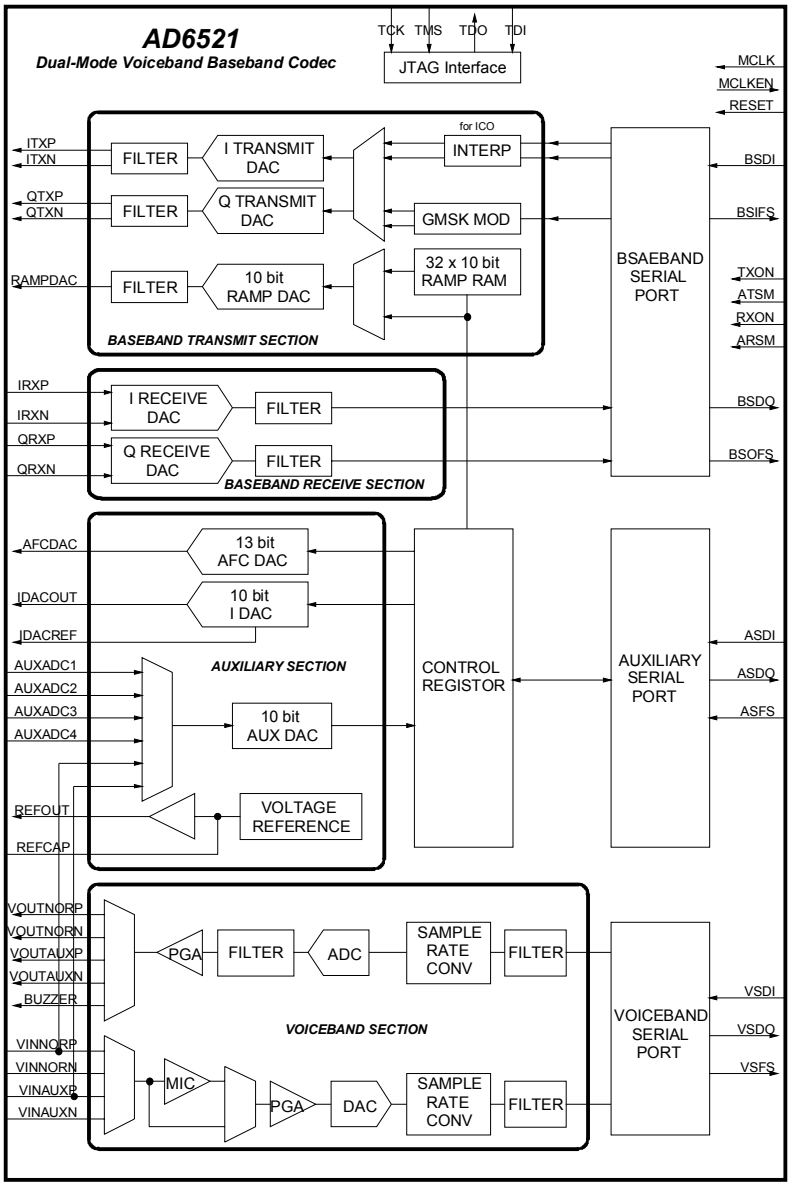


Figure 3-25. AD6521 function block diagram.

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. The phones use differential configuration.
Send audio signal to Receiver. The phones use differential configuration.
It interconnects external devices such as 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 microphone positive/negative terminal.
VOUTAUXP, VOUTAUXON: Hands free kit speaker positive/negative terminal.

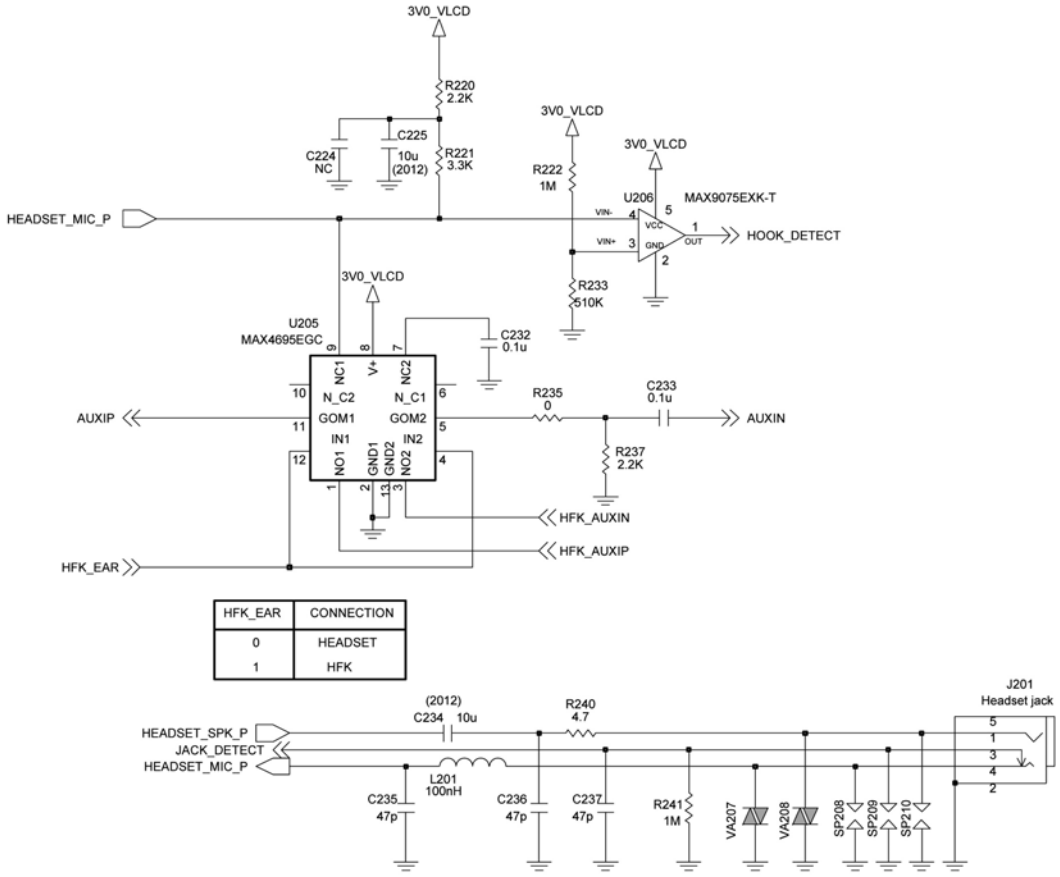


Figure 3-26-1. Voice band circuit diagram (Headset & Hands free kit part 1).

Figure 3-26-2. Voice band circuit diagram (Handset & Hands free kit part 2)).

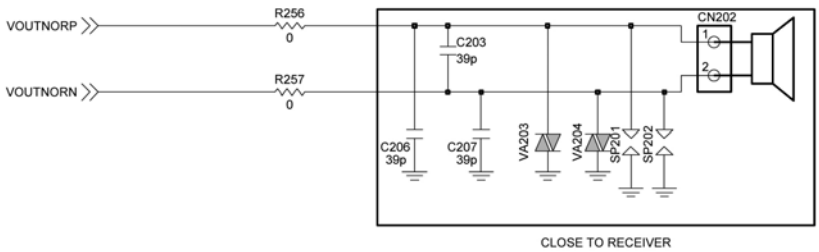


Figure 3-26-3. Voice band circuit diagram (Receiver part).

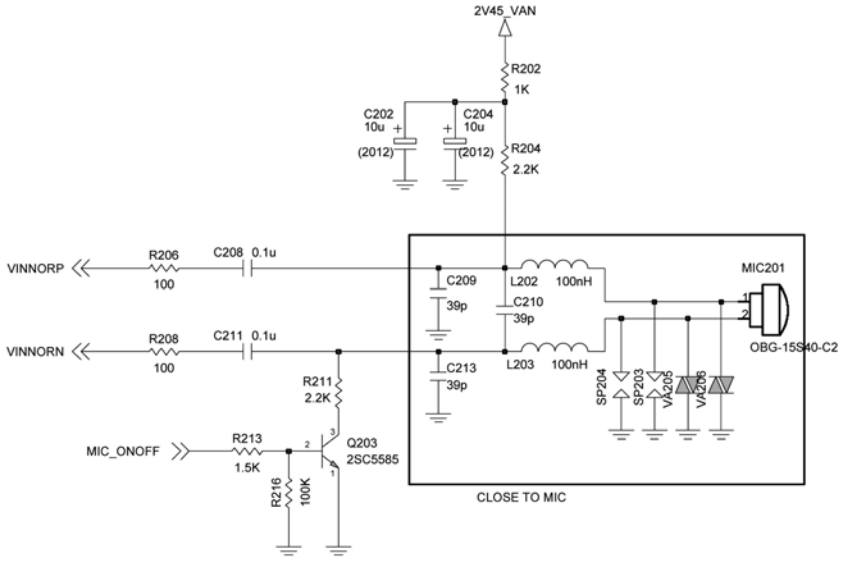


Figure 3-26-4. Voice band circuit diagram(MIC part).

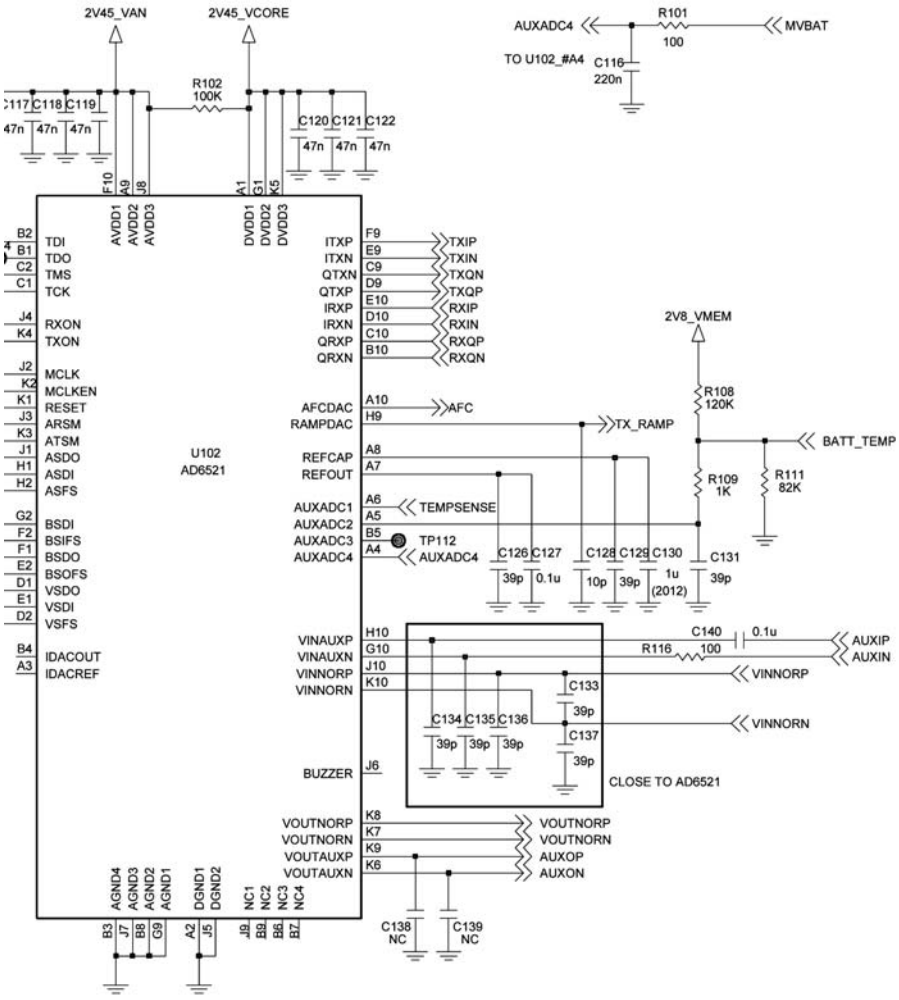


Figure 3-27. AD6521 circuit diagram.

3.8 Power Management

ADP3408

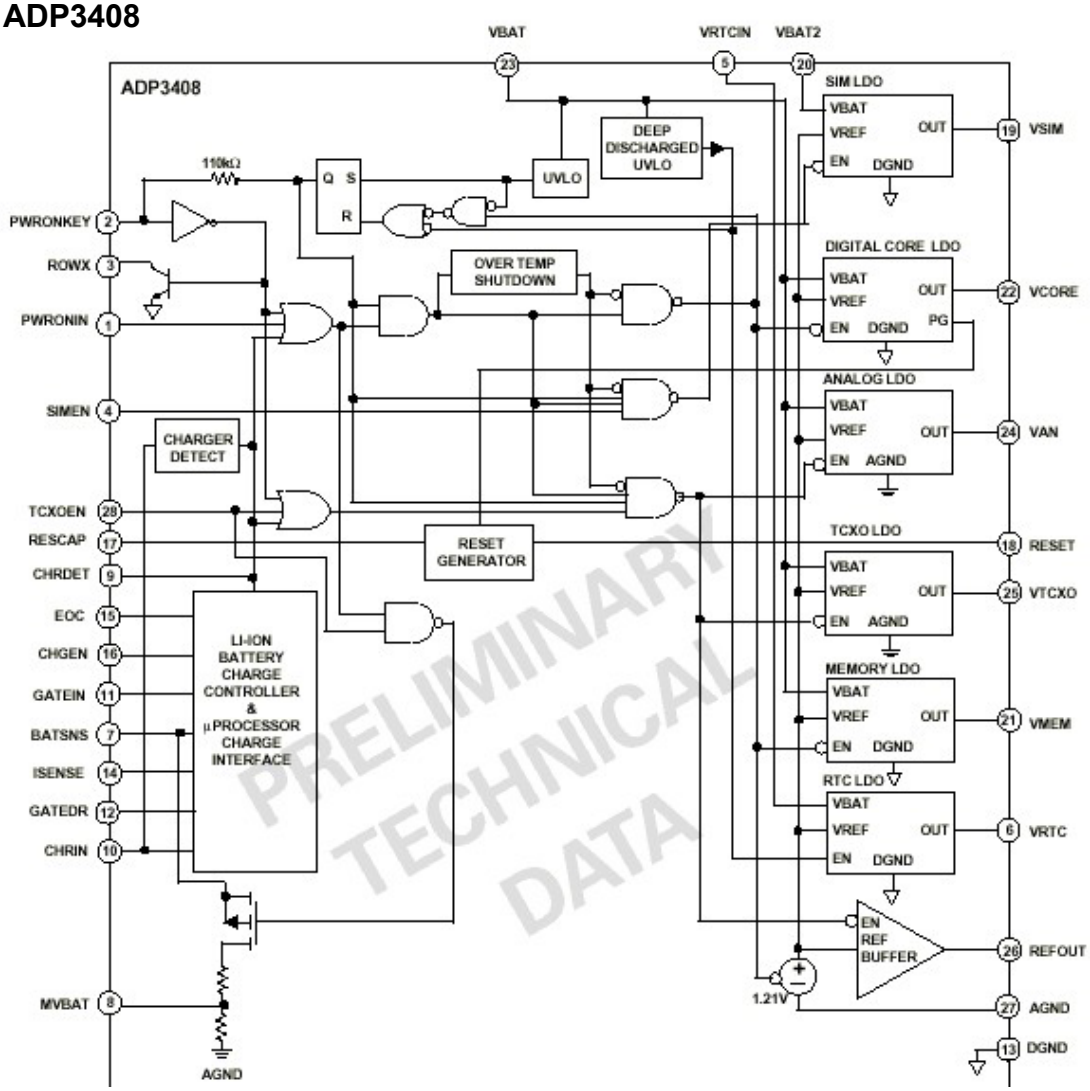


Figure 3-28. ADP3408 (U301) inner block diagram.

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)

Power on sequence

The ADP3408(U301) controls 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 signal is generated and send to the AD6522.

LDO block

There are 6 LDOs in the ADP3408.

Battery charging block

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

Charging Process

1. Check charger is inserted or not.
2. If ADP3408 detects that Charger is inserted, the CC-CV charging starts.
3. Exception: When battery voltage is lower than 3.2V, the trickle charge (low current charge mode) starts firstly. After the battery voltage reaches to 3.2V, the CC-CV charging starts.

Pins used for charging

CHGDET : Interrupt to AD6522 when charger is plugged.
CHGEN : 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_ADC4.

TA (Travel Adaptor)

Input voltage : AC 110V ~ 240V, 50~60Hz
Output voltage : DC 5.2V(±0.2 V)
Output current : Max 800mA

Battery

Li-ion battery : Max 4.2V, Nom 3.7V
Standard battery : Capacity - 850mAh, Li-ion

3.9 Memories

TH50VPF5683CDSB(U103) is a mixed multi-chip package containing a 32Mbit pseudo static RAM and a 64Mbit flash memory.

- 64Mbit flash memory + 32Mbit PSRAM
- 16 bit parallel data bus
- ADD01 ~ ADD22.
- 1 Chip enable input for Flash memory select.
- 2 Chip enable input for Pseudo SRAM.
- RF Calibration data, Audio parameters and battery calibration data etc are stored in Flash memory area.

3.10 Display and Interface

This model supports one 65000 color resolution LCD module.

Control signals : _MAIN_LCD_CS (which is derived from AD6522, this acts as the chip select enable for the LCD), LCD_ID and LCD_RES. AD6522 uses DATA[00:15] pins to send data for displaying graphical text onto the LCD.

Table 3-7.

	LCD
Display Format	128 x 96 dots
Back light	White LED Backlight

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 19 switches (KB101~KB119), connected in a matrix of 5 rows by 5 columns, as shown in Figure 3-29, except for the power switch (KB101), which is connected independently. Functions, the row and the 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.

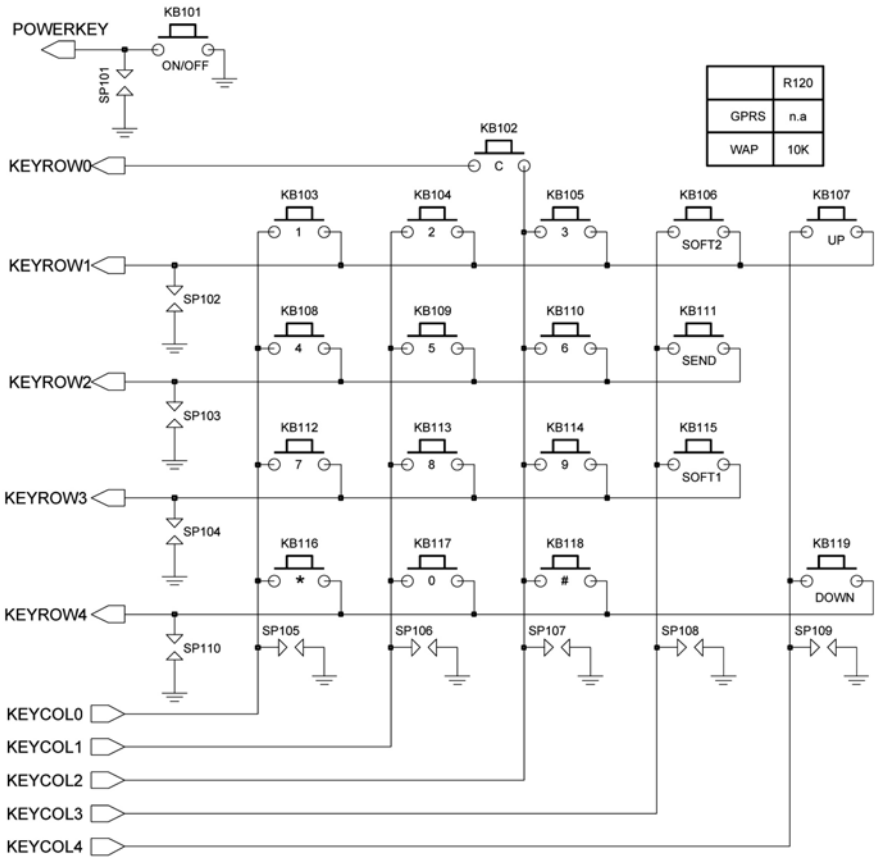


Figure 3-29. Keypad Switches and Scanning.

3.12 Microphone

The microphone is placed to the front cover and contacted to main PCB. The audio signal is passed to VINNORP (#J10) and VINNORN (#K10) pins of AD6521. The voltage of 2V45_VAN is output from ADP3408, and is a bias voltage for both the VINNORP (through R101) and VINAUX (through R112) 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.).

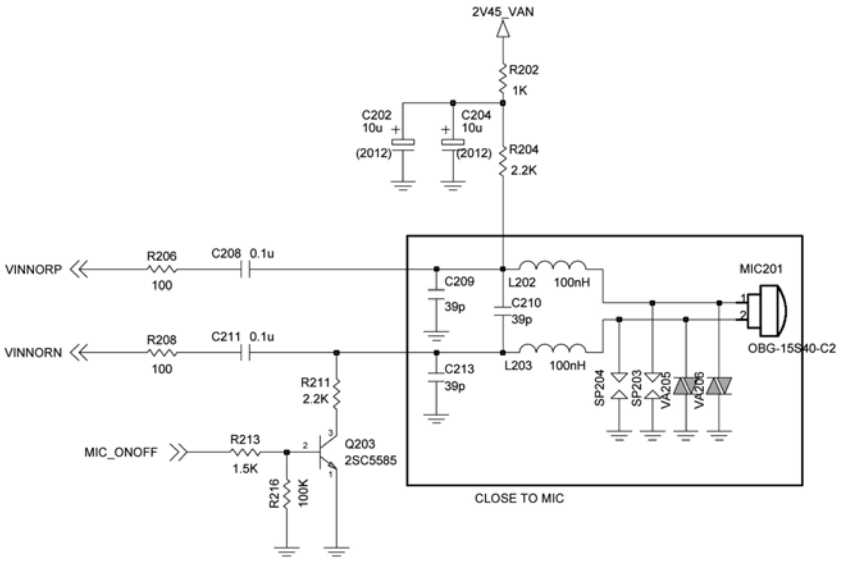


Figure 3-30. Microphone

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 placed in the front cover and contacted to main PCB.

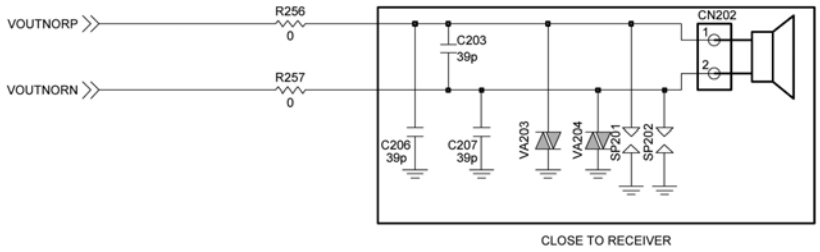


Figure 3-31. Earpiece.

3.14 Hands free / Headset Interface

A. Audio Output

The output audio signals(VOUTAUXP & VOUTAUXN) from AD6521(U102) are used for both hands free and headset. Firstly, the output signals are fed to two analog siwtches (U203, U204). The two analog switches determine using HFK_EAR signal from AD6522(U101) to give the output audio signals to either hands free or headset speaker.

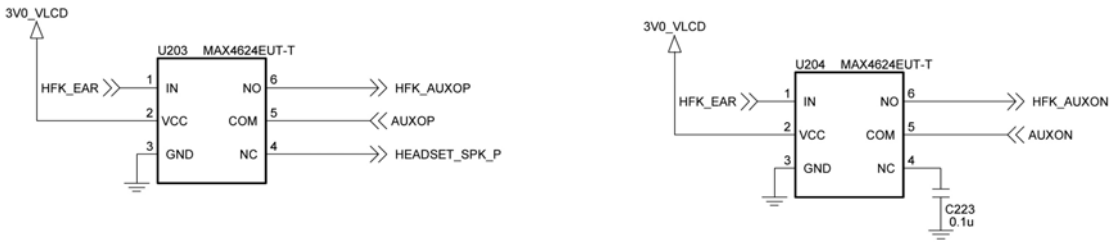


Figure 3-32. Headset and hands free kit (output)

B. Audio Input

Two input audio signals through the hands free kit and one input audio signal through the headset mic are fed to another analog switch (MAX4695EGC(U205)). The analog switch determines using HFK_EAR signal which signal is fed to analog baseband chipset AD6521(U102).

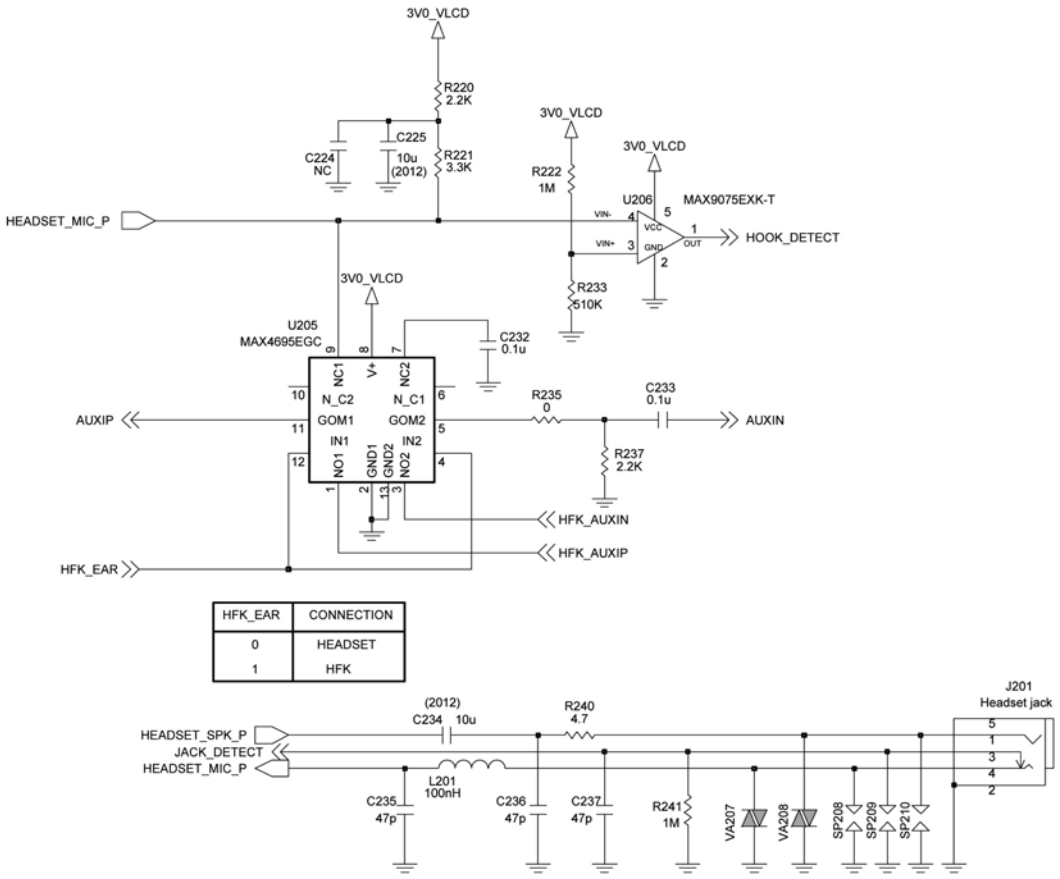


Figure 3-33. Headset and hands free kit (Input)

C. Headset Jack

This phone chooses a 3-pole type ear-mic jack which has three electrodes such as Receiver +, Mic+, and GND. This type usually supports only single-ended configuration in the audio path. But most of phones use the common interface.

3.15 Key Back-light Illumination

In key back-light illumination, there are 6 yellow-green LEDs in Main Board, which are driven by KEY_BACKLIGHT line from AD6522.
The LEDs are also used for precharge indication.

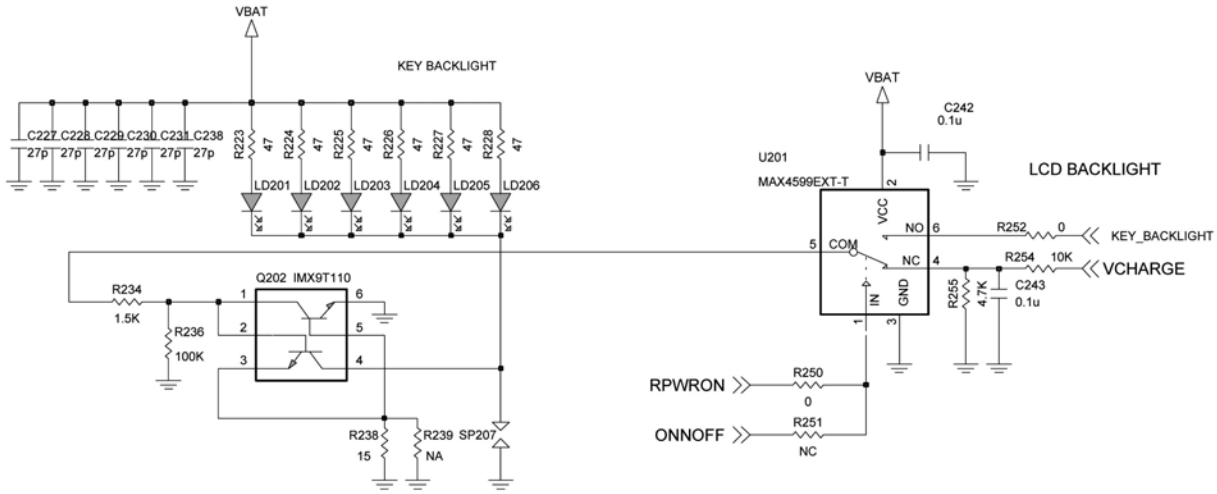


Figure 3-34. Key back-light and precharge indication illumination.

3.16 LCD Back-light Illumination

For LCD Back-light illumination, there is a driver in FPCB of LCD module, which is driven by LCD_BACKLIGHT_CTL (GPO_22) through LCD connector (CN402) from AD6522.

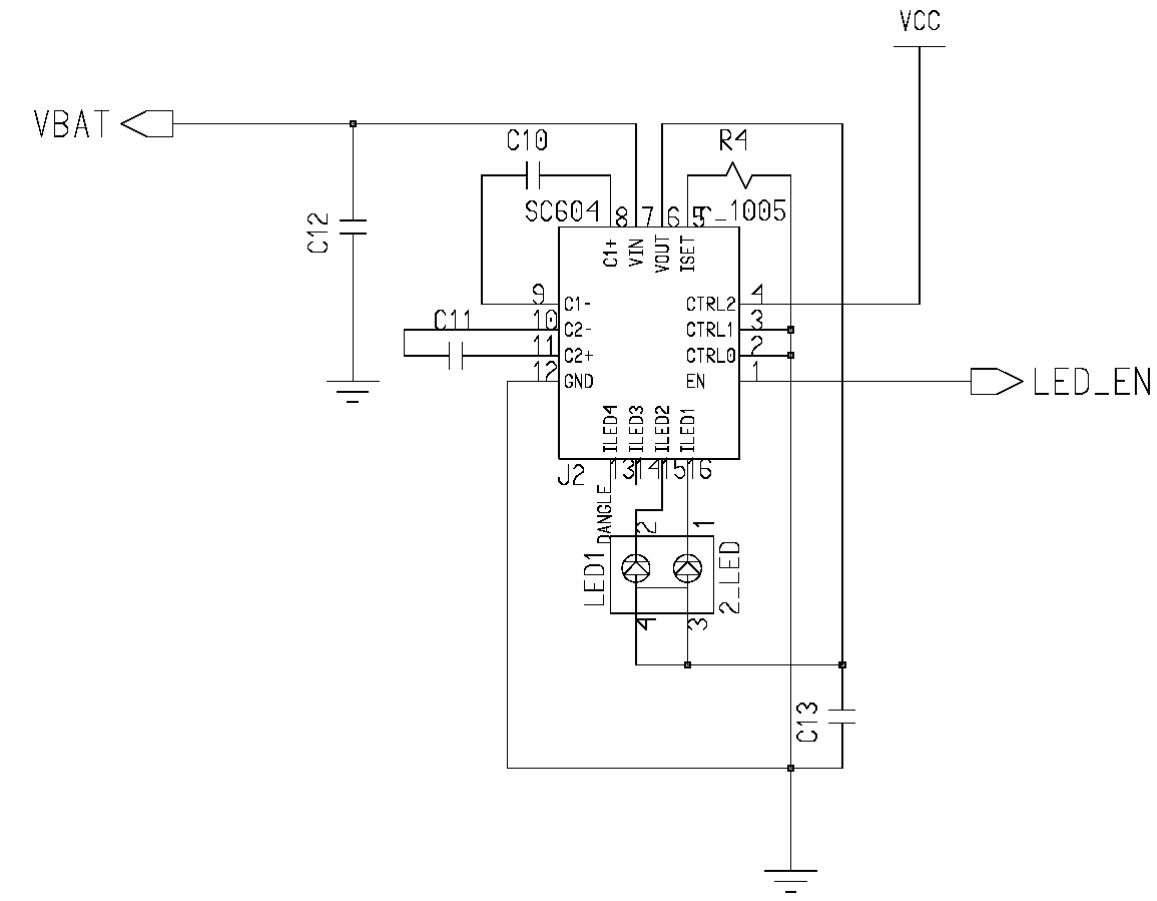


Figure 3-35. LCD back-light illumination.

3.17 Speaker & MIDI IC

The phones of this model use the loud speaker and Melody IC which makes the robust joyful melody sounds(40 ploy).

• Melody IC control

5 GPIO is assigned to control melody IC. Melody data is transferred to melody IC and played by loud speaker.

• External 3.3V LDO

The maximum output current of analog amplifier in melody IC is 300mA. External LDO(U202) is included for max power of loud Speaker.

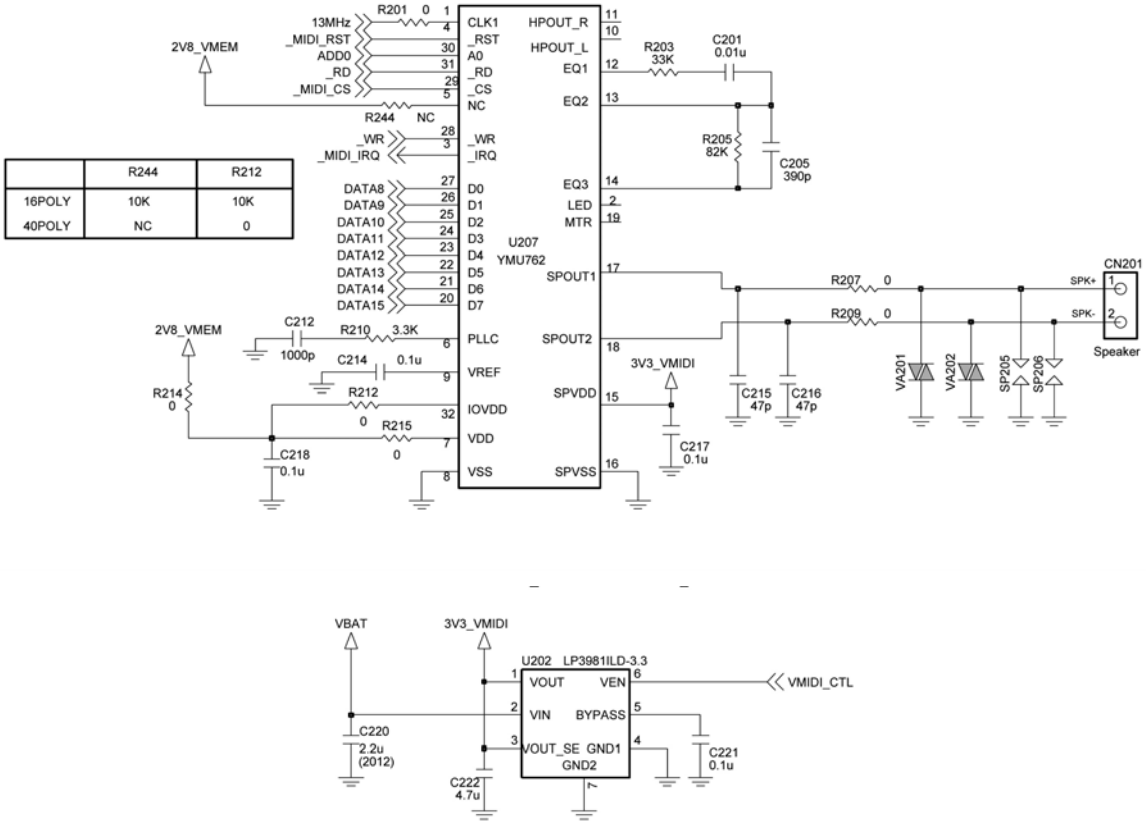
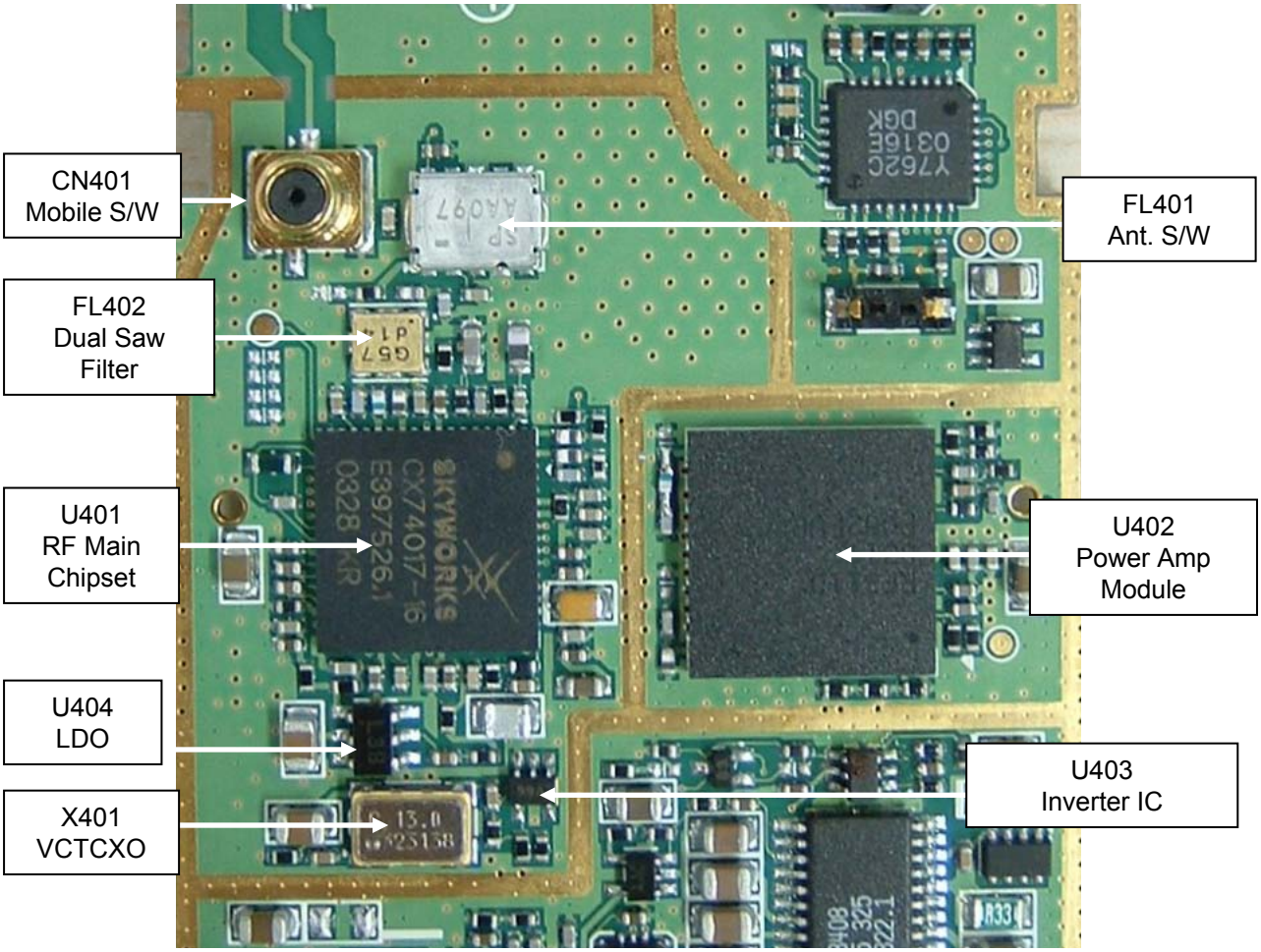


Figure 3-36. MIDI-IC, external LDO, and speaker.

Basically, this phone have a melody IC of Yamaha Ltd.MA-2(nickname from Yamaha) 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.

