Service Manual

Service Manual

KE970/ME970

Model : KE970/ME970

Date: April, 2007 / Issue 1.0

REVISED HISTORY

Editor	Date	Issue	Contents of Changes	S/W Version
G.C. LIM	2006/03/29	0.1		

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

* This manual provides the information necessary to install, program, operate and maintain the ME970.

Table Of Contents

1. INTRODUCTION 7

1.1 Purpose 7
1.2 Regulatory Information..... 7
1.3 ABBREVIATION 9

2. PERFORMANCE 11

2.1 H/W Features.....11
2.2 Technical specification.....12

3. TECHNICAL BRIEF 17

3.1 ME970 Component Block diagram.. 17
3.2 Baseband Processor (BBP) Introduction 18
3.3 Power management IC 30
3.4 Power ON/OFF 35
3.5 SIM interface.....37
3.6 Memory.....38
3.7 LCD Display.....39
3.8 Keypad Switching & Scanning.....40
3.9 Keypad back-light illumination 42
3.10 LCD back light illumination.....43
3.11 Battery current consumption monitor...45
3.12 JTAG & ETM interface connector 45
3.13 Audio.....46
3.14 Multi port switch 48
3.15 USB charging circuit 50
3.16 BLUETOOTH.....51
3.17 Micro SD external memory card slot.....55
3.18 18pin Multi Media Interface connector .57
3.19 General Description 59
3.20 Receiver part.....61
3.21 Transmitter part.....62
3.22 RF synthesizer.....63
3.23 TCXO.....63
3.24 Front End Module control.....64
3.25 Power Amplifier Module.....64

4. PCB layout.....65

4.1 Main & Sub PCB component placement 65

5. Trouble shooting.....72

5.1 Trouble shooting test setup.....72
5.2 Power on Trouble.....72
5.3 Charging trouble 76
5.4 LCD display trouble.....78
5.5 Camera Trouble 80
5.6 Receiver & Speaker trouble 82
5.7 Microphone trouble 84
5.8 Vibrator trouble 86
5.9 Keypad back light trouble.....88
5.10 Micro SD and SIM card trouble.....90
5.11 RF PART TROUBLESHOOTING 93

6. Download & S/W upgrade.....108

6.1 S/W download setup 108
6.2 Download program user guide.....109

7. CIRCUIT DIAGRAM 117

8. PCB LAYOUT.....123

9. RF Calibration 129

9.1 Test Equipment Setup 129
9.2 Calibration Steps.....129

10. Stand along 135

10.1 Test Program Setting 135
10.2 Tx Test 137
10.3 Rx Test.....138

11. ENGINEERING MODE 139

12. EXPLODED VIEW & REPLACEMENT PART LIST 141

12.1 Exploded View 141
12.2 Replacement Parts 146
12.3 Accessory 159

1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of the ME970.

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 you're your telecommunications services. System users are responsible for the security of own system.
There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. LGE does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. LGE will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

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

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the ME970 or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on the ME970 must be performed only at the LGE or its authorized agents. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

The ME970 complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

F. Pictures

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

G. Interference and Attenuation

An ME970 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 contains 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 such as EEPROM to the factory, use the protective package as described.

1.3 ABBREVIATION

For the purposes of this manual, following abbreviations apply:

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

1. INTRODUCTION

OPLL	Offset Phase Locked Loop
PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
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 Feature

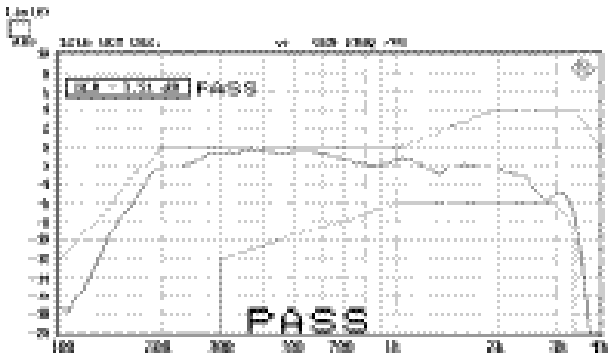
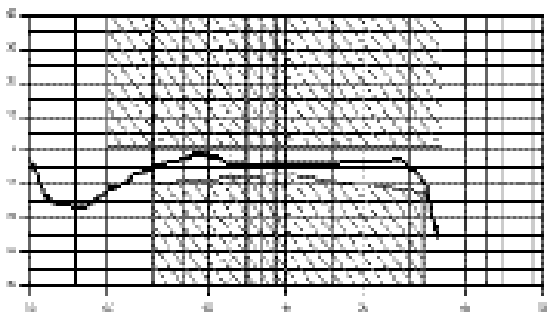
Item	Feature	Comment
Standard Battery	Li-ion, 800mAh	
AVG TCVR Current	280mA	PL5
Standby Current	<2.7mA	@PP9
Talk time	3hours (GSM TX Level 7)	
Standby time	277 hours (Paging Period:9, RSSI: -85dBm)	
Charging time	3 hours	
RX Sensitivity	GSM900 : -105dBm, DCS/PCS : -105dBm	
TX output power	GSM900: 32dBm (Level 5) DCS/PCS: 29dBm (Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V Small	
Display	320 x 240 pixels, 2.2 inch wide, 265K color, TFT	
Status Indicator	Soft icons Key Pad 0 ~ 9, #, *, END/PWR, SEND, CLEAR Key Side Key Up/Down, AF/Camera double action key	
ANT	Built in antenna	
EAR Phone Jack	18pin multi port Headset jack with Remote controller	
PC Synchronization	Yes	
Speech coding	EFR/FR/AMR	
Data and Fax	Yes	
Vibrator	Yes	
Buzzer	No	
Voice Recoding	Yes	
C-Mic	Yes	
Receiver	Yes	
Travel Adapter	Yes	
Options	Bluetooth hands-free kit, Data Kit	

2.2 Technical specification

<table>
<tr><th>Item</th><th>Description</th><th colspan="6">Specification</th></tr>
<tr><td>1</td><td>Frequency Band</td><td colspan="6">GSM900
• TX: 890 + 0.2 x n MHz
• RX: 935 + 0.2 x n MHz (n = 1 ~ 124)
EGSM
• TX: 890 + 0.2 x (n-1024) MHz
• RX: 935 + 0.2 x (n-1024) MHz (n = 975 ~ 1023)
DCS1800
• TX: 1710 + (n-511) x 0.2 MHz (n = 512 ~ 885)
• RX: TX + 95 MHz
PCS1900
• TX: 1850.2 + (n-512) x 0.2 MHz (n = 512 ~ 810)
• RX: TX + 80MHz</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">< 0.1ppm</td></tr>
<tr><td rowspan="20">4</td><td rowspan="20">Power Level</td><td colspan="6">GSM900/EGSM</td></tr>
<tr><td>Level</td><td>Power</td><td>Toler.</td><td>Level</td><td>Power</td><td>Toler.</td></tr>
<tr><td>5</td><td>33 dBm</td><td>±2dB</td><td>13</td><td>17 dBm</td><td>±3dB</td></tr>
<tr><td>6</td><td>31 dBm</td><td>±3dB</td><td>14</td><td>15 dBm</td><td>±3dB</td></tr>
<tr><td>7</td><td>29 dBm</td><td>±3dB</td><td>15</td><td>13 dBm</td><td>±3dB</td></tr>
<tr><td>8</td><td>27 dBm</td><td>±3dB</td><td>16</td><td>11 dBm</td><td>±5dB</td></tr>
<tr><td>9</td><td>25 dBm</td><td>±3dB</td><td>17</td><td>9 dBm</td><td>±5dB</td></tr>
<tr><td>10</td><td>23 dBm</td><td>±3dB</td><td>18</td><td>7 dBm</td><td>±5dB</td></tr>
<tr><td>11</td><td>21 dBm</td><td>±3dB</td><td>19</td><td>5 dBm</td><td>±5dB</td></tr>
<tr><td>12</td><td>19 dBm</td><td>±3dB</td><td></td><td></td><td></td></tr>
<tr><td colspan="6">DCS1800/PCS1900</td></tr>
<tr><td>Level</td><td>Power</td><td>Toler.</td><td>Level</td><td>Power</td><td>Toler.</td></tr>
<tr><td>0</td><td>30 dBm</td><td>±2dB</td><td>8</td><td>14 dBm</td><td>±3dB</td></tr>
<tr><td>1</td><td>28 dBm</td><td>±3dB</td><td>9</td><td>12 dBm</td><td>±4dB</td></tr>
<tr><td>2</td><td>26 dBm</td><td>±3dB</td><td>10</td><td>10 dBm</td><td>±4dB</td></tr>
<tr><td>3</td><td>24 dBm</td><td>±3dB</td><td>11</td><td>8 dBm</td><td>±4dB</td></tr>
<tr><td>4</td><td>22 dBm</td><td>±3dB</td><td>12</td><td>6 dBm</td><td>±4dB</td></tr>
<tr><td>5</td><td>20 dBm</td><td>±3dB</td><td>13</td><td>4 dBm</td><td>±4dB</td></tr>
<tr><td>6</td><td>18 dBm</td><td>±3dB</td><td>14</td><td>2 dBm</td><td>±5dB</td></tr>
<tr><td>7</td><td>16 dBm</td><td>±3dB</td><td>15</td><td>0 dBm</td><td>±5dB</td></tr>
</table>

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	**GSM900/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
		DCS1800/PCS1900	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-65
		3,000~ <6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	**GSM850**	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-19
		600	-21
		1,200	-21
		1,800	-24

2. PERFORMANCE

<table>
<tr><th>Item</th><th>Description</th><th colspan="2">Specification</th></tr>
<tr><td rowspan="6">6</td><td rowspan="6">Output RF Spectrum
(due to switching transient)</td><td colspan="2">DCS1800/PCS1900</td></tr>
<tr><td>Offset from Carrier (kHz).</td><td>Max. (dBm)</td></tr>
<tr><td>400</td><td>-22</td></tr>
<tr><td>600</td><td>-24</td></tr>
<tr><td>1,200</td><td>-24</td></tr>
<tr><td>1,800</td><td>-27</td></tr>
<tr><td>7</td><td>Spurious Emissions</td><td colspan="2">Conduction, Emission Status</td></tr>
<tr><td>8</td><td>Bit Error Ratio</td><td colspan="2">GSM850
BER (Class II) < 2.439% @-102dBm
DCS1800/PCS1900
BER (Class II) < 2.439% @-100dBm</td></tr>
<tr><td>9</td><td>Rx Level Report accuracy</td><td colspan="2">±3 dB</td></tr>
<tr><td>10</td><td>SLR</td><td colspan="2">8 ±3 dB</td></tr>
<tr><td>11</td><td>Sending Response</td><td colspan="2">  </td></tr>
<tr><td>12</td><td>RLR</td><td colspan="2">-15±3 dB</td></tr>
<tr><td rowspan="2">13</td><td rowspan="2">Receiving Response</td><td colspan="2">  </td></tr>
<tr><td colspan="2">∗ Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.</td></tr>
</table>