4. TROUBLE SHOOTING

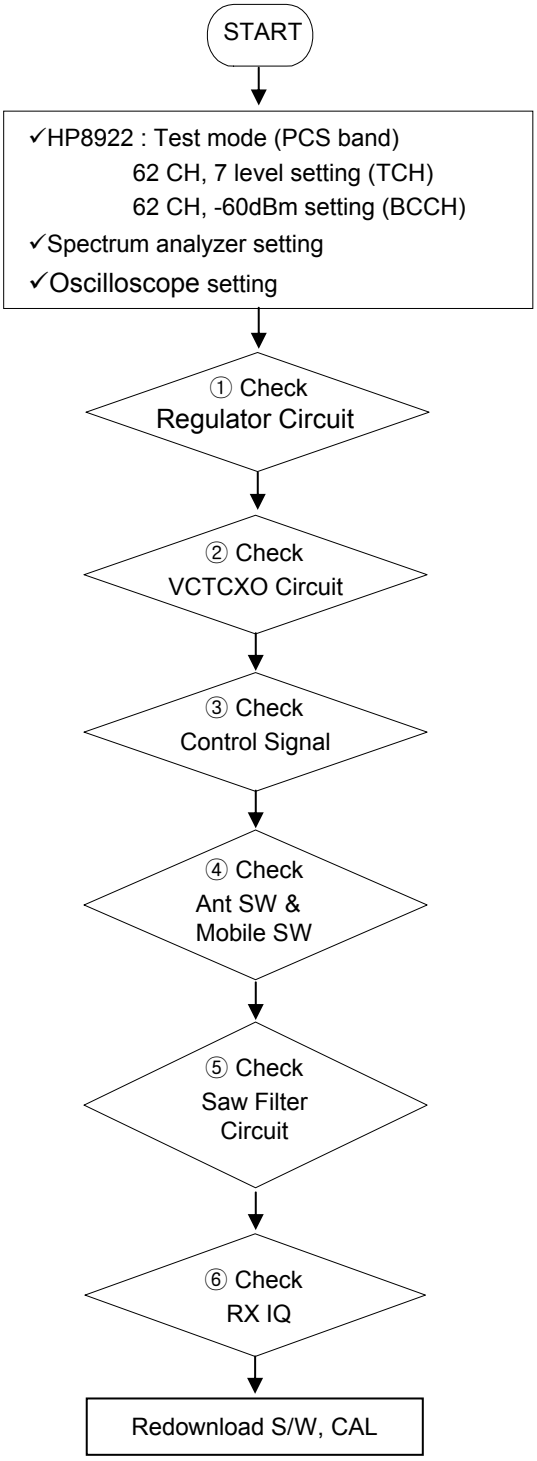
4.1 RF Components

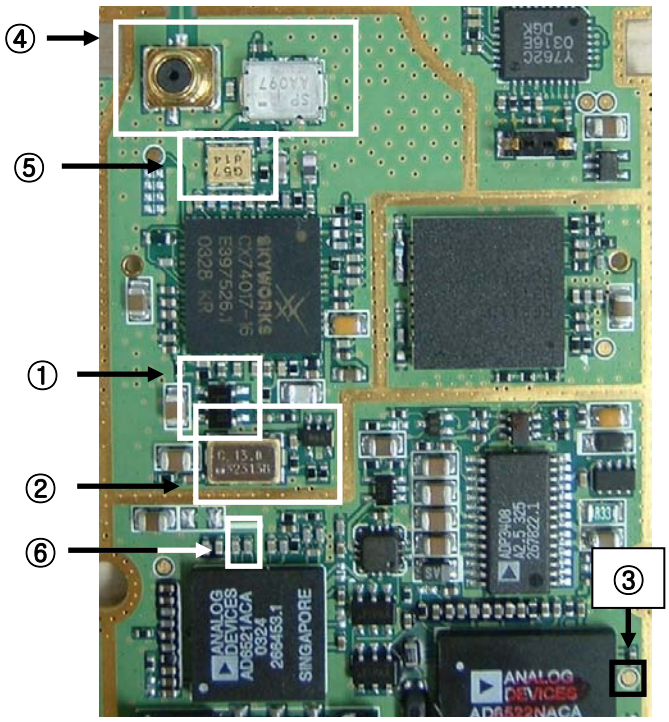


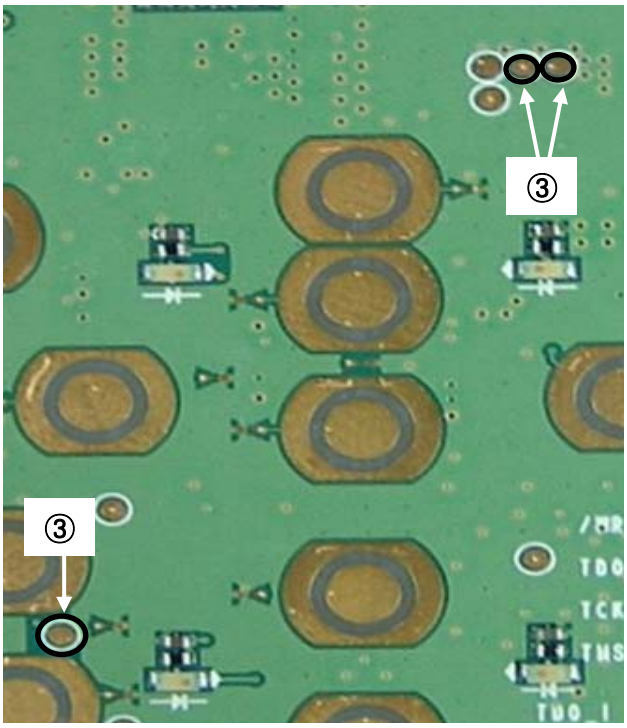
RF Components

Reference	Description	Reference	Description
U401	RF Main Chipset	FL402	Dual SAW Filter
CN401	Mobile S/W	X401	VCTCXO
FL401	Ant. S/W	U404	LDO
U402	PAM	U403	Inverter IC

4.2 RX Trouble

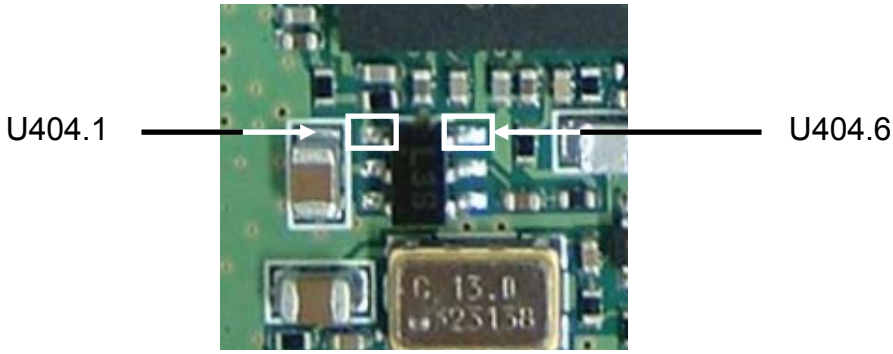


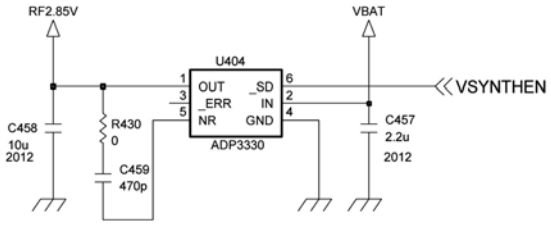


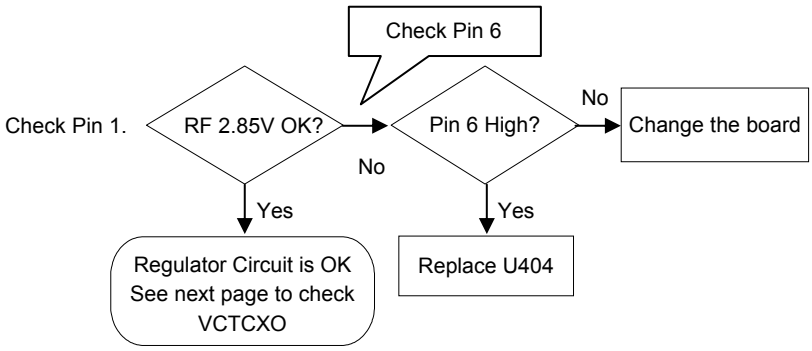


Now See next Page to see
How to check each parts

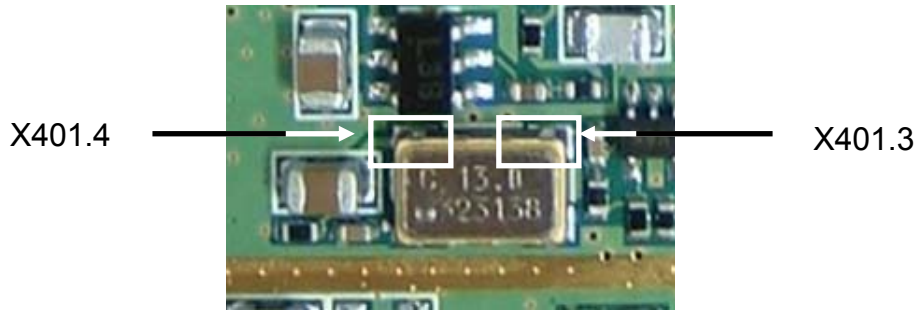
4.2.1 Checking Regulator Circuit

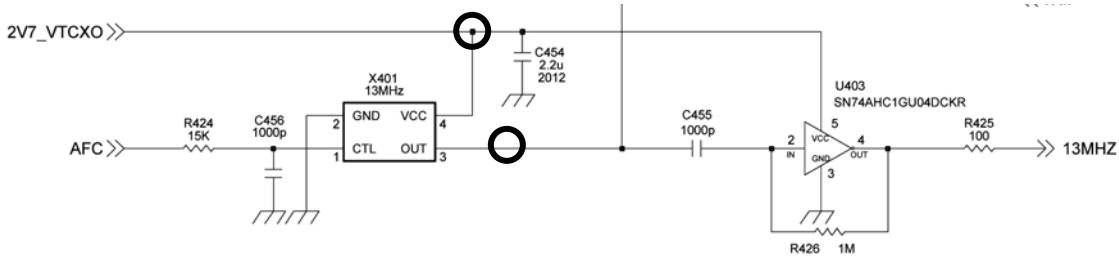


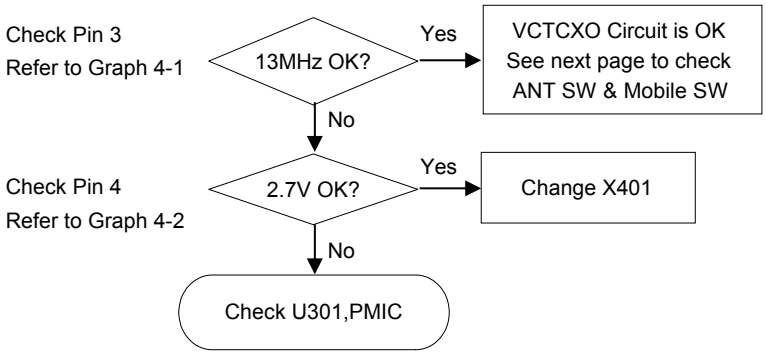


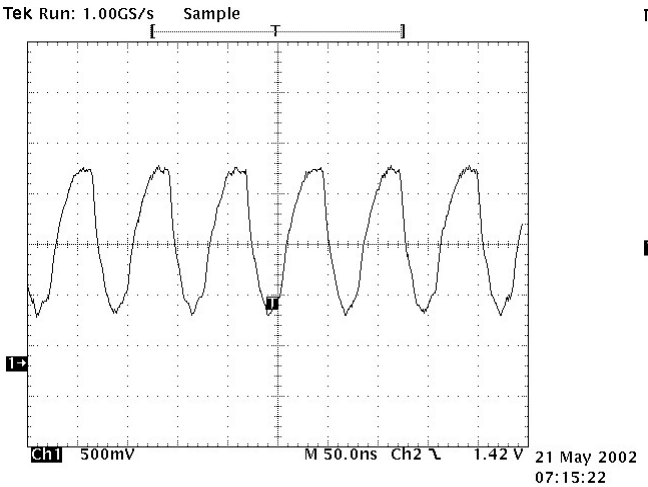


4.2.2 Checking VCTCXO Circuit

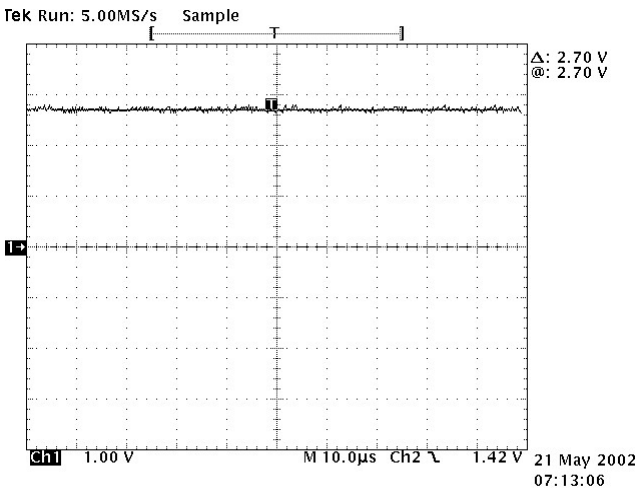






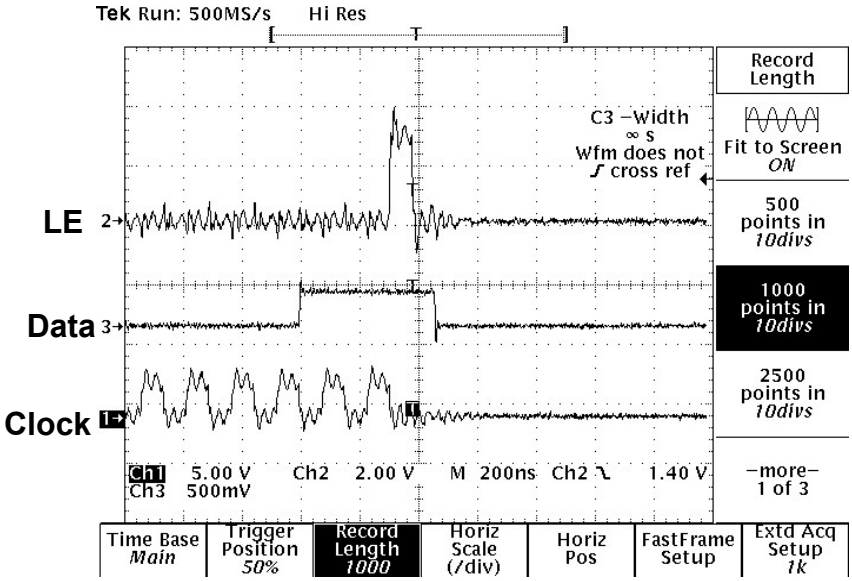


Graph 4-1. VCTCXO 13MHz

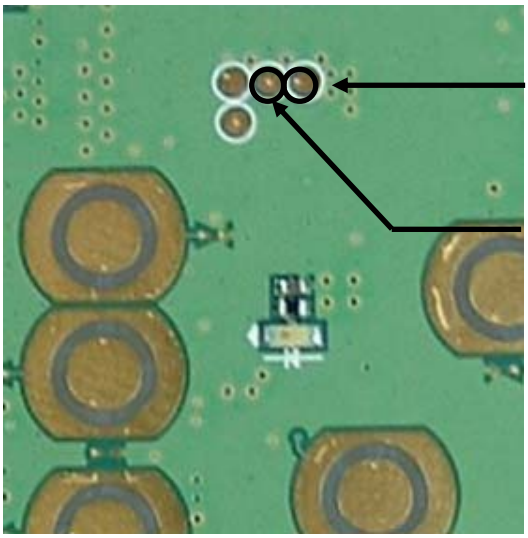


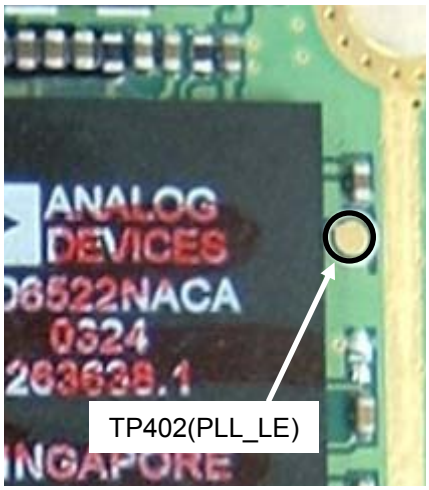
Graph 4-2. VCTCXO 2.7V

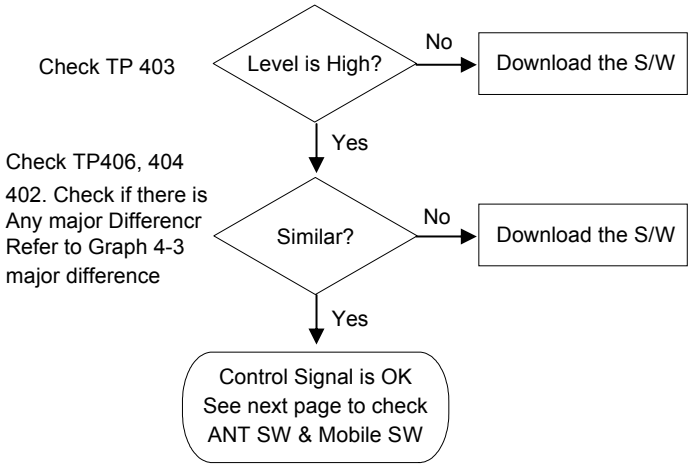
4.2.3 Checking PLL Control Signal



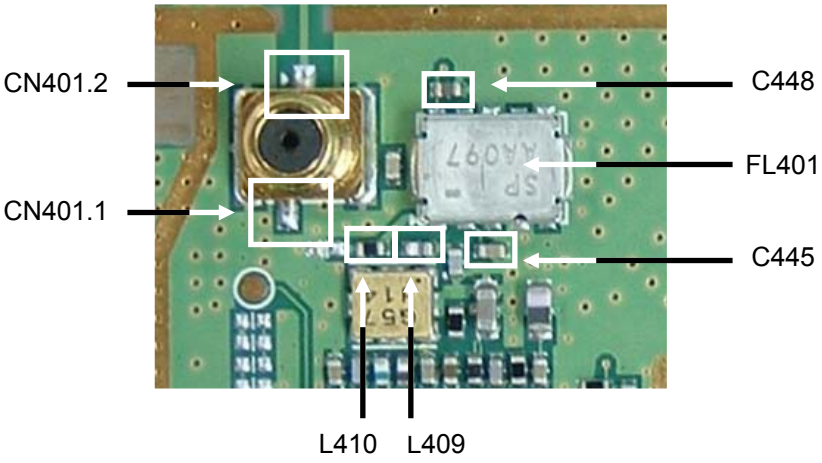
Graph 4-3. RF Control Signal

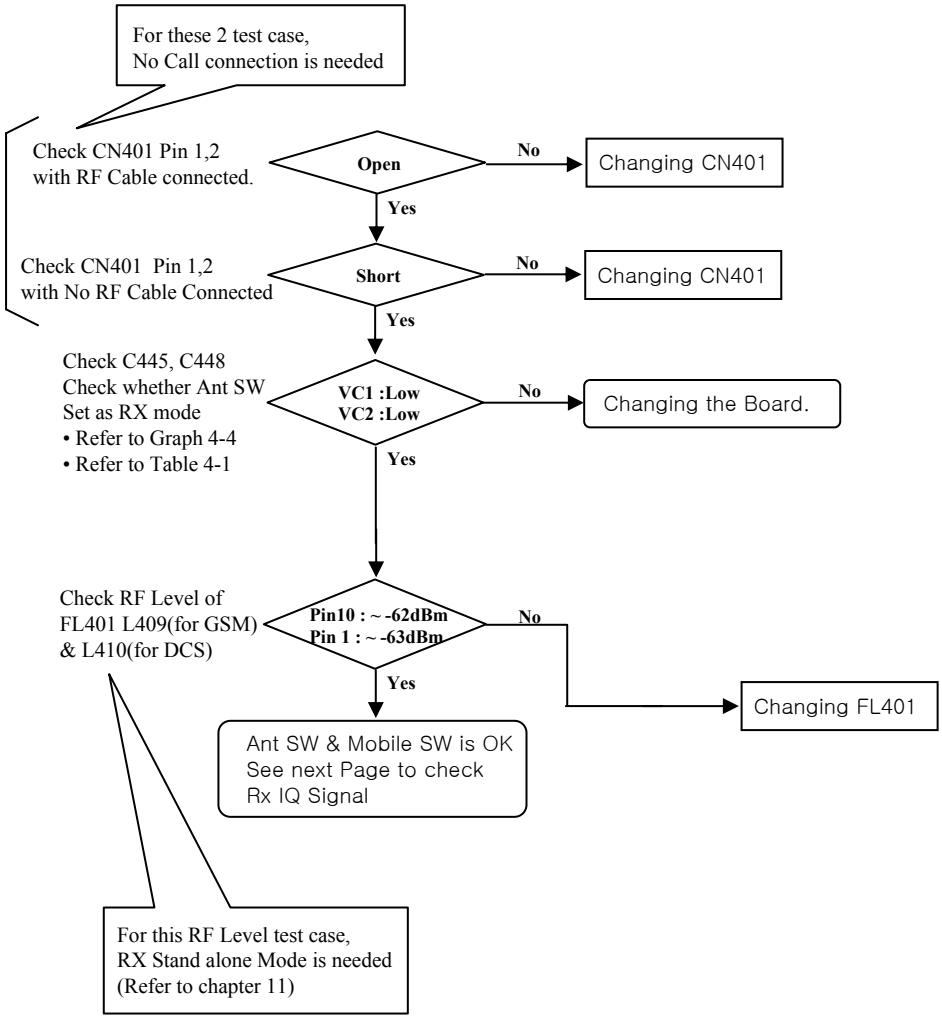




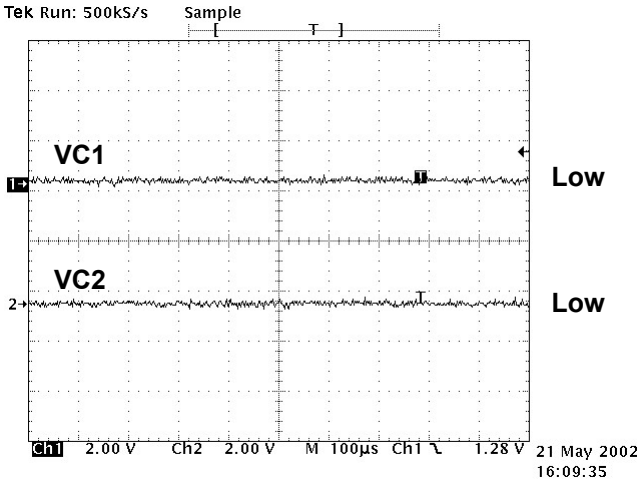


4.2.4 Checking Ant SW & Mobile SW

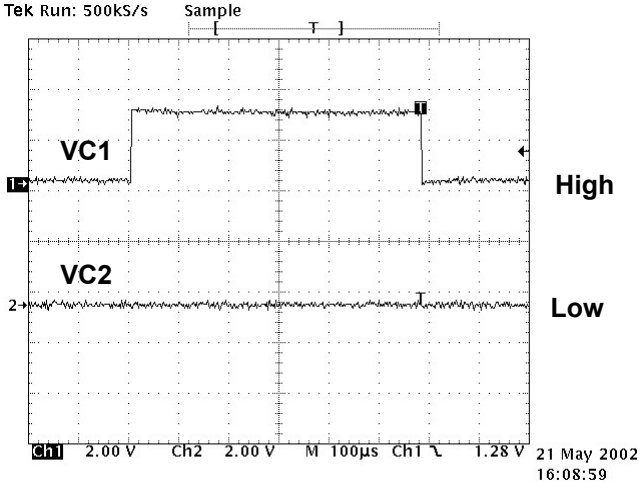




4. TROUBLE SHOOTING



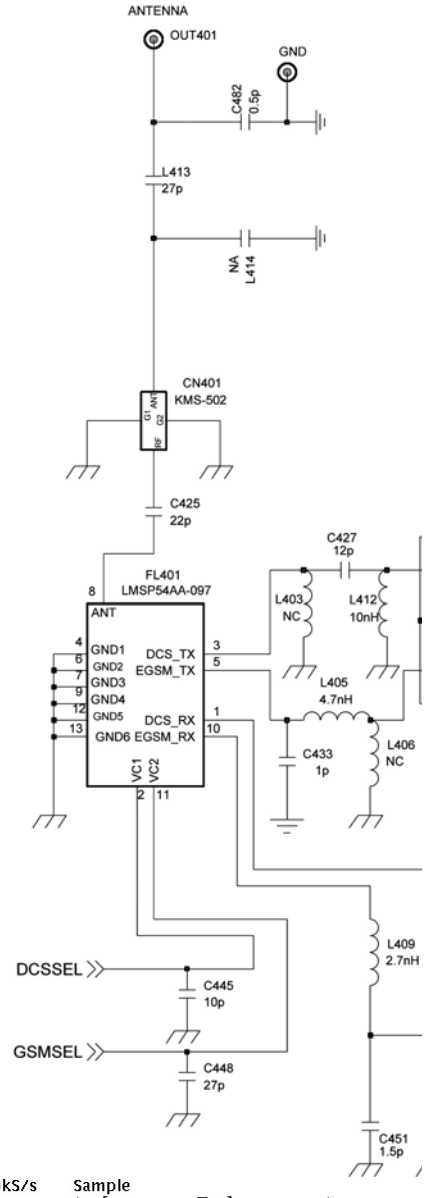
Graph 4-4. ANT SW Control GSM, DCS RX Mode

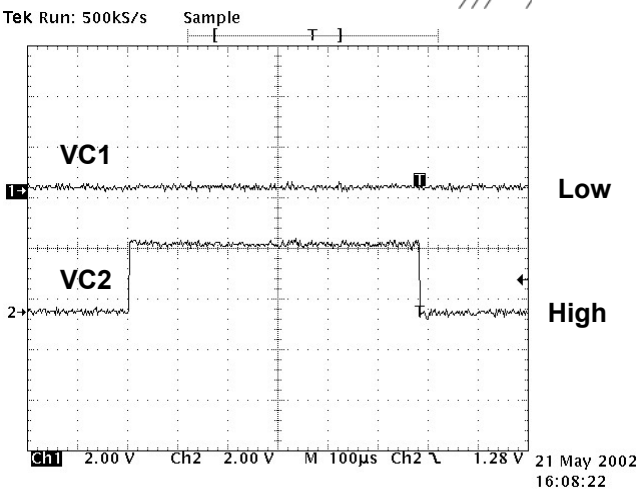


Graph 4-5. ANT SW Control for DCS TX Mode

ANT SW	VC1	VC2
EGSM TX	0	1
DCS TX	1	0
EGSM, DCS RX	0	0

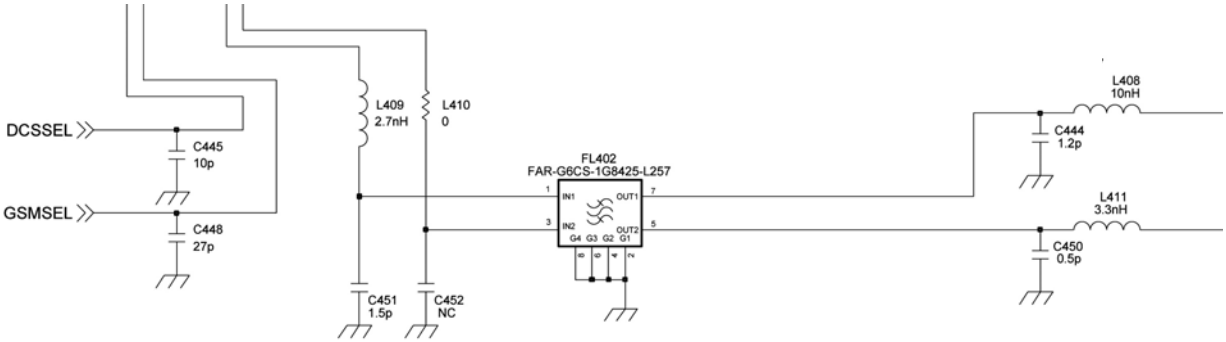
Table 4-1. ANT SW Control Logic

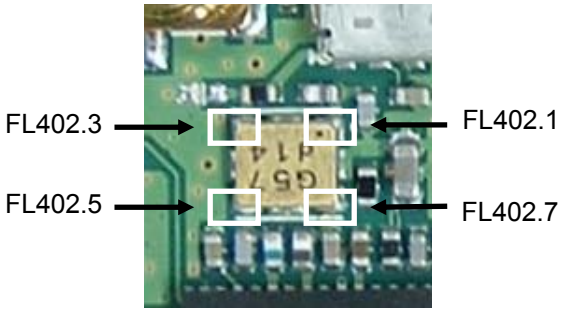


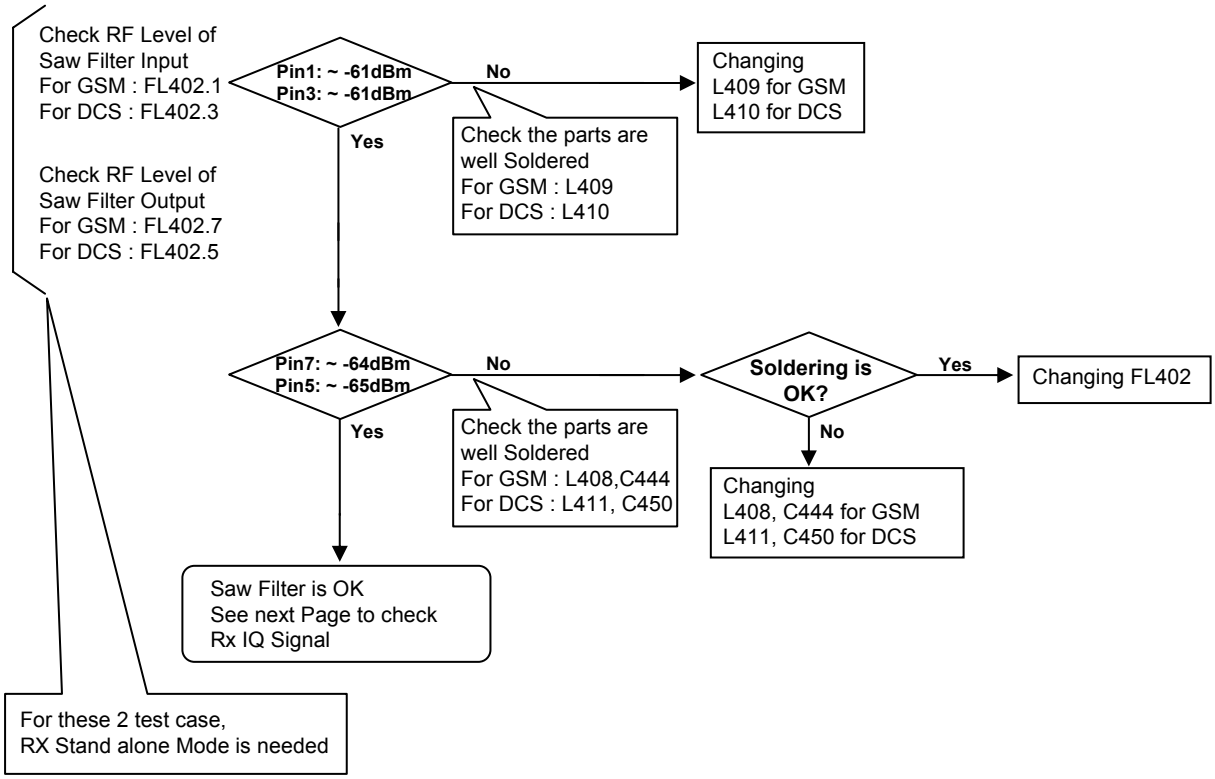


Graph 4-6. ANT SW Control for GSM TX Mode

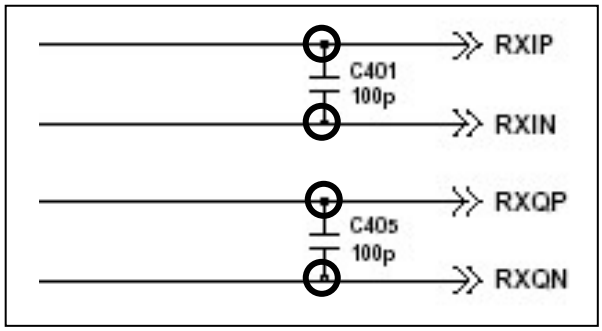
4.2.5 Checking SAW Filter Circuit

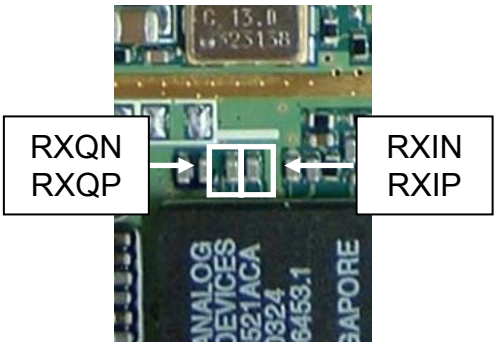


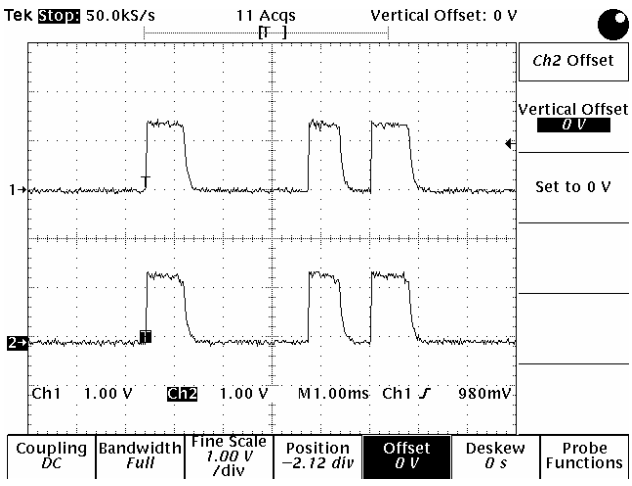




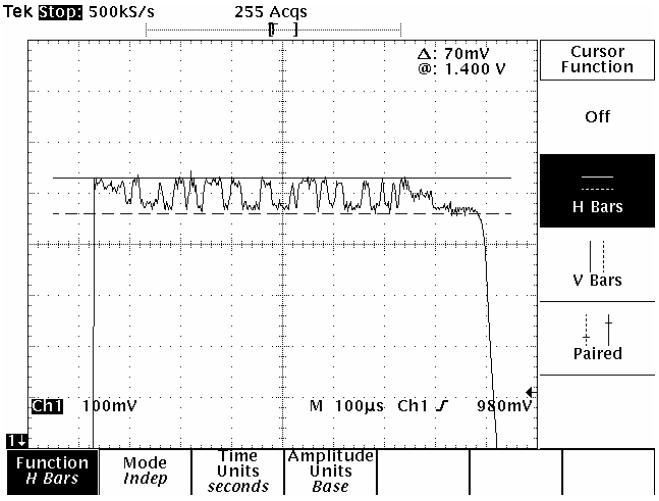
4.2.6 Checking RX IQ



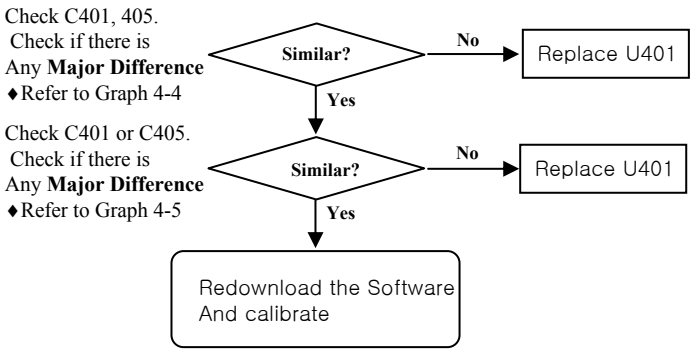




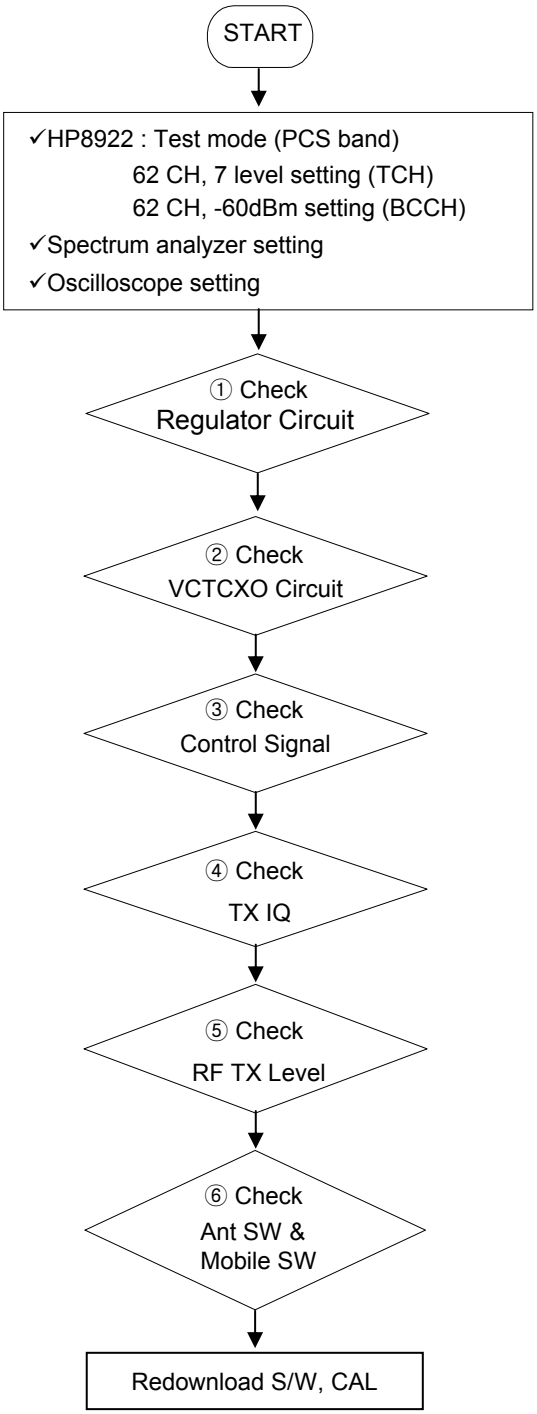
Graph 4-7. RX IQ Signal

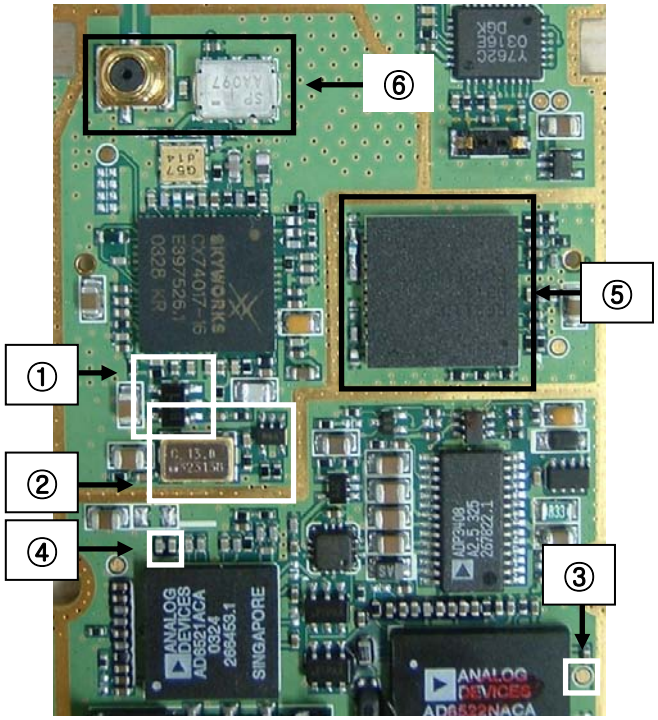


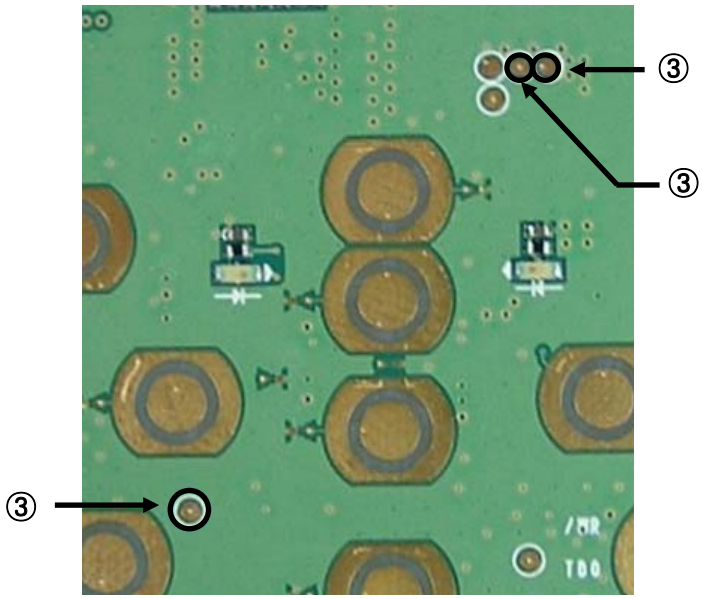
Graph 4-8. RX I Signal (Extended)



4.3 TX Trouble



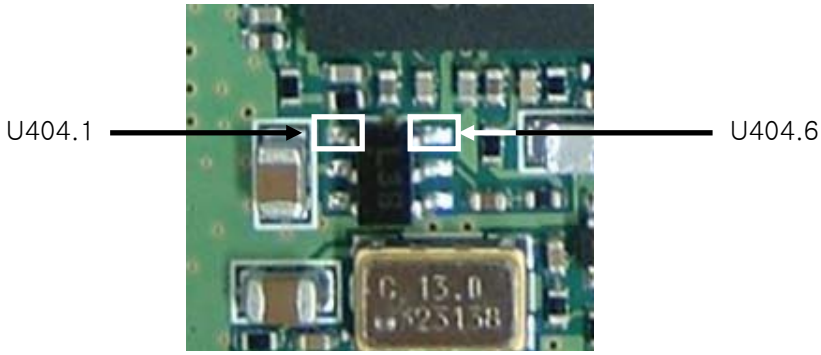


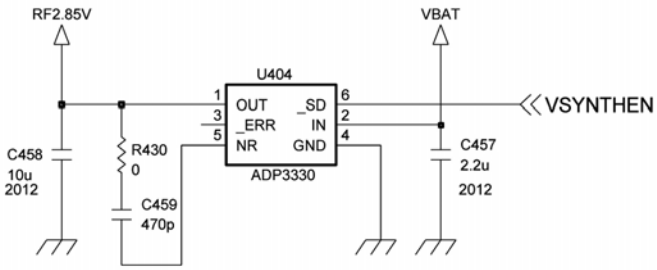


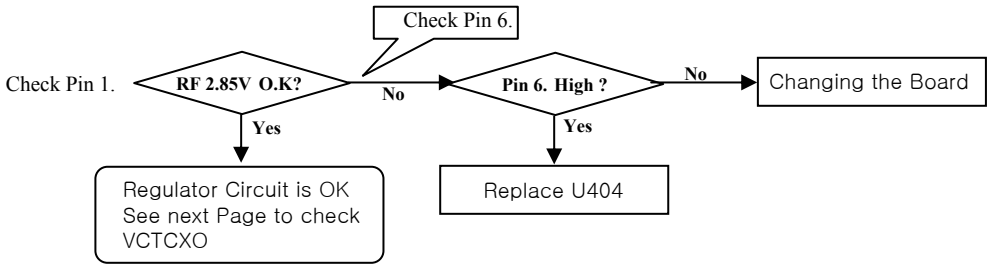
Now See next Page to see
How to check each parts

4-3-1 Checking Regulator Circuit

• If you already check this point while checking RX part, you can skip this test.

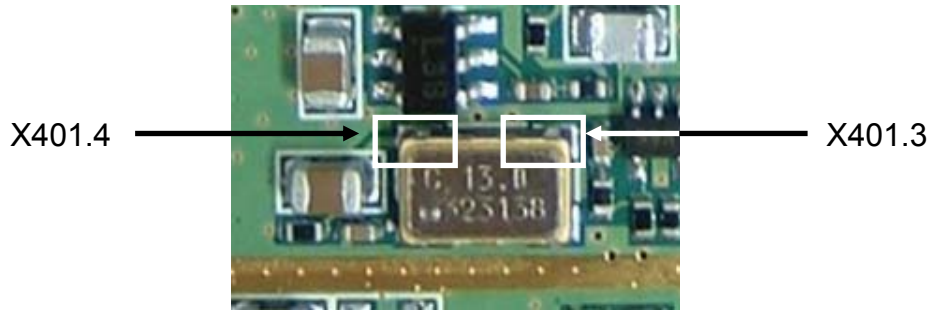


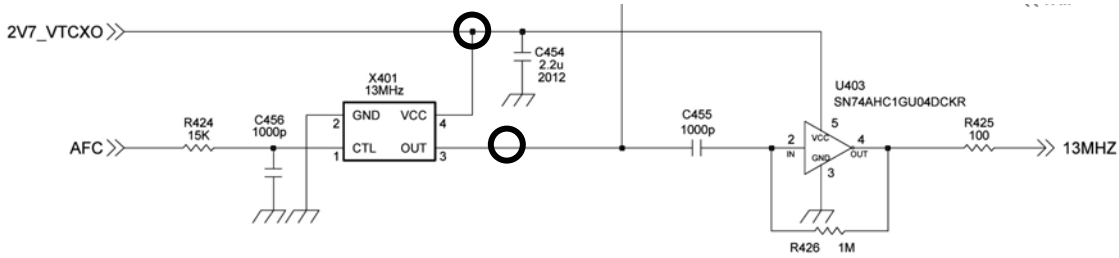


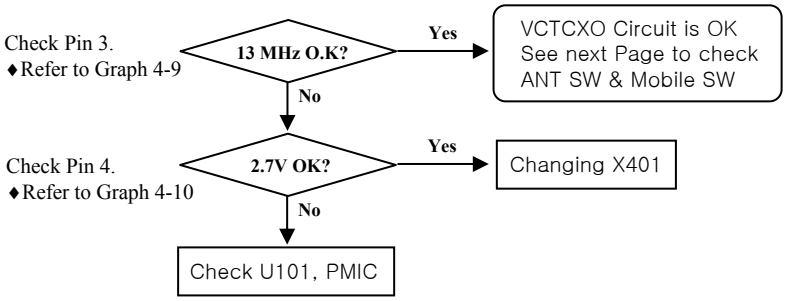


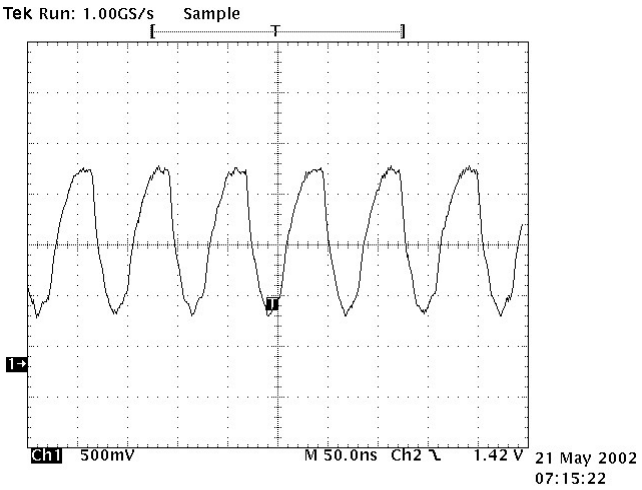
4-3-2 Checking VCTCXO Circuit

• If you already check this point while checking RX part, you can skip this test.

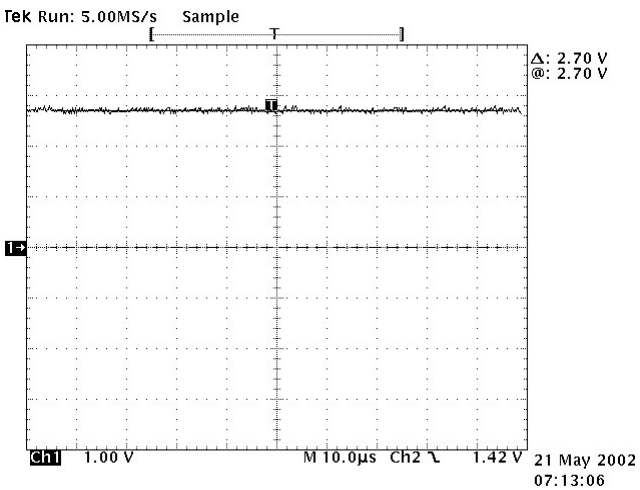






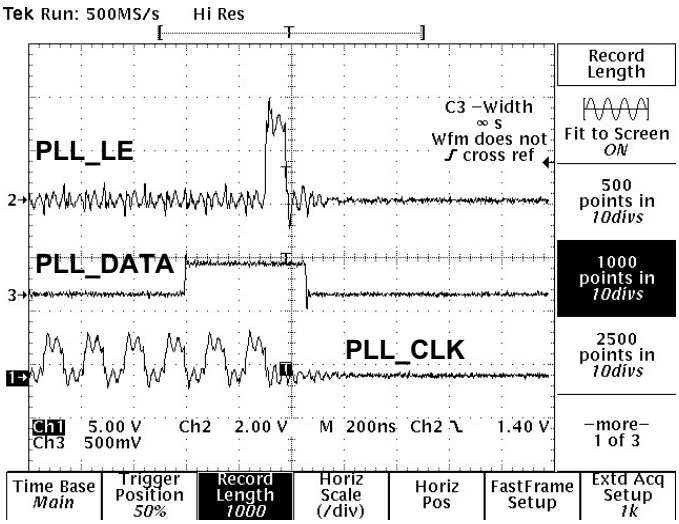


Graph 4-9. VCTCXO 13MHz

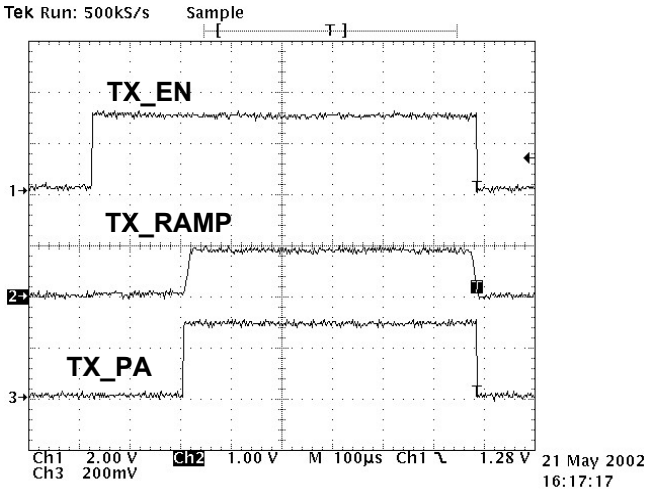


Graph 4-10. VCTCXO 2.7V

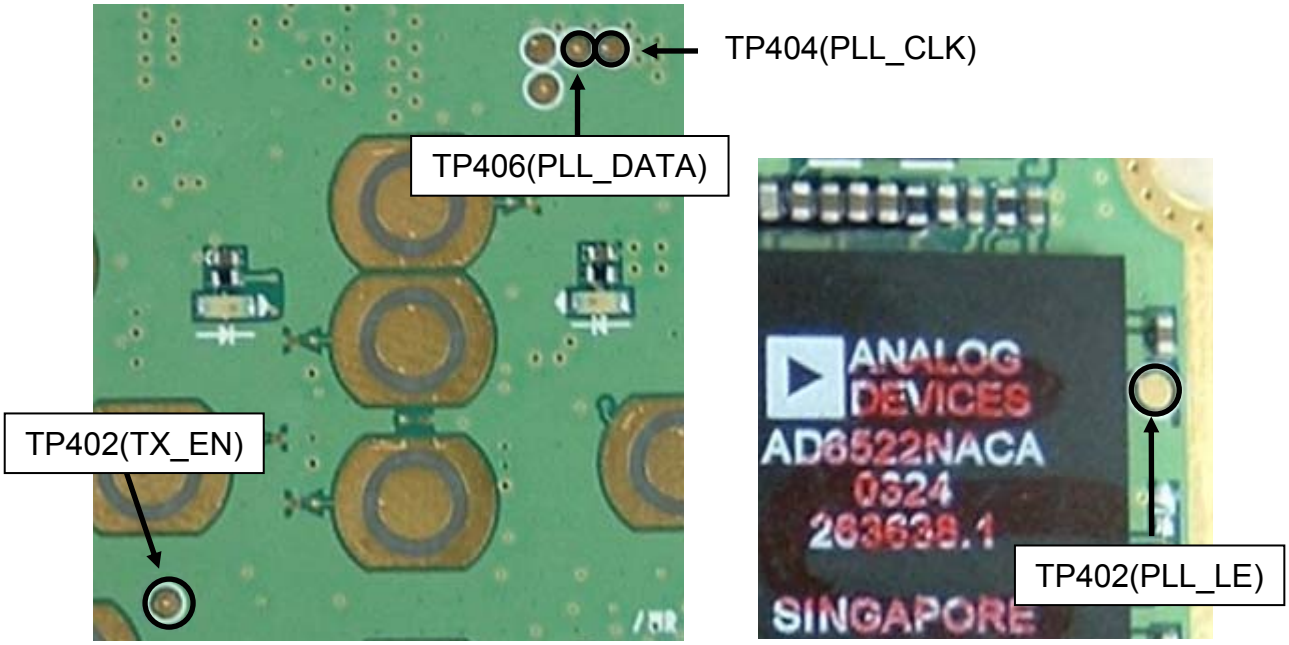
4-3-3 Checking Control Signal

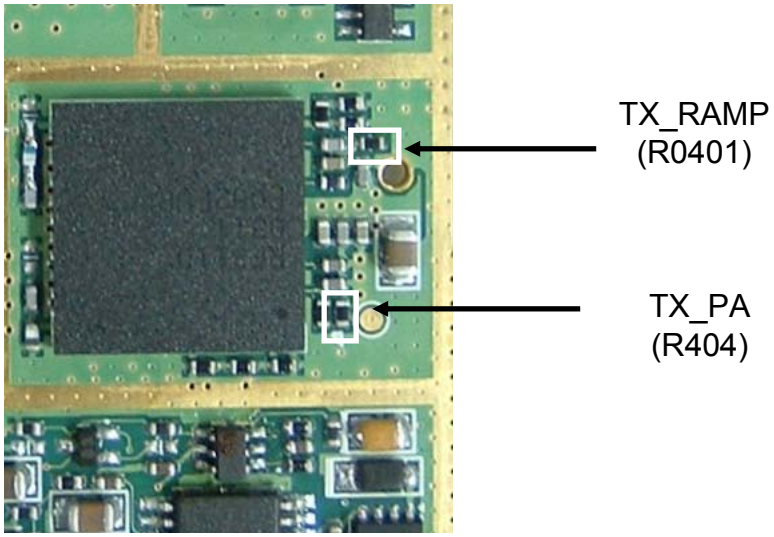


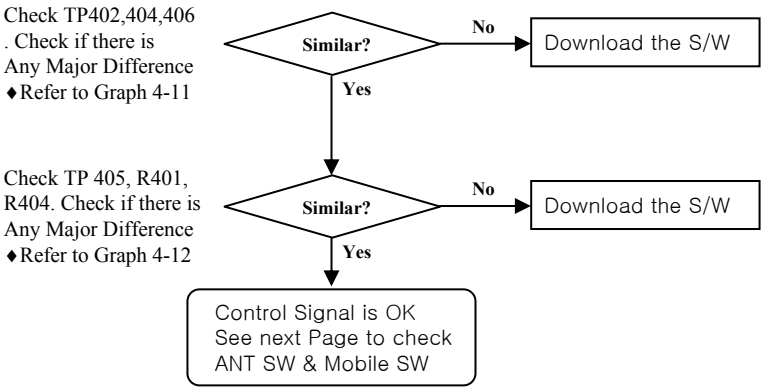
Graph 4-11. RF Control Signal



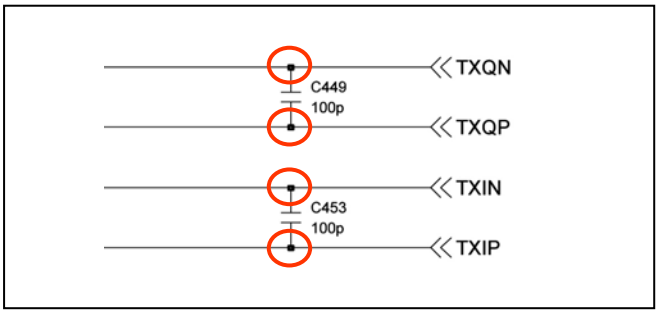
Graph 4-12. RF Control Signal
(TX_EN, TX_RAMP, TX_PA)

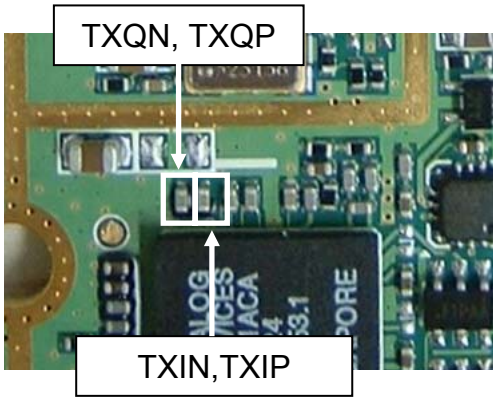


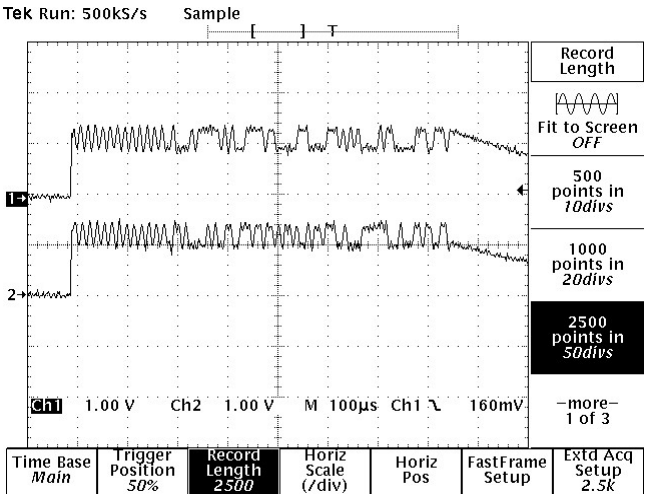

TX_RAMP
(R0401)
TX_PA
(R404)


Check TP402,404,406
. Check if there is
Any Major Difference
♦Refer to Graph 4-11
Similar?
No
Download the S/W
Yes
Check TP 405, R401,
R404. Check if there is
Any Major Difference
♦Refer to Graph 4-12
Similar?
No
Download the S/W
Yes
Control Signal is OK
See next Page to check
ANT SW & Mobile SW

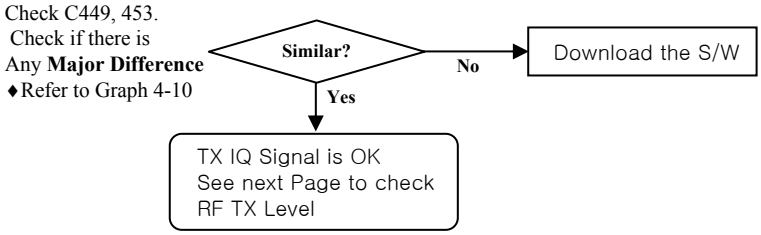
4-3-4 Checking TX IQ



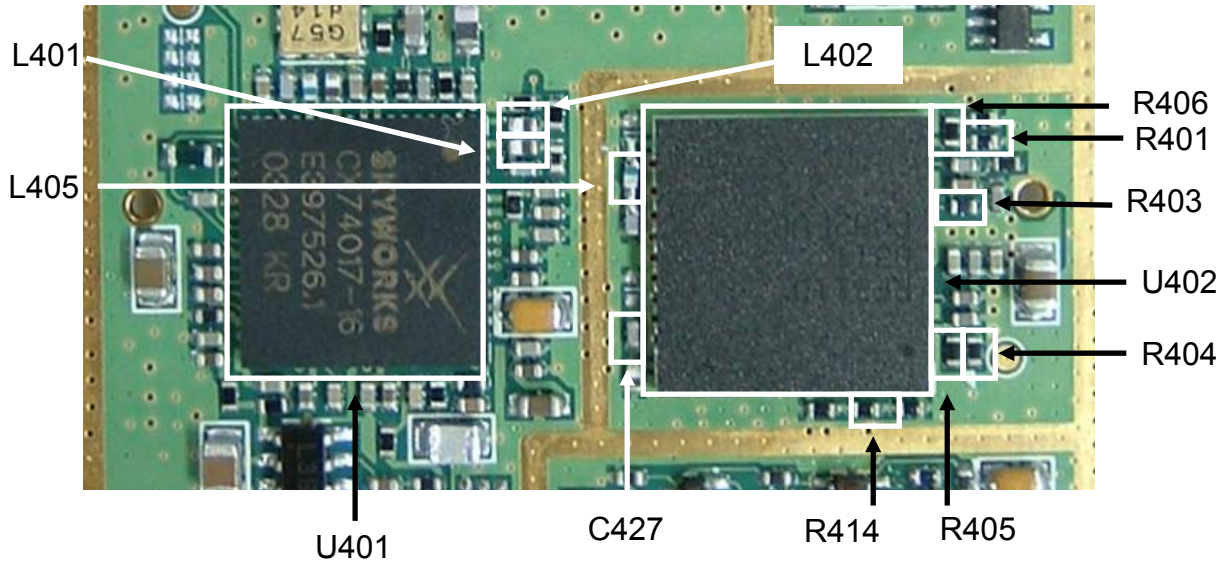


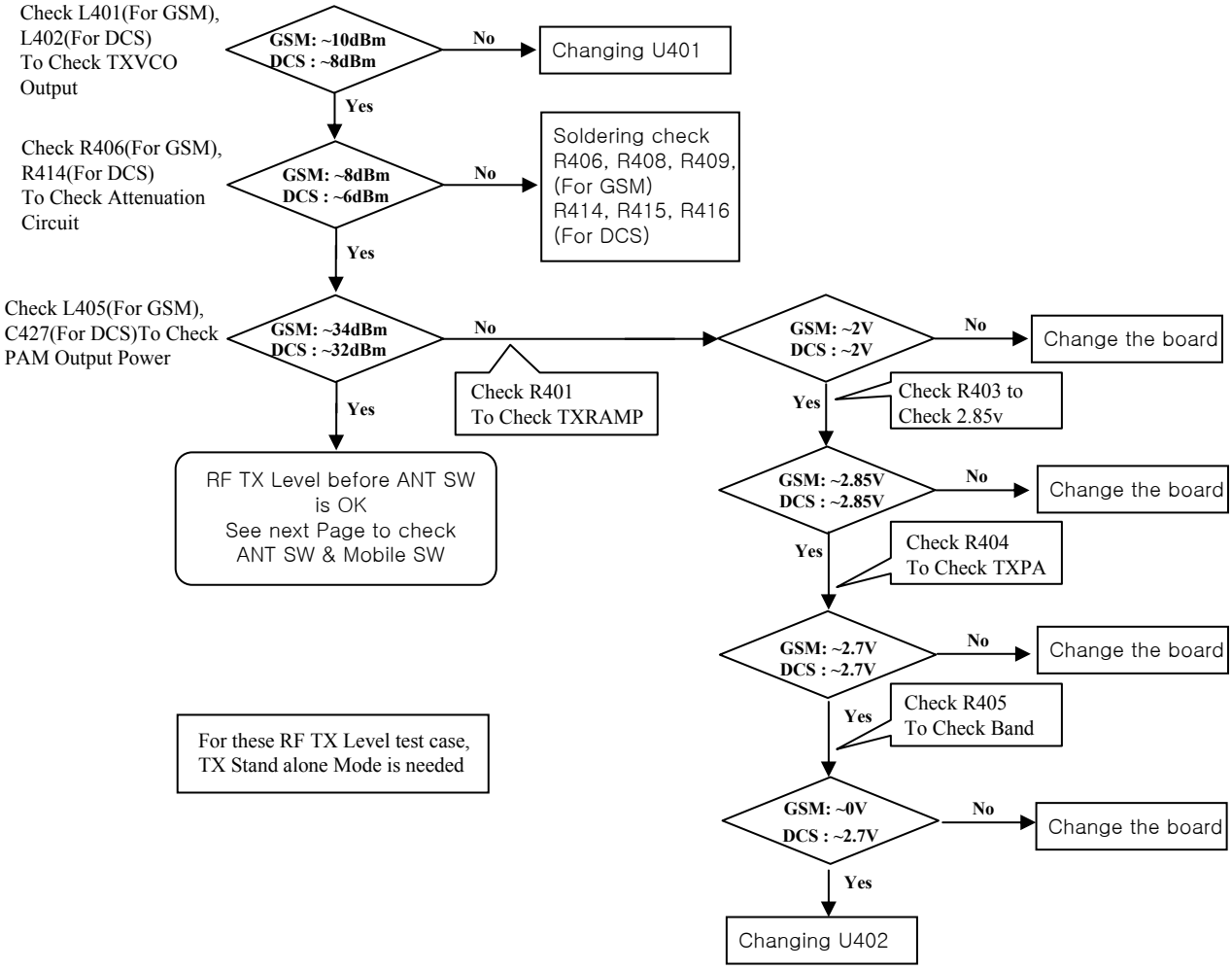


Graph 4-13. TX IQ Signal

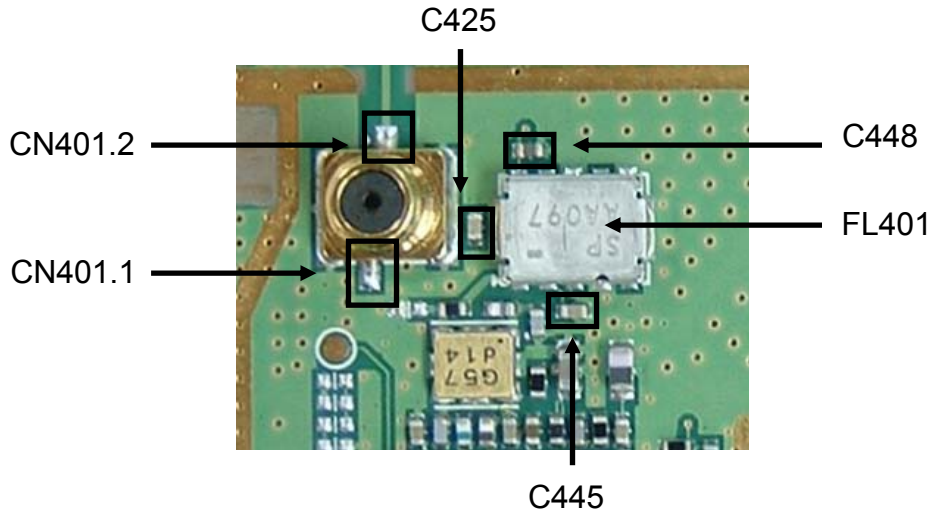


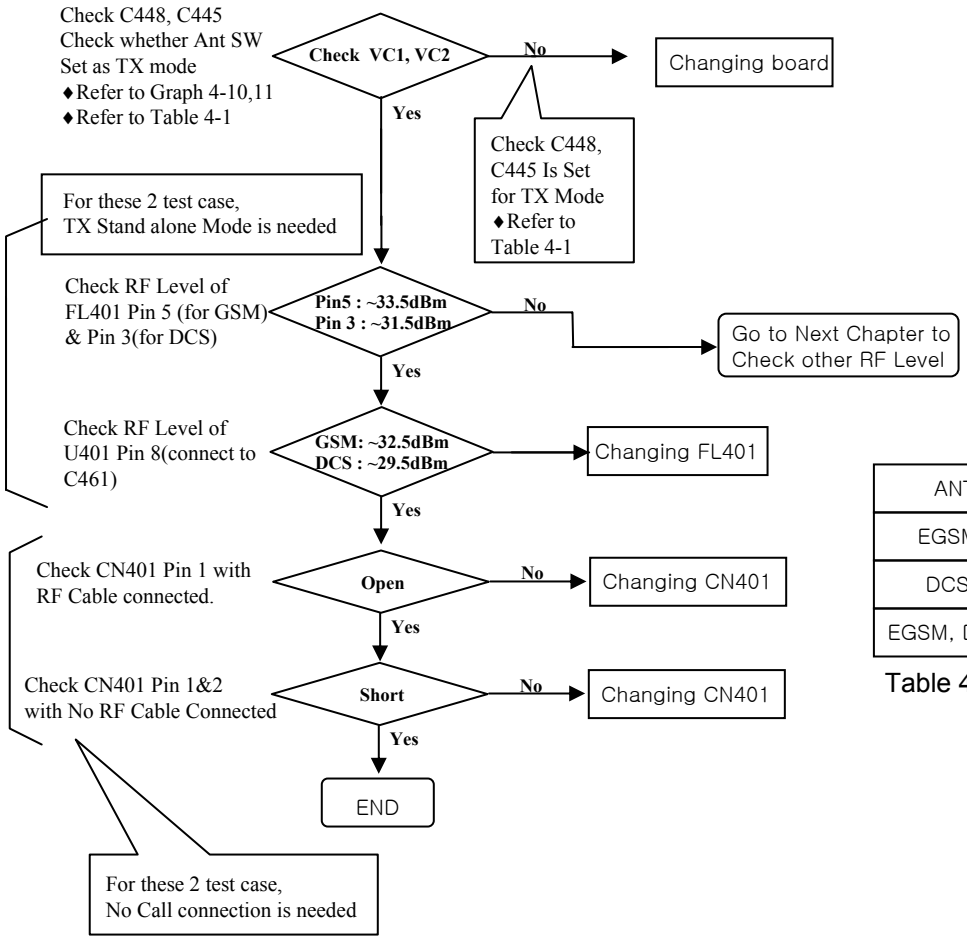
4-3-5 Checking RF TX Level





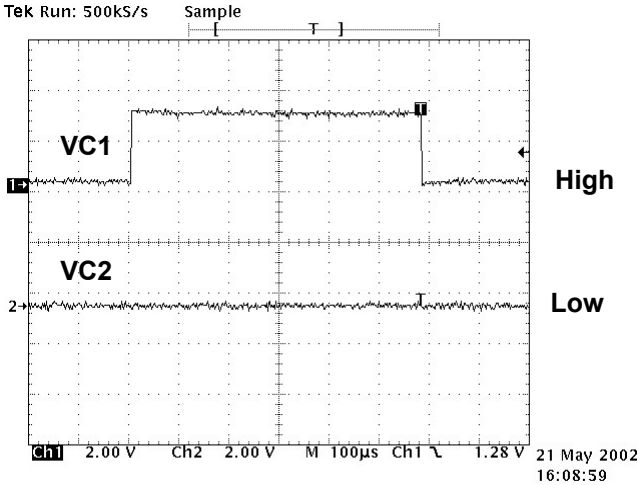
4-3-6 Checking Ant SW & Mobile SW



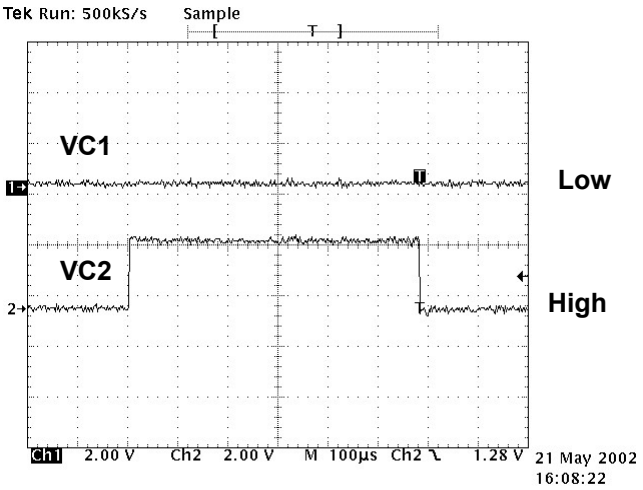


ANT SW	VC1(C445)	VC2(C448)
EGSM TX	0	1
DCS TX	1	0
EGSM, DCS RX	0	0

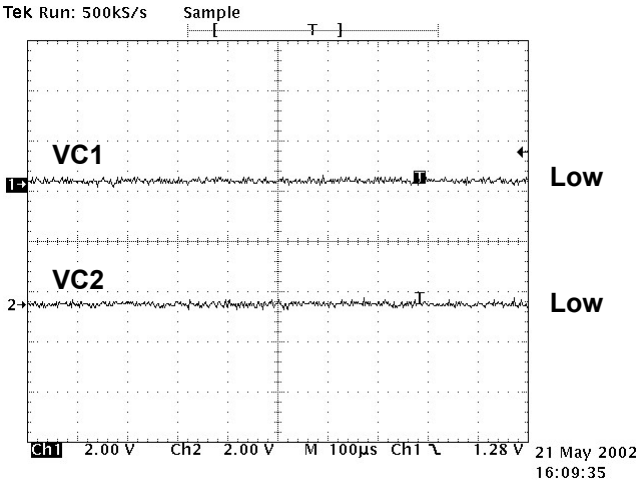
Table 4-2. ANT SW Control Logic



Graph 4-14. ANT SW Control
DCS TX Mode

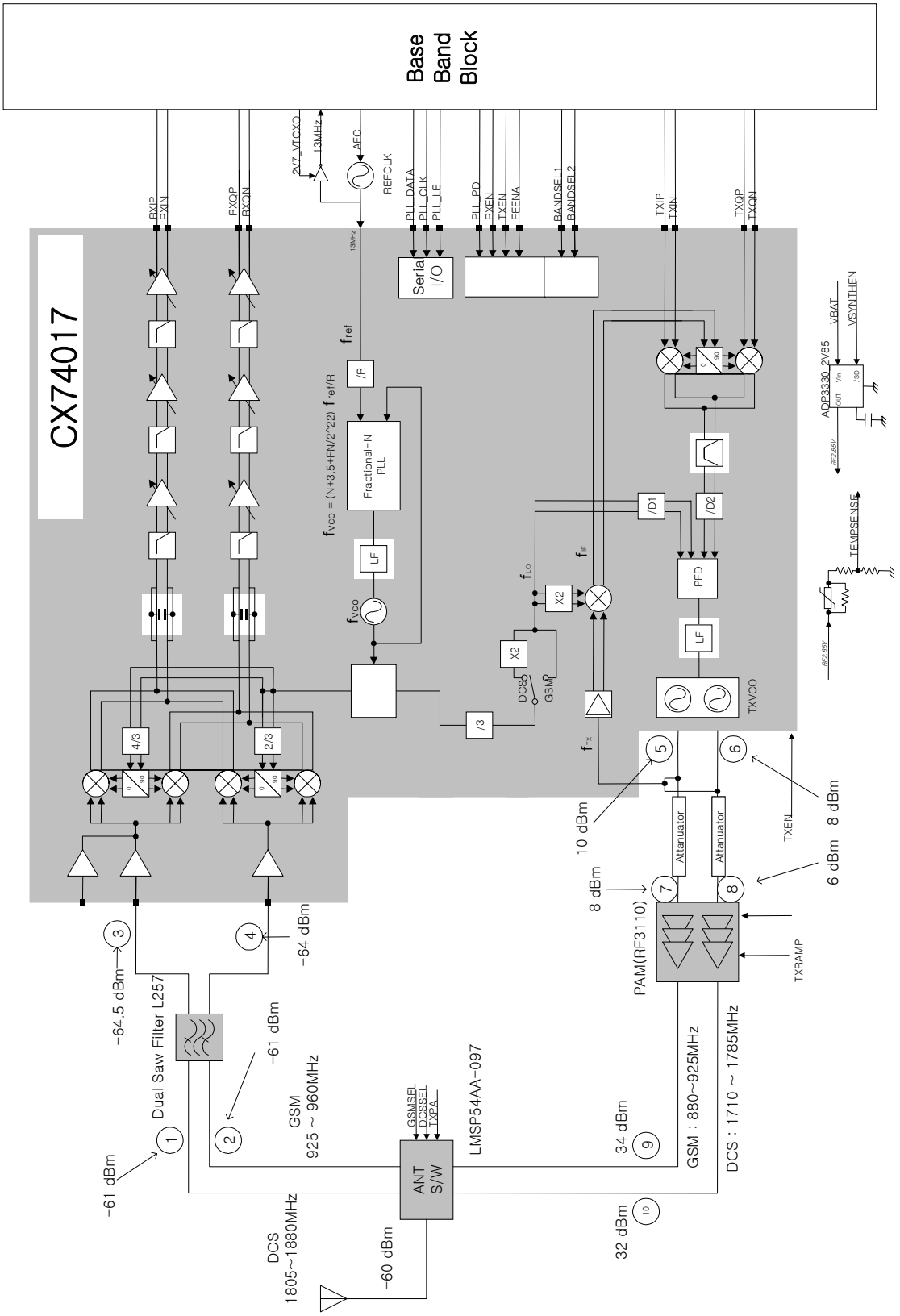


Graph 4-15. ANT SW Control
GSM TX Mode



Graph 4-16. ANT SW Control
GSM, DCS RX Mode

4-3-7 Receiver and Transmitter RF Level



4-3-8 Receiver RF Level

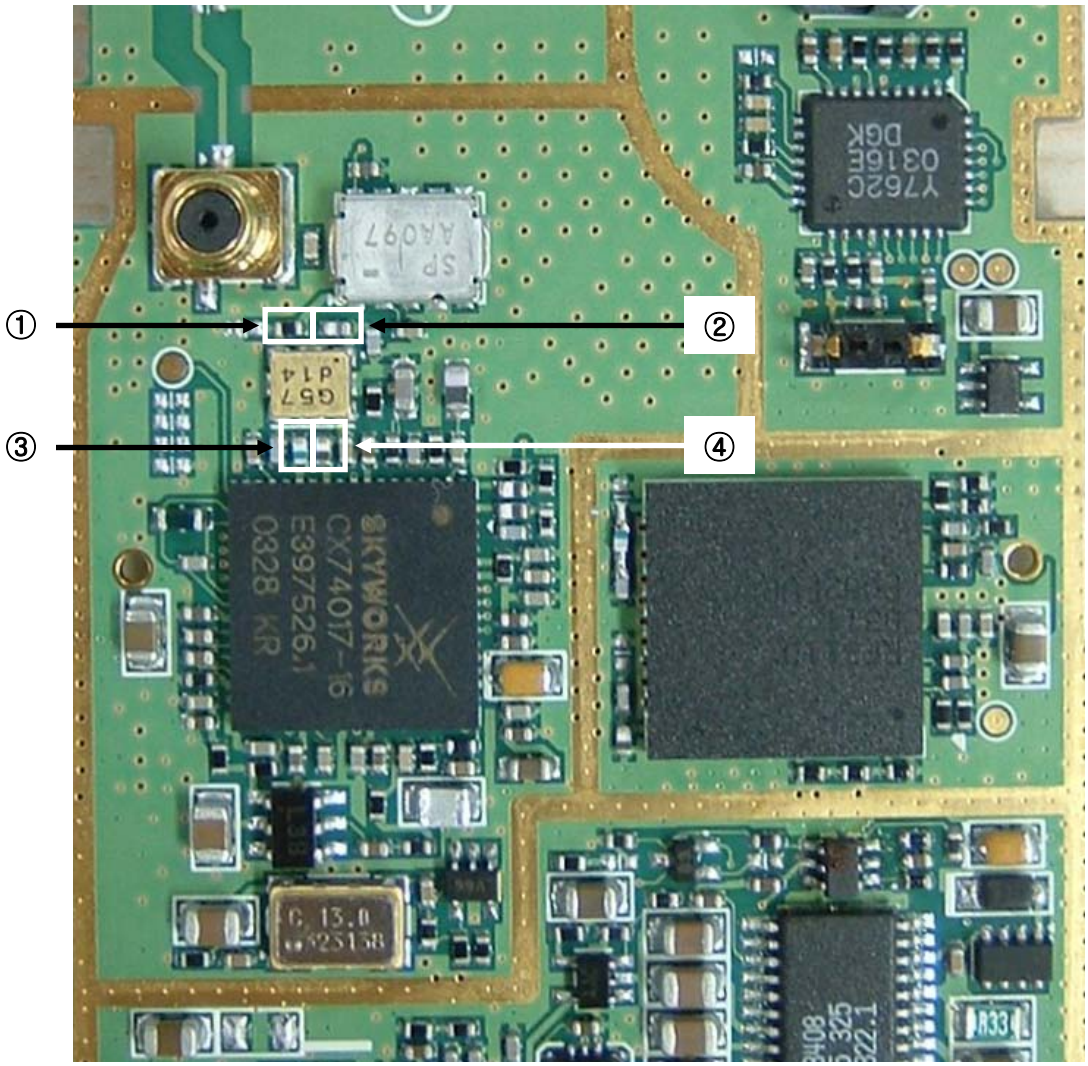


Figure 4-1. Test Points of Rx Level.

4-3-9 Transmitter RF Level

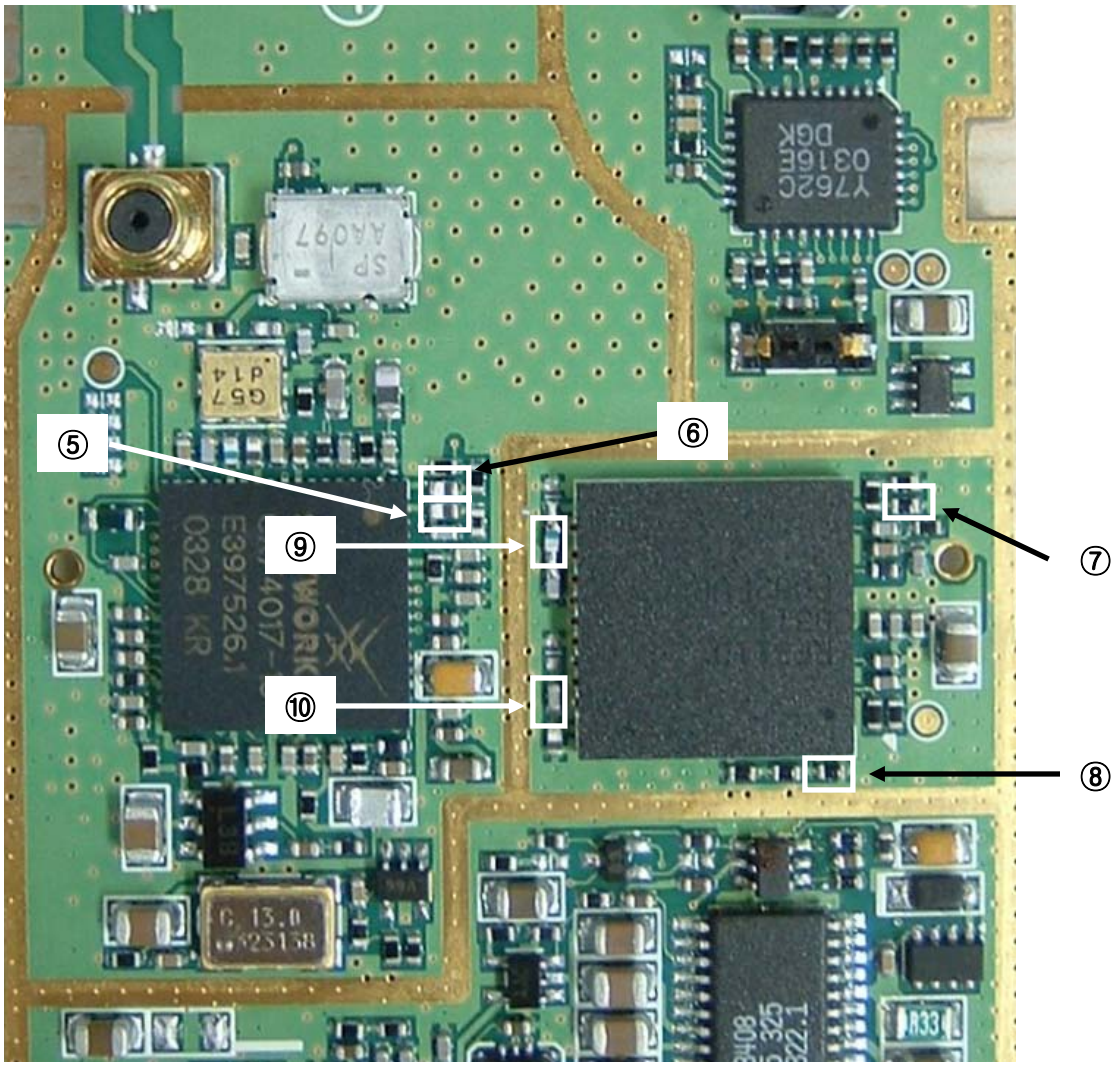
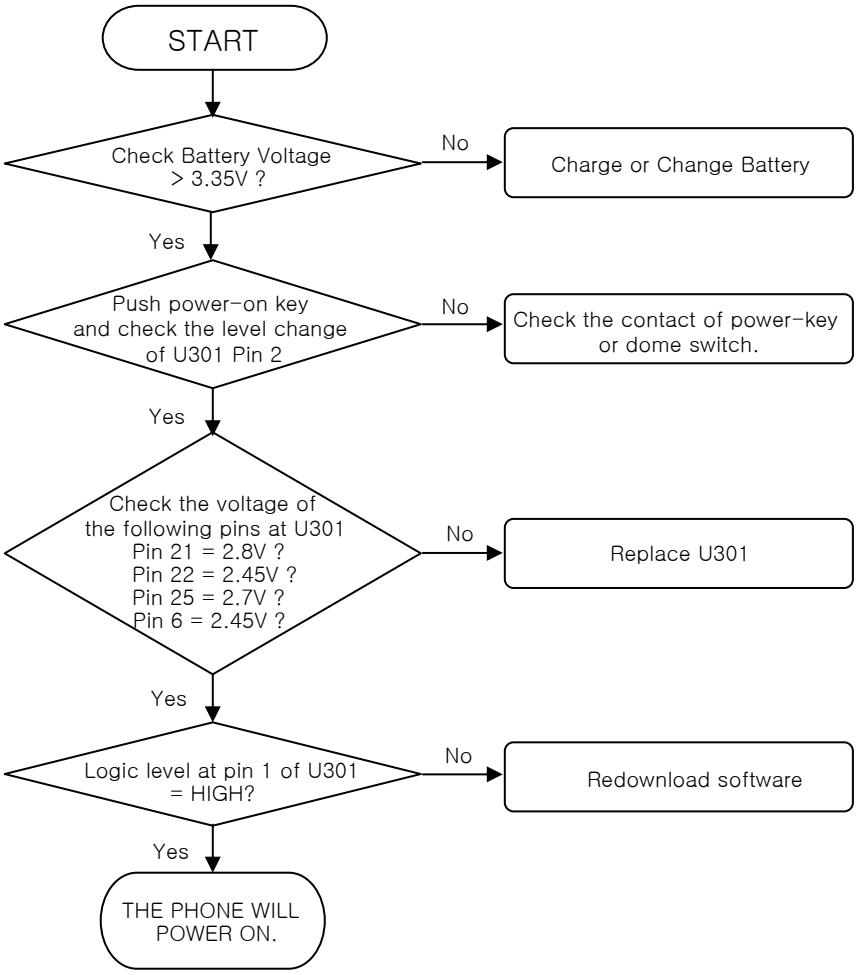


Figure 4-2. Test Points of Tx Level.

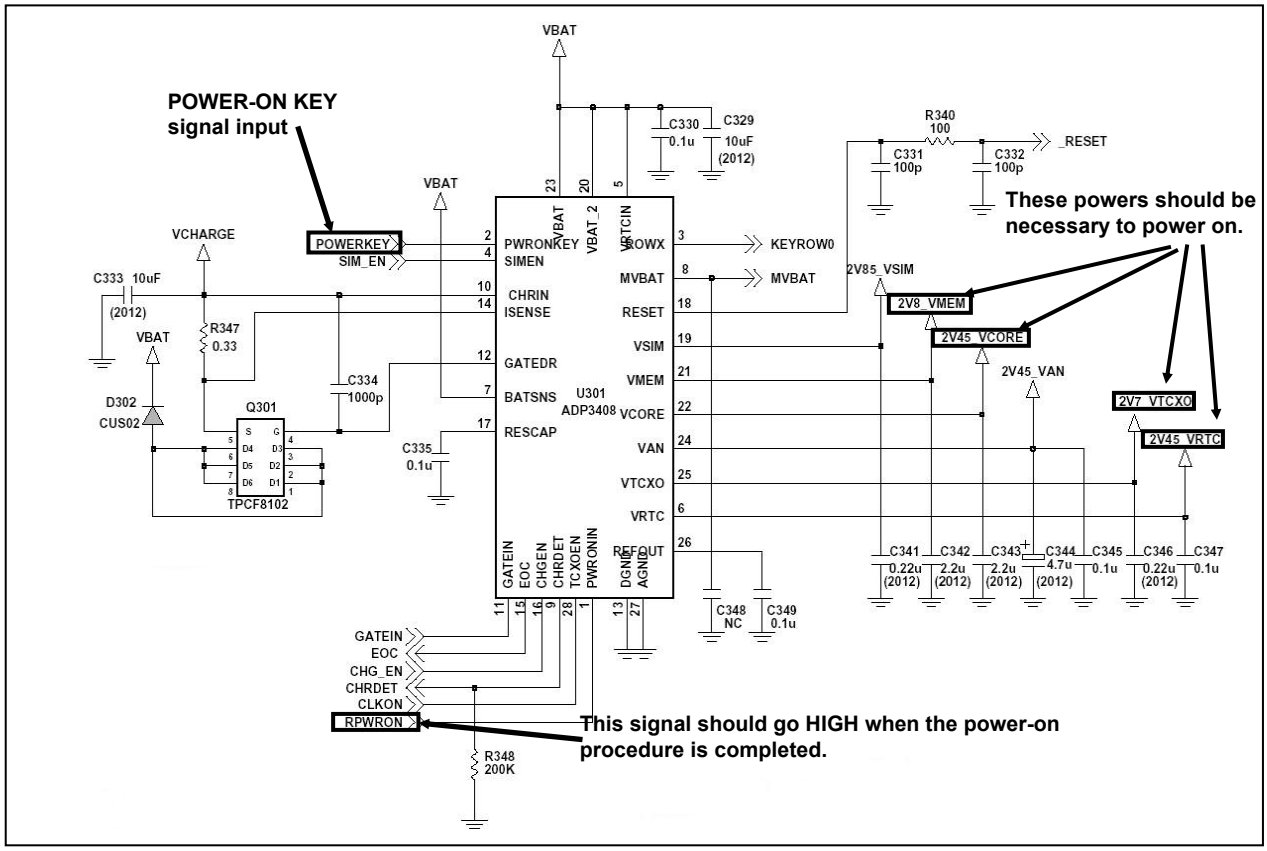
4.4 Power On Trouble

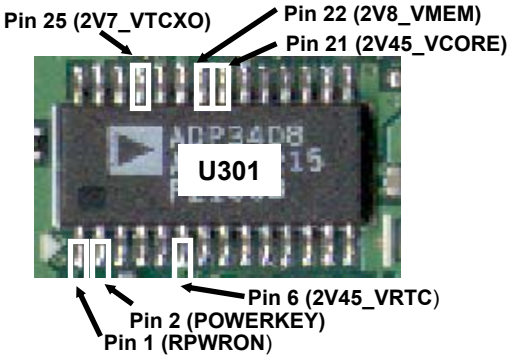
SETTING : Connect PIF, and set remote switch off at PIF.