Item	Description	Specification	
14	STMR	> 17 dB	
15	Stability Margin	> 40 dB	
16	Idle Noise Sending	< -64dB	
17	Idle Noise Receiving	< -47dB	
18	Side tone Distortion	Three stage distortion < 10%	
19	<Change> System frequency (26 MHz) tolerance	$\leq$ 2.5ppm	
20	<Change>32.768KHz tolerance	$\leq$ 30ppm	
21	Power consumption	Standby - Normal $\leq$ 5.2mA(Mix. power)	
22	Talk Time	GSM900/Lvl 7(Battery Capacity 800mA) : Min. 2.5 hr GSM900/Lvl 12(Battery Capacity 800 mA) : Min. 3hr	
23	Standby Time	Under conditions, at least Min. 250 hr 1. Brand new and full 800mAh battery 2. Full charge, no receive/send and keep GSM in idle mode. 3. Broadcast set off. 4. Signal strength display set at 3 level above. 5. Backlight of phone set off.	
24	Ringer Volume	At least 65 dB under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
25	Charge Voltage	Fast Charge : < 450 mA Slow Charge: < 55mA	
26	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

2. PERFORMANCE

Item	Description	Specification	
27	Battery Indicator	Battery Bar Number	Voltage(±0.05V)
		4	3.86V~4.2V
		3	3.75V~3.85V
		2	3.75V~3.69V
		1	3.69V~3.62V
		0	3.62V~
28	Low Voltage Warning	3.62V↓ ±0.05V (Call)	
		3.50V↓ ±0.05V (Standby)	
29	Forced shut down Voltage	3.35± 0.05 V	
30	Battery Type	1 Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 800mAh	
31	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60Hz Out put: 4.8, 0.9A	

3. TECHNICAL BRIEF

3.1. ME970 Component Block diagram.

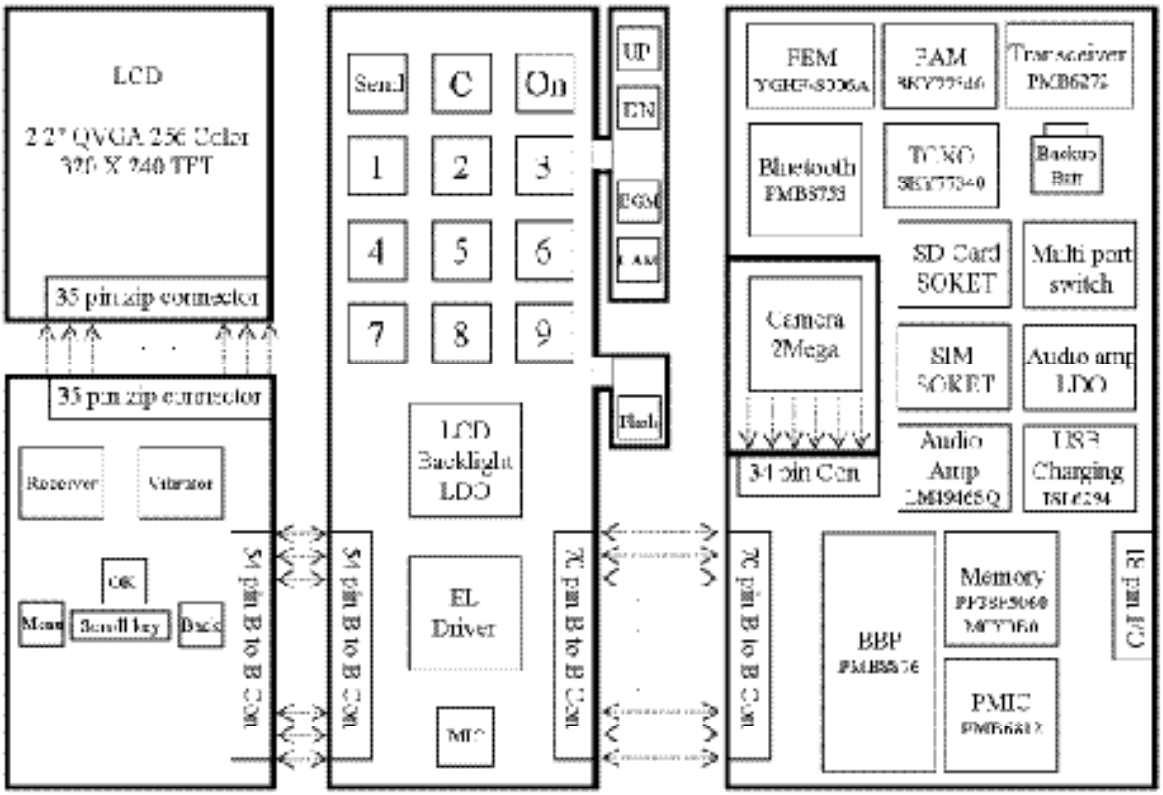


Figure 1. ME970 Hardware architecture

ME970 is composed with 3 different PCB part such as main PCB, keypad FPCB and slide FPCB.

3.2. Baseband Processor (BBP) Introduction

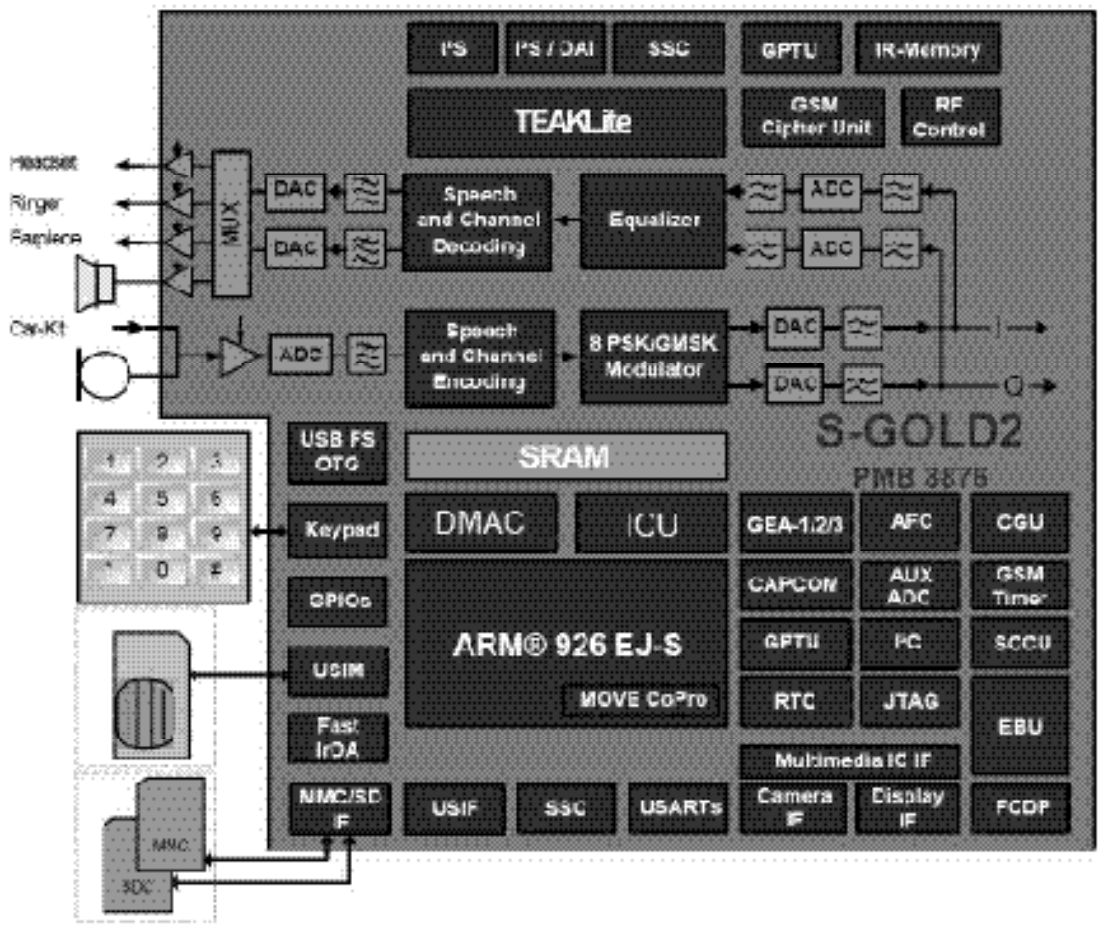


Figure 2. Top level block diagram of the S-GOLD2™ (PMB8876)

3.2.1 General Description

S-GOLD2™ is a GSM/EDGE single chip mixed signal Baseband IC containing all analog and digital functionality of a cellular radio. Additionally S-GOLD2™ Provides multimedia extensions such as camera, software MIDI, MP3 sound. It is designed as a single chip solution, integrating the digital and mixed signal portions of the base band in 0.13um, 1.5V technology. The chip will fully support the FR, EFR, HR and AMR-NB vocoding. S-GOLD2™ support multi-slot operation modes HSCSD (up to class 10), GPRS for high speed data application (up to class 12) and EGPRS (up to class 12) without additional external hardware.

3.2.2. Block Description

• Processing core
ARM926EJ-S 32 bit processor core for controller functions. The ARM926EJ-S includes an MMU, and the Jazelle Java extension for Java acceleration.
- TEAKLite DSP core

• ARM-Memory
- 32k Byte Boot ROM on the AHB
- 96k Byte SRAM on the AHB, flexibly usable as program or data RAM
- 16k Byte Cache for Program (internal)
- 8k Byte tightly coupled memory for Program(internal)
- 8k Byte Cache for Data(internal)
- 8k Byte tightly coupled memory for Data(internal)

• DSP-Memory
- 104K x 16bit Program ROM
- 8k x 16bit Program RAM
- 60k x 16bit Data ROM
- 37k x 16bit Data RAM
- Incremental Redundancy(IR) Memory of 35904 words of 16bit

• Shared Memory Block
1.5K x 32bit Shared RAM(dual ported) between controller system and TEAKLite.

• Controller Bus system
The processor cores and their peripherals are connected by powerful buses. Multi-layer AHB for connecting the ARM and the other master capable building blocks with the internal and external memories and with the peripheral buses.

• Clock system
The clock system allows widely independent selection of frequencies for the essential parts of the S-GOLD2. Thus power consumption and performance can be optimized for each application.