4. TROUBLE SHOOTING

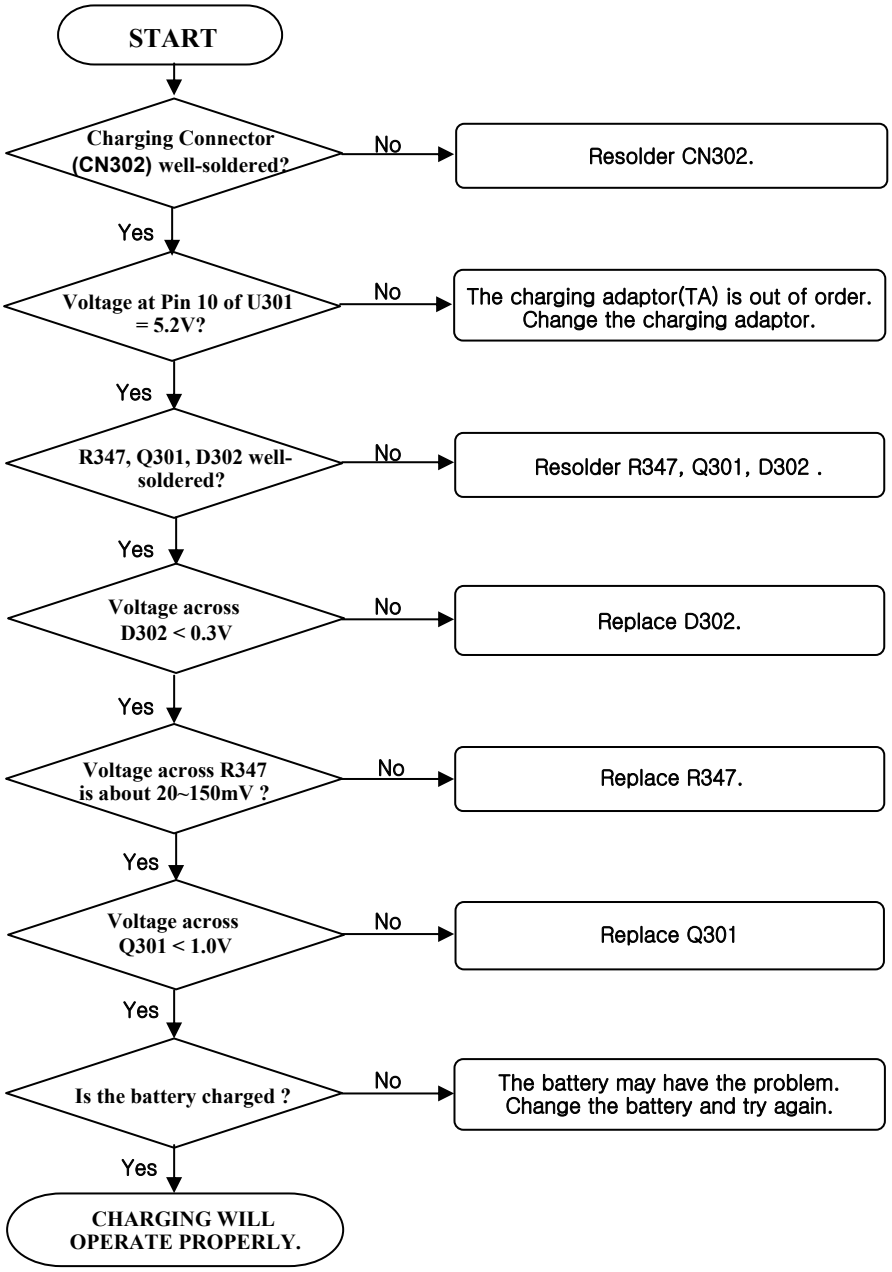
Test) U301 (ADP3408) Check!!



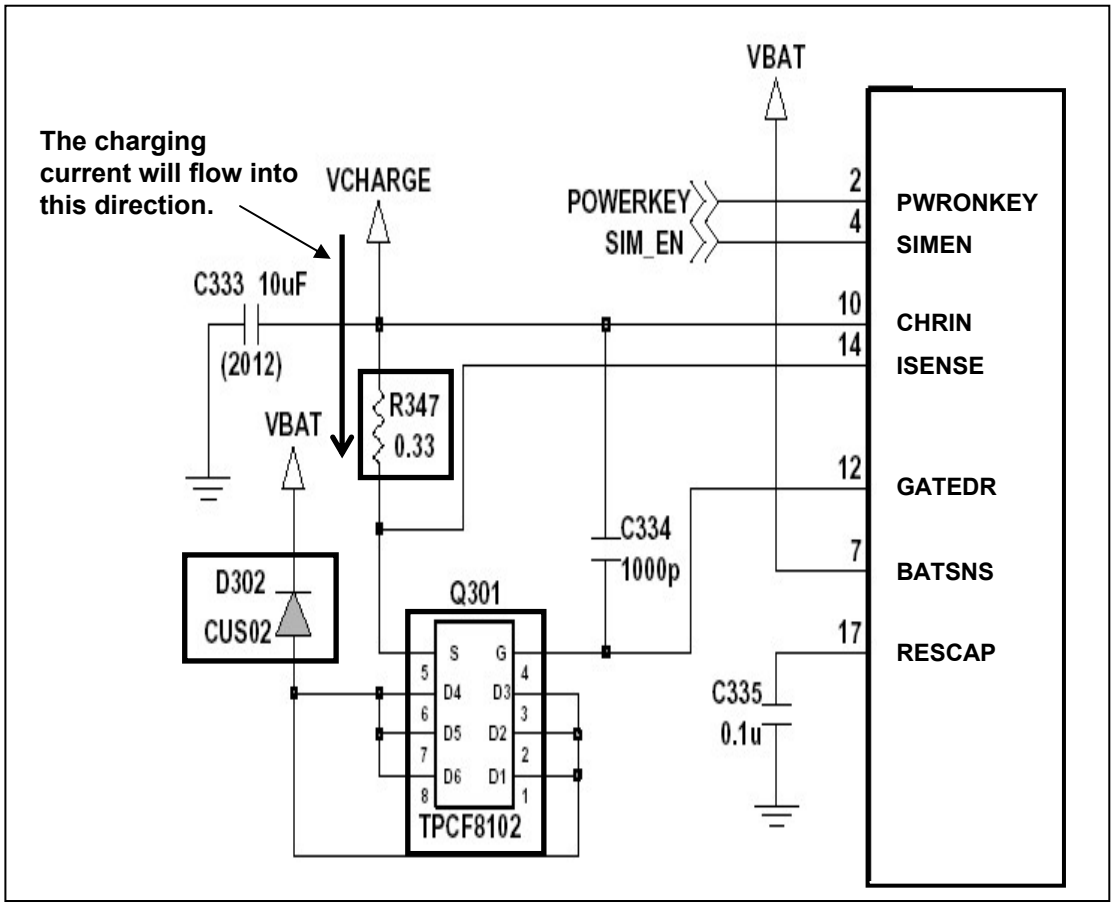


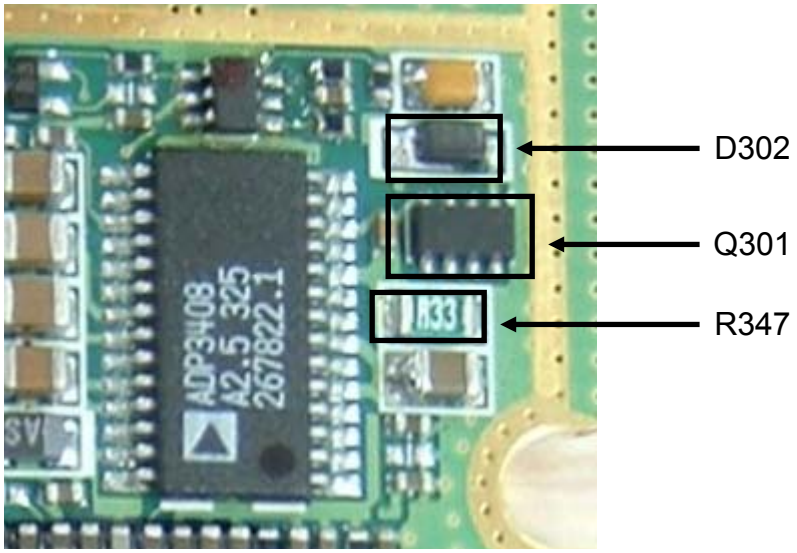
4.5 Charging Trouble

SETTING : Connect the battery and the charging adaptor(TA) to the phone.

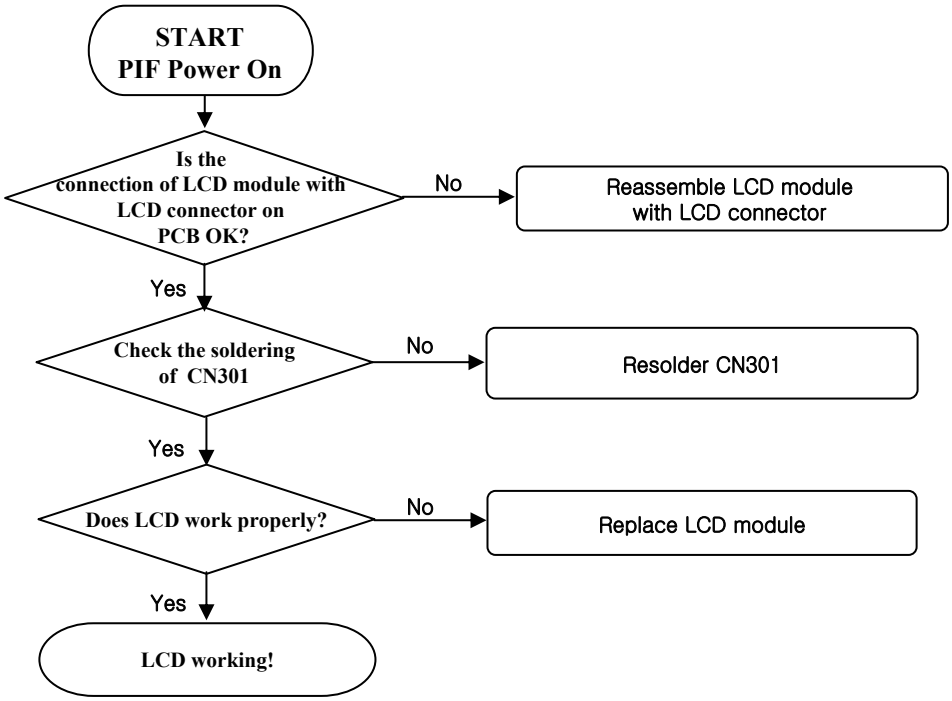


Test) Q301 & D302 Check!!

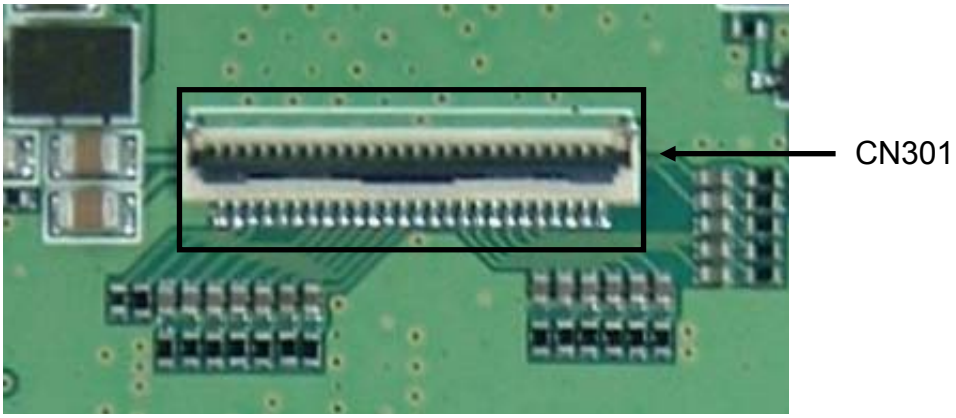




4.6 LCD Trouble



Test) CN301 Check!!



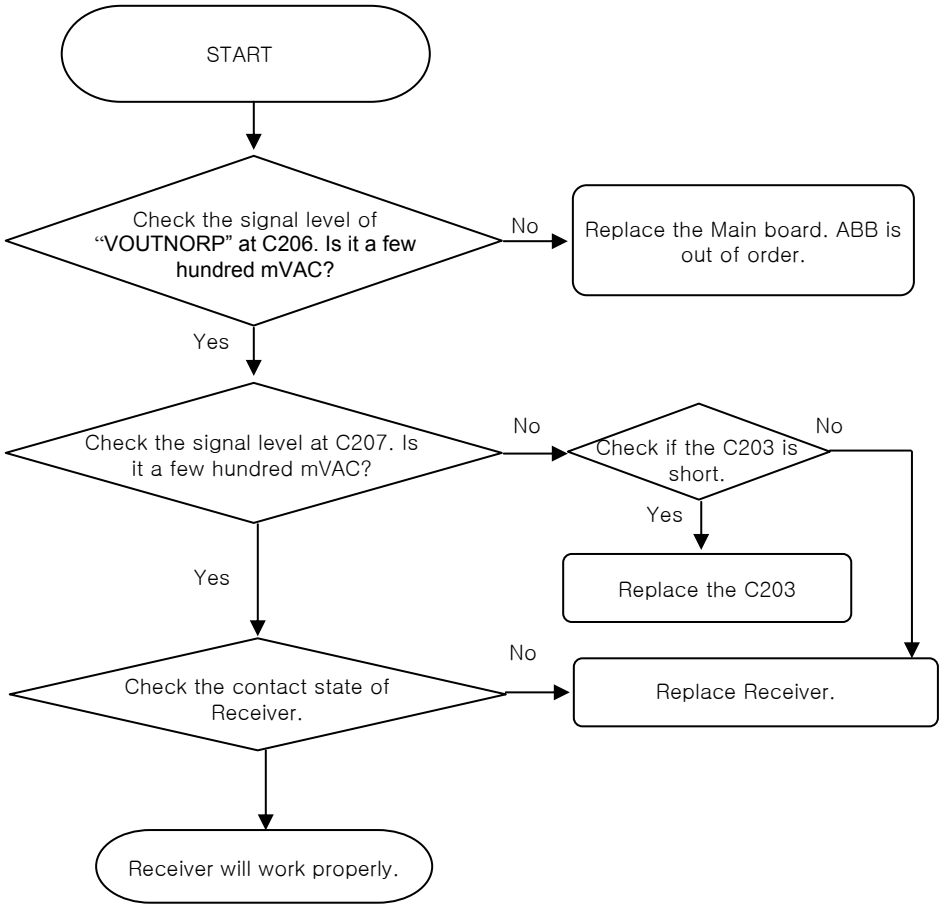
A) Check the connection between LCD & Main board

B) Check the soldering of LCD & Main board

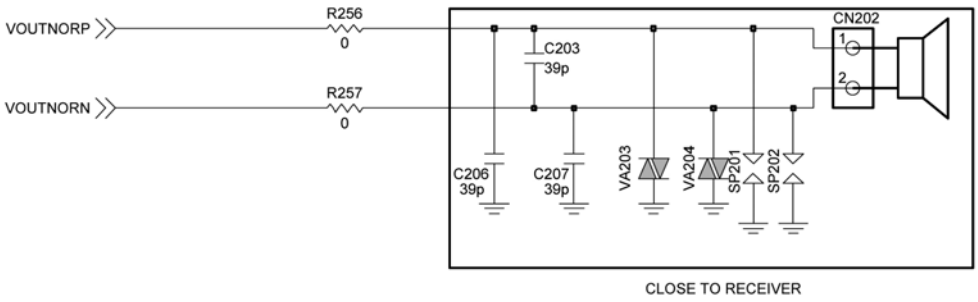
C) Replace LCD module

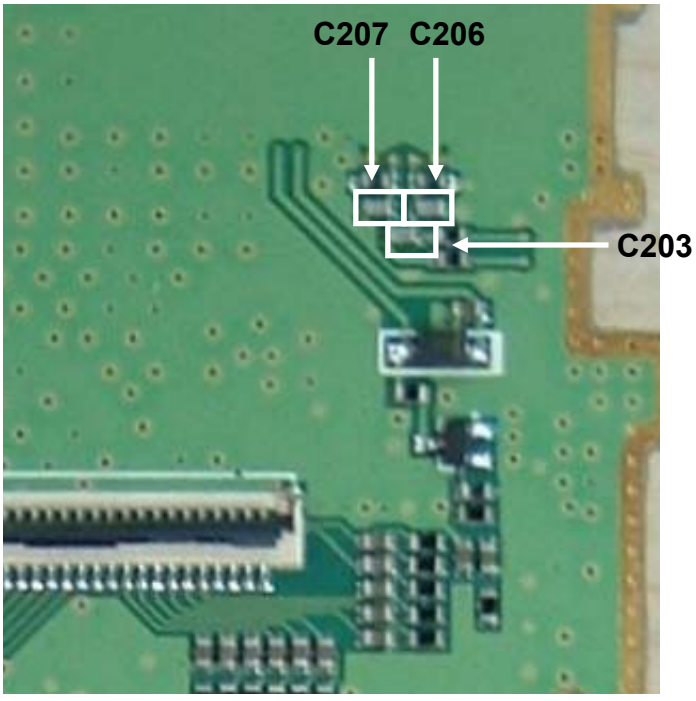
4.7 Receiver Trouble

SETTING : After Initialize Agilent 8960, Test in EGSM, DCS Mode



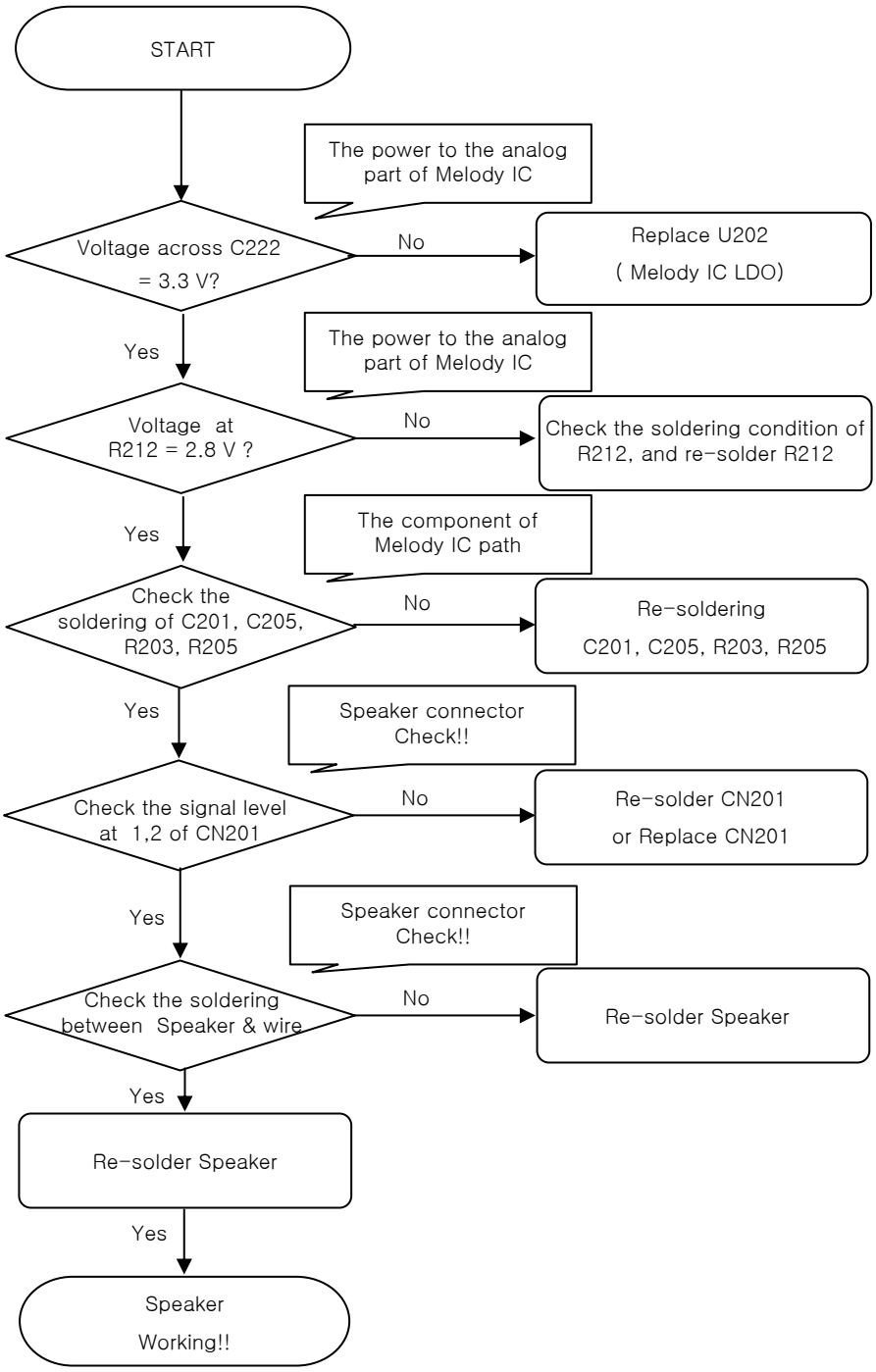
• **The Receiver part Circuit Diagram**



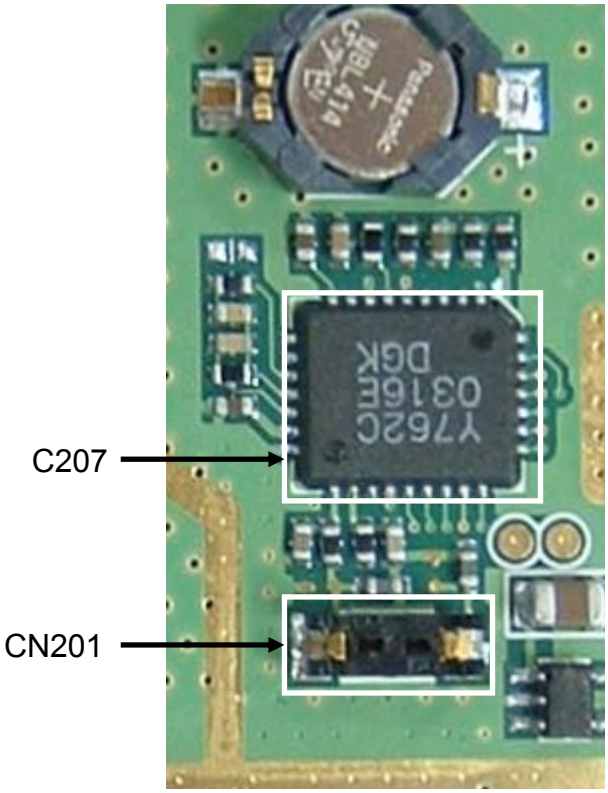


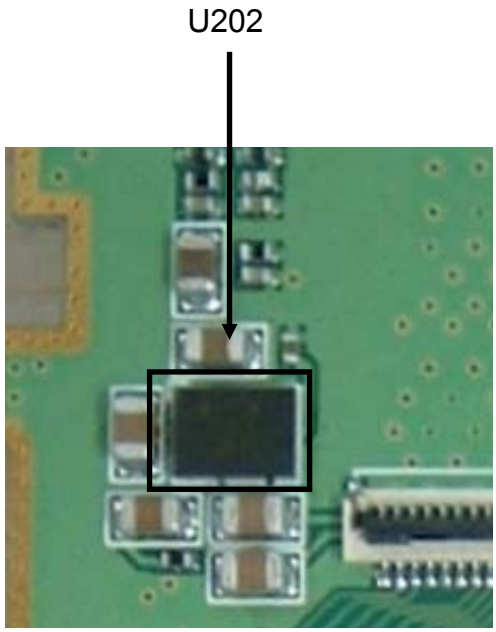
4.8 Speaker Trouble

SETTING : Connect PIF to the phone, and Power on. Enter The engineering mode, and set "Melody on" at Buzzer of BB test menu.

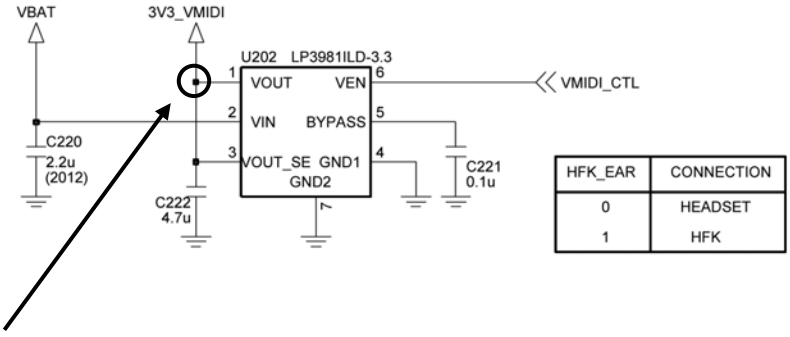


• **Test) Speaker Check!!**





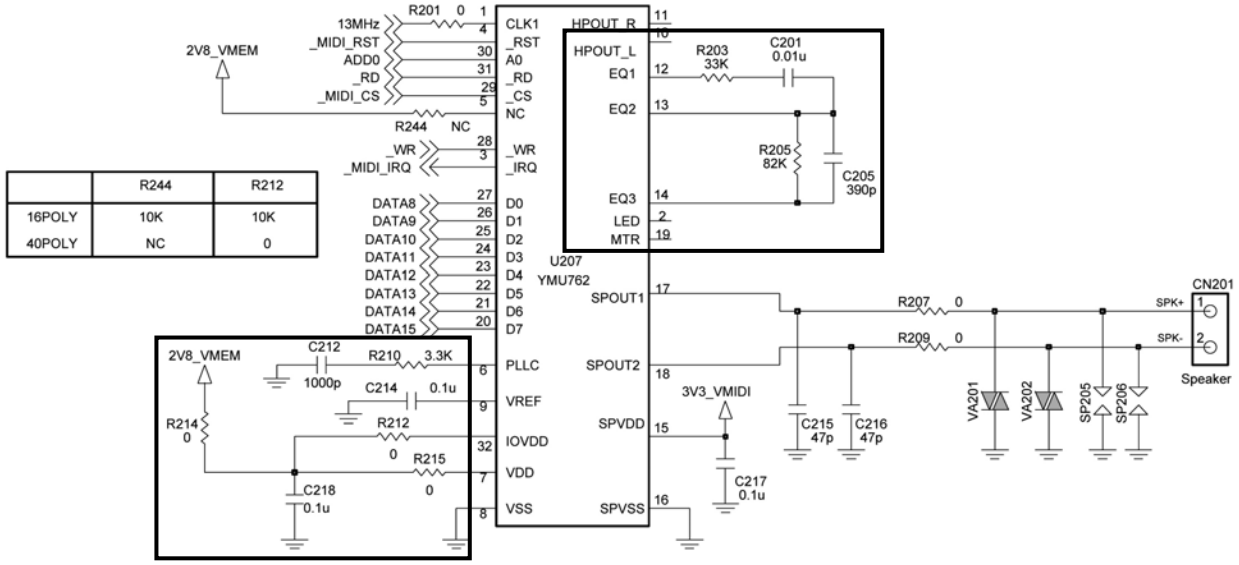
The Power for analog part of the melody IC Circuit diagram



The Power for analog part of the melody IC
The voltage is 3.3V

The Melody IC & Speaker part Circuit Diagram

These 4 components make up the analog amplified stage of melody.

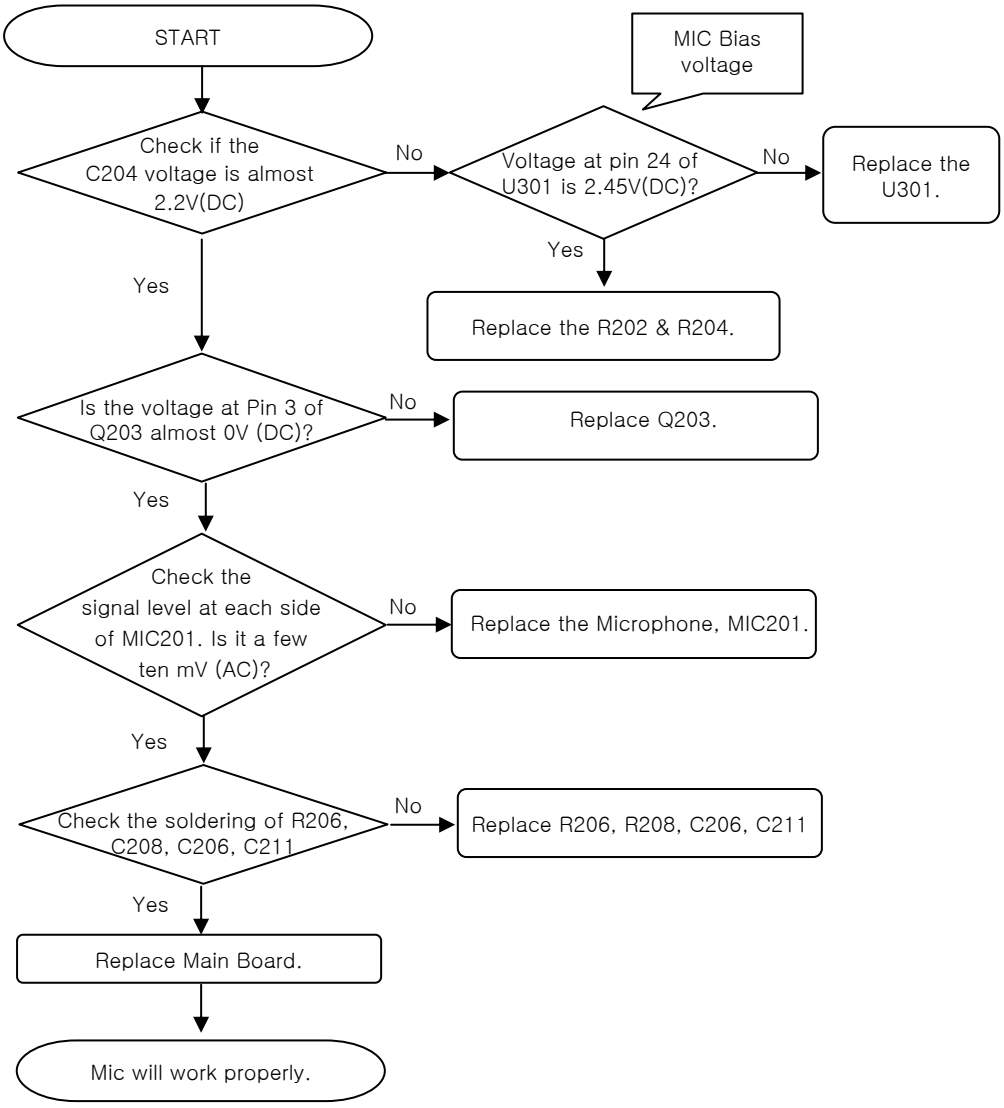


	R244	R212
16POLY	10K	10K
40POLY	NC	0

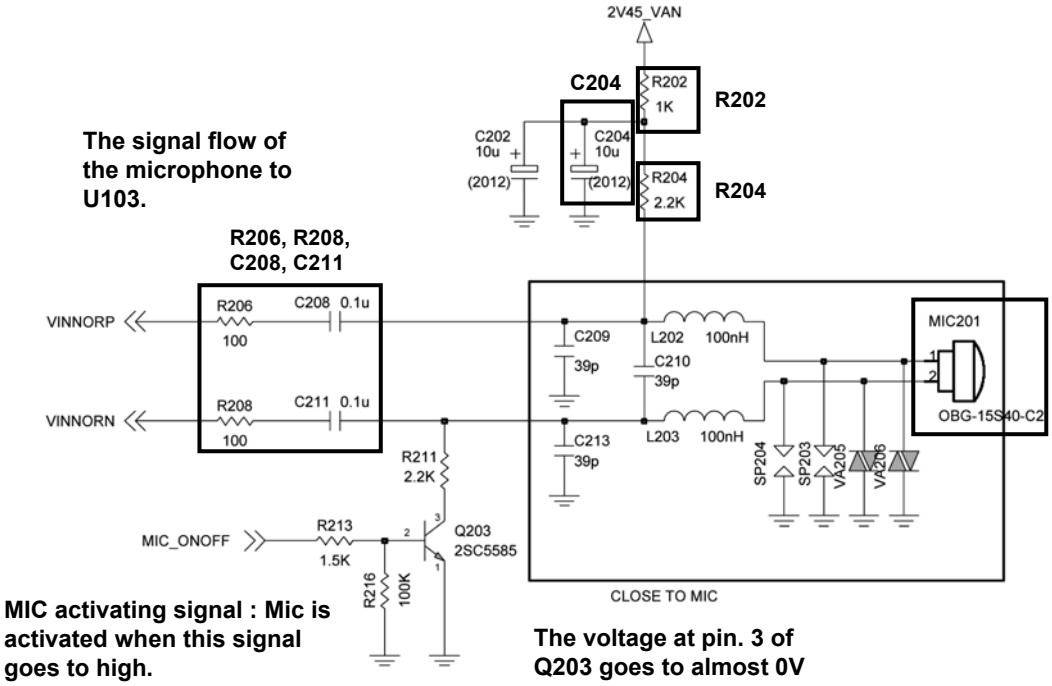
The Power for digital part of The melody IC.
The voltage is 2.8V

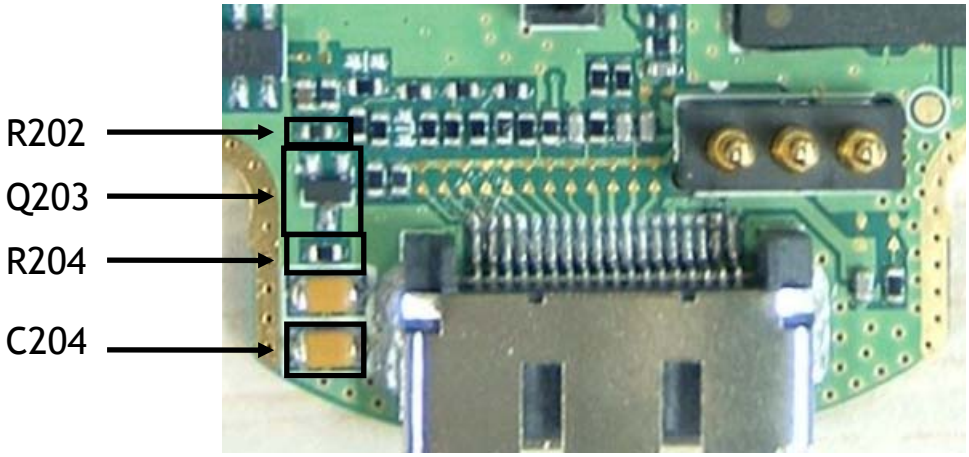
4.9 Mic. Trouble

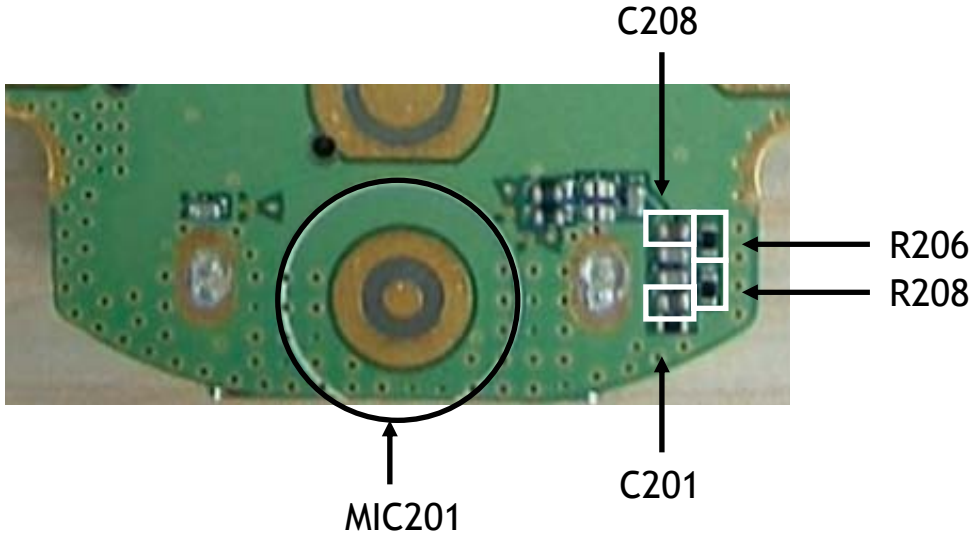
SETTING : After Initialize Agilent 8960, Test in EGSM, DCS Mode.



4. TROUBLE SHOOTING

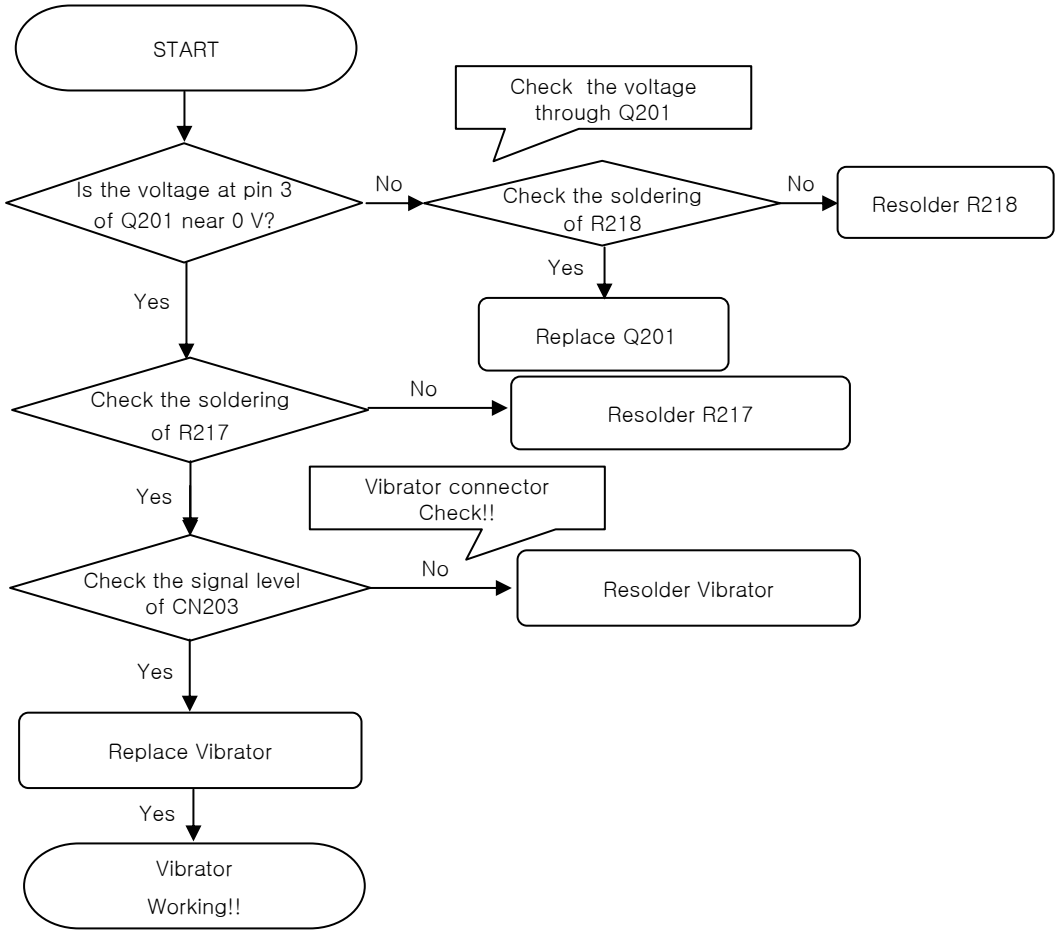


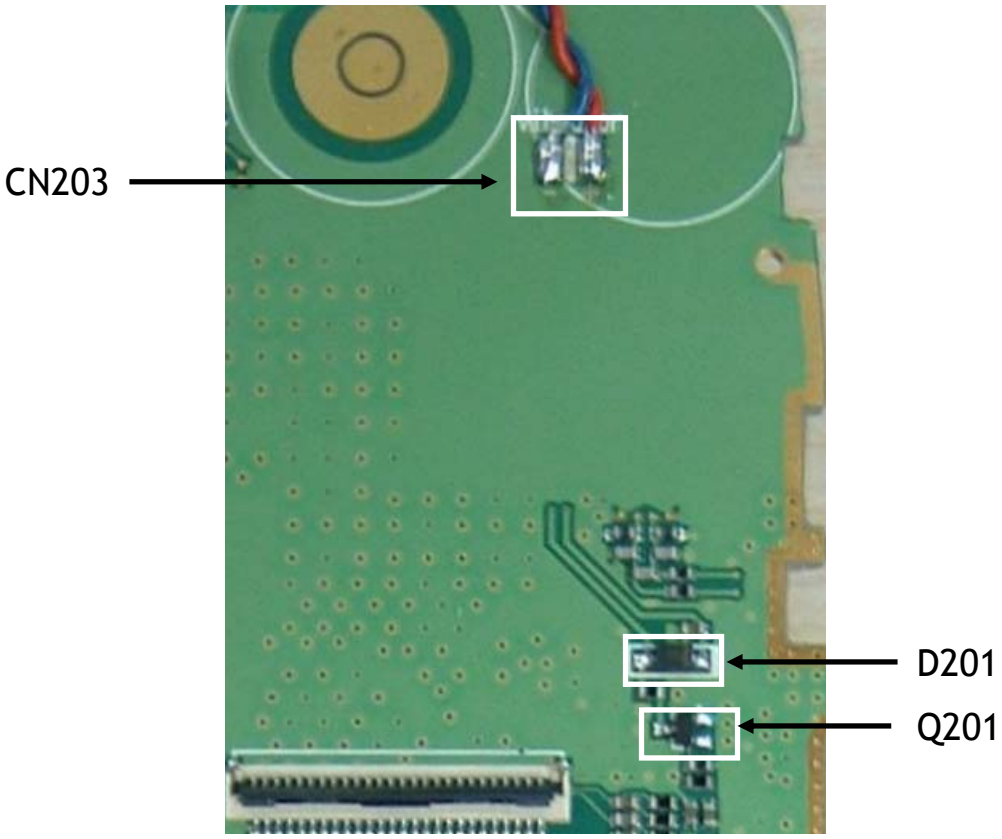

R202
Q203
R204
C204

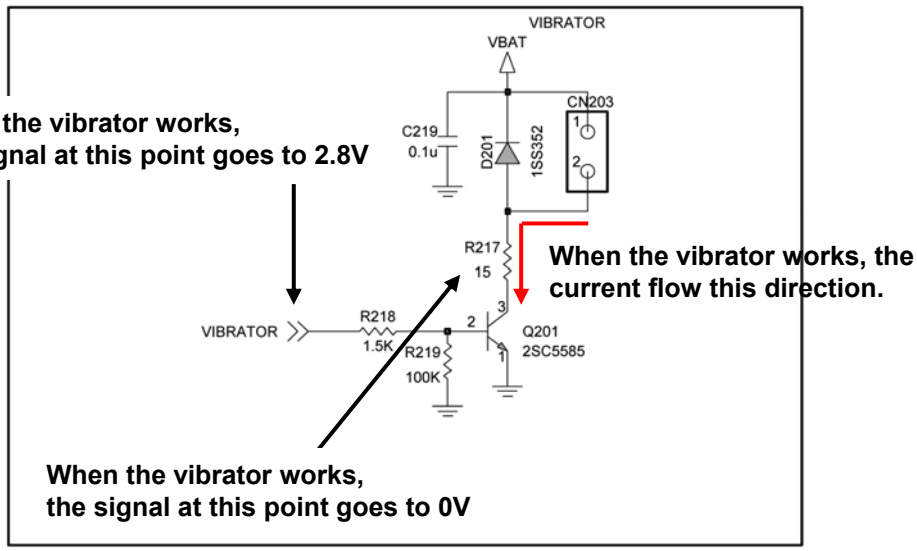

C208
R206
R208
C201
MIC201

4.10 Vibrator Trouble

SETTING : After Initialize Agilent 8960, Test in EGSM, Connect PIF to the phone, and Power on. Enter The engineering mode, and set 'Vibrator on' at Vibration of BB test menu.

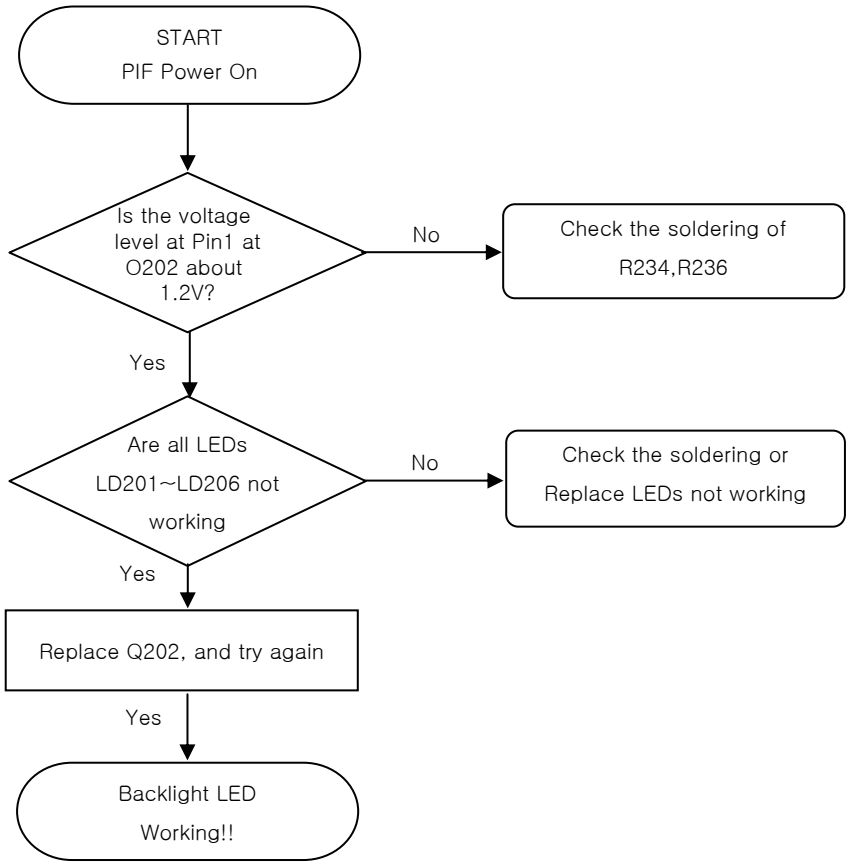



CN203
D201
Q201

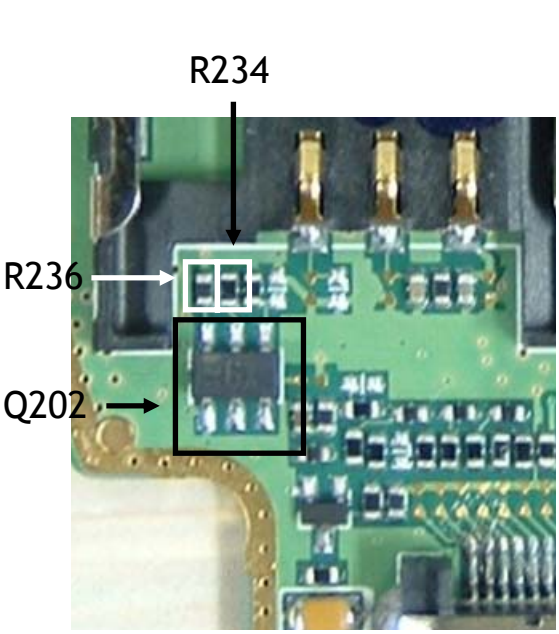

When the vibrator works,
the signal at this point goes to 2.8V
VIBRATOR
VBAT
CN203
C219
0.1u
D201
1SS352
R217
15
When the vibrator works, the
current flow this direction.
VIBRATOR
R218
1.5K
R219
100K
Q201
2SC5585
When the vibrator works,
the signal at this point goes to 0V

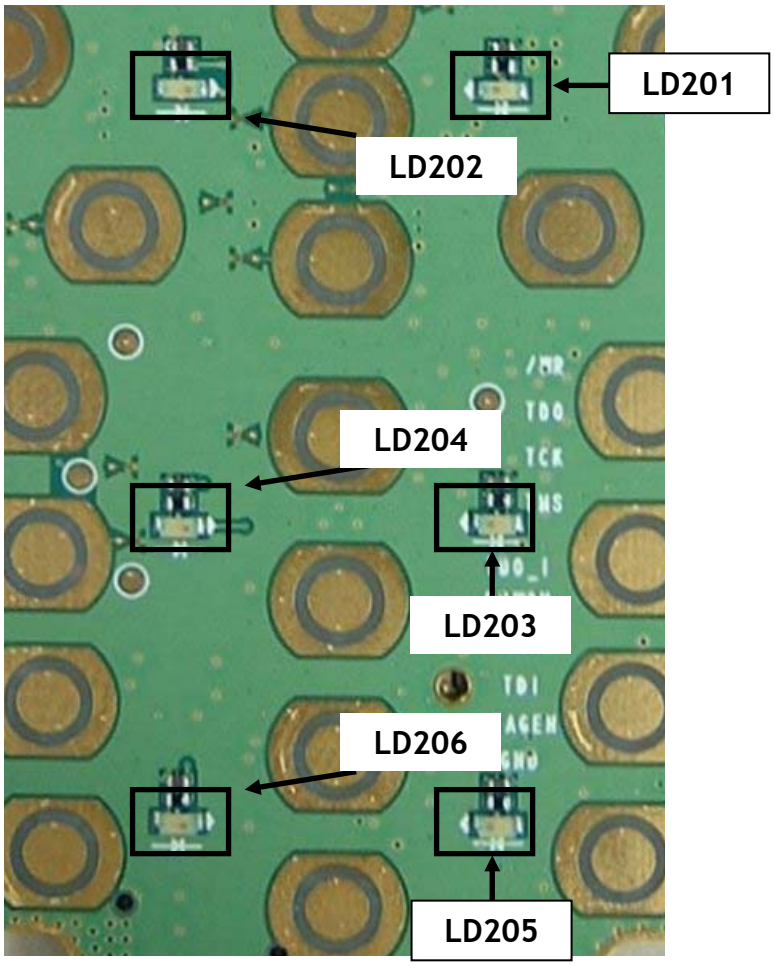
4.11 Key Backlight LED Trouble

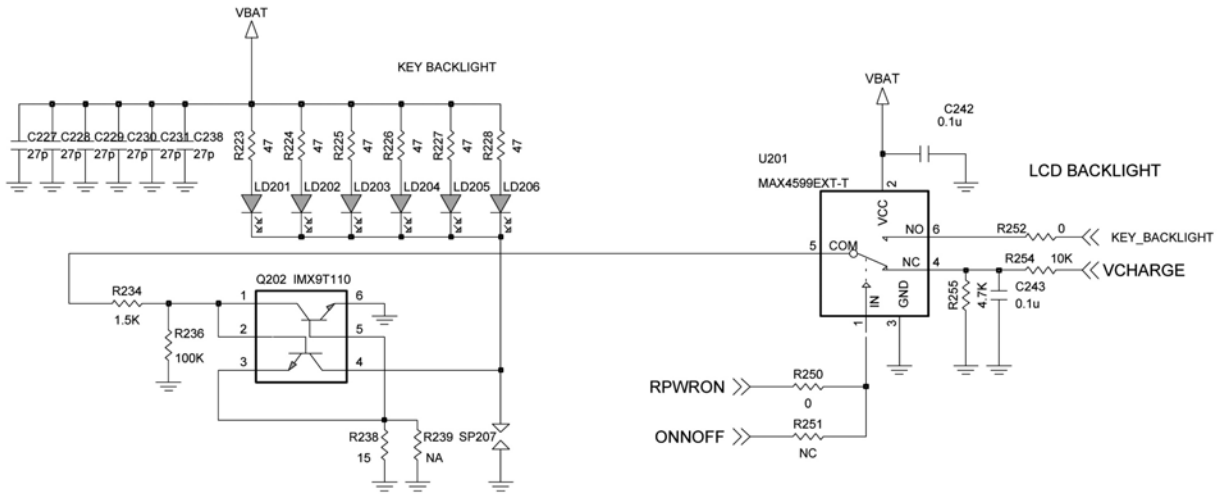
SETTING : Connect PIF to the phone, and power on. Enter engineering mode, and set "Backlight on" in "at" "BB test-Backlight" menu



• **Test) LD201~LD206 & Q201 Check!!**



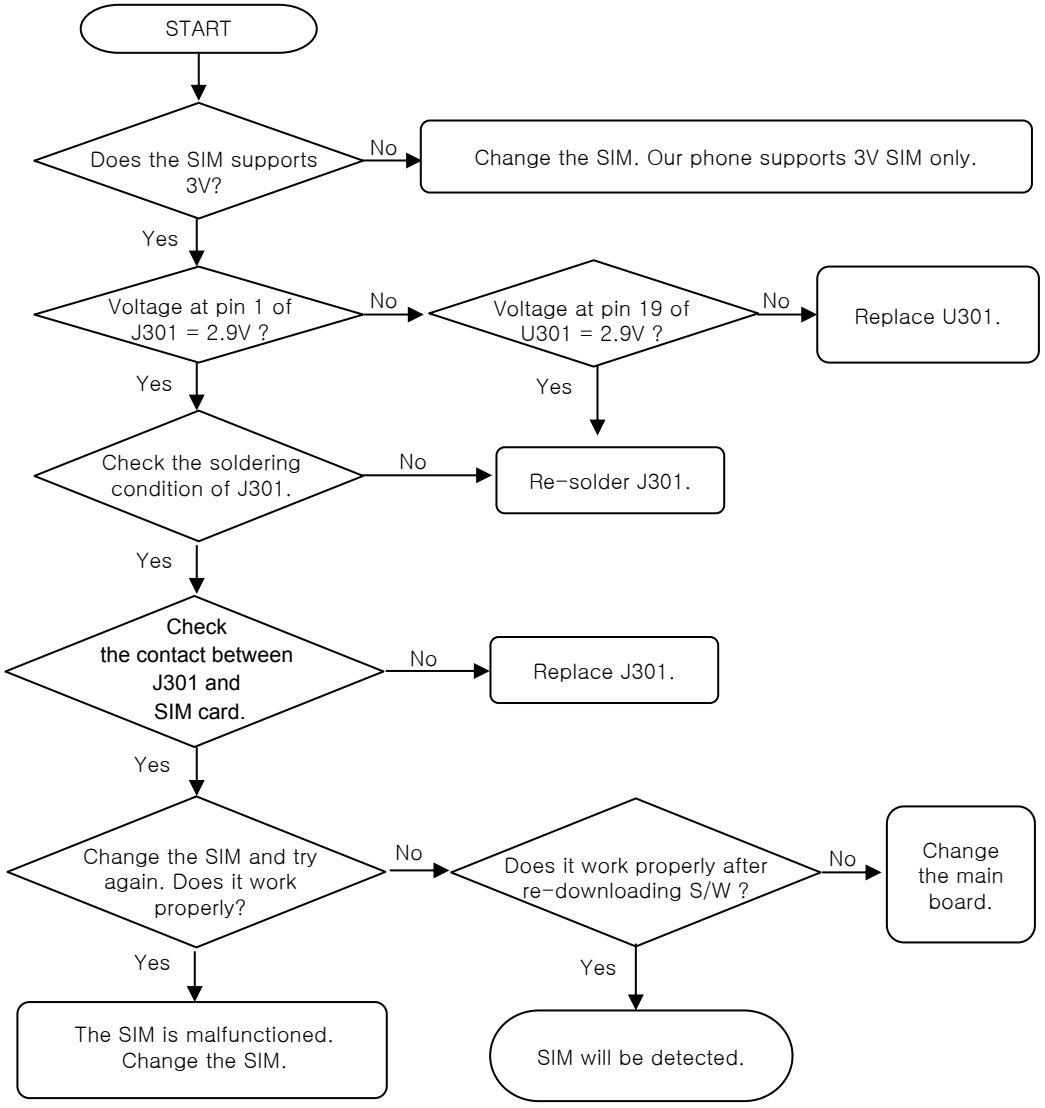




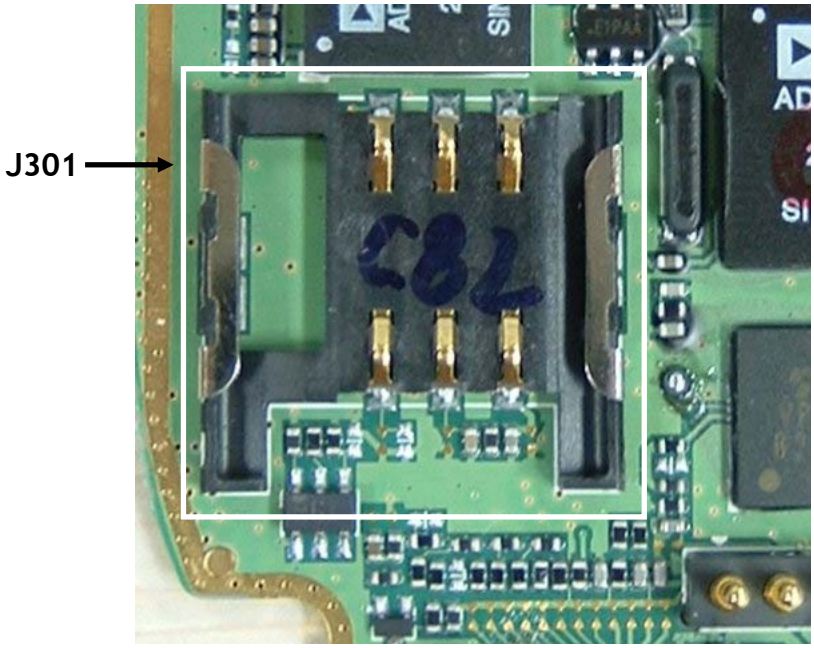
A) Check the diode LD201~LD206.
B) Check the current through Q202.

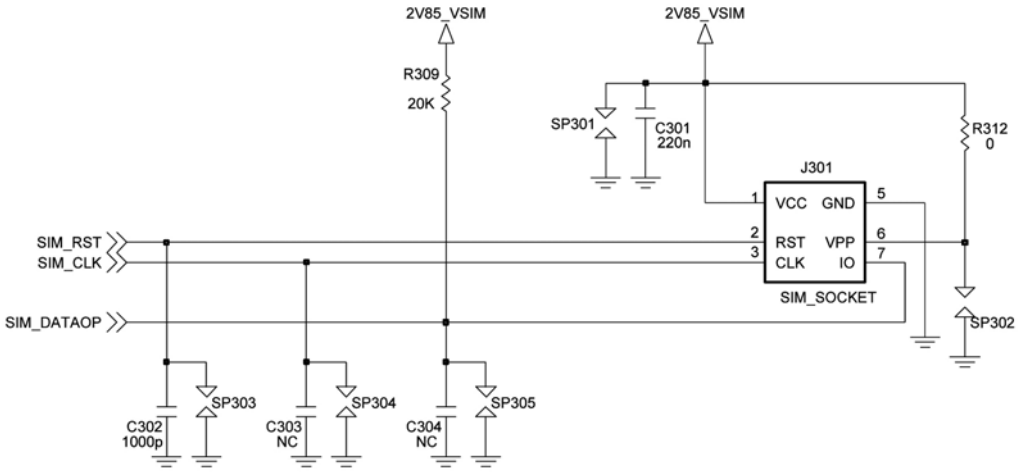
4.12 SIM Detect Trouble

SETTING : Insert the SIM into J301. Connect PIF to the phone, and power on.



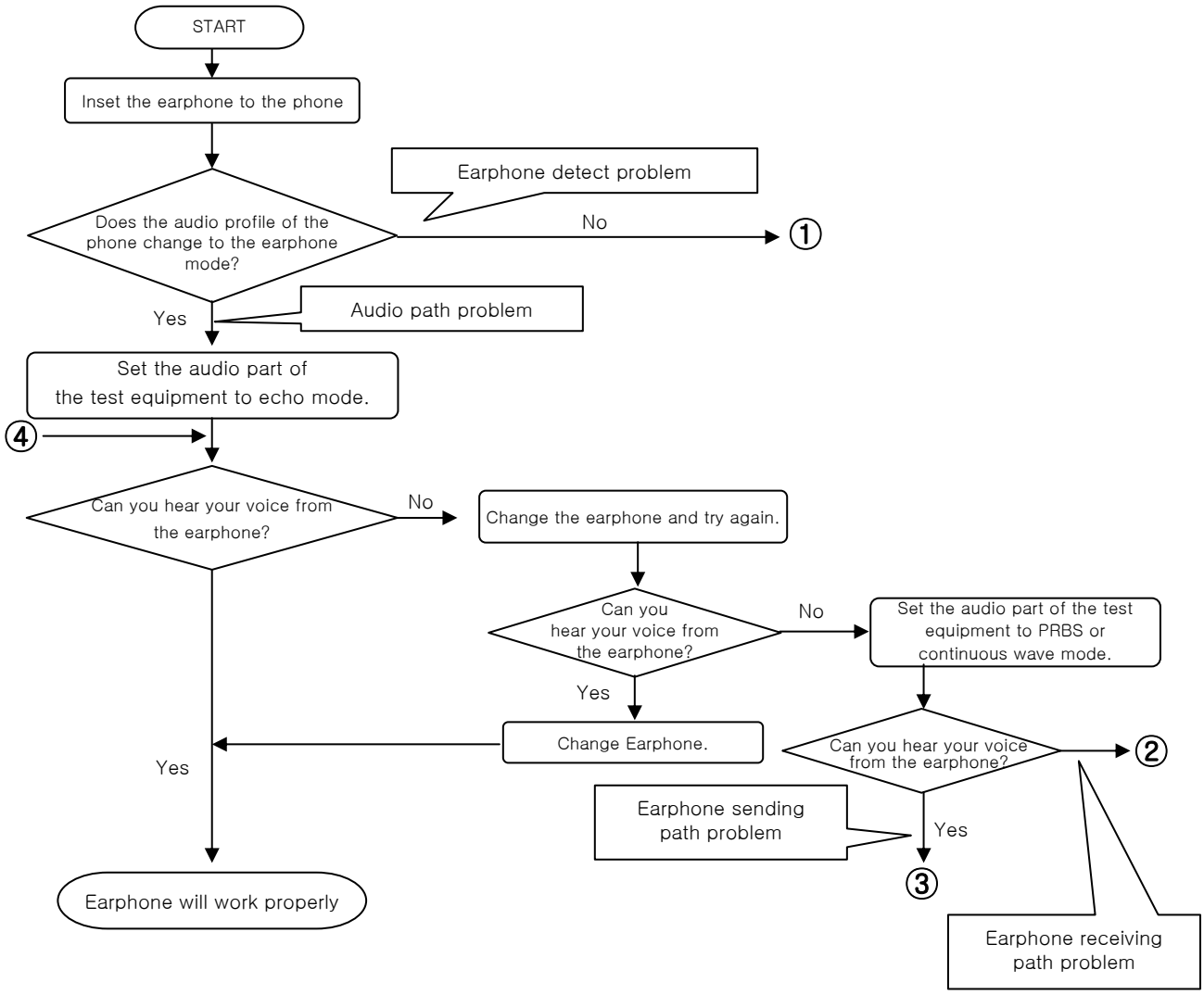
• **Test) SIM Connector Check!!**

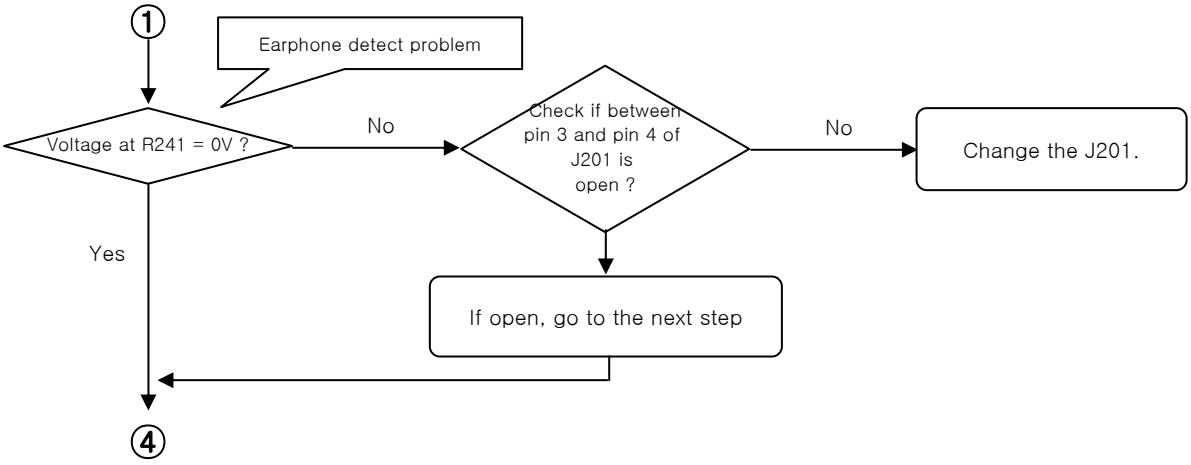


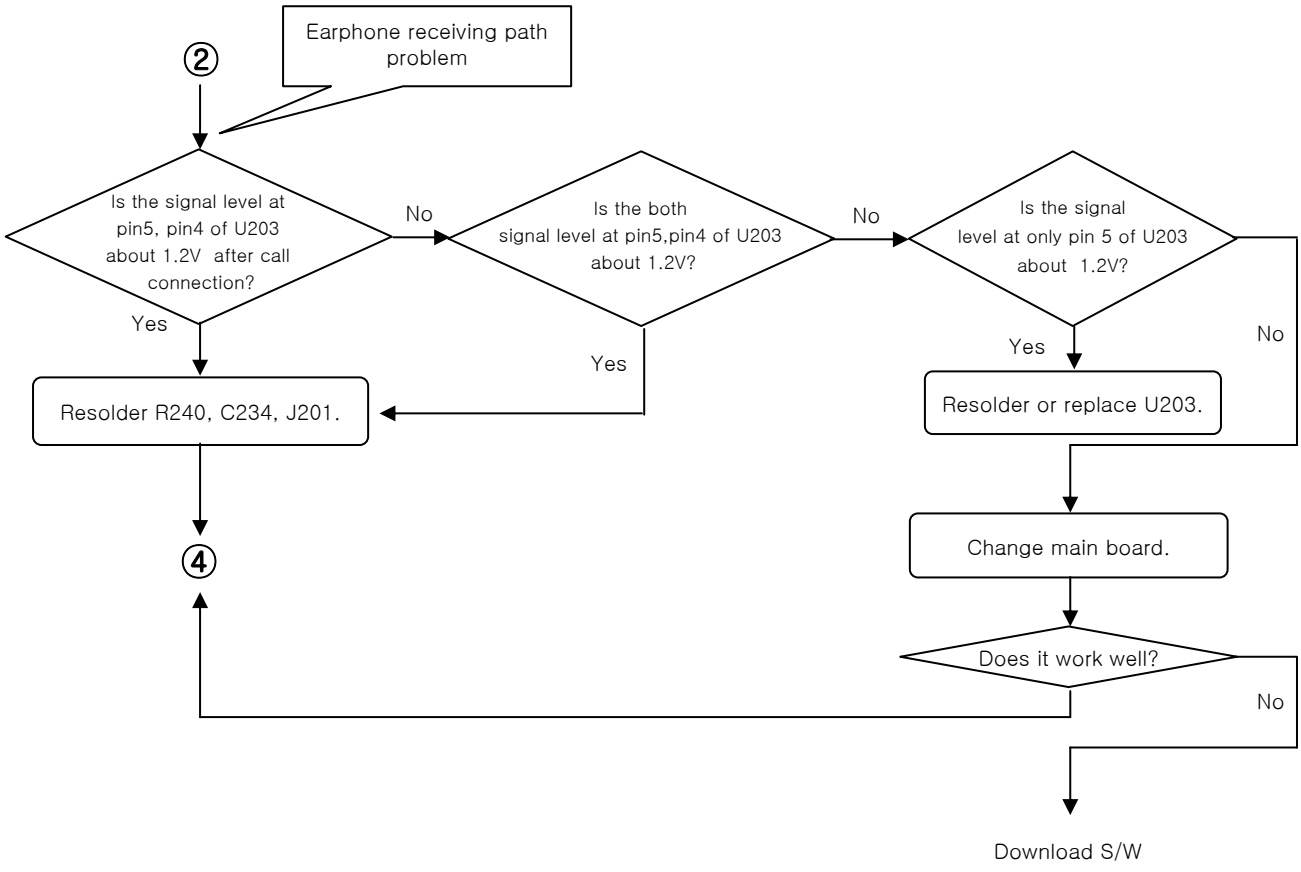


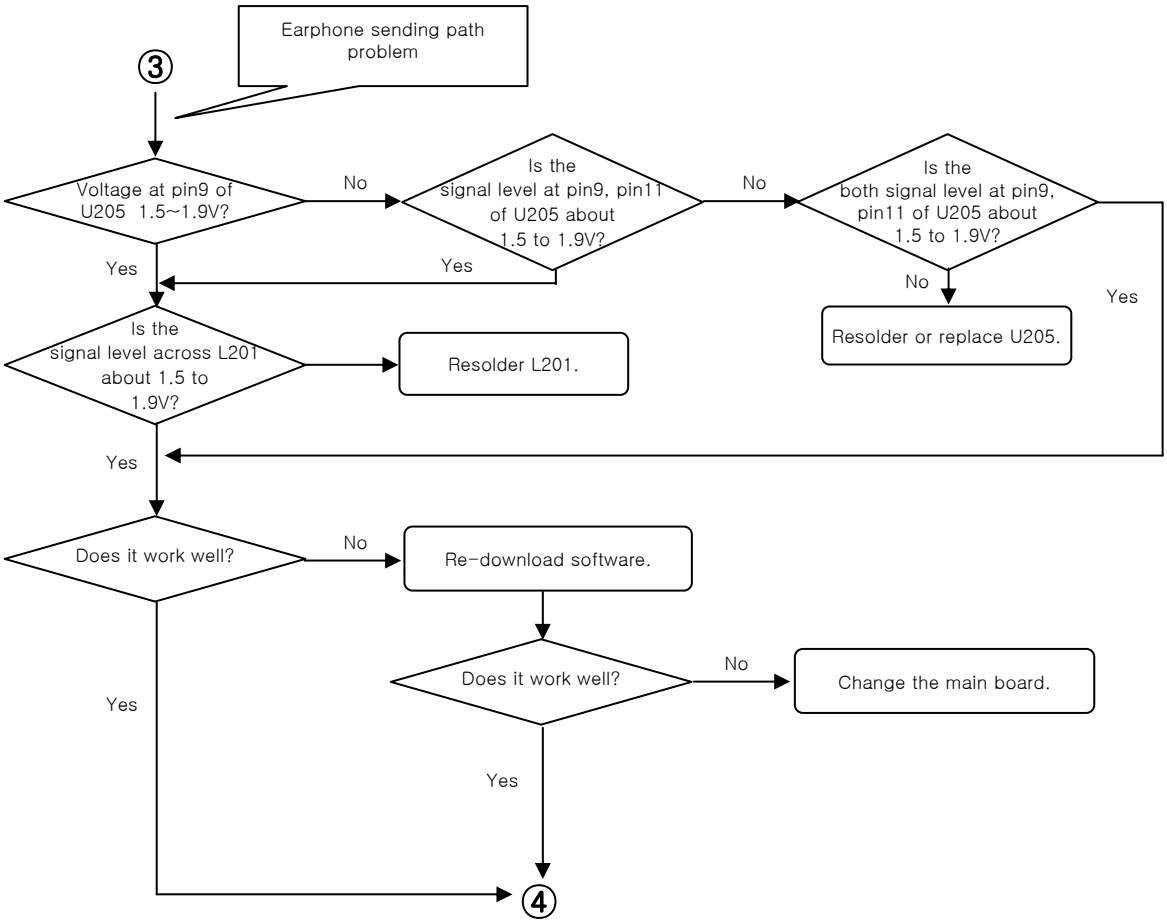
4.13 Earphone Trouble

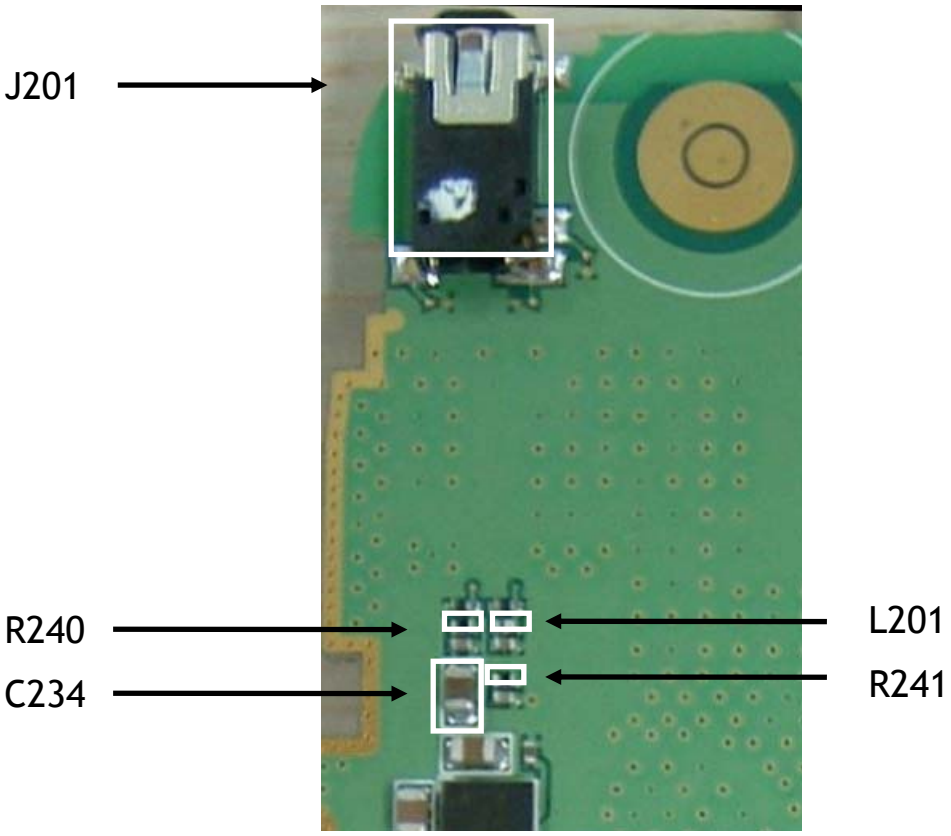
SETTING : After Initialize Agilent 8960, Test in EGSM, DCS Mode.

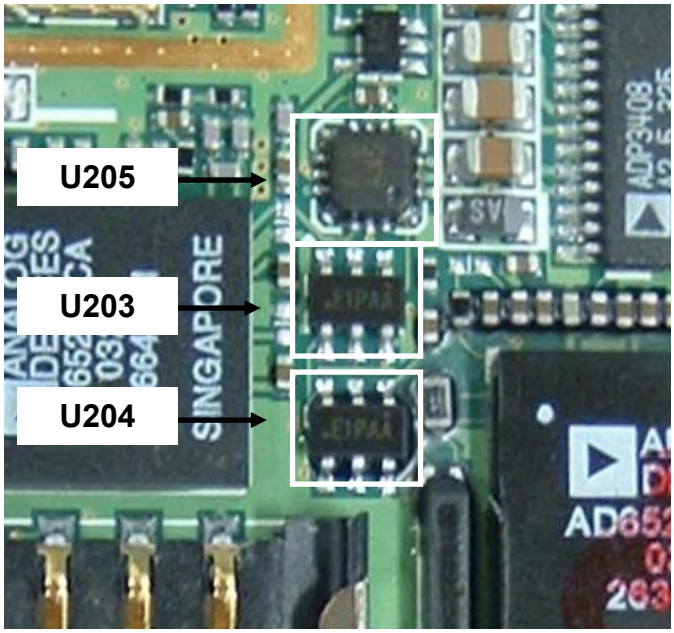



①
Earphone detect problem
Voltage at R241 = 0V ?
No
Check if between pin 3 and pin 4 of J201 is open ?
No
Change the J201.
Yes
If open, go to the next step
④

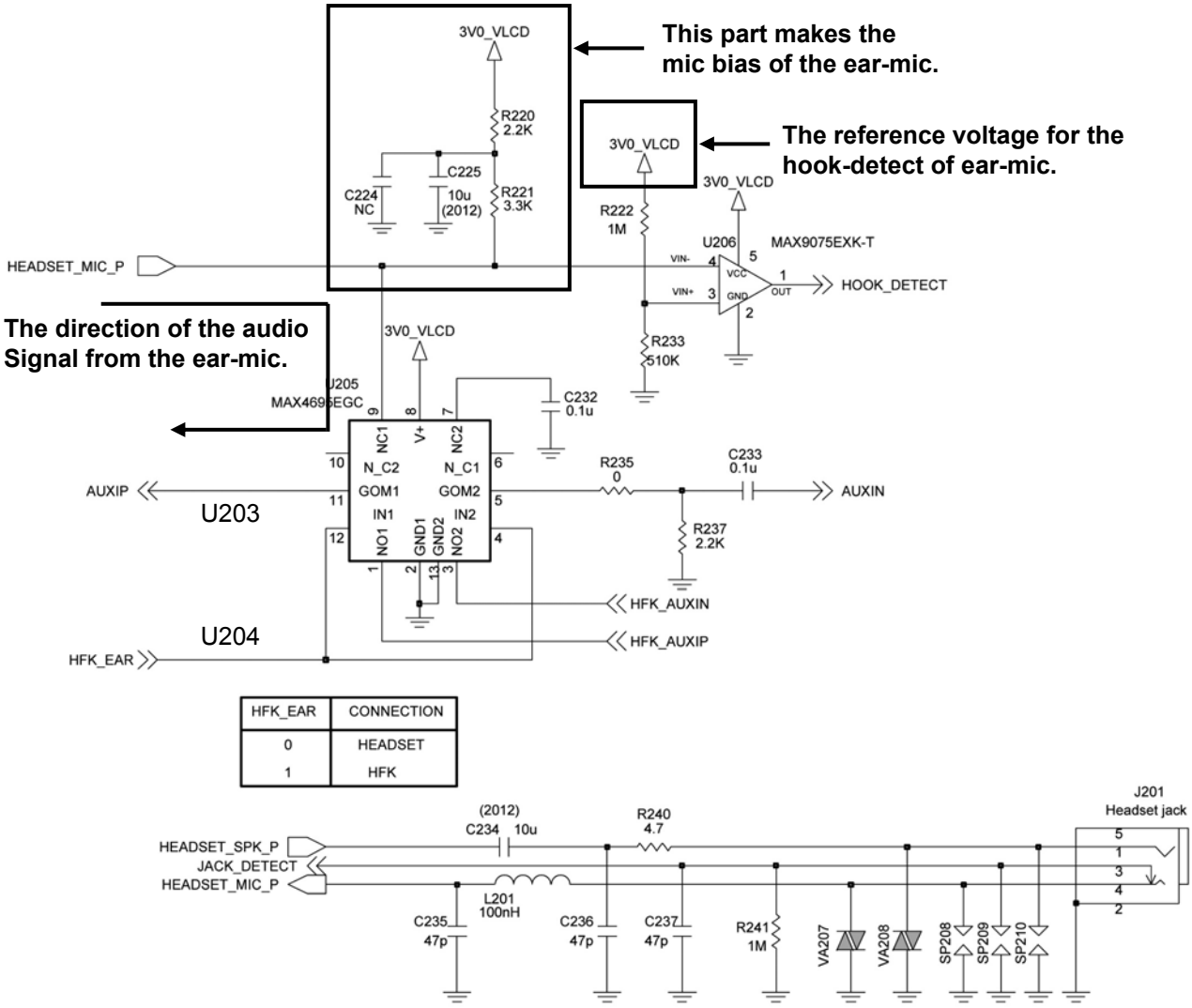

②
Earphone receiving path problem
Is the signal level at pin5, pin4 of U203 about 1.2V after call connection?
No
Is the both signal level at pin5,pin4 of U203 about 1.2V?
No
Is the signal level at only pin 5 of U203 about 1.2V?
Yes
Yes
No
Yes
Resolder R240, C234, J201.
Resolder or replace U203.
④
Change main board.
Does it work well?
No
Download S/W


Earphone sending path problem
③
Voltage at pin9 of U205 1.5~1.9V?
No
Is the signal level at pin9, pin11 of U205 about 1.5 to 1.9V?
No
Is the both signal level at pin9, pin11 of U205 about 1.5 to 1.9V?
Yes
Yes
No
Yes
Resolder or replace U205.
Is the signal level across L201 about 1.5 to 1.9V?
Resolder L201.
Yes
Does it work well?
No
Re-download software.
Does it work well?
No
Change the main board.
Yes
Yes
④


J201
R240
C234
L201
R241


U205
U203
U204
SINGAPORE
ADP3408

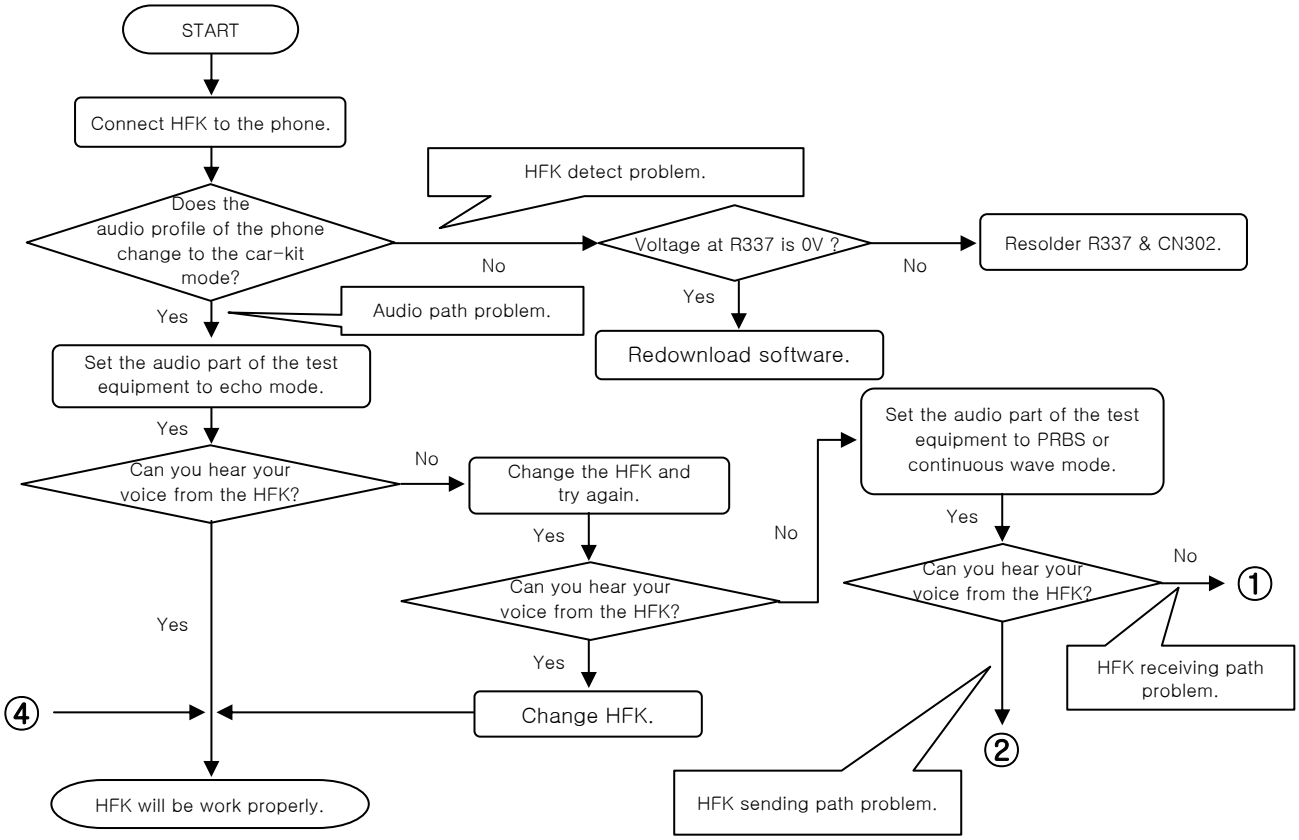
4. TROUBLE SHOOTING

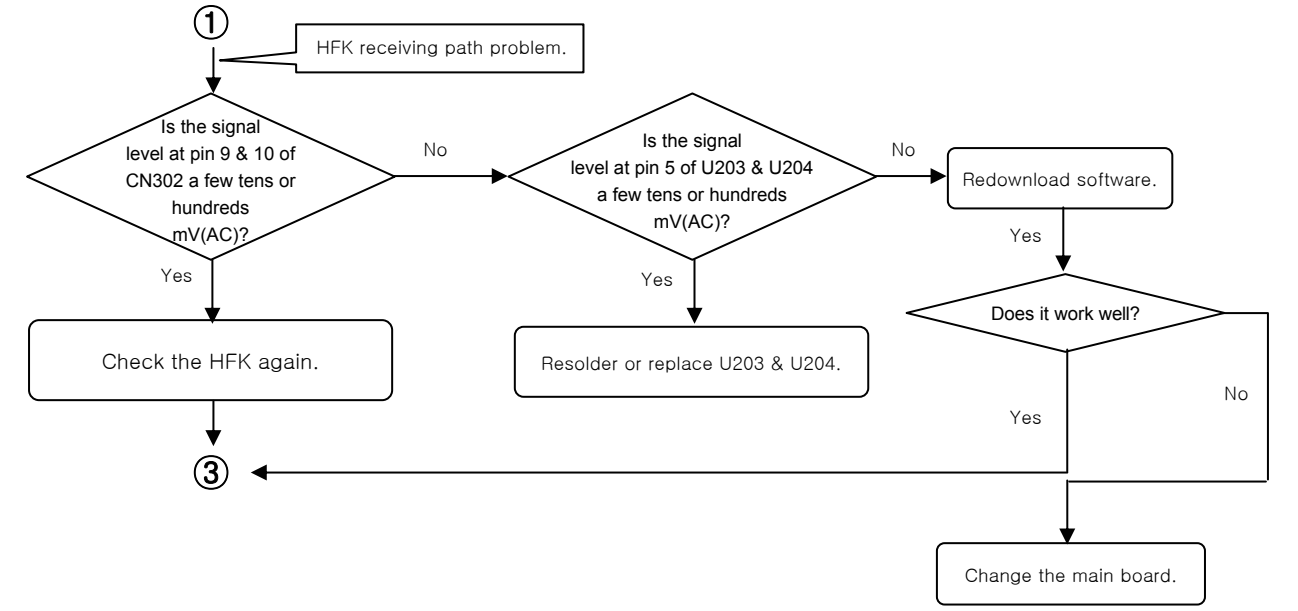


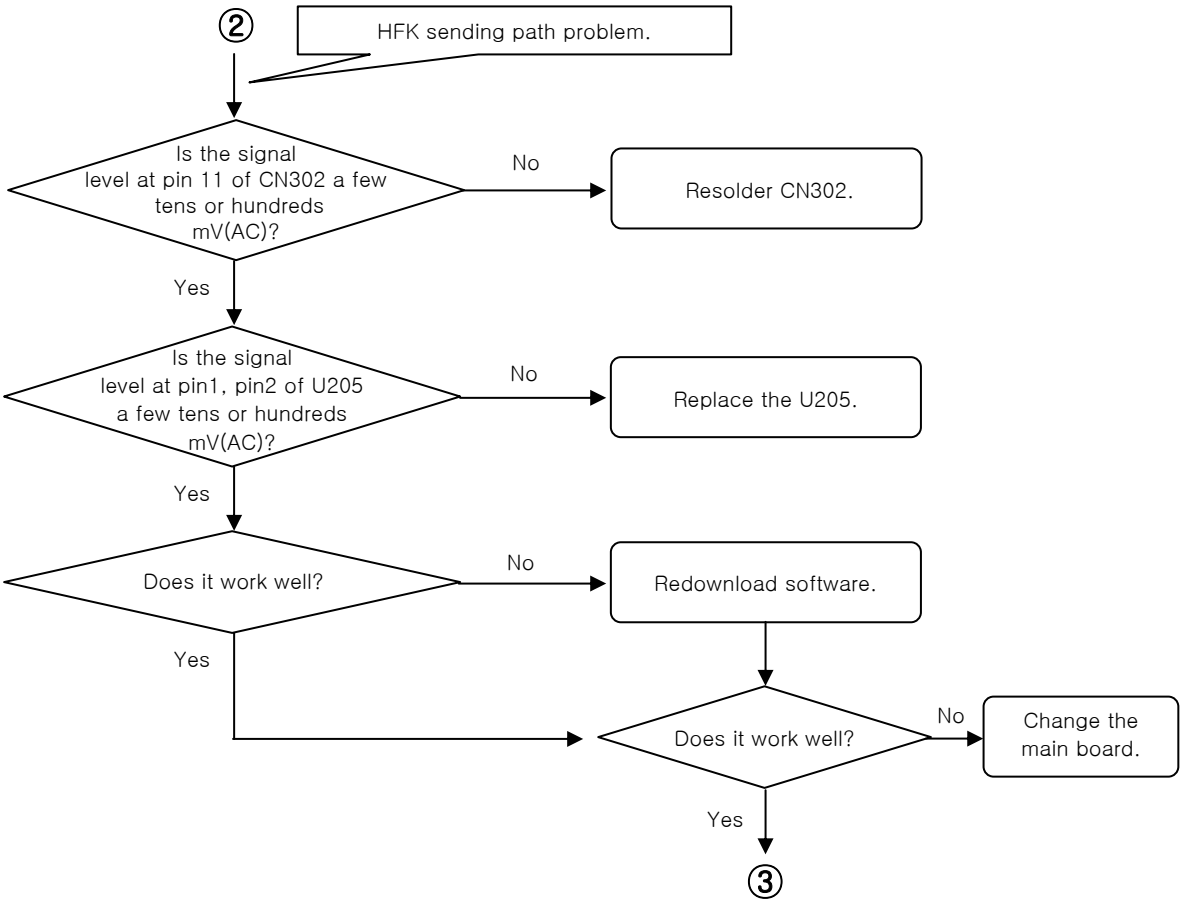
Ear-mic detection part

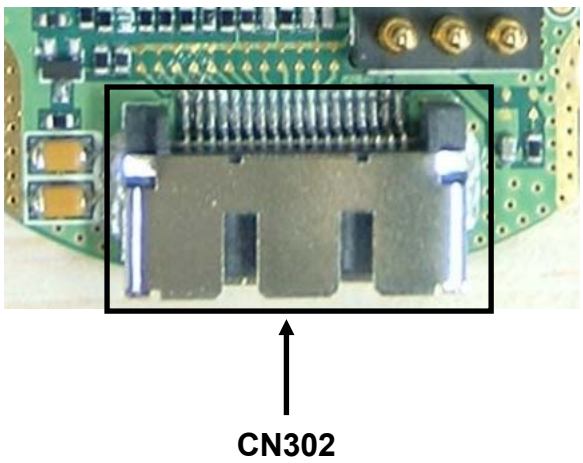
4.14 HFK Trouble

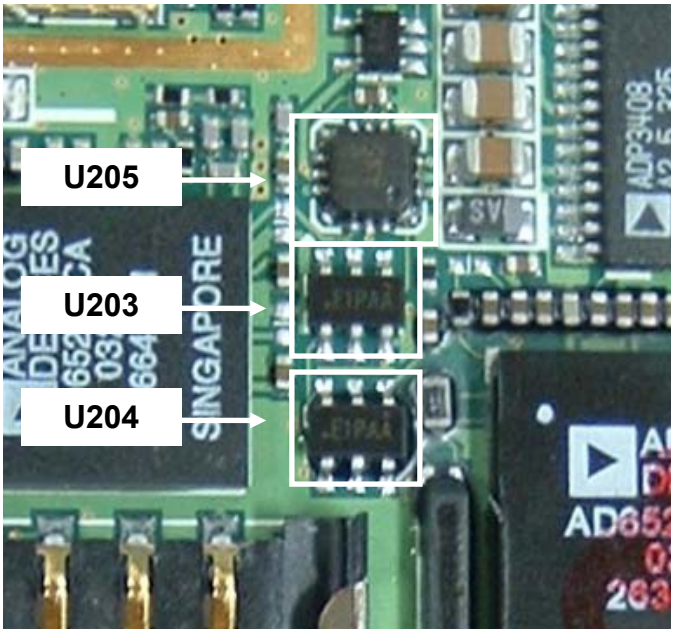
SETTING : After initializing GSM test equipment, Connect PIF to the phone, and power on.