• Functional Hardware block
- CPU and DSP Timers
- MOVE coprocessor performing motion estimation for video encoding algorithms (H.263, MPEG-4)
- Programmable PLL with additional phase shifters for system clock generation
- GSM Timer Module that off-loads the CPU from radio channel timing
- GMSK / 8-PSK Modulator according to GSM-standard 05.04 (5/2000)
- GMSK Modulator: gauss-filter with B*T=0.3
- EDGE Modulator: 8PSK-modulation with linearized GMSK-Pulse-Filter
- Hardware accelerators for equalizer and channel decoding.
- Incremental Redundancy memory for EDGE class 12 support
- A5/1, A5/2, A5/3 Cipher unit
- GEA1, GEA2, GEA3 Cipher Unit to support GPRS data transmission

- Advanced static and dynamic power management features including TDMA-Frame synchronous low power mode and enhanced CPU modes(idle and sleep modes)
- Pulse Number Modulation output for Automatic Frequency Correction(AFC)
- Serial RF Control interface: support of direct conversion RF
- A Universal Serial Interface(USIF) enabling asynchronous (UART) of synchronous (SPI) serial data transmission
- 1 Serial Synchronous SPI compatible interfaces in the controller domain
- 1 Serial Synchronous SPI compatible interface in the TEAKLite domain
- 2 USART with autobaud detection, hardware flow control and integrated IrDA controller supporting IrDA's SIR standard (up to 115.2Kbps)
- A dedicated Fas IfDA Controller supporting IrDA's SIR,MIR and FIR standards (up to 4Mbps)
- I2C-bus interface (e.g. connection to S/M power)
- A fast display interface supporting serial and parallel interconnection
- An ITU-R BT.656 compatible Camera interface.
- Programmable clock output for a camera
- An multimedia/Secure Digital Card Interface (MMCI/SD:SDIO capable)

3.2.3. External Devices connected to memory interface

Table 1 Memory interface

Device	Name	Maker	Remark
FLASH	PF38F5060M0Y0B0	Intel	Synchronous / A synchronous
SDRAM	PF38F5060M0Y0B0	Intel	Synchronous 104MHz
LCD	IL220DBN1A	LGIT	8bit access 3times transmission
Melody IC	Not Used	S/W	Infineon Software CODEC

3.2.4. RF Interface (T_OUT)

S-Gold2 uses this interface to control RF IC and Peripherals. 13 signals are provided switch on/off RF ICs Periodically each TDMA frame.

Table 2 RF Interface Spec.

T_OUT		
Resource	Interconnection	Description
T_OUT0	TXON_PA	PAM Power on
T_OUT1	VIBRATOR_EN	VBRATOR ON-
T_OUT2	PA_BAND	TX RF band select
T_OUT3	ANT_SW1	FEM control
T_OUT4	ANT_SW2	FEM control
T_OUT5	ANT_SW3	FEM control
T_OUT6	MODE	PAM Mode select

3.2.5. USART Interface

ME970 have two UART Drivers as follow :
- USART1 : Hardware Flow Control / SW upgrade / Calibration
- USART2 : SW debug trace.

Table 3 USART Interface Spec.

USART_0(USART1)		
Resource	Name	Remark
USART0_TXD	TXD_0	Transmit Data
USART0_RXD	RXD_0	Receive Data
USART0_CTS	CTS_0	Clear To Send
USART0_RTS	RTS_0	Request To Send
	DSR	N.C.
USART_1(USART2)		
USART1_TXD	TX_DEBUG	Trace data tx
USART1_RXD	RX_DEBUG	Trace data rx
USART1_CTS	N.C.	N.C.
USART1_RTS	N.C.	N.C.

3.2.6. ADC channel

BBP ADC block is composed of 7 external ADC channel . This block operates charging process and other related process by reading battery voltage and other analog values.

Table 4 S-Gold2 ADC channel usage

ADC channel		
Resource	Interconnection	Description
M0	BATT_TEMP	Battery temperature measure
M1	RF_TEMP	RF block temperature measure
M2	JACK_TYPE	Accessory type detect
M7	H/W VERSION	S-Gold2 H/W version detect
M8	VSUPPLY	Battery supply voltage measure
M9	I_MONITOR	Current consumption measure
M10	REMOTE_ADC	Remote control key detect

3.2.7. GPIO map

Over a hundred allowable resources, ME970 is using as follows except dedicated to SIM and Memory. ME970 GPIO(General Purpose Input/Output) Map, describing application, I/O state, and enable level, is shown in below table.

Table 5 S-Gold2 GPIO pin Map

Port function	KE260 Net Name	Description
KEY MATRIX		
KP_IN0	KP_IN0	Refer to Key Matrix
KP_IN1	KP_IN1	Refer to Key Matrix
KP_IN2	KP_IN2	Refer to Key Matrix
KP_IN3	KP_IN3	Refer to Key Matrix
KP_IN4	KP_IN4	Refer to Key Matrix
KP_IN5	KP_IN5	Refer to Key Matrix
KP_OUT5	KP_OUT5	Refer to Key Matrix
KP_OUT0	KP_OUT0	Refer to Key Matrix
KP_OUT1	KP_OUT1	Refer to Key Matrix
KP_OUT2	KP_OUT2	Refer to Key Matrix
KP_OUT3	KP_OUT3	Refer to Key Matrix
USART_0		
USART0_RXD	RXD_0	UARTO, RS232 Data
USART0_TXD	TXD_0	UARTO, RS232 Data
USART0_RTS_N	CTS_0	UARTO, RS232 RTS
USART0_CTS_N	RTS_0	UARTO, RS232 CTS
CC1CC6IO	FM_INT	For FM Radio Interrupt
USART_1		
USART1_RXD	TX_DEBUG	For debugging
USART1_TXD	RX_DEBUG	For debugging
USART1_RTS_N	Not Use	
USART1_CTS_N	Not Use	
USB		
USB_DPLUS	USB_DP	USB data
USB_DMINUS	USB_DM	USB data

MEMORY &CLK		
GPIO_20	F_DPD	For INTEL Memory
CLK32K	CLK32K	For FM Radio & BLUETOOTH
GPIO_22	Not Use	
CAMERA I/F		
CIF_D0	CIF_D(0)	Camera DATA[0]
CIF_D1	CIF_D(1)	Camera DATA[1]
CIF_D2	CIF_D(2)	Camera DATA[2]
CIF_D3	CIF_D(3)	Camera DATA[3]
CIF_D4	CIF_D(4)	Camera DATA[4]
CIF_D5	CIF_D(5)	Camera DATA[5]
CIF_D6	CIF_D(6)	Camera DATA[6]
CIF_D7	CIF_D(7)	Camera DATA[7]
CIF_PCLK	CIF_PCLK	Camera pixel clock
CIF_HSYNC	CIF_HS	Camera H sync
CIF_VSYNC	CIF_VS	Camera V sync
CLKOUT	CIF_MCLK	Camera main clock
CIF_PD	CIF_PD	Camera power down(active high)
CIF_RESET	CIF_RESET	Camera reset
LCD IF/		
DIF_D0	DIF_D(0)	LCD data[0]
DIF_D1	DIF_D(1)	LCD data[1]
DIF_D2	DIF_D(2)	LCD data[2]
DIF_D3	DIF_D(3)	LCD data[3]
DIF_D4	DIF_D(4)	LCD data[4]
DIF_D5	DIF_D(5)	LCD data[5]
DIF_D6	DIF_D(6)	LCD data[6]
DIF_D7	DIF_D(7)	LCD data[7]
DIF_CS1	DIF_CS	LCD chip select
GPIO_96	FM_BBP_SEL	Audio amp inuput select(High: FM sound, Low: BBP sound)
DIF_CD	DIF_CD	Command Data switch
DIF_WR	MM_WR	LCD Write
DIF_RD	MM_RD	LCD Read

GPIO_99	_USB_CHG_EN	USB charging (High: charge disable, Low: enable)
DIF_VD (in)	_TF_PWR_EN	Trans-Flash card power enable(active low)
DIF_RESET1_GPIO	DIF_RESET1	LCD Reset
EINT6	REMOTE_INT	For Remote Control Headset
I2c		
I2C_SCL	SCL	For SM-Power, FM Radio, Audio AMP
I2C_SDA	SDA	"
PM_INT (EINT)	PM_INT	SM-Power interrupt
SIM CARD		
CC_IO	SIM_IO	SIM CARD I/O
CC_CLK	SIM_CLK	SIM CARD CLOCK
CC_RST	SIM_RST	SIM CARD RESET
I2S		
I2S2_CLK0	Not Use	
GPIO_102	_WP	Not Connected
I2S2_RX	Not Use	
I2S2_TX	Not Use	
I2S2_WA0	Not Use	
I2S2_WA1	Not Use	
EXTERNAL MEMORY		
MMCI_CMD	TF_CMD	For T-Flash
MMCI_DAT[0]	TF_DAT0	"
MMCI_CLK	TF_CLK	"
BT I/F		
USIF_TXD_MTSR	USIF_TXD	For Bluetooth
USIF_RXD_MRST	USIF_RXD	"
GPIO_109	_USB_EOC	USB End of charging detect(High: EOC, Low: charging)
GPIO_110	RPWRON	Remote power on detect (High: Remote , Low: Normal
GPIO_111	SPK_RCV_SEL	Audio pass select(high: Speaker, Low: Receiver)
I2S		
I2S1_CLK0	I2S1_CLK	For Bluetooth
GPTU0_0	FLASH_EN	For Camera Flash LED

I2S1_RX	I2S1_RX	For Bluetooth
I2S1_TX	I2S1_TX	"
I2S1_WA0	I2S1_WA0	"
MMC		
MMCI_DAT[1]	TF_DAT1	For T-Flash
MMCI_DAT[2]	TF_DAT2	"
MMCI_DAT[3]	TF_DAT3	"
AUDIO I/F		
EPN1	RCV_N	For Receiver
EPP1	RCV_P	"
EPPA1	BBP_SND_L	For Speaker
EPPA2	BBP_SND_R	For Speaker
MICN1	MIC1_N	For Mic
MICP1	MIC1_P	"
MICN2	MIC2_N	For Headset Mic
MICP2	MIC2_P	"
VMICP	VMICP	For Mic
VMICN	VMICN	"
RF I/F		
PAOUT1		
PAOUT2		
BB_I		
BB_IX		
BB_Q		
BB_QX		
ADC		
M_0	BAT_TEMP	Battery temperature detect
M_1	RF_TEMP	RF Power amp reference temperature detect
M_2	JACK_TYPE	For 18Pin Cable Type Detect
M_7		HW revision indication
M_8		Battery voltage measurement
M_9	I_MONITOR	Current consumption measurement
M_10	REMOTE_ADC	For Remote Control Headset Key detect with REMOTE_INT
Reference		
VREF		
IREF		
JTAG		
TDO	TDO	For JTAG & ETM Interface
TDI	TDI	"
TMS	TMS	"
TCK	TCK	"
TRST_n	TRSTn	"
RTCK	RTCK	"