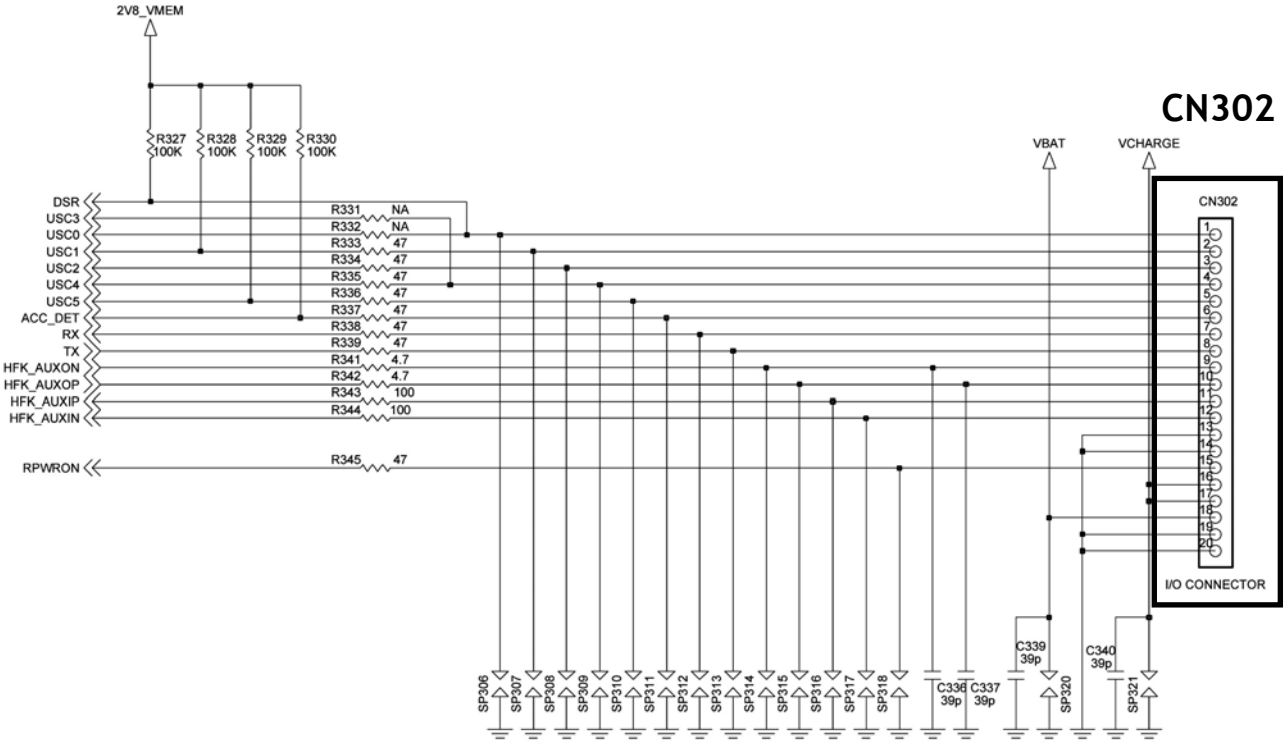


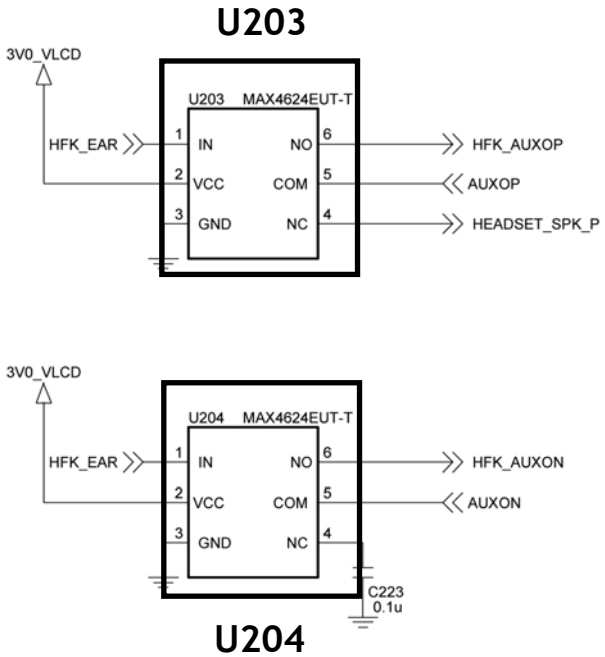



②
HFK sending path problem.
Is the signal level at pin 11 of CN302 a few tens or hundreds mV(AC)?
No
Resolder CN302.
Yes
Is the signal level at pin1, pin2 of U205 a few tens or hundreds mV(AC)?
No
Replace the U205.
Yes
Does it work well?
No
Redownload software.
Yes
Does it work well?
No
Change the main board.
Yes
③

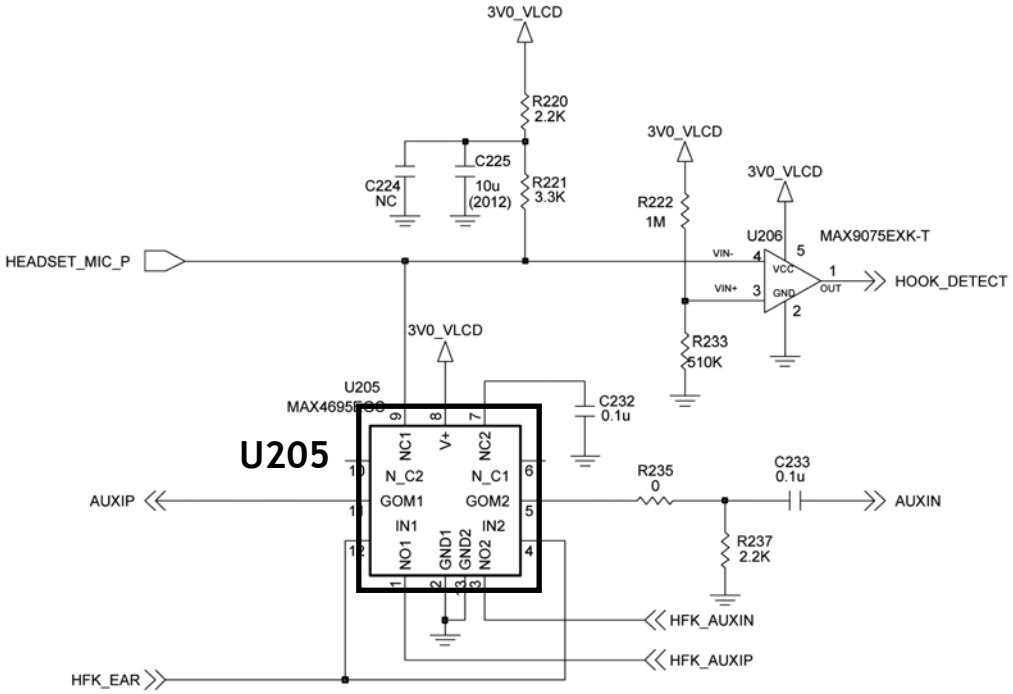

CN302


U205
U203
U204
SINGAPORE


CN302
2V8_VMEM
R327 100K
R328 100K
R329 100K
R330 100K
DSR
USC3
USC0
USC1
USC2
USC4
USC5
ACC_DET
RX
TX
HFK_AUXON
HFK_AUXOP
HFK_AUXIP
HFK_AUXIN
RPWRON
R331 NA
R332 NA
R333 47
R334 47
R335 47
R336 47
R337 47
R338 47
R339 47
R341 4.7
R342 4.7
R343 100
R344 100
R345 47
VBAT
VCHARGE
CN302
I/O CONNECTOR
SP306
SP307
SP308
SP309
SP310
SP311
SP312
SP313
SP314
SP315
SP316
SP317
SP318
C336 39p
C337 39p
C339 39p
SP320
C340 39p
SP321


U203
3V0_VLCD
U203 MAX4624EUT-T
HFK_EAR
1 IN
2 VCC
3 GND
NO 6
COM 5
NC 4
HFK_AUXOP
AUXOP
HEADSET_SPK_P
3V0_VLCD
U204 MAX4624EUT-T
HFK_EAR
1 IN
2 VCC
3 GND
NO 6
COM 5
NC 4
HFK_AUXON
AUXON
C223 0.1u
U204

4. TROUBLE SHOOTING



5. DISASSEMBLY INSTRUCTION

5.1 Disassembly

1. Remove the Battery and Screws as shown below.

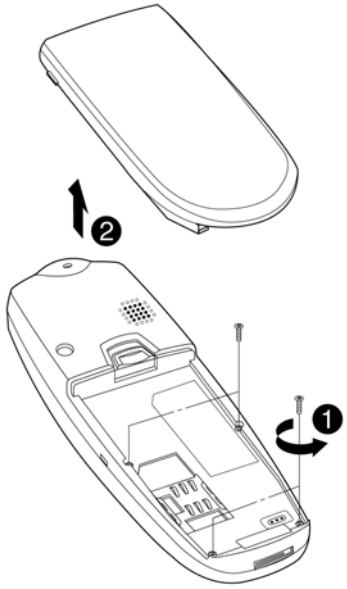


Figure 5-1. Removing the Battery.

2. Lift up and remove the Rear cover.

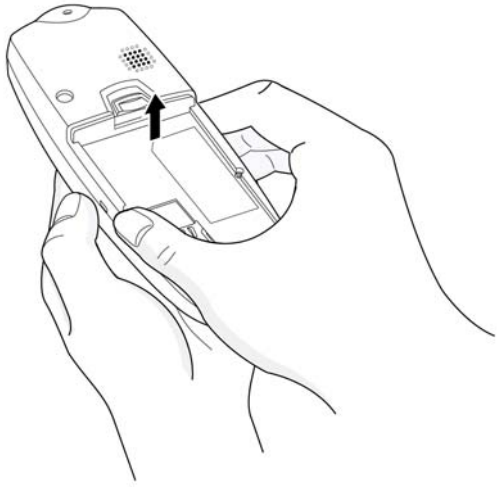


Figure 5-2. Removing the Rear cover.

3. Detach the rest components as shown below.

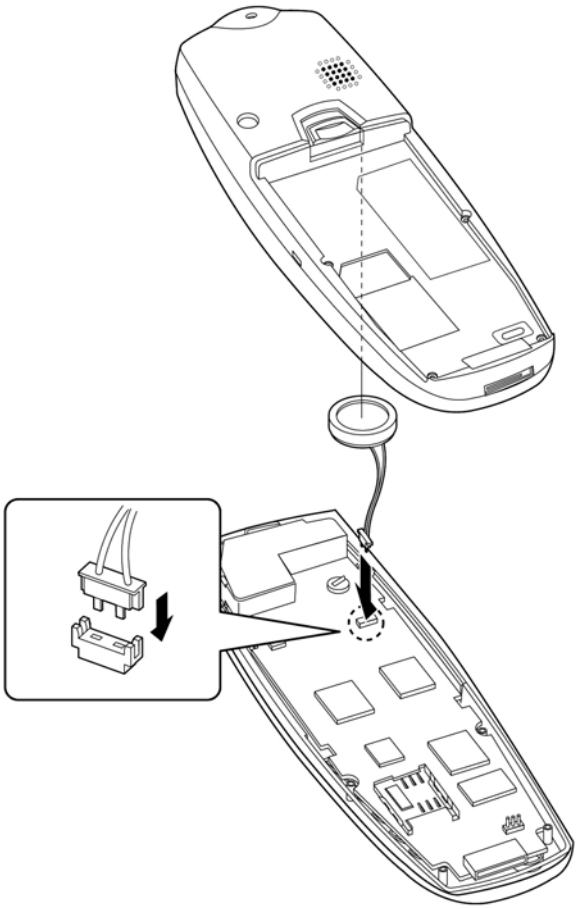


Figure 5-3. Detaching the rest components.

4. First, lift up PCB and remove the Antenna holding the hooks of the both end sides. After that, detach the Receiver and Keypad.

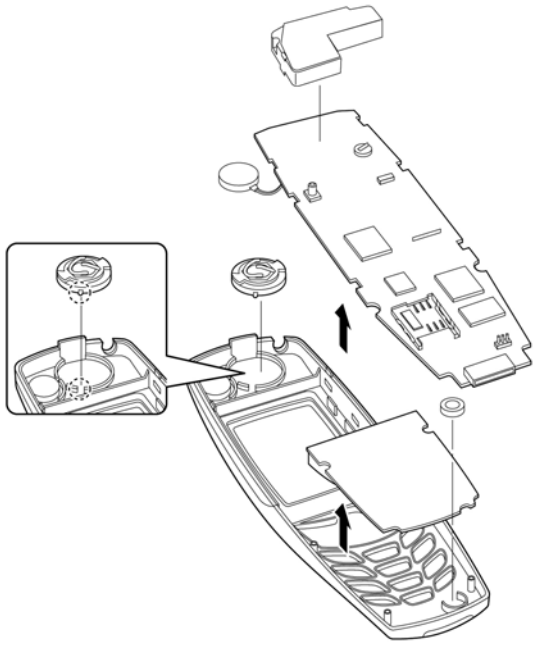


Figure 5-4. Removing PCB, Antenna, Receiver and Keypad.

5. Use a tweezers to remove the Battery locker and Spring.

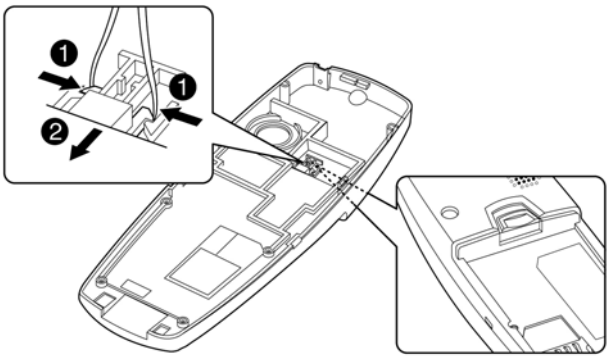


Figure 5-5. Removing the Battery locker.

6. SOFTWARE DOWNLOAD

6.1 Download Setup

Figure 6-1 describes Download setup

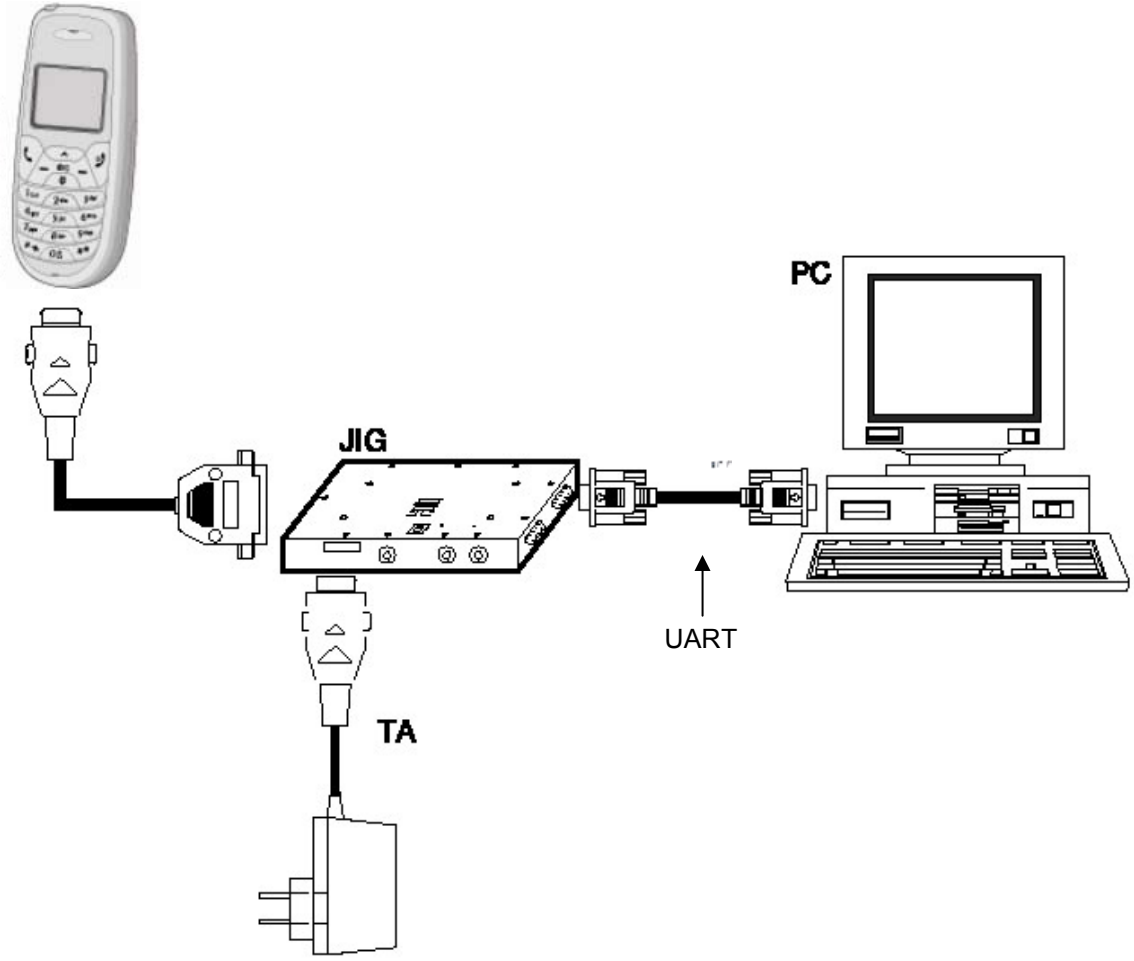


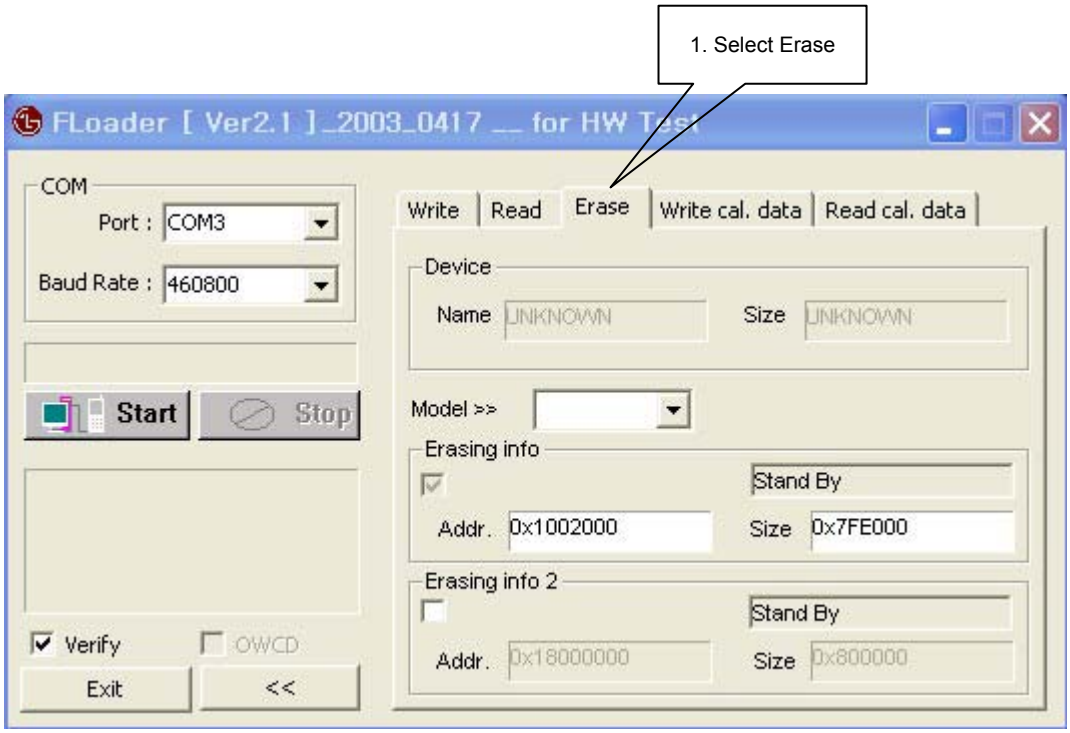
Figure 6-1. Download Setup

Condition

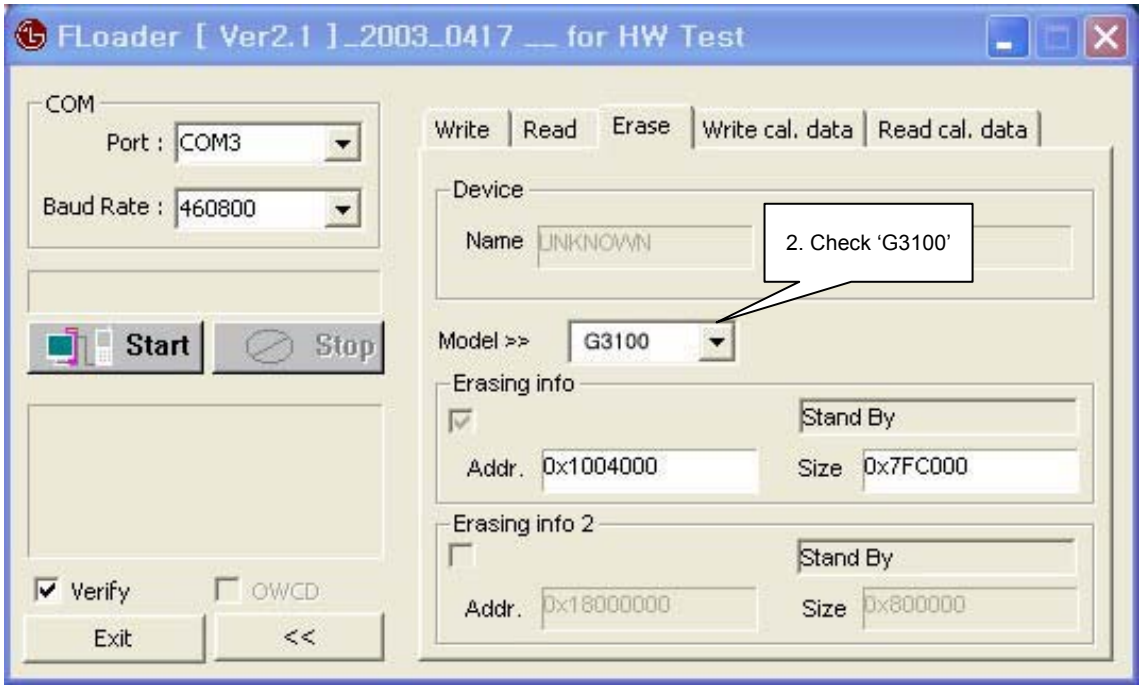
Disconnect TA to the Datakit and phone have a battery
→ Check the battery up to two blocks more.

6.2 Download Procedure

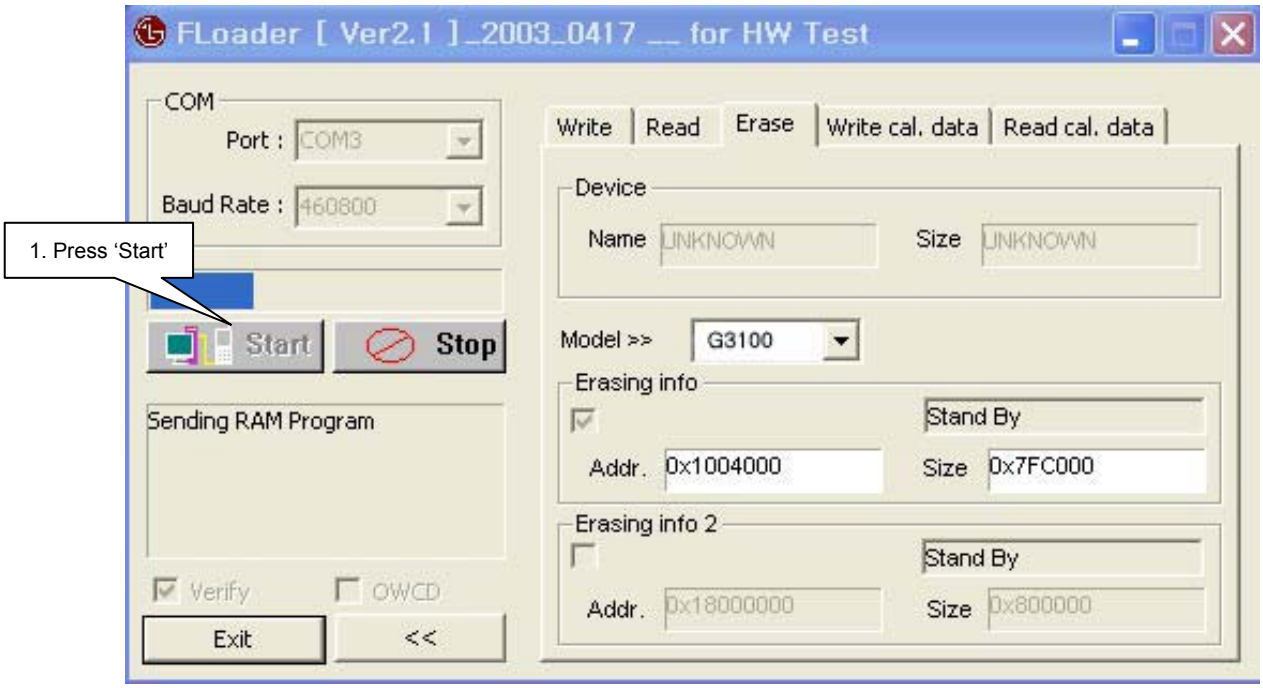
1. Access Flash loader program in PC and select Erase.

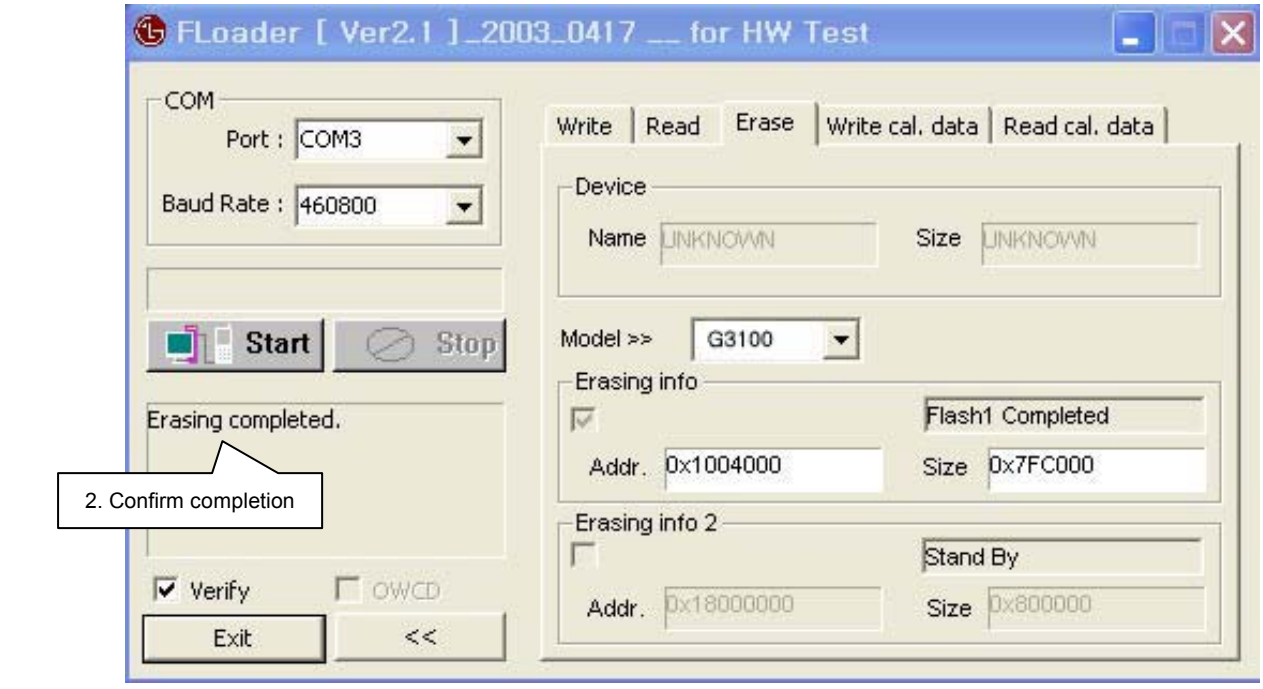


2. Check the Model. (G3100)

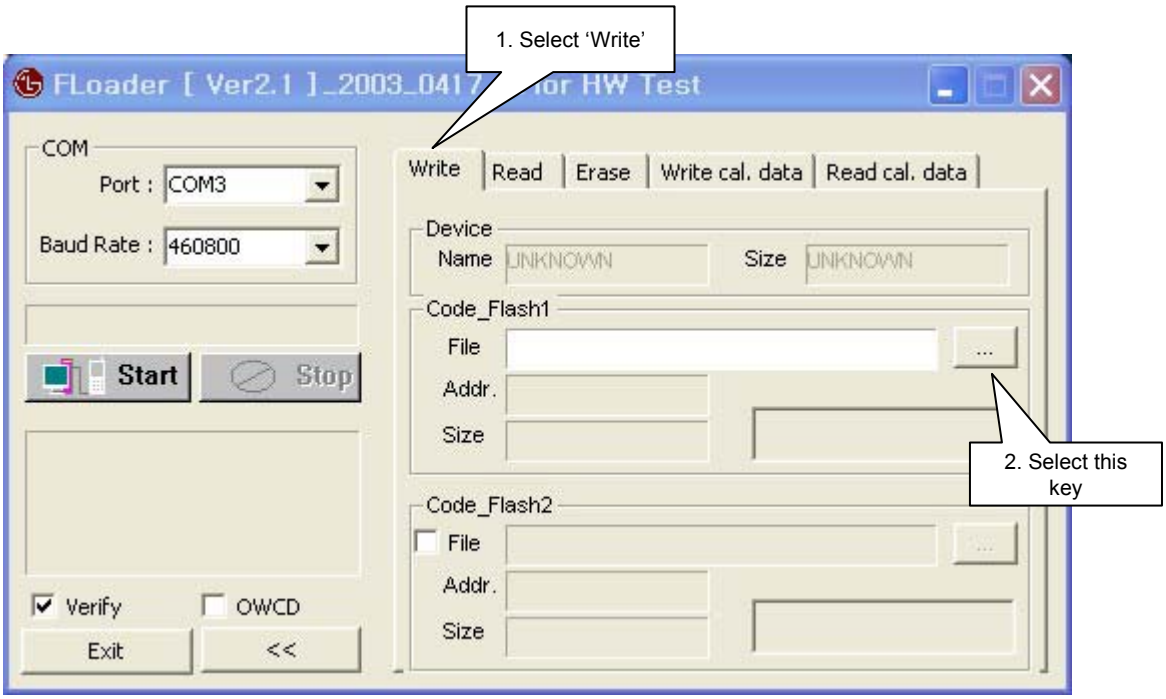


3. Press Start and Wait until Erase is completed.

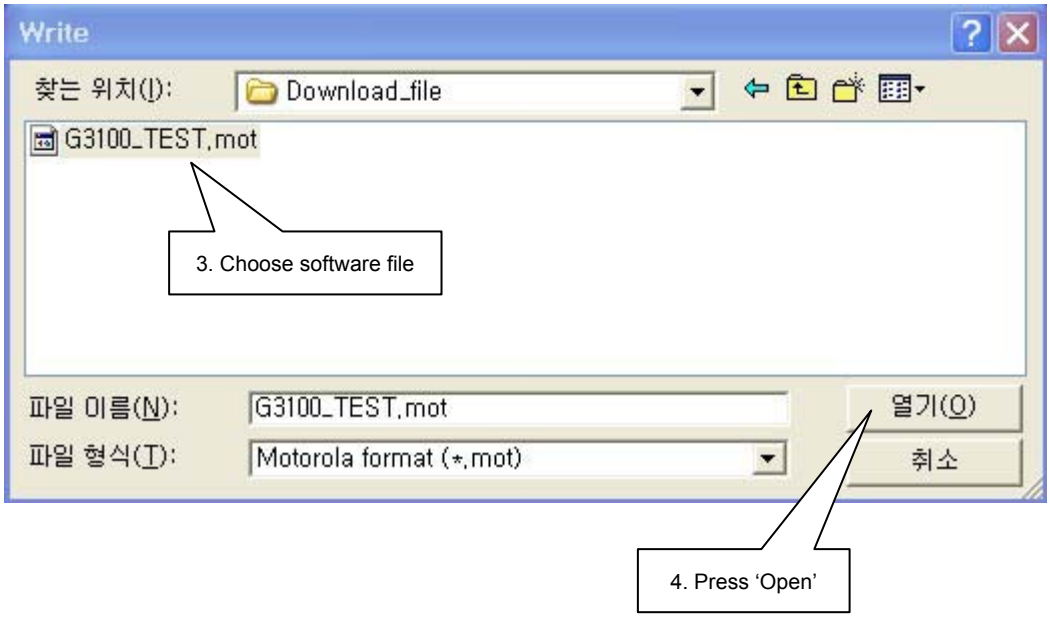




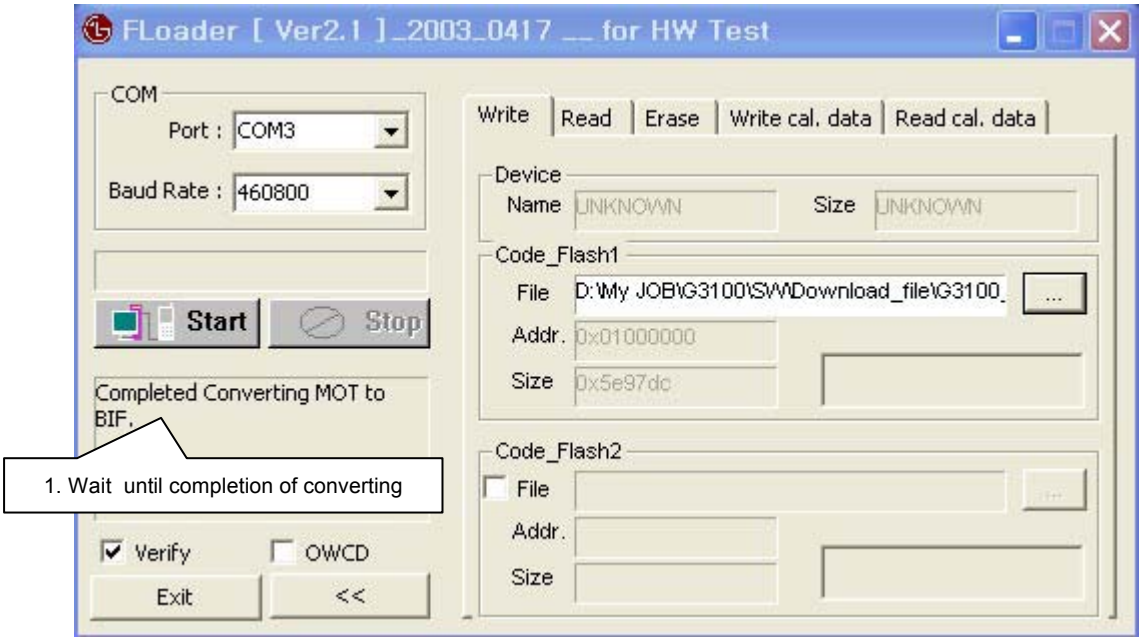
4. Select Write and Select [...] Key to Choose software (Mot. File).



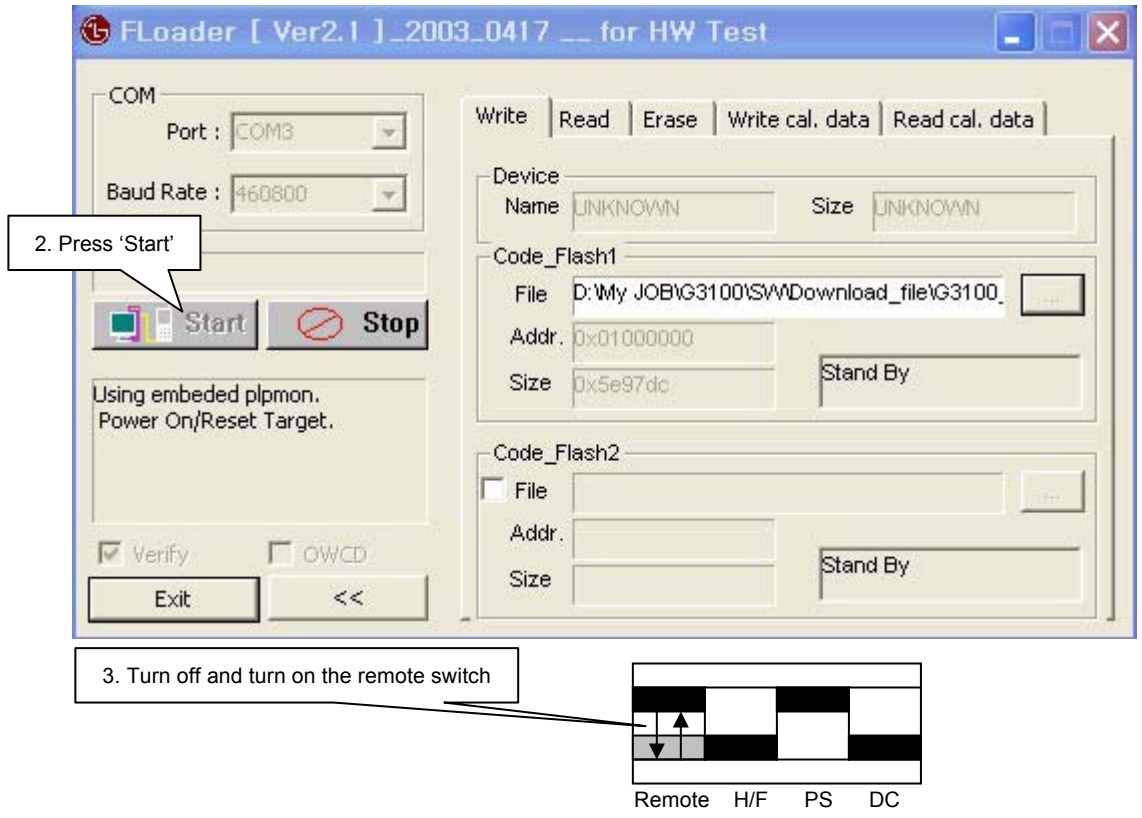
5. Press Open after choosing software



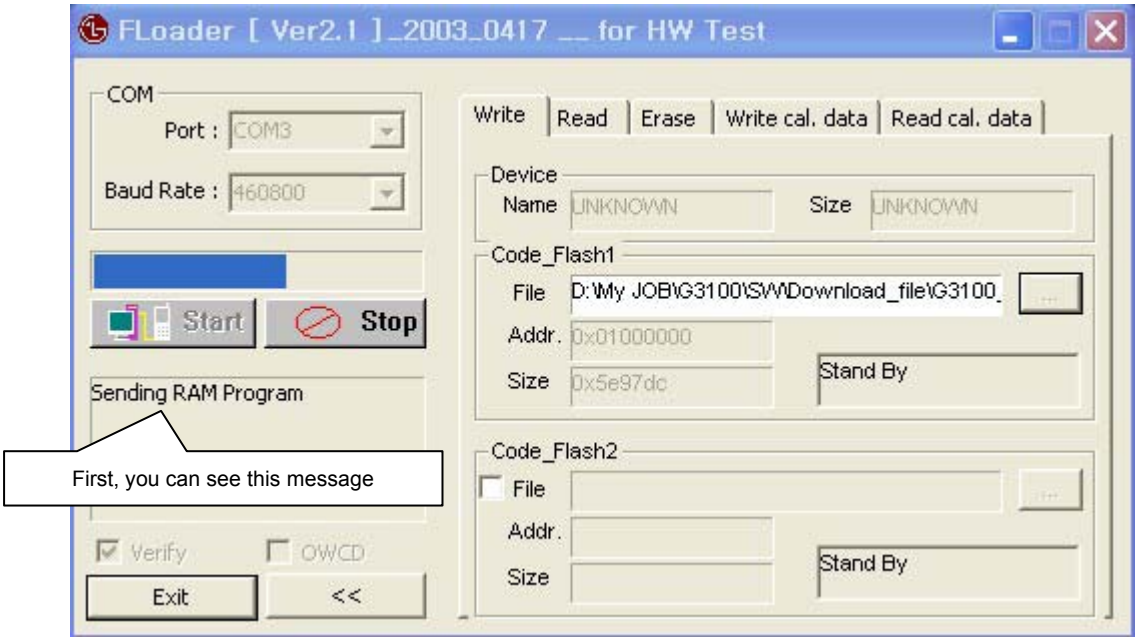
6. Wait until converting from MOT to BIF is completed.