ETM		
TRIG_IN	TRIG_IN	"
MON1	MON1	"
MON2	MON2	"
TRACESYNC	TRACESYNC	"
TRACECLK	TRACECLK	"
PIPESTAT[2]	PIPESTAT[2]	"
PIPESTAT[1]	PIPESTAT[1]	"
PIPESTAT[0]	PIPESTAT[0]	"
TRACEPKT[0]	TRACEPKT[0]	"
TRACEPKT[1]	TRACEPKT[1]	"
TRACEPKT[2]	TRACEPKT[2]	"
TRACEPKT[3]	TRACEPKT[3]	"
TRACEPKT[4]	TRACEPKT[4]	"
TRACEPKT[5]	TRACEPKT[5]	"
TRACEPKT[6]	TRACEPKT[6]	"
TRACEPKT[7]	TRACEPKT[7]	"
Memory		
EBU_AD[0]	D(0)	Data bus[0]
EBU_AD[1]	D(1)	Data bus[1]
EBU_AD[2]	D(2)	Data bus[2]
EBU_AD[3]	D(3)	Data bus[3]
EBU_AD[4]	D(4)	Data bus[4]
EBU_AD[5]	D(5)	Data bus[5]
EBU_AD[6]	D(6)	Data bus[6]
EBU_AD[7]	D(7)	Data bus[7]
EBU_AD[8]	D(8)	Data bus[8]
EBU_AD[9]	D(9)	Data bus[9]
EBU_AD[10]	D(10)	Data bus[10]
EBU_AD[11]	D(11)	Data bus[11]
EBU_AD[12]	D(12)	Data bus[12]
EBU_AD[13]	D(13)	Data bus[13]
EBU_AD[14]	D(14)	Data bus[14]
EBU_AD[15]	D(15)	Data bus[15]
EBU_WR_n	_WR	Write strobe

EBU_RD_n	_RD	Read strobe
EBU_BC0_n	_BC0	
EBU_BC1_n	_BC1	
EBU_A[0]	A(0)	Address bus[0]
EBU_A[1]	A(1)	Address bus[1]
EBU_A[2]	A(2)	Address bus[2]
EBU_A[3]	A(3)	Address bus[3]
EBU_A[4]	A(4)	Address bus[4]
EBU_A[5]	A(5)	Address bus[5]
EBU_A[6]	A(6)	Address bus[6]
EBU_A[7]	A(7)	Address bus[7]
EBU_A[8]	A(8)	Address bus[8]
EBU_A[9]	A(9)	Address bus[9]
EBU_A[10]	A(10)	Address bus[10]
EBU_A[11]	A(11)	Address bus[11]
EBU_A[12]	A(12)	Address bus[12]
EBU_A[13]	A(13)	Address bus[13]
EBU_A[14]	A(14)	Address bus[14]
EBU_A[15]	A(15)	Address bus[15]
EBU_A[16]	A(16)	Address bus[16]
EBU_A[17]	A(17)	Address bus[17]
EBU_A[18]	A(18)	Address bus[18]
EBU_A[19]	A(19)	Address bus[19]
EBU_A[20]	A(20)	Address bus[20]
EBU_A[21]	A(21)	Address bus[21]
EBU_A[22]	A(22)	Address bus[22]
EBU_A[23]	A(23)	Address bus[23]
EBU_A[24]	A(24)	Address bus[24]
EBU_CS0_n	_FLASH1_CS	Flash ROM chip select
EBU_CS1_n	_RAM_CS	SDRAM Chip select
EBU_CS2_n	_FLASH2_CS	Not used
EBU_CS3_n	_CS3	Not used
EBU_ADV_n	_ADV	
EBU_RAS_n	_RAS	
EBU_CAS_n	_CAS	

EBU_WAIT_n	_WAIT	
EBU_SDCLKO	SDCLKO	
EBU_SDCLKI	SDCLKI	
EBU_BFCLKO	BFCLKO	
EBU_BFCLKI	BFCLKI	
EBU_CKE	CKE	
Memory		
FCDP_RBn	F_DPD	
TDMA RF I/F		
T_OUT0	TXON_PA	RF Power amp turn on
GPIO_44	VIBRATOR_EN	Vibrator enable(High: enable, Low:disable)
T_OUT2	PA_BAND	RF band select
T_OUT3	ANT_SW1	RF FEM control signal 1
T_OUT4	ANT_SW2	RF FEM control signal 2
EINT3	ANT_SW3	RF FEM control signal 3
T_OUT6	MODE	For RF
GPIO_50	KP_OUT(4)	Key pad
EINT7	JACK_DETECT	Headset Detect(High: unplugged, Low: plugged)
CC1CC3IO	LCD BACKLIGHT	LCD Backlight Control
GPIO_53	LCD ID	Neodis : L
GPIO_54	_FM_RESET	FM Radio chip reset
GPIO_55	AU_PWR_EN	Audio amp power enable(active high)
RF I/F		
RF_STR0	EN	RF Transceiver chip enable
GPIO_57	TF_DETECT	Micro SD card detect (High: inserted, Low: ejected)
RF_DATA	DA	RF Transceiver chip data
RF_CLK	CLK	RF Transceiver chip clock
System port		
AFC	AFC	Automatic Frequency control DAC output for 26MHz VCTCXO
CLKOUT0 [<=26MHz]	Not Use	
F26M	26MHZ_MCLK	Baseband processor PLL input Main clock

F32K		Sleep crystal 32.768KHz
OSC32K		Sleep crystal 32.768KHz
RESET_n	_RESET	Baseband processor reset
CC1CC1IO	TRIG_OUT	For JTAG & ETM Interface
RTC_OUT	RTC_OUT	Wake up signal to alarm (High; wake up, Low: Power off)
VCXO_EN	VCXO_EN	26MHz clock enable
DSP		
DSPIN0	_BT_RESET	Bluetooth chip reset
GPIO_62	MIC_GAIN_SEL	Microphone gain select (High: 12dB, Low: 0dB)
GPIO_63	_SIM_EN	SIM card power enable

3.3. Power management IC

3.3.1. General Description

SM-POWER is a highly integrated Power and Battery Management IC for mobile handsets. It has been specially designed for usage with S-Gold2. Although optimized for usage with the Infineon S-GOLD baseband device it is suitable for the S-GOLDlite and the E-GOLD+ baseband devices as well. It also supports the cellular RF devices like SMARTi-DC, SMARTi-DC+, SMARTi-SD and the Bluemoon Single, Infineon's single chip solution for Bluetooth. If used with S-GOLD2 it provides all power supply functions (except for the RF PA) for a complete advanced GSM Edge smart phone minimizing external device count.

Block Description

- Highly efficient step-down converter for main digital baseband supply including Core, DSP and memory interface (External Bus Unit).
- Support of S-GOLD standby power-down concept
- Low-drop-out (LDO) regulators for Flash and mobile RAM memory devices
- Voltage independent switching of two SIM cards
- LDO regulators for baseband I/O supply
- LDO regulator for analog mixed-signal section of S-GOLD
- Low-noise LDO regulators for RF devices
- Supply for Bluemoon Single, Infineon's single chip solution for Bluetooth
- Audio amplifier 8 Ohms for handsfree operation and ringing
- Charge Control for charging Li-Ion/Polymer batteries under software control
- Pre-charge current generator with selectable current level
- RTC regulator with ultra-low quiescent current
- USB interface support for peripheral and mini-host mode
- Backlight LEDs driver with current selection and PWM dimming function
- Two single LED driver outputs for signaling
- Vibrator driver with adjustable voltage
- Fully controlable by software via I2C - Bus
- Temperature and battery voltage sensors
- Interrupt channels for peripherals
- System debug mode
- VQFN 48 package with heat sink and non-protruding leads
- Compatible with the Infineon E-GOLD+ V2 and V3

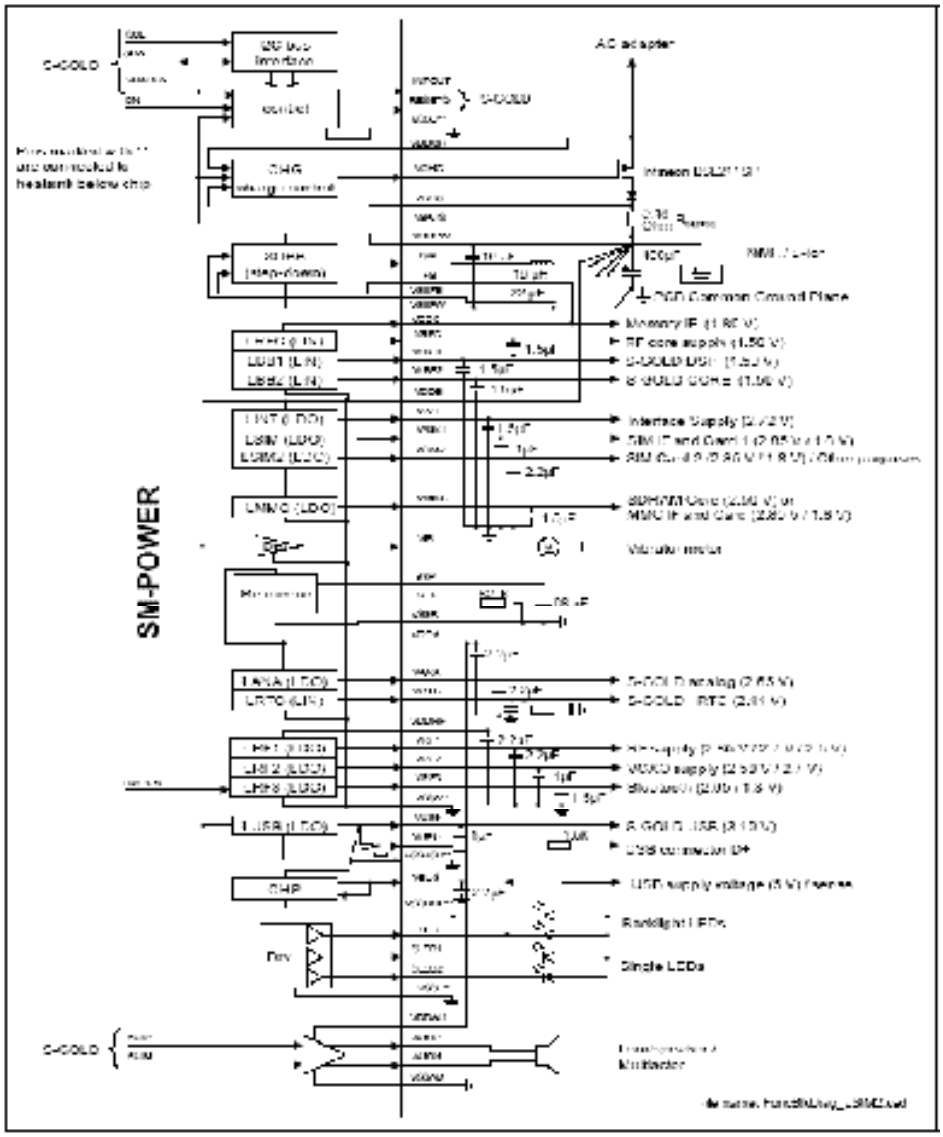


Figure 3 Top level block diagram of the SM-Power(PMB6812)

SM-POWER is a further step on the successful E-Power product line with enhanced and optimized functionality. SM-POWER features a baseband supply concept with a DC/DC step-down converter (SDBB) cascaded by two linear regulators (LBB1/2)

- SM-POWER's DC/DC converter makes up to 40 % reduction of battery current for smart phone functions (e.g. organizer functions, games, MP3 decoding) possible.
- SDBB has high efficiency up to 95% and also a power save mode.
- Memory Interface is directly supported by the SDBB
- SDBB can also act as main supply voltage for E-GOLD+ or S-GOLDlite baseband devices.
- For S-GOLD two linear regulators for DSP and Core are cascaded after the SDBB.

3. TECHNICAL BRIEF

SM-POWER supports the standby power-down concept of S-GOLD by temporarily switching off the linear regulator LBB1 for the DSP during mobile standby whenever this subsystem is not used. In this phase the ARM controller and most peripherals including parts of the on-chip SRAM are kept powered-up with power being supplied by the other linear regulator LBB2.
SM-POWER includes a fully differential audio amplifier able to drive loads down to a nominal value of 8 Ohm for usage in hands-free phones and for ringing

- 400 mW maximum output power
- adjustable gain
- mute switch
- click and pop - protection

SM-POWER also integrates a charging function for Li-Ion, Li-Polymer batteries

- Precharge current source with two current levels
- Constant current / constant voltage charging with 3 different termination voltages
- Programable charge current limitation for use with different batteries
- Freely programable pulse charging to reduce the thermal power dissipation in the constant voltage charging phase
- Top-off charge current sensing

SM-POWER completes the USB interface of S-GOLD

- Regulated voltage for S-GOLD USB interface including reverse current and overvoltage protection
- Switch to supply USB pull-up resistor
- Mini-host pull down resistor functionality
- Charge pump with internal switching capacitor for USB host VBUS supply voltage

SM-POWER fully supports LED and Vibra Motor functionality

- no external components needed
- driver for backlight LEDs adjustable in steps up to 140mA and with soft turn on and off by PWM dimming
- two driver outputs for single LEDs for precharge indication and signaling with i.e. change of colour
- driver for Vibra Motor with adjustable voltages, soft startup / shutdown and current limitation

SM-POWER offers several control functions

- Power-on Reset Generator with logic state machine
- I2C bus interface
- I2C bus configurable mode control logic with ON (push-button or RTC), VCXOEN and LRF3EN (wake-up by Bluetooth) inputs
- Programable interrupt channels to handle peripherals like SIM, MMC and USB
- Monitoring of charging functions
- Undervoltage Shut-Down
- Errorflags (volatile or non-volatile) from many power-supply functions and thermal sensor in order to debug system
- Overtemperature Shut-Down
- Overtemperature Warning
- Support of S-GOLD standby power-down concept
- Support of S-GOLD Power-Down Pad Tristate Function

Table 6 LDO Output Table of SM-Power

LDO	Net name	Output Voltage	Output Current	Usage
SDBB	1V8_MEM	1.8V	850mA	Memory & for LDO
LRFC	1V5_RF	1.5V	120mA	RF transceiver
LBB1	1V5_DSP	1.5V	170mA	DSP in BBP
LBB2	1V5_CORE	1.5V	300mA	ARM core in BBP
LINT	2V72_IO	2.72V	135mA	Peripherals
LSIM	2V85_SIM	2.85V	22mA	SIM card
LSIM2	2V85_IO2	2.85V	200mA	Peripherals
LMMC	2V85_CARD	2.85V	135mA	SD card
LANA	2V65_ANA	2.65V	220mA	Analog block in BBP
LRTC	2V11_RTC	2.11V	0.3mA	RTC block & Backup battery
LRF1	2V85_RF	2.85V	250mA	RF IC
LRF2	2V7_RF	2.7V	10mA	RF IC
LRF3	2V65_BT	2.65V	150mA	BT IC(Blue moon)
LUSB	3V1_USB	3.1V	45mA	USB I/F

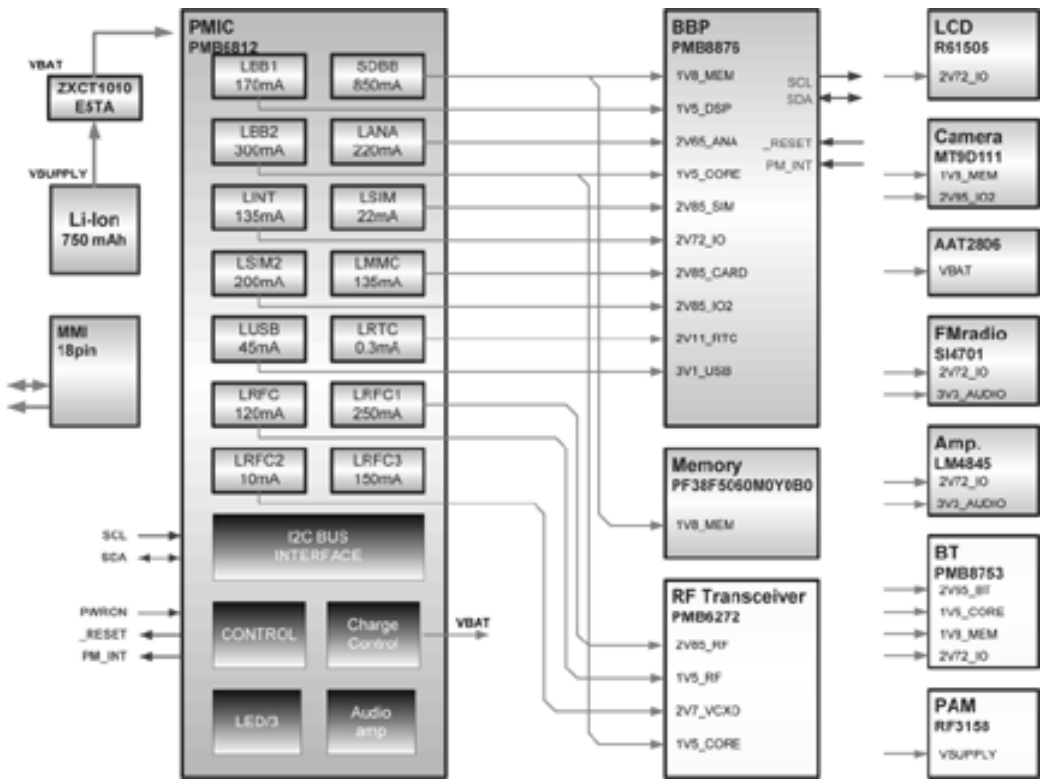


Figure 4 Power domain block diagram of ME970

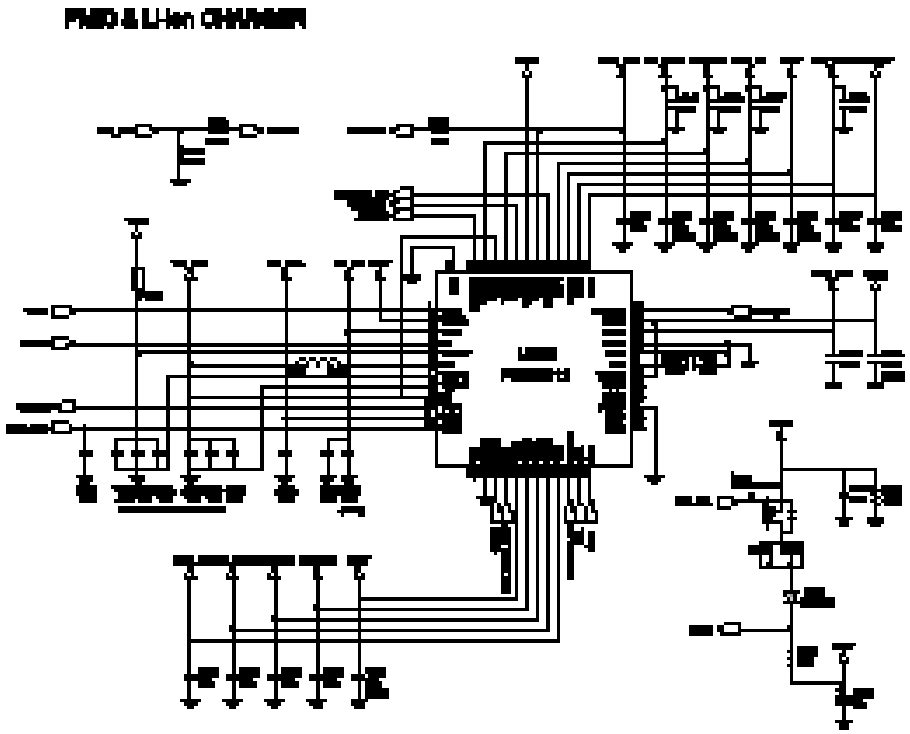


Figure 5 SM-Power circuit diagram with charging part

3.3.2. Charging

SM-POWER provides together with an external p-channel FET Siliconix Si3455 an external AC-adapter a complete charge control function for charging of Li-Ion or Li-Ion-Polymer batteries. Either a 1-cell Li-Ion or Li-Ion-Polymer battery with 4.1, 4.2 or 4.4 Volts may be used.