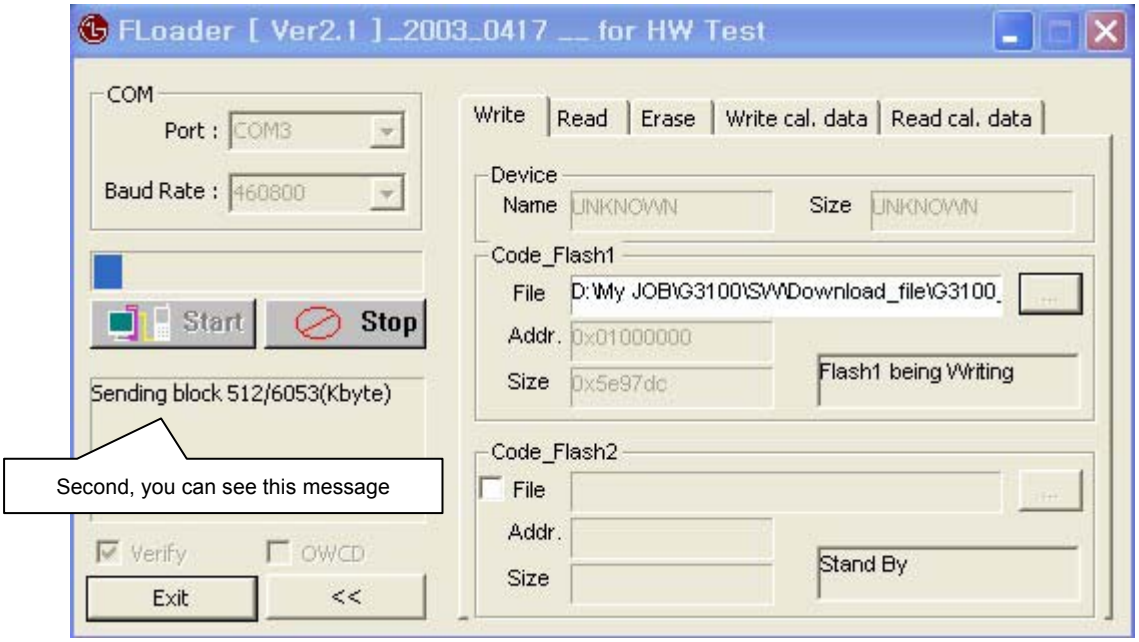


7. Press Start and Power on the phone using JIG remote Power on. (switch 1)



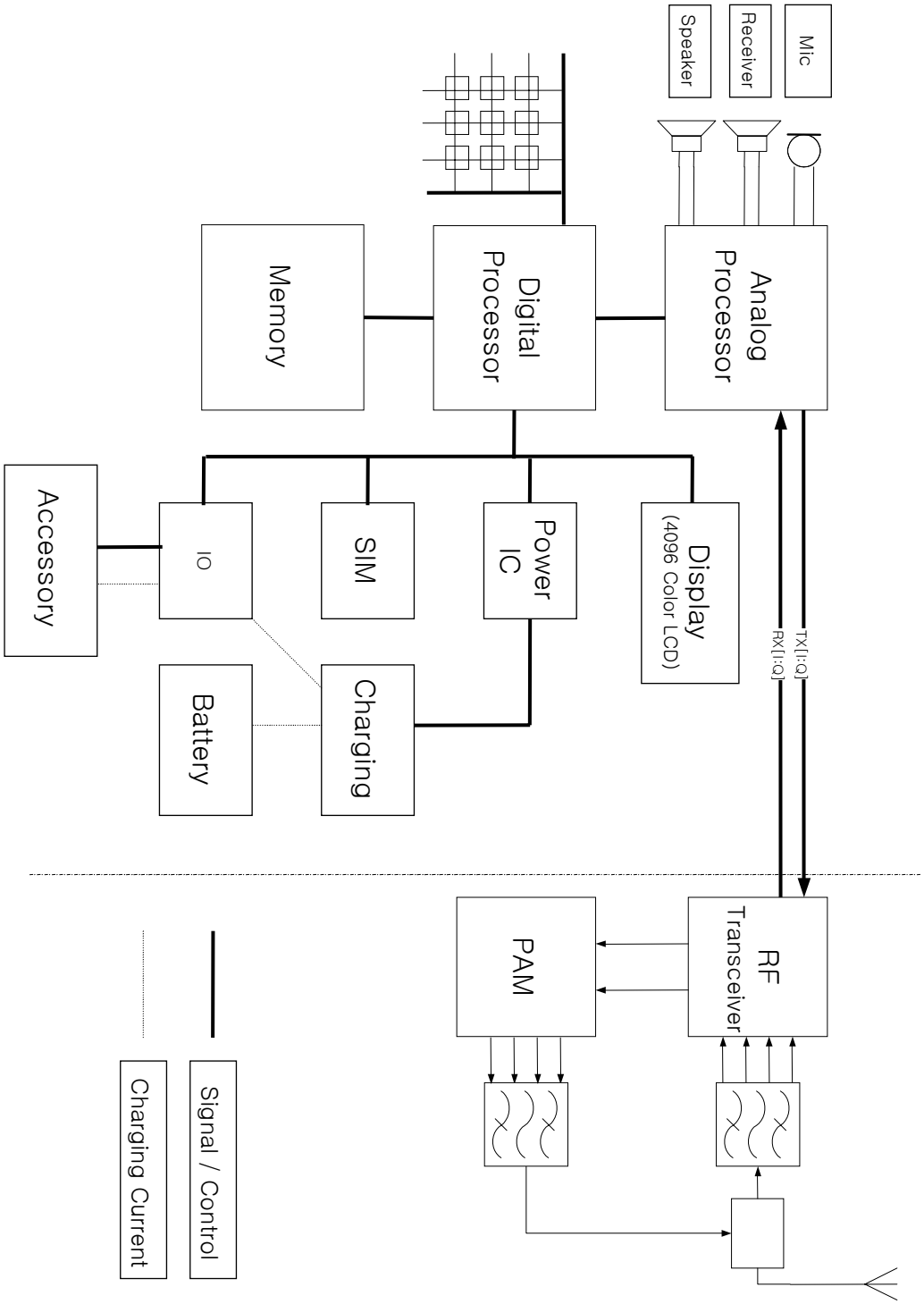
8. Wait until Sending Block is complete.





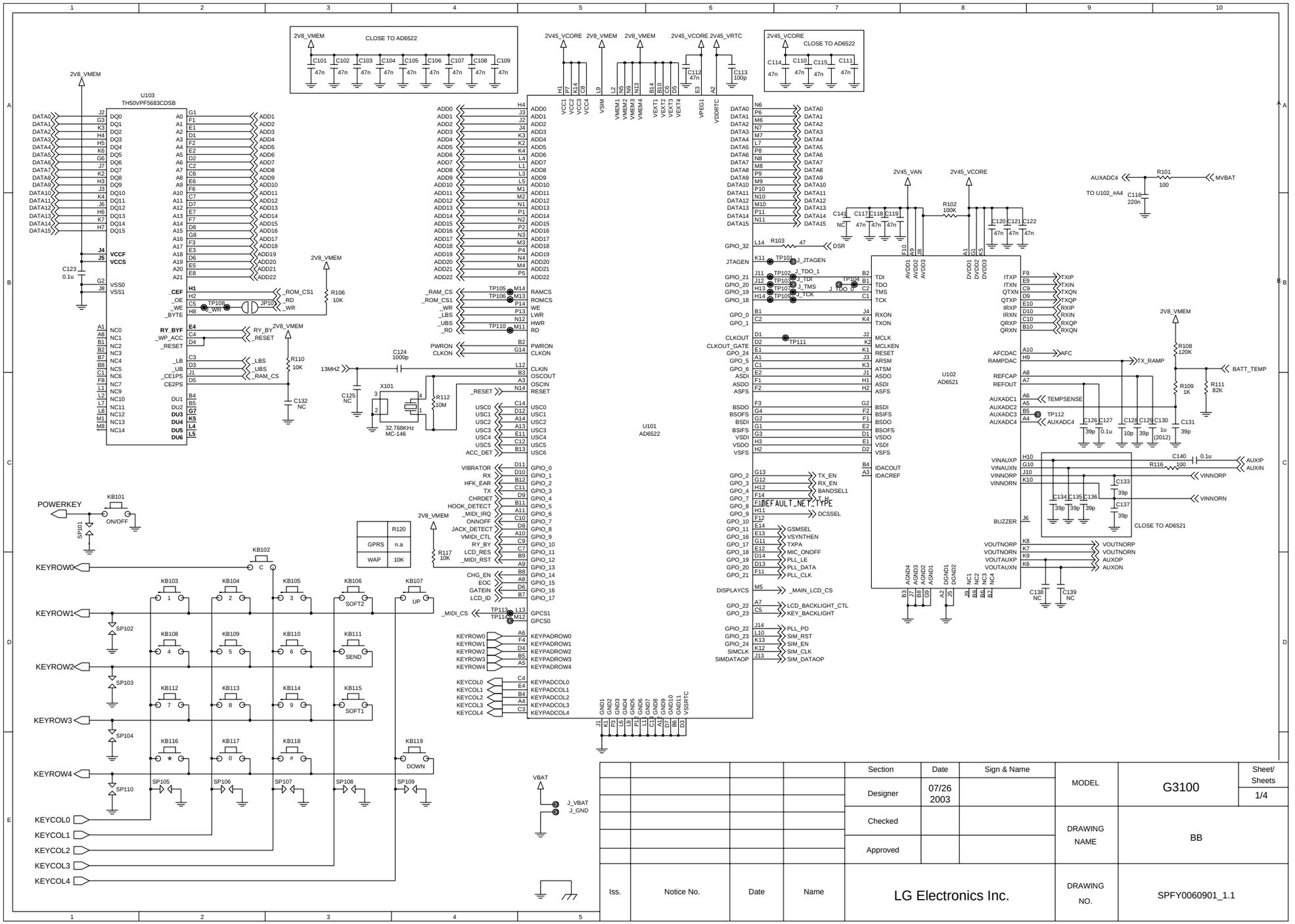
7. BLOCK DIAGRAM

The G3100 is made up of one PCB. Blow you can see the block diagram of G3100.

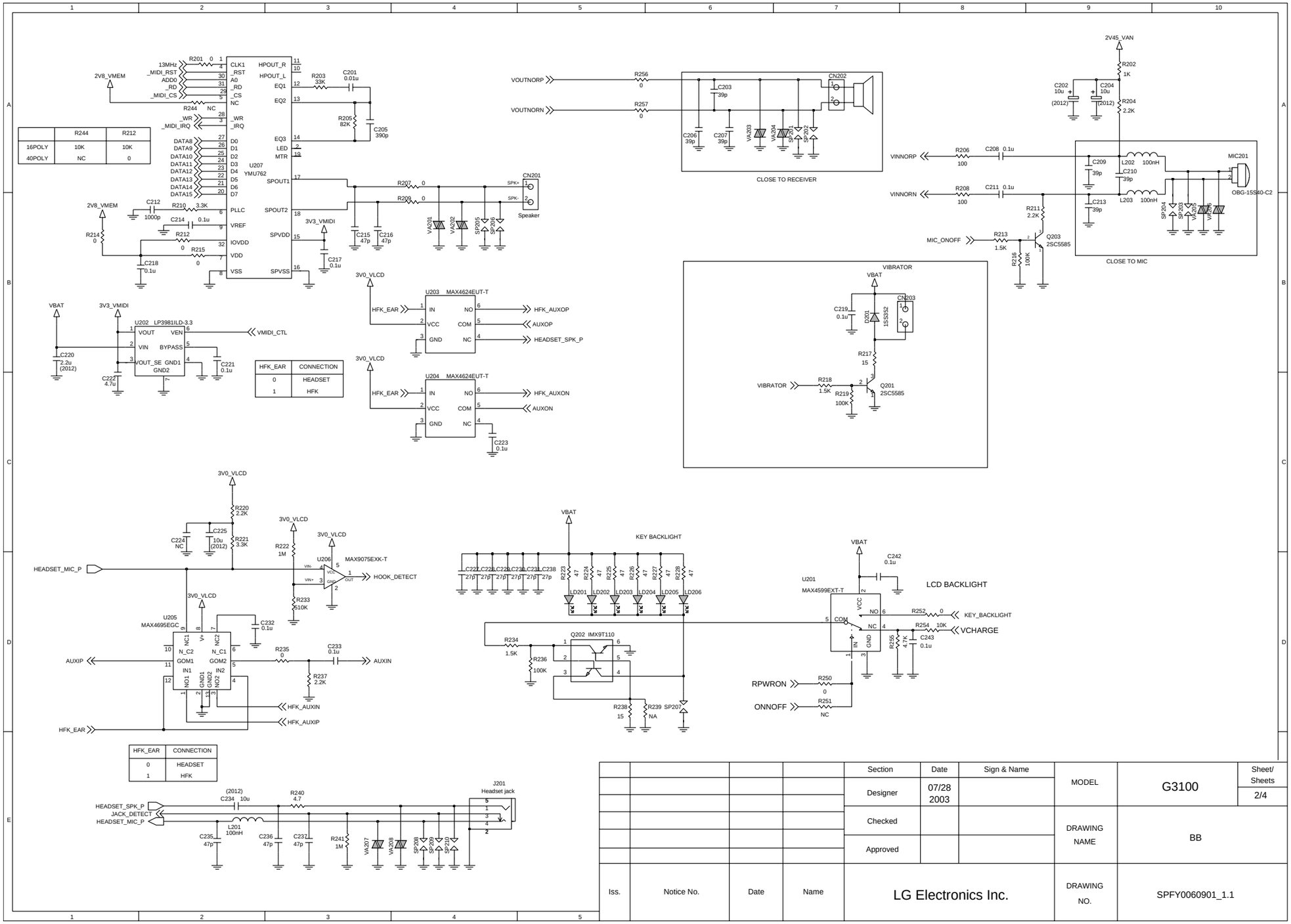


8. Circuit Diagram

8.1 Main Chipset and Memory



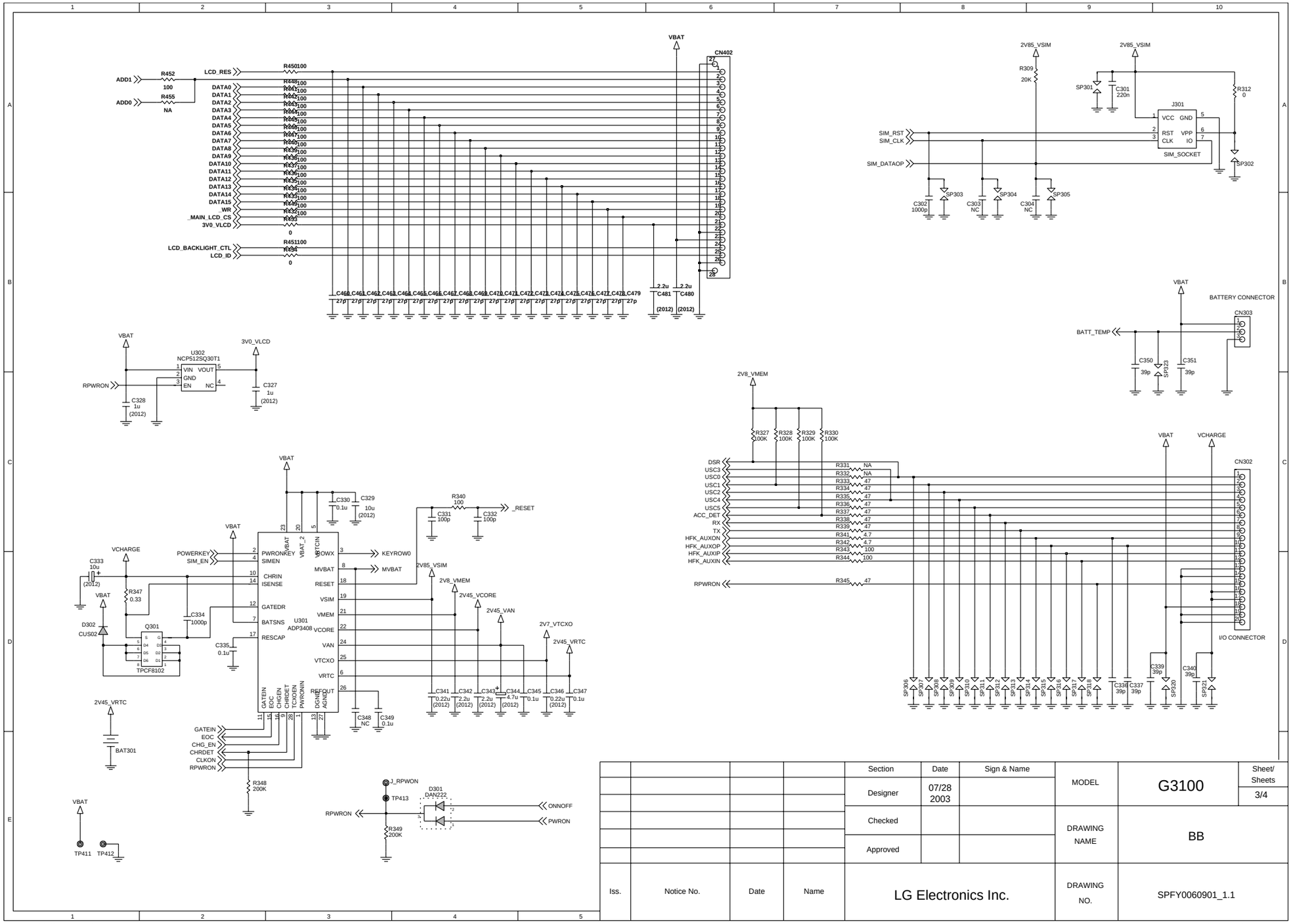
8.2 Audio Part



LGIC(42)-A-5505-10:01

LG Electronics Inc.

8.3 PMIC, LCD and I/O Connector

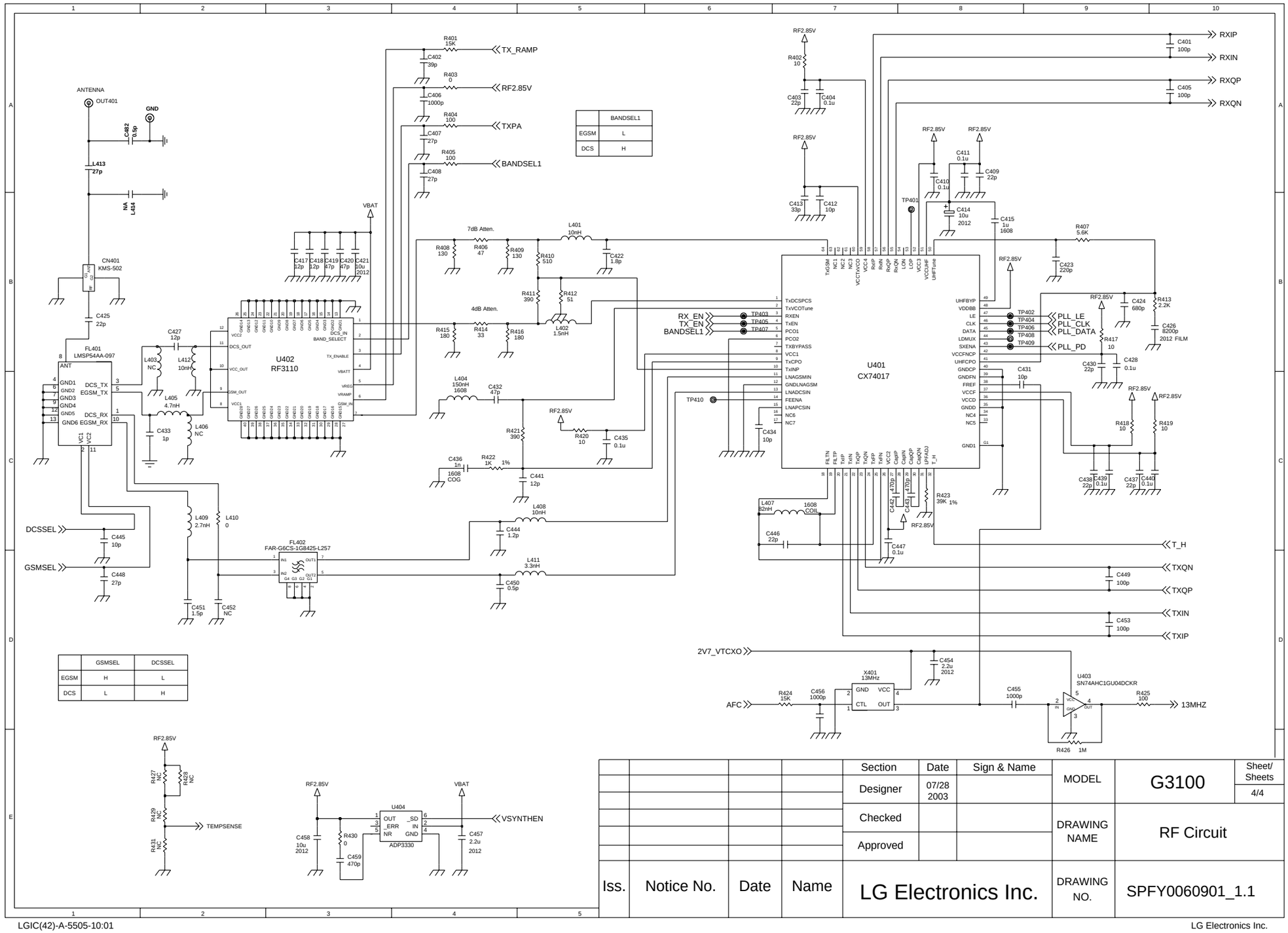


				Section	Date	Sign & Name	MODEL	G3100	Sheet/ Sheets
				Designer	07/28 2003				3/4
				Checked			DRAWING NAME	BB	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	SPFY0060901_1.1	

LGIC(42)-A-5505-10:01

LG Electronics Inc.

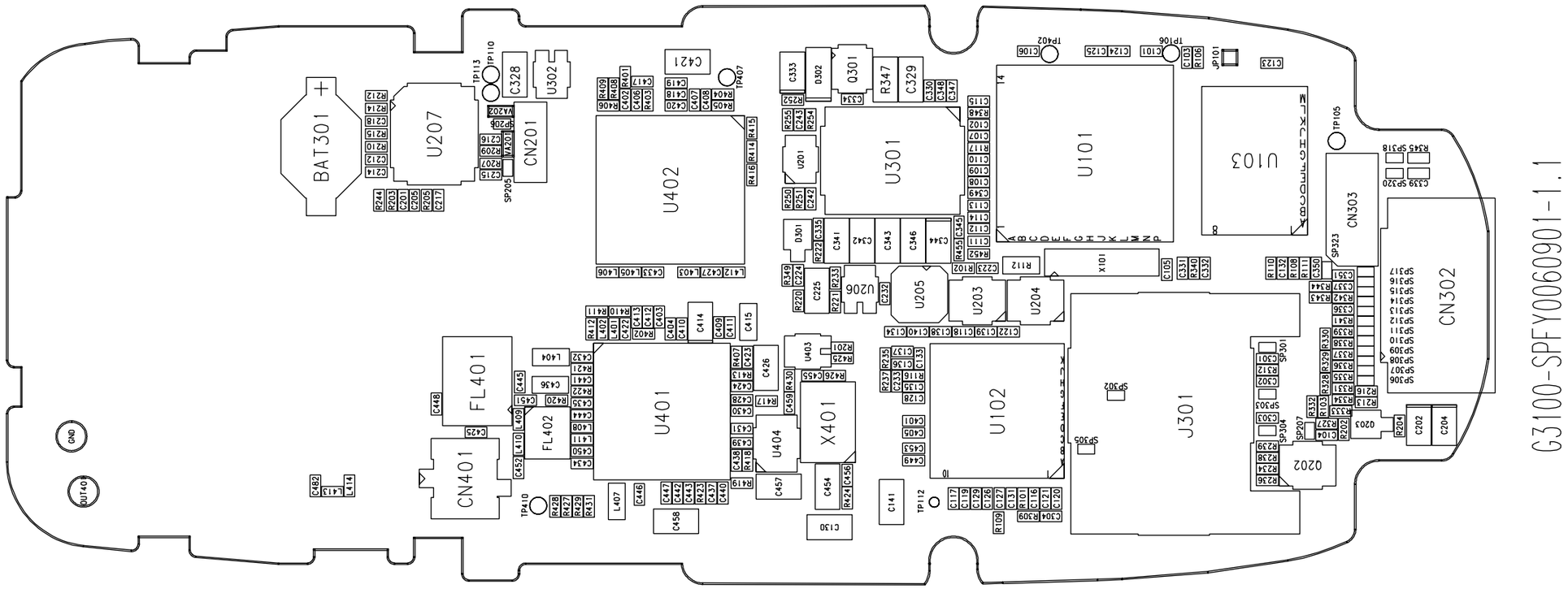
8.4 RF Part



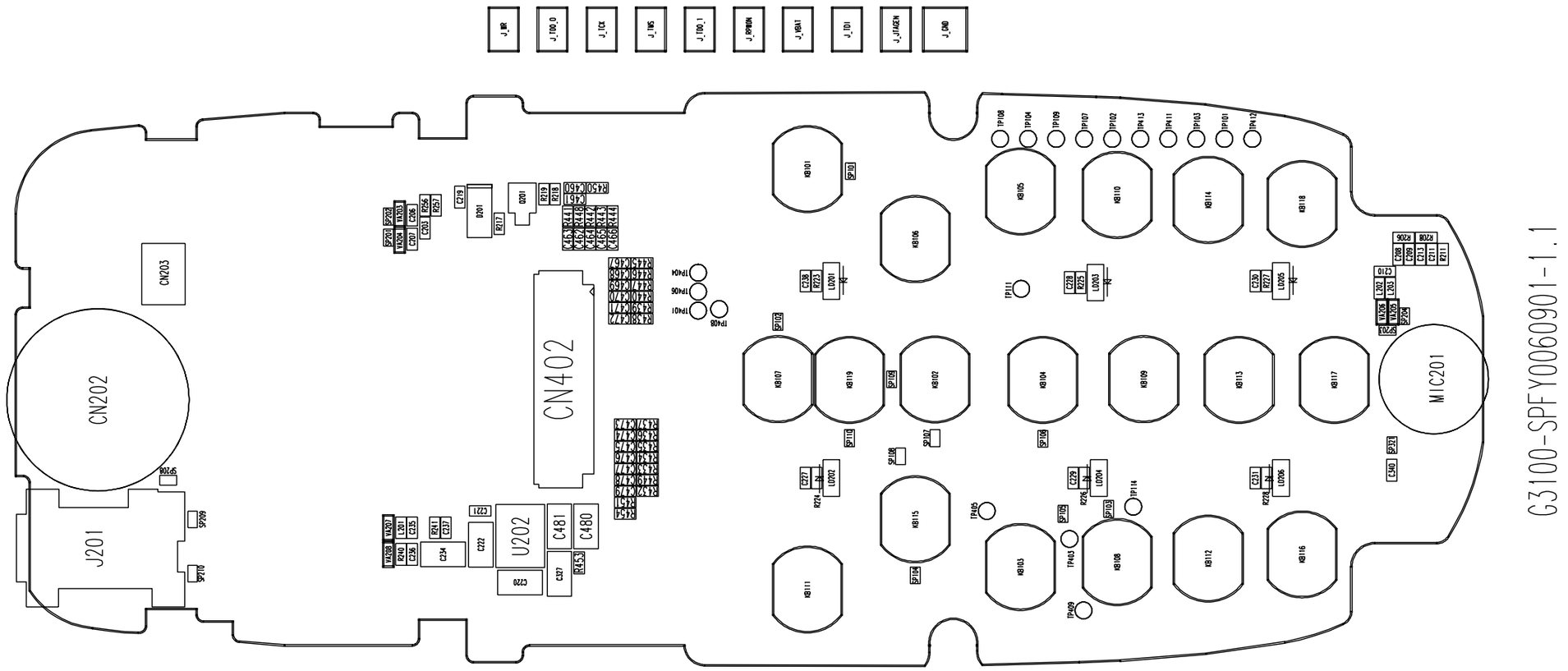
				Section	Date	Sign & Name	MODEL	G3100	Sheet/ Sheets
				Designer	07/28 2003				4/4
				Checked			DRAWING NAME	RF Circuit	
				Approved					
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	SPFY0060901_1.1	

9. PCB LAYOUT

9.1 Rear Part



9.2 Front Part



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. LCD [1-1]

This menu is to test the LCD contrast.
• **Contrast Value [1-1-1]** : Change this value by up and down key.

B. Backlight [1-2]

This menu is to test the LCD Backlight and Keypad Backlight.
• **Backlight On [1-2-1]** : LCD Backlight and Keypad Backlight light on at the same time.
• **Backlight Off [1-2-2]** : LCD Backlight and Keypad Backlight light off at the same time.
• **Backlight value [1-2-3]** : 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.

C. Buzzer [1-3]

This menu is to test the melody sound.
• **Melody on [1-3-1]** : Melody sound is played through the speaker.
• **Melody off [1-3-1]**: Melody sound is off.

D. Vibrator [1-4]

This menu is to test the vibration mode.
• **Vibrator On [1-4-1]** : Vibration mode is on.
• **Vibrator Off [1-4-2]** : Vibration mode is off.

E. ADC (Analog to Digital Converter) [1-5]

This displays the value of each ADC.
• MVBAT ADC (Main Voltage Battery ADC) [1-5-1]
• AUX ADC (Auxiliary ADC) [1-5-2]
• TEMPER ADC (Temperature ADC) [1-5-3]

F. BATTERY [1-6]

• Bat Cal [1-6-1] :
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 [1-6-2] :
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

G. Audio [1-7]

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 [1-7-1] : VbControl1 bit Register Value Setting
• VbControl2 [1-7-2] : VbControl2 bit Register Value Setting
• VbControl3 [1-7-3] : VbControl3 bit Register Value Setting
• VbControl4 [1-7-4] : VbControl4 bit Register Value Setting
• VbControl5 [1-7-5] : VbControl5 bit Register Value Setting
• VbControl6 [1-7-6] : VbControl6 bit Register Value Setting

H. DAI (Digital Audio Interface) [1-8]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.
• DAI AUDIO [1-8-1] : DAI audio mode
• DAI UPLINK [1-8-2] : Speech encoder test
• DAI DOWNLINK [1-8-3] : Speech decoder test
• DAI OFF [1-8-4] : 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. Backlight [3-2]

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

C. Buzzer [3-3]

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

D. Vibrator [3-4]

Vibrator is on for about 1.5 seconds.

E. LCD [3-5]

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

F. Key pad [3-6]

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.

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]

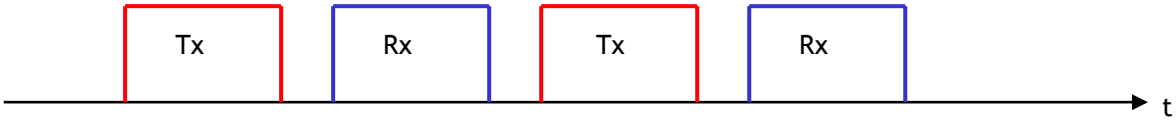
This displays software version stored in the phone.
Attention
- Fact. Reset (i.e.Factory Reset) should be only used during the Manufacturing process.
- Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

11. STAND ALONE TEST

11.1 What's the Standalone Test?

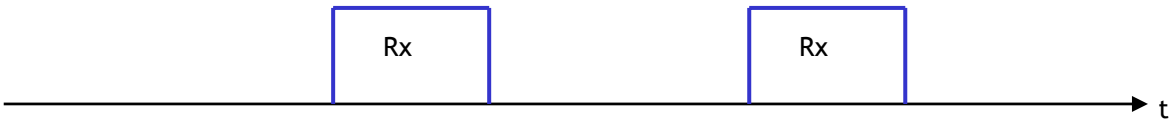
Set the Phone to Perform only Tx or Rx mode for monitoring performance of Tx part or Rx part pnly.

1. Normal Call

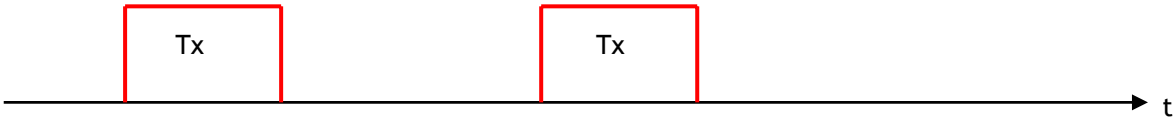


2. Standalone

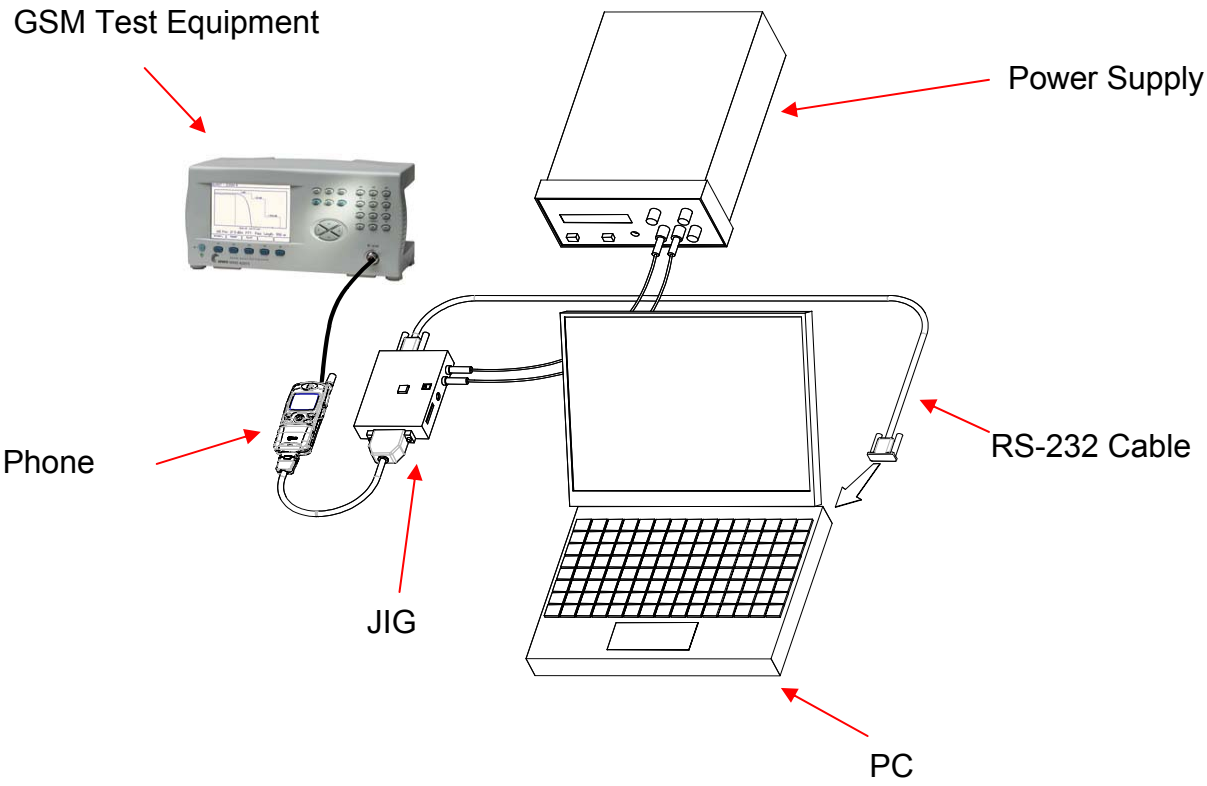
• During Rx Standalone



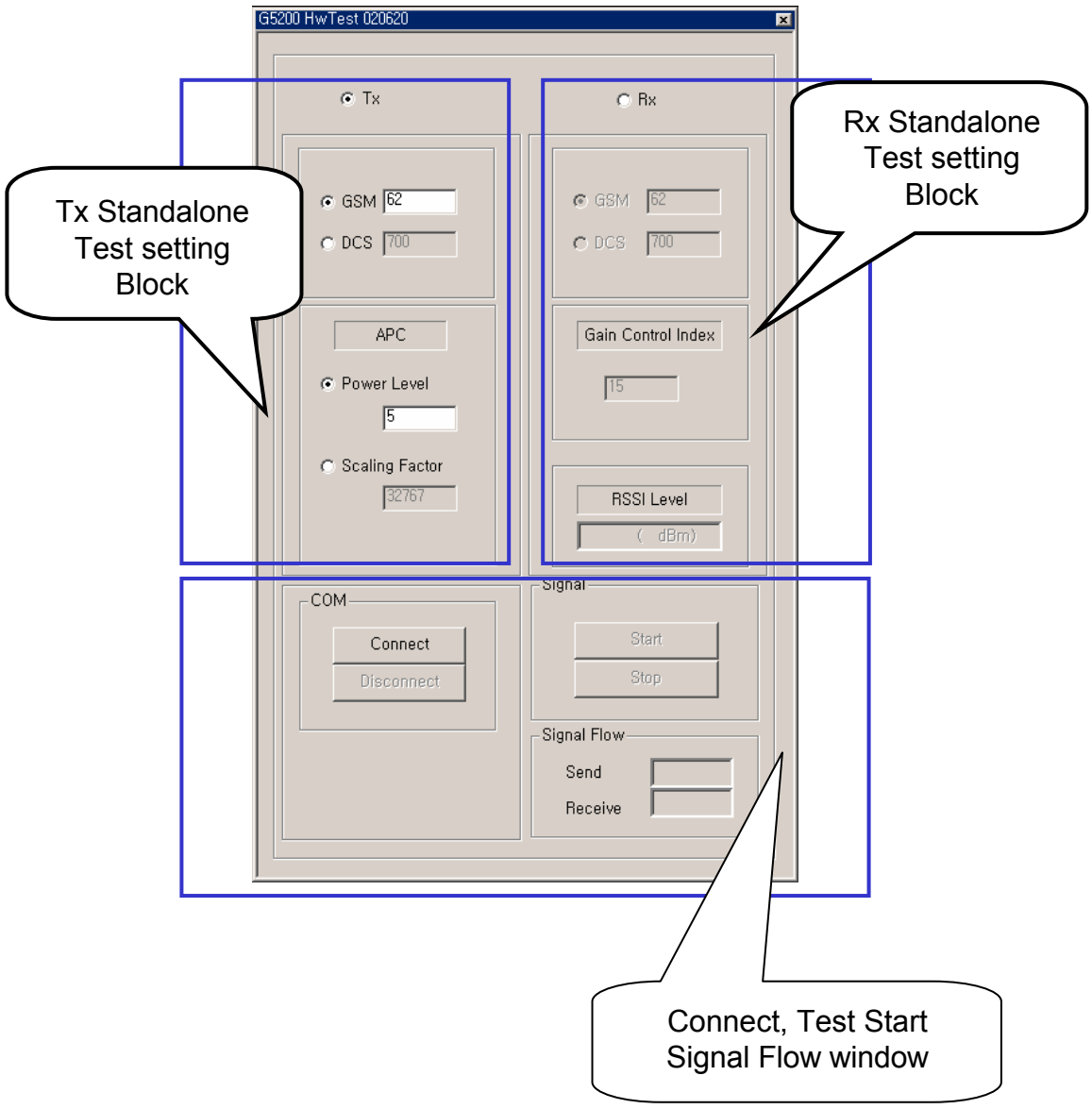
• During Tx Standalone



11.2 Standalone Test Equipment Setup



11.3 HW Test : Software for Standalone Test Setup



11.4 Tx Stand alone Test Setting

1. Setting the Test Equipment as 'Test Mode-BCH'

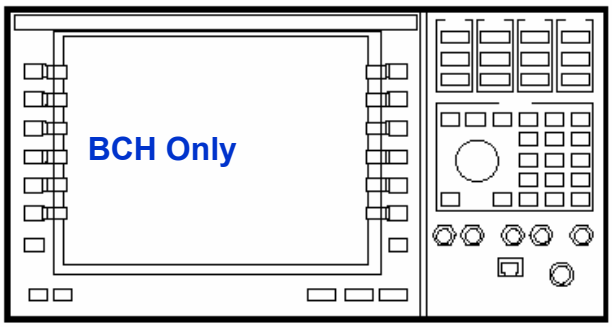
Example)

For HP8960
On the Control Window
Operating Mode : Test
Test Function : BCH

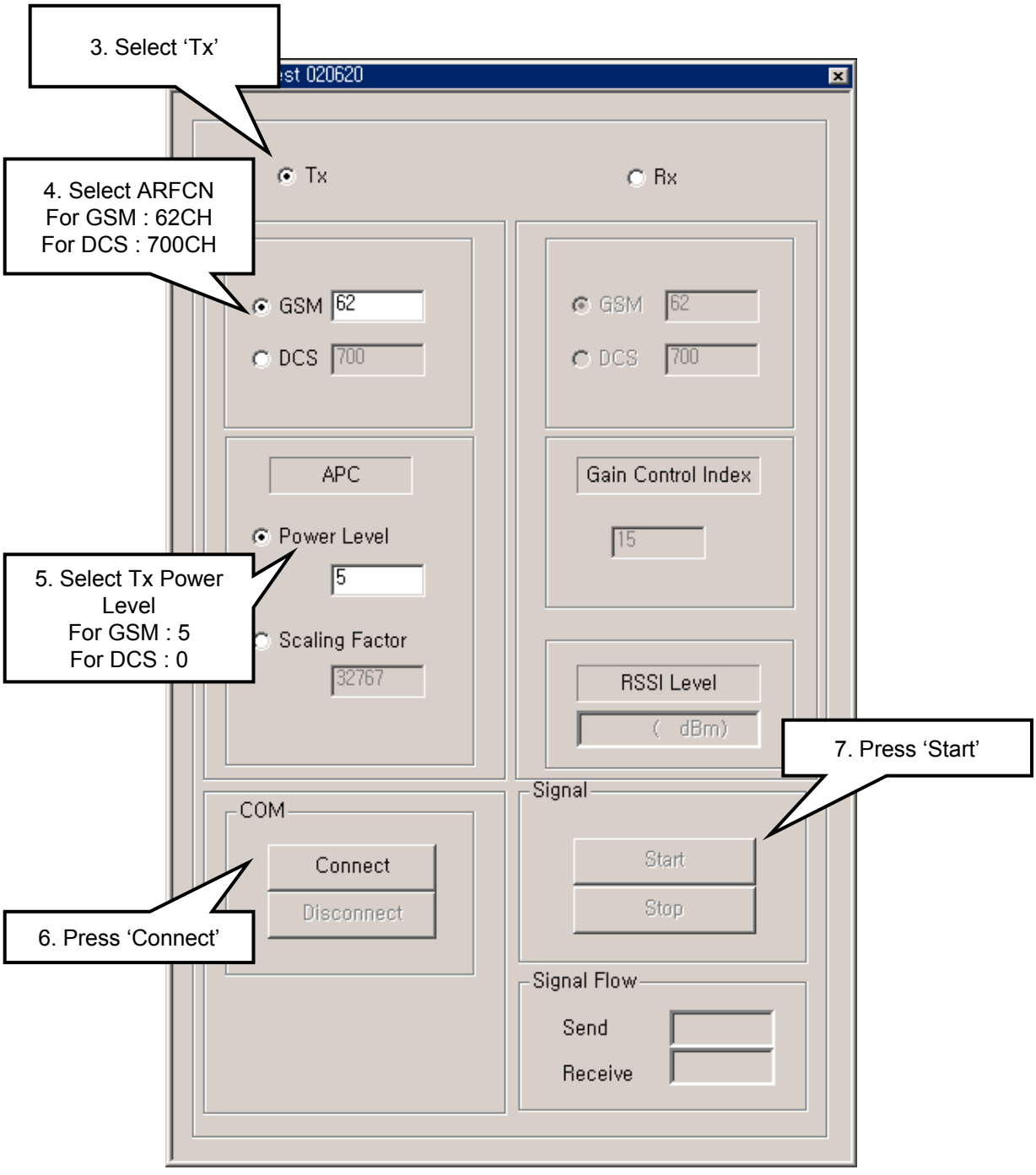
For HP8922
Operating mode : Test Mode

2. Setting Channel and Power

For GSM	For DCS
BCH : 62 CH TCH : 62 CH Tx Level : 5	BCH : 700 CH TCH : 700 CH Tx Level : 0