Figure 6 Battery Block Indication

1. Charging method : CC-CV
2. Charger detect voltage : 4.0V
3. Charging time : 3h
4. Charging current : 500mA
5. CV voltage : 4.2V
6. Cutoff current : 100mA
7. Full charge indication current (icon stop current) : 100mA

8. Recharge voltage : 4.00V
9. Low battery alarm
   a. Idle : 3.50V~3.35V
   b. Dedicated : 3.59V~3.35V
10. Low battery alarm interval
   a. Idle : 3min
   b. Dedicated:1min
11. Switch-off voltage : 3.35V
12. Charging temperature adc range
   a. ~ -5˚C : low charging voltage operation (3.6V ~ 3.9V) .
   b. -5˚C ~ 50˚C : standard charging (up to 4.2 V)
   c. 50˚C ~ : low charging voltage operation (3.6V ~ 3.9V)

3.4. Power ON/OFF

ME970 Power State : Defined 3cases as follow

- ▶ Power-ON : Power key detect (SM-Power's ON port
- ▶ Power-ON-charging : Charger detect.
- ▶ Power-ON-remote : remote power on detect (Factory use only)

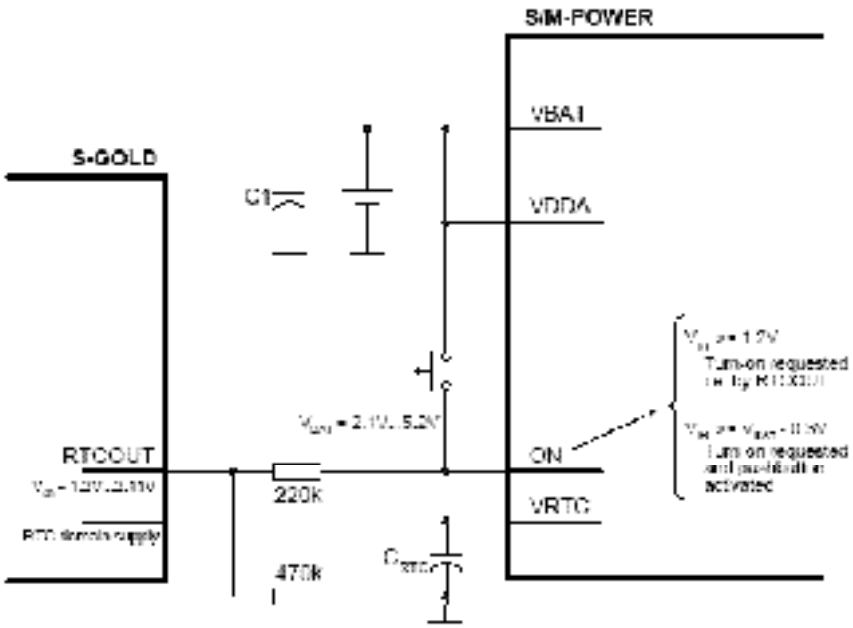


Figure 7 Power on application.

Input ON is a power-on input for SM-POWER with 2 active high levels (see Figure 8). It might be triggered by a push button or by the RTCOUT output of the S-GOLD device as well. To detect if the push-button is pressed during system operation the logical level at pin ON or its change (if Bit 1 EION in INTCTRL2 is asserted) is recorded in bit LON of the ISF register. If the high level of voltage at pin ON does not reach VIHdet (Vbat-0.8 ~ Vbat-0.3) the above-mentioned bit won't be set.
To support Remote power on function for factory mass production, applied an analog switch as following figure. As monitoring the RPWRON(GPIO_110) and Key matrix KP_OUT(1) & KP_IN(5), ME970 system recognize whether remote power on or End-key pushed

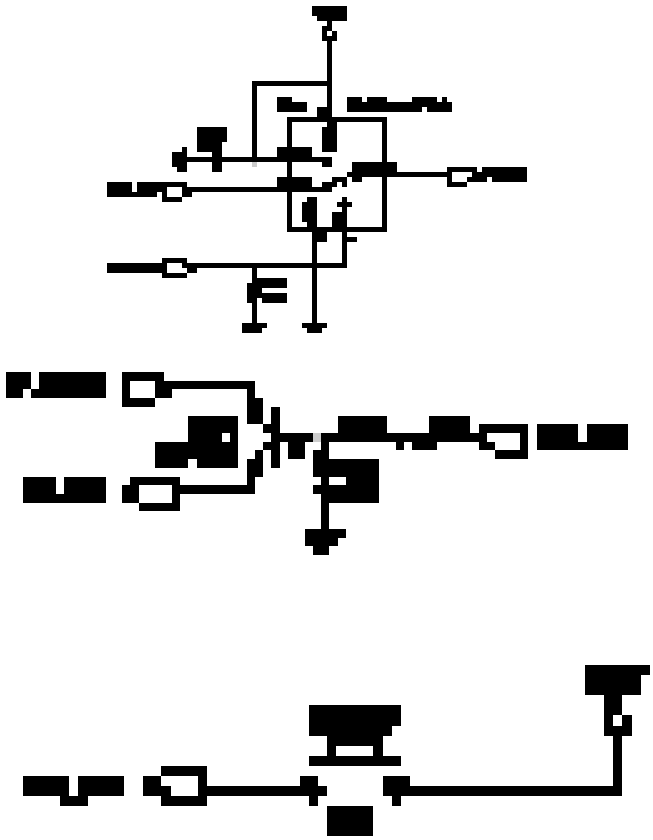


Figure8 Remote power on and End-key power on circuit

3.5. SIM interface

ME970 supports 3V plug in SIM, SIM interface scheme is shown in (Figure 10).
SIM_IO, SIM_CLK, SIM_RST ports are used to communicate with BBP(S-Gold2) and the SIM power supply enabled by BBP (_SIM_EN).

SIM Interface

SIM_CLK : SIM card reference clock
SIM_RST : SIM card Async /sync reset
SIM_IO : SIM card bidirectional reset

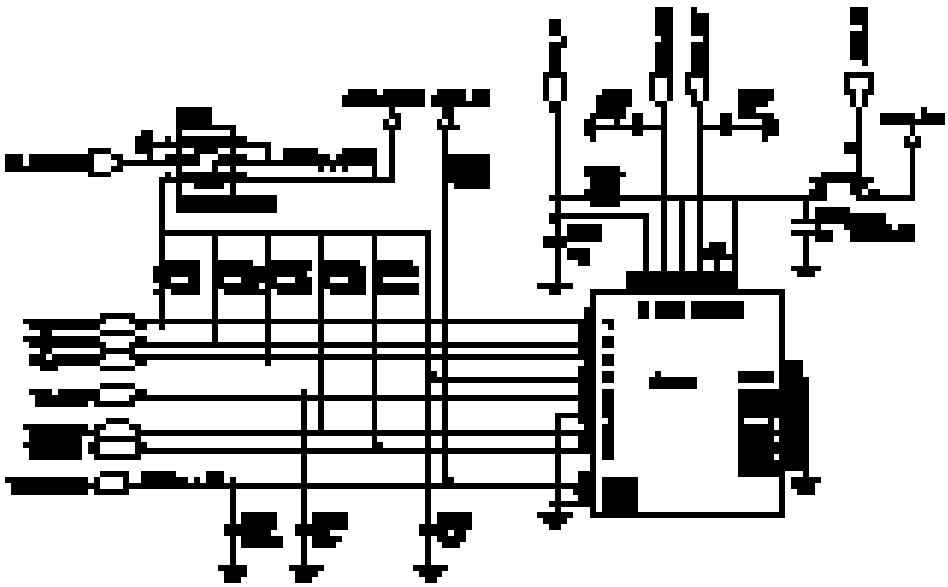


Figure 9 SIM CARD Interface

3.6. Memory

512Mbit Flash & 256Mbit SDRAM employed on ME970 with 16 bit parallel data bus thru ADD(0) ~ ADD(24). The 512Mbit Sibley Wireless Flash memory with LPSDRAM stacked device family offers multiple high-performance solutions. The Sibley flash die is manufactured on 90 nm process technology.

It delivers 108 MHz synchronous burst and page-mode read rates with supports multi-partitioning with Read-While-Write (RWW) or Read-While-Erase (RWE) dual operations. The LPSDRAM is a high-performance volatile memory operating at speeds up to 104 MHz with configurable burst lengths.

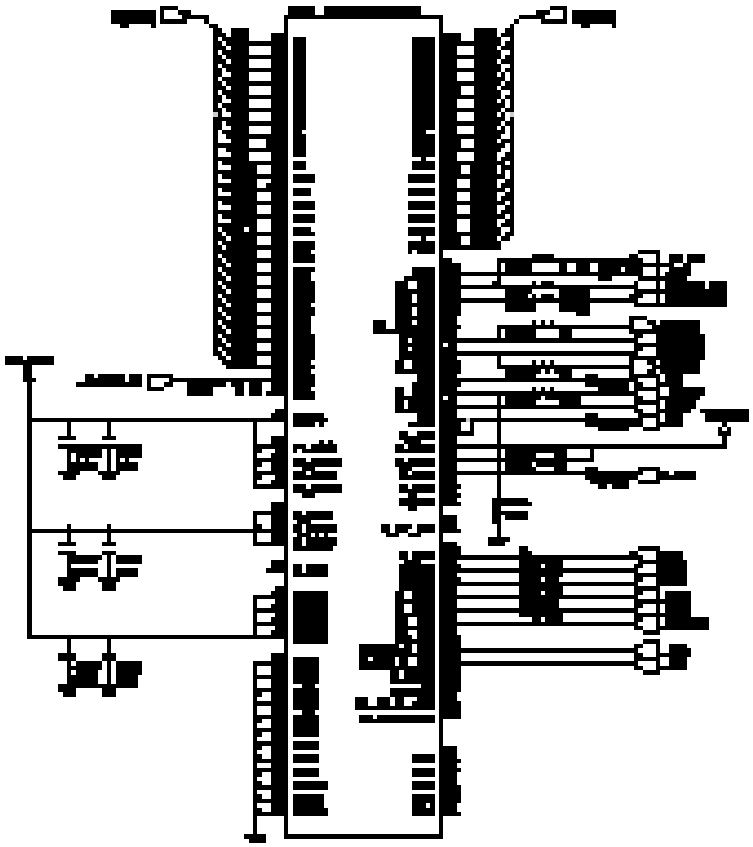


Figure 10 Flash memory & SDRAM MCP circuit diagram

3.7. LCD Display

LCD module include:

- LCD : 320*240 265K Color TFT LCD
- Backlight : 5 piece of white LED illumination

LCD module is connected to main board thru 35 pins connector.

LCD FPC Interface Spec:

Table 7 LCD FPC Interface Spec.

Pin No.	Pin Name	I/O	Description
1	VCC(2.8V)	Power	LCD power supply
2	VDDIO(2.8V)	Power	LCD power supply
3	GND	Power	LCD power supply
4	MAKER_ID	O	LCD maker Identification
5	D0	I/O	Data[0] for LCD
6	D1	I/O	Data[1] for LCD
7	D2	I/O	Data[2] for LCD
8	D3	I/O	Data[3] for LCD
9	D4	I/O	Data[4] for LCD
10	D5	I/O	Data[5] for LCD
11	D6	I/O	Data[6] for LCD
12	D7	I/O	Data[7] for LCD
13	D8	I/O	Data[8] for LCD
14	D9	I/O	Data[9] for LCD
15	D10	I/O	Data[10] for LCD
16	D11	I/O	Data[11] for LCD
17	D12	I/O	Data[12] for LCD
18	D13	I/O	Data[13] for LCD
19	D14	I/O	Data[14] for LCD
20	D15	I/O	Data[15] for LCD
21	GND	-	Ground
22	/RESET	I	Reset
23	/WR	I	Write strobe
24	/RD	I	Read strobe
25	/CS	I	LCD chip select
26	RS	I	Command / Data switch
27	IFMODE	I	8bit / 16bit switch
28	GND	-	Ground
29	VSYNC_OUT	I	NA
30	MLED_Cathod5	O	Back light LED Cathode
31	MLED_Cathod4	O	Back light LED Cathode
32	MLED_Cathod3	O	Back light LED Cathode
33	MLED_Cathod2	O	Back light LED Cathode
34	MLED_Cathod1	O	Back light LED Cathode
35	MLED_Anode	I	Back light LED Anode

3.8. Keypad Switching & Scanning

The keypad interface is a peripheral which can be used for scanning keypads up to 6 rows (outputs from Port Control Logic) and 6 columns (inputs to PCL). The number of rows and columns depend on settings of the PCL.

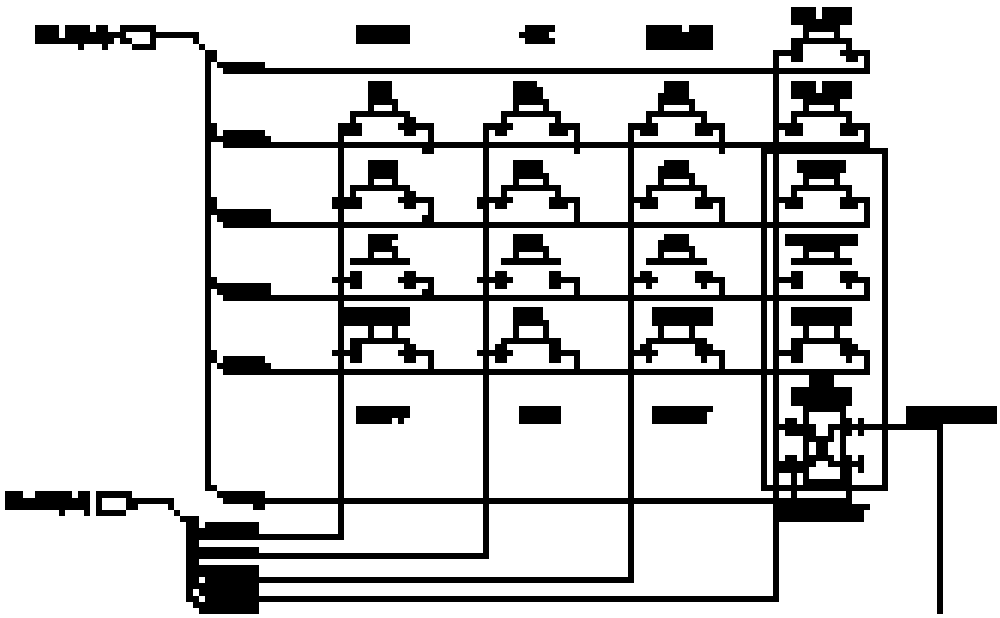
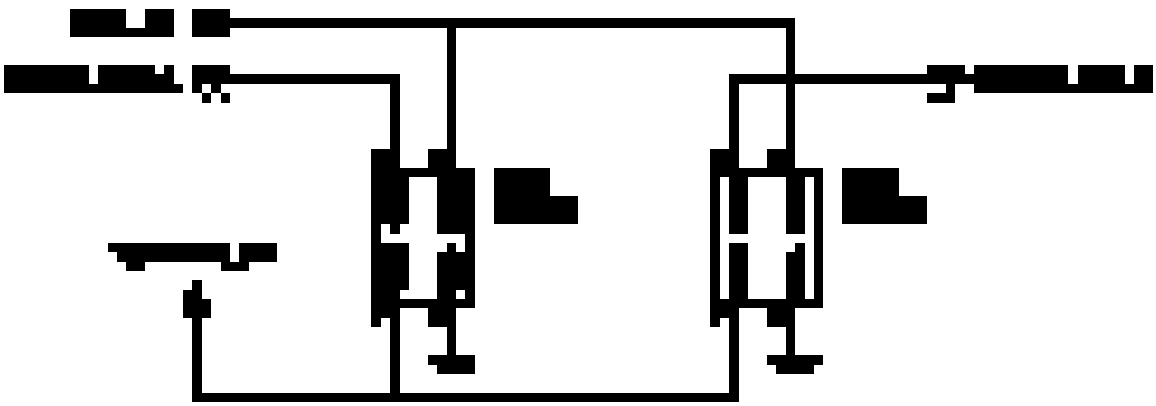


Figure 11 KEY FPCB part numeric key matrix



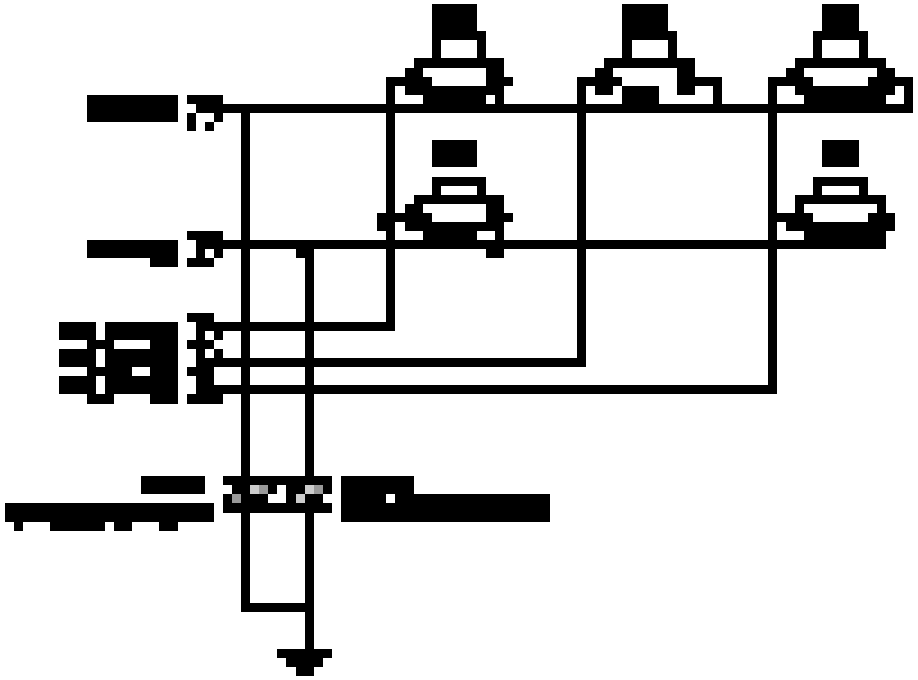


Figure 12 LCD PCB part Navi & Scroll key matrix

Most of numeric keys are located on the Keypad FPCB, Scroll key for menu navigation is on the LCD FPCB, and Power on (End key), BGM hot key, Camera shutter and volume up & down keys are connected via 70pin board to board connector between main PCB and Keypad FPCB.

3.9. Keypad back-light illumination

There are 2 snow white color LEDs on the KEY FPCB for keypad illumination. Keypad Back-light is controlled by SM-Power LED port which has constant current control function.
The whole configuration of the SM-POWER LED drivers is shown in below Figure16.

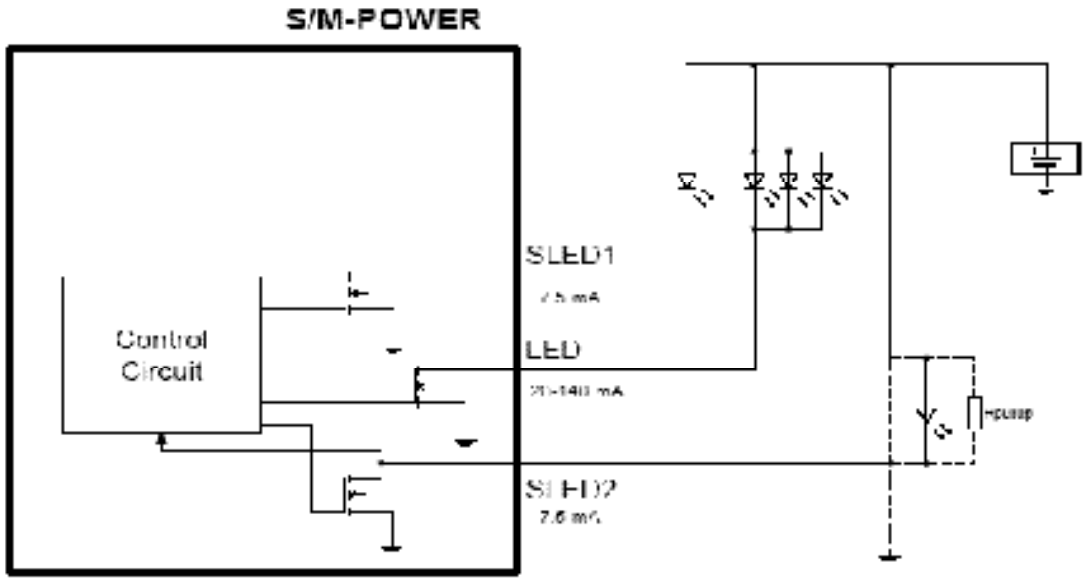


Figure 13 Keypad Back-light LEDs

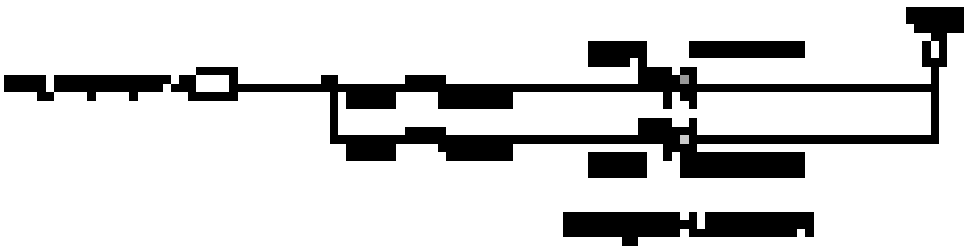


Figure 14 Keypad Back-light LEDs

3.10. LCD back light illumination

The MAX8645Y charge pump drives up to 6 white LEDs in the main display for backlighting and up to 2 white LEDs for flash, all with regulated constant current for uniform intensity. By utilizing adaptive 1x/1.5x/2x charge pump modes and very-low-dropout current regulators, it achieves high efficiency over the 1-cell lithium-battery input voltage range. 1MHz fixed-frequency switching allows for tiny external components and low input ripple. Two on-board 200mA programmable output voltage LDOs are provided to meet camera module requirements.