Tx Stand alone Test Setting



11.5 Rx Stand alone Test Setting

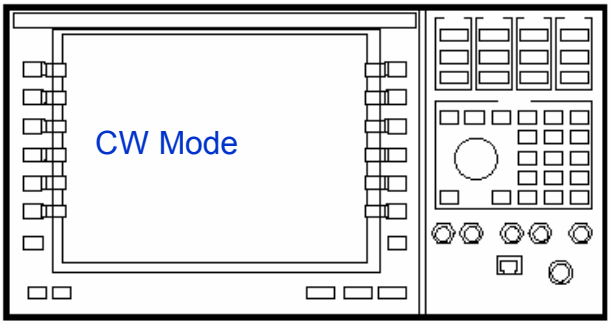
1. Setting the Test Equipment as 'CW Mode'

Example)

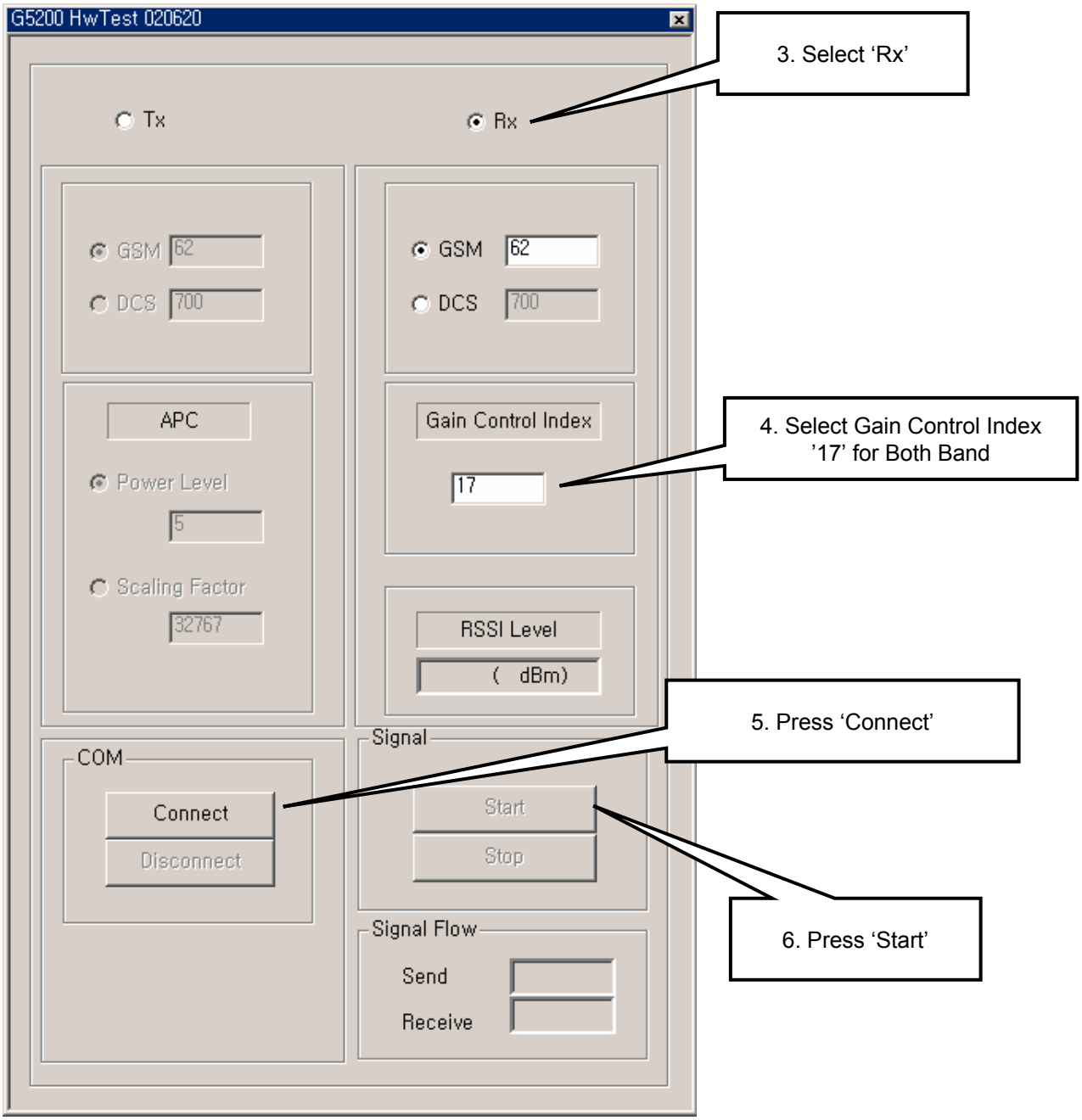
For HP8960
On the Control Window
Operating Mode : Test
Test Function : CW
For HP8922
Operating mode : CW Generator

2. Setting Channel and Power

For GSM	For DCS
BCH : 62 CH TCH : 62 CH Tx Level : 5	BCH : 700 CH TCH : 700 CH Tx Level : 0



Rx Stand alone Test Setting



12. AUTO CALIBRATION

12.1 Overview

AutoCal (Auto Calibration) is the PC side calibration tool that performs Rx and Tx calibration with Agilent 8960 or other equipment. AutoCal generates calibration data by communicating with phone and measuring equipment and writes it into calibration data block of flash memory in GSM phone. There are three steps for automatic gain control (AGC) for Rx, automatic power control (APC) for Tx, and ADC control for monitoring battery voltage.

12.2. Equipment List

Equipment for Calibration	Type / Model	Band
Wireless Communication Test Set	HP-8960	Agilent
RS-232 Cable and Test JIG		LG
RF Cable		LG
Power Supply	Tektronix PS2521G	Agilent
GPIO interface card	HP-GPIB	Agilent
Calibration & Final test software		LG
Test SIM Card		
PC (for Software Installation)	Pentium Ⅱ class above 300MHz	

Table 12-1. Calibration Equipment List.

12.3 Equipment Setup

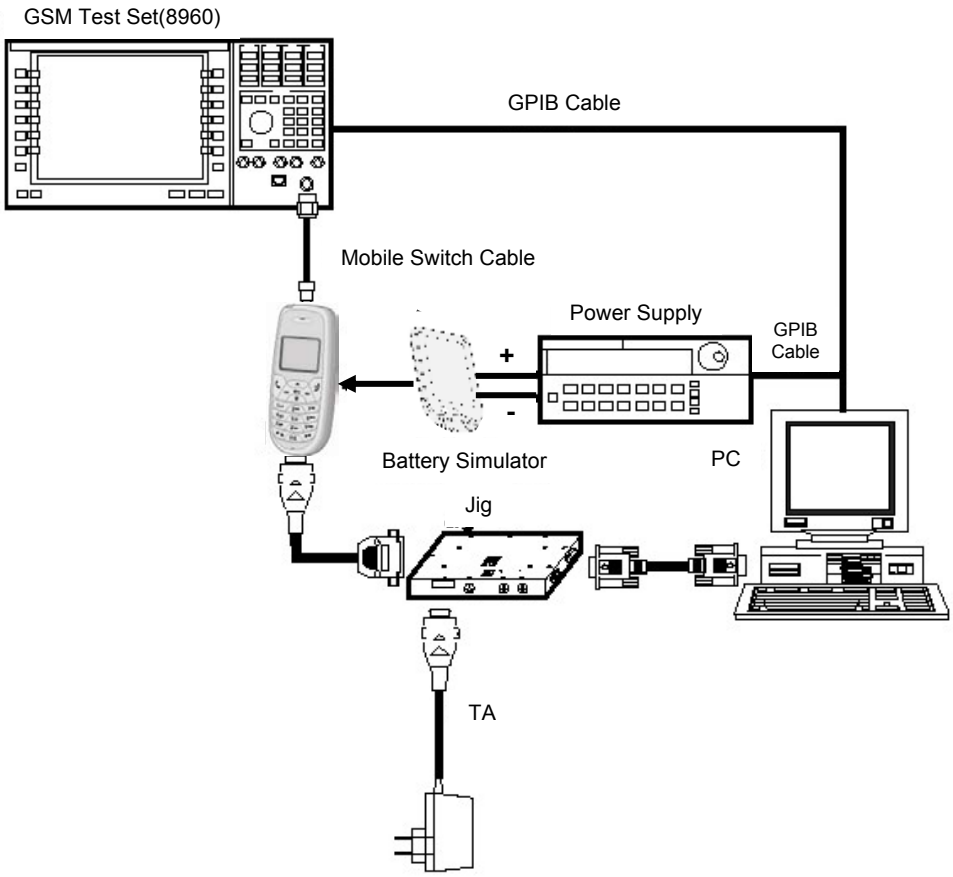
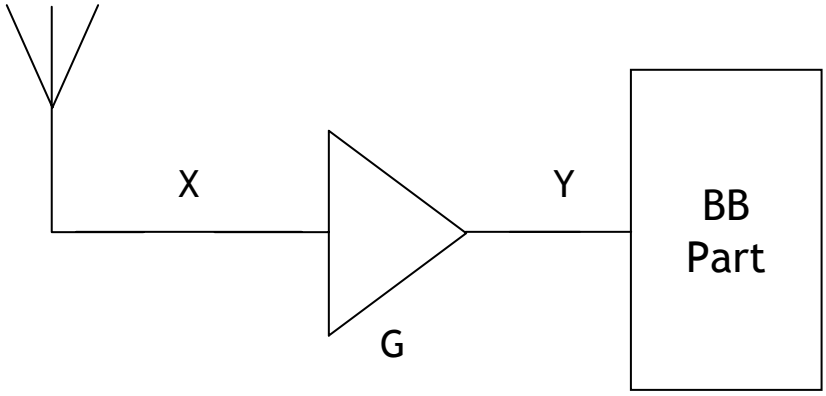


Figure 12-1. Equipment Setup

12.4 AGC for RX

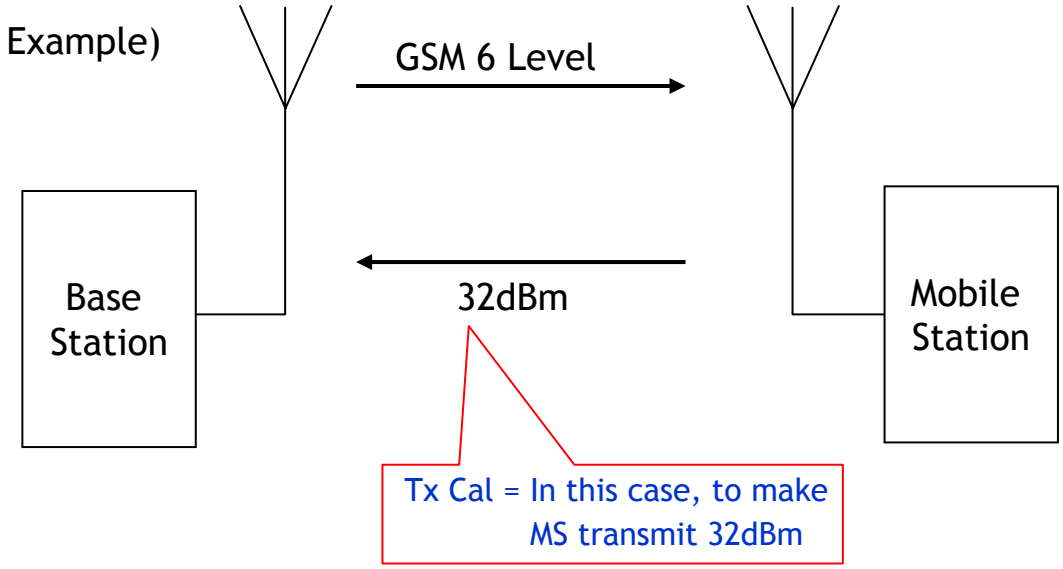
Setting the AGC Gain to make same Rx Power fed into the Base Band Part Regardless of Antenna Input Level.



X(Input Level)+G(Gain)=Y

12.5 APC for TX

To make Tx Power Level transmitted properly following the information of Base Station



12.6 ADC

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

12.7 How to do calibration

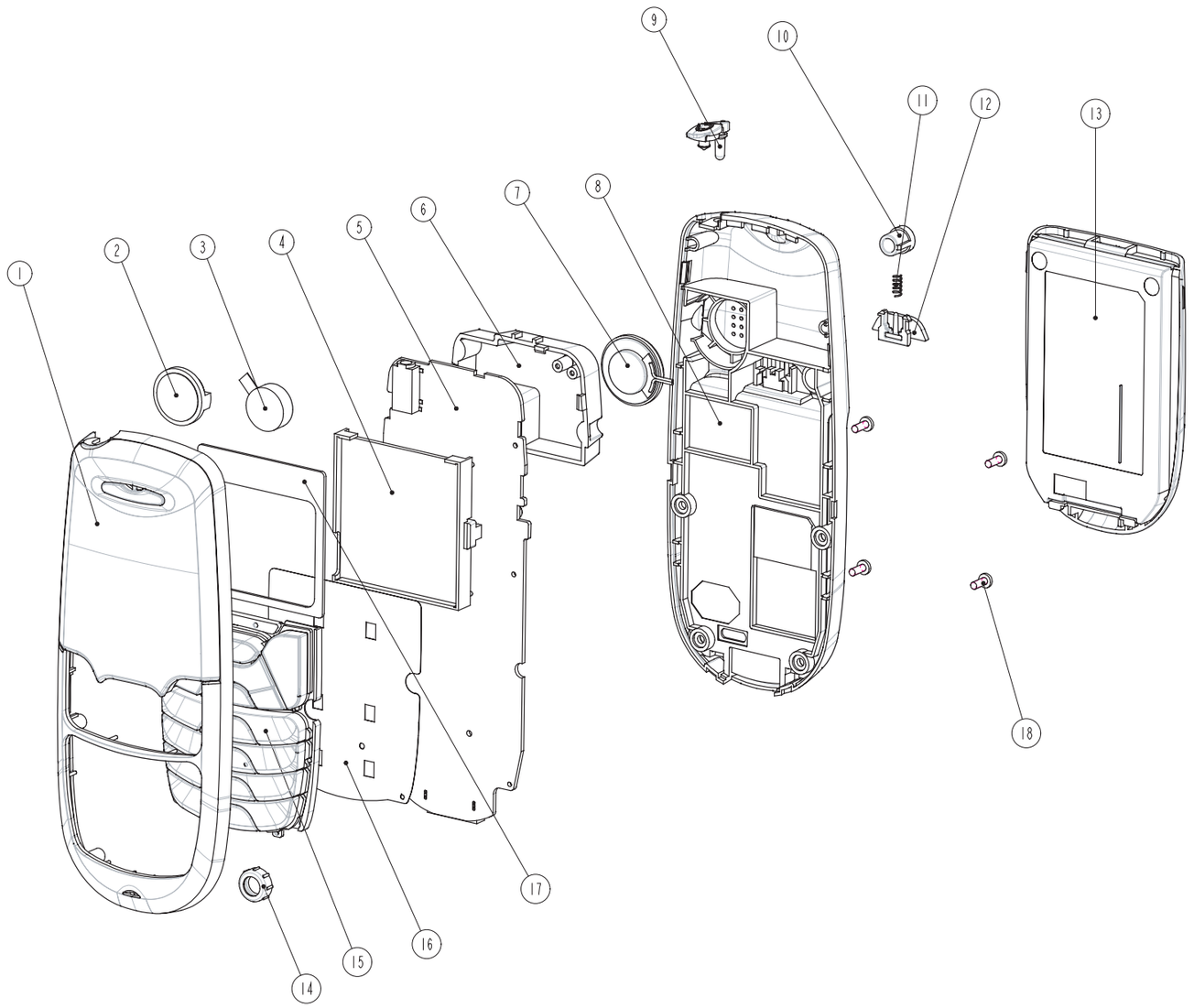
A. Connect cable between phone and serial port of PC.

B. Connect Agilent 8960 equipment, programmable power supply, and phone.

C. Press Start button. AutoCal processes all calibration procedure
  i. AGC EGSM
  ii. AGC DCS
  iii. APC EGSM
  iv. APC DCS
  v. ADC

13. EXPLODED VIEW & REPLACEMENT PART LIST

13.1 Exploded View



NO	품 명	품 번	수량	비고
18	SCREW	GTZZ0000604	4	
17	PAD LCD	MPBG0015701	1	
16	METAL DOME S/W	ADCA0015101	1	
15	DIAL KEYPAD	MBJA0011201	1	
14	MIC	SUMY0004601	1	
13	BATTERY	SBPL0072108	1	
12	LOCKER, BATTERY	MLEA0012301	1	
11	SPRING, LOCKER	MSDB0001701	1	
10	CAP MOBILE	MCCF0011901	1	
9	CAP EAR	MCCC0011301	1	
8	REAR CASE	MCJN0016401	1	
7	SPEAKER	SUSY0002402	1	
6	ANTENNA	SNGF0002401	1	
5	PCB ASS'Y	SAFY0084901	1	
4	LCD	SVLM0006701	1	
3	VIBRATOR	SJMY0003602	1	
2	RECIVER	SURY0005601	1	
1	FRONT ASS'Y	ACGK0027901	1	

13.2 Accessory

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
2	SBPL00	BATTERY PACK,LI-ION	SBPL0072108	3.7 V,850 mAh,1 CELL,PRISMATIC ,G3100 BATTERY(SV)	Y	Silver	13
2	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0003401	W3000 ,3Pole Necklace type(CDMA Design)	Y		
2	SSAD00	ADAPTOR,AC-DC	SSAD0007824	100-240V ,60 Hz,5.2 V,800 mA,CE,CB,GOST , EU PLUG(18P),STD	Y		
2	MHBY00	HANDSTRAP	MHBY0001101	Neck Strap 400mm (CDMA,common use)	Y	Gray	
2	SGDY00	DATA CABLE	SGDY0003003	LG-510W/G510 ,CABLE W/O POWER BULK	N		
2	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0002901	G7000,G5200 Common use, 3P EAR MIC	Y		
2	SRCY00	CDROM	SRCY0001303	S/W ,NONE , ,650 MB,G7000/G5200 CD CONTENTS	N		

13.3 Replacement Parts

<Mechanic component>

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
1		GSM,BAR/FILP	TGSM0011806	G3100 MORSV,SILVER	N	Silver	
1		GSM,BAR/FILP	TGSM0011804	G3100 MYS, SILVER	N	Silver	
1		GSM,BAR/FILP	TGSM0011807	G3100 NGRSV,SILVER	N	Silver	
1		GSM,BAR/FILP	TGSM0011805	G3100 GRCSV,SILVER	N	Silver	
1		GSM,BAR/FILP	TGSM0011809	G3100 ARE SILVER	N	Silver	
1		GSM,BAR/FILP	TGSM0011810	G3100 NLD SILVER	N	Silver	
1		GSM,BAR/FILP	TGSM0011808	G3100 ZAF SILVER	N	Silver	
2	APEY00	PHONE	APEY0102607	G3100 MORSV,SILVER	N	Silver	
2	APEY00	PHONE	APEY0102603	G3100 MYS, SILVER	N	Silver	
2	APEY00	PHONE	APEY0102608	G3100 NGRSV,SILVER	N	Silver	
2	APEY00	PHONE	APEY0102606	G3100 GRCSV,SILVER	N	Silver	
2	APEY00	PHONE	APEY0102610	G3100 ARE SILVER	N	Silver	
2	APEY00	PHONE	APEY0102611	G3100 NLD SILVER	N	Silver	
2	APEY00	PHONE	APEY0102609	G3100 ZAF SILVER	N	Silver	
3	ACGK00	COVER ASSY,FRONT	ACGK0027801	G3100 EUASV, SILVER	Y	Silver	
4	ACGK00	COVER ASSY,FRONT	ACGK0027901	G3100 EUASV, SILVER	Y	Silver	1
5	MCJK00	COVER,FRONT	MCJK0019601	G3100 EUASV, SILVER	N	Silver	
5	MTAD00	TAPE,WINDOW	MTAD0017401	G3100 EUASV,SILVER	Y		
5	MTAD01	TAPE,WINDOW	MTAD0017402	G3100 EUASV,SILVER	N		
4	AWAB00	WINDOW ASSY,LCD	AWAB0006901	G3100 WINDOW	Y	Silver	
5	BFAA00	FILM,INMOLD	BFAA0011501	G3100 EUARD INMOLDE FILM	Y	Red	
5	MWAC00	WINDOW,LCD	MWAC0031601	G3100 EUASV,SILVER	Y		
4	MPBG00	PAD,LCD	MPBG0015701	G3100 EUASV,SILVER	Y	Black	17
4	MTAB00	TAPE,PROTECTION	MTAB0028801		N		
4	SUMY00	MICROPHONE	SUMY0004601	ASSY ,-40 dB,6*1.5 ,W3000 MIC	Y		14
4	SURY00	RECEIVER	SURY0005601	ASSY ,113 dB,32 ohm,13*4.7 ,Receiver	Y		2
3	ACGM00	COVER ASSY,REAR	ACGM0025501	G3100 EUASV, SILVER	Y	Silver	
4	ACGM00	COVER ASSY,REAR	ACGM0025601	G3100 EUASV, SILVER	Y	Silver	
5	MCCC00	CAP,EARPHONE JACK	MCCC0011301	G3100 EUASV,SILVER	Y	Silver	9
5	MCJN00	COVER,REAR	MCJN0016401	G3100 EUASV,SILVER	N	Silver	8
5	MLEA00	LOCKER,BATTERY	MLEA0012301	G3100 EUASV,SILVER	Y	Silver	12
5	MPBZ00	PAD	MPBZ0035101	G3100	Y	Black	
5	MSDB00	SPRING,COIL	MSDB0001701	G7000	Y	Pearl White	11
4	SUSY00	SPEAKER	SUSY0002402	ASSY ,8 ohm,89 dB,17 mm,G5300 SPEAKER	Y		7
3	ADCA	DOME ASSY,METAL	ADCA0015101	G3100 EUASV,SILVER	Y		16
3	GTZZ00	SCREW TAP TITE	GTZZ0000604	M1.7x4.0,MSWR3(FN) ,N ,ETC-	N	Black	18

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
3	MBJA00	BUTTON,DIAL	MBJA0011201	G3100 EUASV,SILVER	Y	Silver	15
3	MCCF	CAP,MOBILE SWITCH	MCCF0011901	G3100 EUASV,SILVER	Y	Silver	10
3	SBCL00	BATTERY,CELL,LITHIUM	SBCL0001302	2 V,1 mAh,COIN ,W3000 Back Up Battery	Y		
3	SJMY00	VIBRATOR,MOTOR	SJMY0003602	3 V,0.08 A,10*3.4 ,W3000 VIBRATOR	Y		3
3	SNGF00	ANTENNA,GSM,FIXED	SNGF0002401	3.0 ,-2 dBd,WHITE ,GSM+DCS, G3100,INTENNA	Y		6
3	SVLM00	LCD MODULE	SVLM0006701	128 * 96 ,28.3*23.13 ,4096/65K, 26.1*21.11(A/A), TF	Y		4

13.3 Replacement Parts

<Main component>

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
3	SAFY00	PCB ASSY,MAIN	SAFY0084901	G3100 EUASV	Y	Silver	5
4	MLAB00	LABEL,A/S	MLAB0000601	HUMIDITY STICKER	N		
4	SAFA00	PCB ASSY,MAIN,AUTO	SAFA0031101	G3100 EUASV	N		
5	BAT301	CONN,JACK/PLUG, EARPHONE	ENJE0003001	2 ,2 PIN,W3000 Back Up Battery Holder	Y		
5	C101	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C102	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C103	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C104	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C105	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C106	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C107	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C108	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C109	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C110	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C111	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C112	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C113	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C114	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C115	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C116	CAP,CERAMIC,CHIP	ECCH0001811	220000 pF,10V ,Z ,Y5V ,HD ,1005 ,R/TP	Y		
5	C117	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C118	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C119	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C120	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C121	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C122	CAP,CERAMIC,CHIP	ECCH0000163	47 nF,10V,K,X5R,HD,1005,R/TP	Y		
5	C123	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C124	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C126	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C127	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C128	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP	Y		
5	C129	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C130	CAP,CERAMIC,CHIP	ECCH0000378	1 uF,16V ,K ,X7R ,HD ,2012 ,R/TP	Y		
5	C131	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C133	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	C134	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C135	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C136	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C137	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C140	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C201	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP	Y		
5	C202	CAP,TANTAL,CHIP,MAKER	ECTZ0002601	10 uF,10V ,M ,STD ,2125 ,R/TP	Y		
5	C203	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C204	CAP,TANTAL,CHIP,MAKER	ECTZ0002601	10 uF,10V ,M ,STD ,2125 ,R/TP	Y		
5	C205	CAP,CERAMIC,CHIP	ECCH0000138	390 pF,50V,K,X7R,HD,1005,R/TP	Y		
5	C206	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C207	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C208	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C209	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C210	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C211	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C212	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C213	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C214	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C215	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C216	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C217	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C218	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C219	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C220	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C221	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C222	CAP,CERAMIC,CHIP	ECCH0003803	4.7 uF,10V ,Z ,Y5V ,HD ,2012 ,R/TP	Y		
5	C223	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C225	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP	Y		
5	C227	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C228	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C229	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C230	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C231	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C232	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C233	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C234	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP	Y		
5	C235	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	C236	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C237	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C238	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C242	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C243	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C301	CAP,CERAMIC,CHIP	ECCH0001811	220000 pF,10V ,Z ,Y5V ,HD ,1005 ,R/TP	Y		
5	C302	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C327	CAP,CERAMIC,CHIP	ECCH0000378	1 uF,16V ,K ,X7R ,HD ,2012 ,R/TP	Y		
5	C328	CAP,CERAMIC,CHIP	ECCH0000378	1 uF,16V ,K ,X7R ,HD ,2012 ,R/TP	Y		
5	C329	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP	Y		
5	C330	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C331	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C332	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C333	CAP,TANTAL,CHIP,MAKER	ECTZ0002601	10 uF,10V ,M ,STD ,2125 ,R/TP	Y		
5	C334	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C335	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C336	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C337	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C339	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C340	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C341	CAP,CERAMIC,CHIP	ECCH0000371	0.22 uF,50V,Z,Y5V,HD,2012,R/TP	Y		
5	C342	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C343	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C344	CAP,TANTAL,CHIP	ECTH0001702	4.7 uF,10V ,M ,STD ,2012 ,R/TP	Y		
5	C345	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C346	CAP,CERAMIC,CHIP	ECCH0000371	0.22 uF,50V,Z,Y5V,HD,2012,R/TP	Y		
5	C347	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C349	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C350	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C351	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C401	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C402	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C403	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C404	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C405	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C406	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C407	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C408	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	C409	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C410	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C411	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C412	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP	Y		
5	C413	CAP,CERAMIC,CHIP	ECCH0000186	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP	Y		
5	C414	CAP,TANTAL,CHIP,MAKER	ECTZ0002601	10 uF,10V ,M ,STD ,2125 ,R/TP	Y		
5	C415	CAP,CERAMIC,CHIP	ECCH0000276	1 uF,10V,Z,Y5V,HD,1608,R/TP	Y		
5	C417	CAP,CERAMIC,CHIP	ECCH0000111	12 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C418	CAP,CERAMIC,CHIP	ECCH0000111	12 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C419	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C420	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C421	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP	Y		
5	C422	CAP,CERAMIC,CHIP	ECCH0000183	1.8 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP	Y		
5	C423	CAP,CERAMIC,CHIP	ECCH0000133	220 pF,50V ,K ,X7R ,HD ,1005 ,R/TP	Y		
5	C424	CAP,CERAMIC,CHIP	ECCH0000141	680 pF,50V,K,X7R,HD,1005,R/TP	Y		
5	C425	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C426	CAP,FILM,MPP	ECFD0000101	8200 pF,16V ,J ,NI ,SMD ,2012 mm,R/TP	Y		
5	C427	CAP,CERAMIC,CHIP	ECCH0000111	12 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C428	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C430	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C431	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP	Y		
5	C432	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C433	CAP,CERAMIC,CHIP	ECCH0000102	1 pF,50V,C,NP0,TC,1005,R/TP	Y		
5	C434	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP	Y		
5	C435	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C436	CAP,CERAMIC,CHIP	ECCH0000247	1 nF,50V,J,NP0,TC,1608,R/TP	Y		
5	C437	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C438	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C439	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C440	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C441	CAP,CERAMIC,CHIP	ECCH0000111	12 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C442	CAP,CERAMIC,CHIP	ECCH0000139	470 pF,50V,K,X7R,HD,1005,R/TP	Y		
5	C443	CAP,CERAMIC,CHIP	ECCH0000139	470 pF,50V,K,X7R,HD,1005,R/TP	Y		
5	C444	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP	Y		
5	C445	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP	Y		
5	C446	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C447	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP	Y		
5	C448	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	C449	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C450	CAP,CERAMIC,CHIP	ECCH0000101	0.5 pF,50V,C,NP0,TC,1005,R/TP	Y		
5	C451	CAP,CERAMIC,CHIP	ECCH0000103	1.5 pF,50V,C,NP0,TC,1005,R/TP	Y		
5	C453	CAP,CERAMIC,CHIP	ECCH0000128	100 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C454	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C455	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C456	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP	Y		
5	C457	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C458	CAP,CERAMIC,CHIP	ECCH0003401	10 uF,6.3V ,Z ,Y5V ,HD ,2012 ,R/TP	Y		
5	C459	CAP,CERAMIC,CHIP	ECCH0000139	470 pF,50V,K,X7R,HD,1005,R/TP	Y		
5	C460	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C461	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C462	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C463	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C464	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C465	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C466	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C467	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C468	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C469	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C470	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C471	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C472	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C473	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C474	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C475	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C476	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C477	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C478	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C479	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	C480	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C481	CAP,CERAMIC,CHIP	ECCH0000379	2.2 uF,6.3V ,K ,X5R ,HD ,2012 ,R/TP	Y		
5	C482	CAP,CERAMIC,CHIP	ECCH0000177	0.68 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP	Y		
5	CN201	CONNECTOR,BOARD TO BOARD	ENBY0001802	2 PIN,1.27 mm,STRAIGHT ,SILVER ,	Y		
5	CN302	CONN,RECEPTACLE	ENEY0003101	18 PIN,0 ,0 ,	Y		
5	CN303	TERMINAL,PIN	MTCB0000702	7.4*2.8 4.3T Mold 2.2T 3P	Y	Black	
5	CN401	CONN,RF SWITCH	ENWY0002401	STRAIGHT ,SMD ,0.7 dB,4.5*5.3*4.6T	Y		
5	CN402	CONNECTOR,FFC/FPC	ENQY0006401	26 PIN,0.5 mm,ETC ,AU ,	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	D201	DIODE,SWITCHING	EDSY0012301	1-1E1A ,85 V,1 A,R/TP ,P=200mW, IFM=200mA	Y		
5	D301	DIODE,SWITCHING	EDSY0000401	SOT-23,80V,0.3A,R/TP	Y		
5	D302	DIODE,SWITCHING	EDSY0012101	US-FLAT ,30 V,1 A,R/TP ,2.5*1.25*0.6(t)	Y		
5	FL401	FILTER,SEPERATOR	SFAY0001901	880/960 ,1710/1880 ,1.3 dB,1.5 dB,30 dB,25 dB,ETC ,5.4*4.0*1.8	Y		
5	FL402	FILTER,SAW	SFSY0014401	MHz,3.0*2.5*0.9(t) ,SMD ,DUAL SAW FILTER,EGSM-RX/DCS1800-RX	Y		
5	J201	CONN,JACK/PLUG, EARPHONE	ENJE0002301	3,5 PIN,G7000 EAR JACK 3 pole, 5 pin KSD	Y		
5	J301	CONN,SOCKET	ENSY0007602	6 PIN,ETC , , mm,Height 2.7mm	Y		
5	L201	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,	Y		
5	L202	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,	Y		
5	L203	INDUCTOR,CHIP	ELCH0005009	100 nH,J ,1005 ,R/TP ,	Y		
5	L401	INDUCTOR,CHIP	ELCH0001001	10 nH,J,1005,R/TP	Y		
5	L402	INDUCTOR,CHIP	ELCH0001404	1.5 nH,S,1005,R/TP	Y		
5	L404	INDUCTOR,CHIP	ELCH0000718	150 nH,J,1608,R/TP	Y		
5	L405	INDUCTOR,CHIP	ELCH0001406	4.7 nH,S,1005,R/TP	Y		
5	L407	INDUCTOR,CHIP	ELCH0000701	82 nH,J,1608,R/TP	Y		
5	L408	INDUCTOR,CHIP	ELCH0001001	10 nH,J,1005,R/TP	Y		
5	L409	INDUCTOR,CHIP	ELCH0005002	2.7 nH,S ,1005 ,R/TP ,	Y		
5	L410	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	L411	INDUCTOR,CHIP	ELCH0001405	3.3 nH,S,1005,R/TP	Y		
5	L412	INDUCTOR,CHIP	ELCH0001001	10 nH,J,1005,R/TP	Y		
5	L413	CAP,CERAMIC,CHIP	ECCH0000117	27 pF,50V,J,NP0,TC,1005,R/TP	Y		
5	LD201	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T	Y		
5	LD202	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T	Y		
5	LD203	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T	Y		
5	LD204	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T	Y		
5	LD205	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T	Y		
5	LD206	DIODE,LED,CHIP	EDLH0004502	BLUE ,1608 ,R/TP ,0.35T	Y		
5	Q201	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY	Y		
5	Q202	TR,BJT,NPN	EQBN0004801	SMT6 ,0.2 W,R/TP ,	Y		
5	Q203	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY	Y		
5	Q301	TR,FET,P-CHANNEL	EQFP0004201	2.9*1.9*0.8(t) ,0.7 W,20 V,-6.0 A,R/TP ,NDC652P upgrade(substitution) item	Y		
5	R101	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R102	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R103	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R106	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP	Y		
5	R108	RES,CHIP	ERHY0000282	120K ohm,1/16W,J,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	R109	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP	Y		
5	R110	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP	Y		
5	R111	RES,CHIP	ERHY0000278	82K ohm,1/16W,J,1005,R/TP	Y		
5	R112	RES,CHIP	ERHY0000512	10M ohm,1/16W,J,1608,R/TP	Y		
5	R116	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R117	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP	Y		
5	R201	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R202	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP	Y		
5	R203	RES,CHIP	ERHY0000138	33K ohm,1/16W,F,1005,R/TP	Y		
5	R204	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP	Y		
5	R205	RES,CHIP	ERHY0000278	82K ohm,1/16W,J,1005,R/TP	Y		
5	R206	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R207	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R208	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R209	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R210	RES,CHIP	ERHY0000250	3.3K ohm,1/16W,J,1005,R/TP	Y		
5	R211	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP	Y		
5	R212	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R213	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP	Y		
5	R214	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R215	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R216	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R217	RES,CHIP	ERHY0000205	15 ohm,1/16W,J,1005,R/TP	Y		
5	R218	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP	Y		
5	R219	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R220	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP	Y		
5	R221	RES,CHIP	ERHY0000250	3.3K ohm,1/16W,J,1005,R/TP	Y		
5	R222	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP	Y		
5	R223	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R224	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R225	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R226	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R227	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R228	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R233	RES,CHIP	ERHY0000293	510K ohm,1/16W,J,1005,R/TP	Y		
5	R234	RES,CHIP	ERHY0000244	1.5K ohm,1/16W,J,1005,R/TP	Y		
5	R235	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R236	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	R237	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP	Y		
5	R238	RES,CHIP	ERHY0000205	15 ohm,1/16W,J,1005,R/TP	Y		
5	R240	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP	Y		
5	R241	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP	Y		
5	R250	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R252	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R254	RES,CHIP	ERHY0000261	10K ohm,1/16W,J,1005,R/TP	Y		
5	R255	RES,CHIP	ERHY0000254	4.7K ohm,1/16W,J,1005,R/TP	Y		
5	R256	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R257	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R309	RES,CHIP	ERHY0000265	20K ohm,1/16W,J,1005,R/TP	Y		
5	R312	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R327	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R328	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R329	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R330	RES,CHIP	ERHY0000280	100K ohm,1/16W,J,1005,R/TP	Y		
5	R333	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R334	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R335	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R336	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R337	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R338	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R339	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R340	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R341	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP	Y		
5	R342	RES,CHIP	ERHY0000202	4.7 ohm,1/16W,J,1005,R/TP	Y		
5	R343	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R344	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R345	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		
5	R347	RES,CHIP	ERHY0001103	0.33 ohm,1/4W ,F ,2012 ,R/TP	Y		
5	R348	RES,CHIP	ERHY0000286	200K ohm,1/16W,J,1005,R/TP	Y		
5	R349	RES,CHIP	ERHY0000286	200K ohm,1/16W,J,1005,R/TP	Y		
5	R401	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP	Y		
5	R402	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP	Y		
5	R403	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R404	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R405	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R406	RES,CHIP	ERHY0000213	47 ohm,1/16W,J,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	R407	RES,CHIP	ERHY0000255	5.6K ohm,1/16W,J,1005,R/TP	Y		
5	R408	RES,CHIP	ERHY0004301	130 ohm,1/16W ,J ,1005 ,R/TP	Y		
5	R409	RES,CHIP	ERHY0004301	130 ohm,1/16W ,J ,1005 ,R/TP	Y		
5	R410	RES,CHIP	ERHY0000234	510 ohm,1/16W,J,1005,R/TP	Y		
5	R411	RES,CHIP	ERHY0000231	390 ohm,1/16W,J,1005,R/TP	Y		
5	R412	RES,CHIP	ERHY0000214	51 ohm,1/16W,J,1005,R/TP	Y		
5	R413	RES,CHIP	ERHY0000247	2.2K ohm,1/16W,J,1005,R/TP	Y		
5	R414	RES,CHIP	ERHY0000211	33 ohm,1/16W,J,1005,R/TP	Y		
5	R415	RES,CHIP	ERHY0000224	180 ohm,1/16W,J,1005,R/TP	Y		
5	R416	RES,CHIP	ERHY0000224	180 ohm,1/16W,J,1005,R/TP	Y		
5	R417	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP	Y		
5	R418	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP	Y		
5	R419	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP	Y		
5	R420	RES,CHIP	ERHY0000203	10 ohm,1/16W,J,1005,R/TP	Y		
5	R421	RES,CHIP	ERHY0000231	390 ohm,1/16W,J,1005,R/TP	Y		
5	R422	RES,CHIP	ERHY0000241	1K ohm,1/16W,J,1005,R/TP	Y		
5	R423	RES,CHIP	ERHY0000141	39K ohm,1/16W,F,1005,R/TP	Y		
5	R424	RES,CHIP	ERHY0000263	15K ohm,1/16W,J,1005,R/TP	Y		
5	R425	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R426	RES,CHIP	ERHY0000296	1M ohm,1/16W,J,1005,R/TP	Y		
5	R430	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R432	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R433	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R434	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R435	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R436	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R437	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R438	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R439	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R440	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R441	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R442	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R443	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R444	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R445	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R446	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R447	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R448	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	R449	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R450	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R451	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R452	RES,CHIP	ERHY0000220	100 ohm,1/16W,J,1005,R/TP	Y		
5	R453	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	R454	RES,CHIP	ERHY0000201	0 ohm,1/16W,J,1005,R/TP	Y		
5	SPFY00	PCB,MAIN	SPFY0060901	FR-4 ,1 mm,MULTI-8 ,G3100 Ver. C	N	Silver	
5	U101	IC	EUSY0100601	160 PIN MINI-BGA ,160 PIN,R/TP ,GSM DIGITAL BASEBAND / AD20MSP430	Y		
5	U102	IC	EUSY0100701	64 BALL LFBGA / MINI-BGA ,64 PIN,R/TP ,DUAL-MODE VOICEBAND BASEBAND CODEC / AD20MSP430	Y		
5	U103	IC	EUSY0150301	P-FBGA73 ,73 PIN,R/TP ,64M FLASH 32M PSRAM / BOTTOM BOOT	N		
5	U201	IC	EUSY0077301	SC70-6/SOT23-6 ,6 PIN,R/TP ,	Y		
5	U202	IC	EUSY0122501	LLP-6 ,6 PIN,R/TP ,300mA CMOS LDO / 3.3V	Y		
5	U203	IC	EUSY0077401	SOT23-6 ,6 PIN,R/TP ,SPDT ANALOG SWITCH	Y		
5	U204	IC	EUSY0077401	SOT23-6 ,6 PIN,R/TP ,SPDT ANALOG SWITCH	Y		
5	U205	IC	EUSY0136701	12 QFN ,12 PIN,R/TP ,QFN TYPE SPDT ANALOG SWITCH	Y		
5	U206	IC	EUSY0077701	SC70-5 ,5 PIN,R/TP ,	Y		
5	U207	IC	EUSY0111601	32-PIN QFN ,32 PIN,R/TP ,MA-3 / 40 TONES / FM + WAVEFORM TABLE	Y		
5	U301	IC	EUSY0100401	TSSOP ,28 PIN,R/TP ,GSM POWER MANAGEMENT SYSTEM	Y		
5	U302	IC	EUSY0145301	SC70-5 ,5 PIN,R/TP ,80 mA REGULATOR / 3.0 V	Y		
5	U401	IC	EUSY0129801	Land Grid Array(LGA) ,64 PIN,R/TP ,9 x 9 mm	Y		
5	U402	PAM	SMPY0003901	35 dBm,55 %,80 mA,-50 dBc,25 dB,10*10*1.8 ,SMD ,	Y		
5	U403	IC	EUSY0077201	SOT(DCK) ,5 PIN,R/TP ,	Y		
5	U404	IC	EUSY0076701	SOT-23-6 ,6 PIN,R/TP ,	Y		
5	VA201	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	VA202	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	VA203	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	VA204	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	VA205	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	VA206	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		

Level	Location No.	Description	Part Number	Specification	SVC	Color	Remark
5	VA207	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	VA208	RES,VARIABLE,ETC	ERVZ0000101	ohm, PIN, ,SMD ,R/TP ,1005 SIZE CHIP VARISTOR	Y		
5	X101	X-TAL	EXXY0004601	0.32768 MHz,20 PPM,12.5 pF,65000 ohm,SMD ,6.9*1.4*1.3 ,	Y		
5	X401	VCTCXO	EXSK0003501	13 MHz,2.5 PPM,10 pF,SMD ,5.0*3.2*1.5 ,	Y		