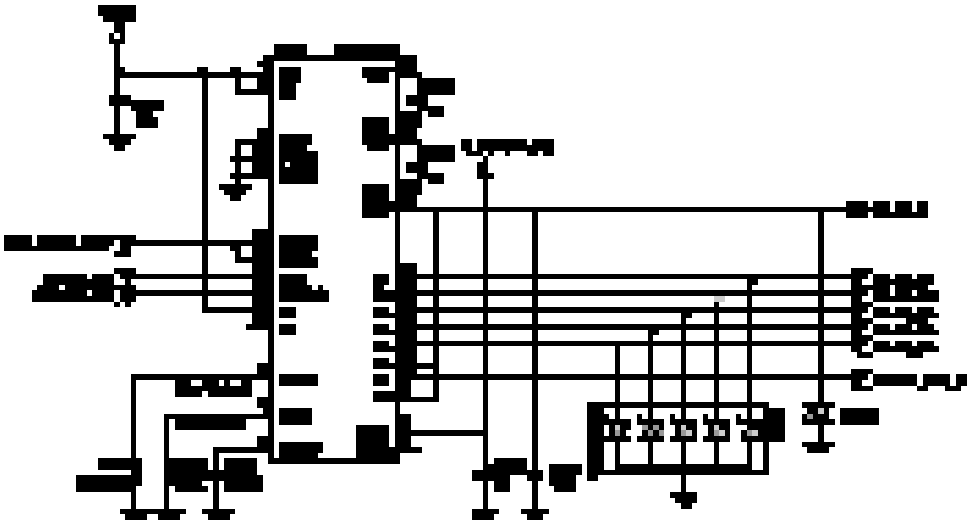


Figure 15 LCD Back light unit and Flash LED charge pump IC

For more dimming flexibility or to reduce the number of control traces, the MAX8645Y supports serial pulse dimming. Connect ENM1 and ENM2 together to enable single-wire pulse dimming of the main LEDs (or ENF only for single-wire pulse dimming of the Flash LEDs). When ENM1 and ENM2 (or ENF) go high simultaneously, the main (or flash) LEDs are enabled at full brightness. Each subsequent low-going pulse (500ns to 250•Ïs pulse width) reduces the LED current by 3.125% (1/32), so after one pulse the LED current is 96.9% (or 31/32) * I_{LED}. The 31st pulse reduces the current to 0.03125 x ILED. The 32nd pulse sets the LED current back to I_{LED}. Figure 1 shows a timing diagram for single-wire pulse dimming.
Because soft-start is longer than the intitial tHI, apply dimming pulses quickly upon startup (after initial tHI) to avoid LED current transitioning through full brightness.

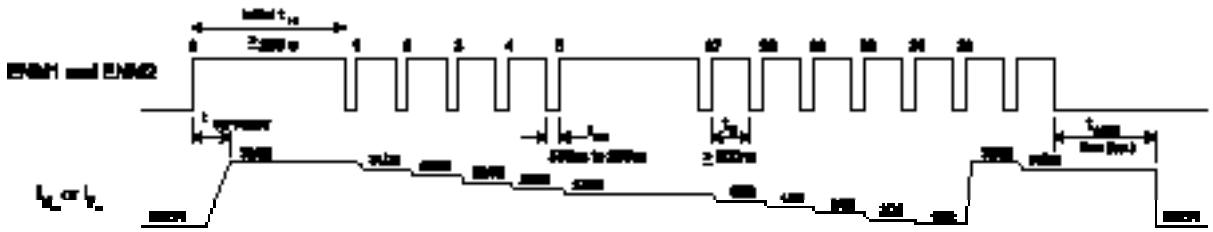


Figure 16 Seiral pulse dimming timing diagram

Setting the Main Output Current
SETM controls M1-M6 regulation current. Current flowing into M1, M2, M3, M4, M5, and M6 is a multiple of the current flowing out of SETM.

$I_{M1}=I_{M2}=I_{M3}=I_{M4}=I_{M5}=I_{M6}$ = K * (0.6V / R_{SETM}) = 18.4mA
where K = 230, R_{SETM} = 7500

where K = 23, 69, or 230 (depending upon the state of ENM1 and ENM2, see Table 8), and R_{SETM} is the resistor connected between SETM and GND (see the Typical Operating Circuit).

Table 8. ENM1/ENM2 current setting table

ENM1/ENM2 STATES	BRIGHTNESS	M1 - M6 CURRENT
ENM1 = low, ENM2 = low	Shutdown	0
ENM1 = low, ENM2 = high	1/10 Brightness	23 x I_{SETM}
ENM1 = high, ENM2 = low	3/10 Brightness	69 x I_{SETM}
ENM1 = high, ENM2 = high	Full Brightness	230 x I_{SETM}

Setting the Flash Output Current

SETF controls the F1-F2 regulation current. Current flowing into F1 and F2 is a multiple of the current flowing out of SETF.

$I_{F1}=I_{F2}$ = N * (0.6V / R_{SETF}) = 162mA
where N = 1380, R_{SETF} = 5100

3.11 Battery current consumption monitor

ME970 use a current monitoring function to calculate the battery capacity and the remaining time, as monitoring current flow from the battery thru 47mohm resistor.

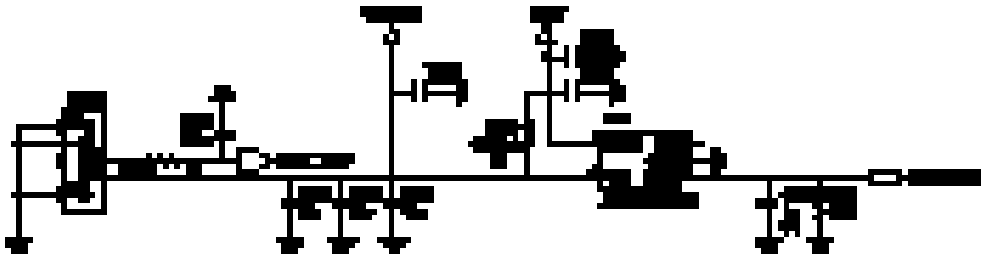


Figure 17 Current monitor circuit

3.12 JTAG & ETM interface connector

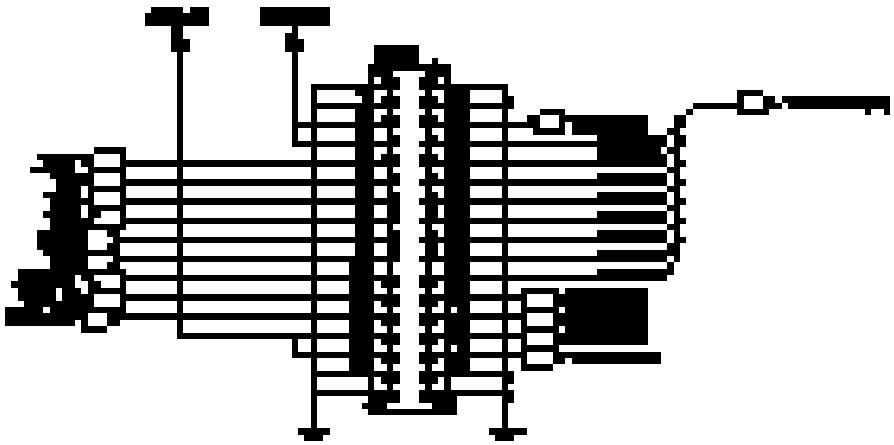


Figure 18 JTAG & ETM(Embedded Trace Module) interface connector

In case of ME970 mass production, the JTAG & ETM interface connector will not be mount on board. That is only for developing and software debugging purpose.

3.13. Audio

ME970 Audio signal flow diagram as following diagram.

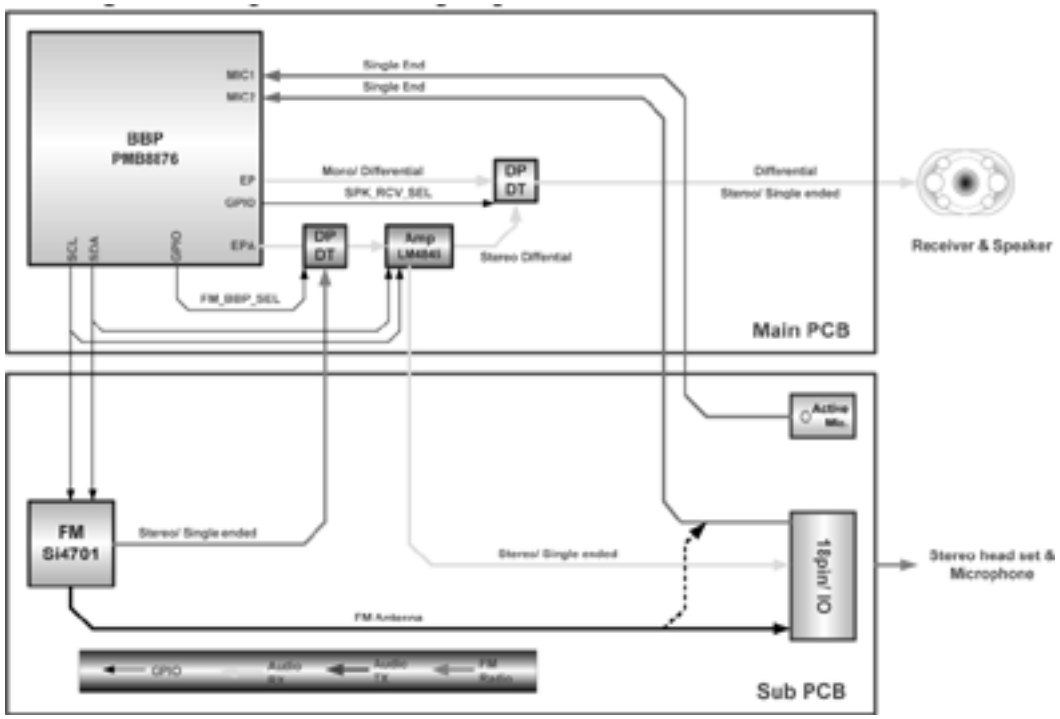


Figure 19 Audio signal flow diagram

3.13.1. Audio amplifier sub system IC with 3D effect

Audio amplifier sub system IC is an audio power amplifier capable of delivering 500mW of continuous average power into a mono 8Ω load, 25mW per channel of continuous average power into stereo 32Ω single-ended (SE) loads. The LM4845 features a 32-step digital volume control and eight distinct output modes. The digital volume control, 3D enhancement, and output modes (mono/SE/OCL) are programmed through a two-wire I2C interface that allows flexibility in routing and mixing audio channels.

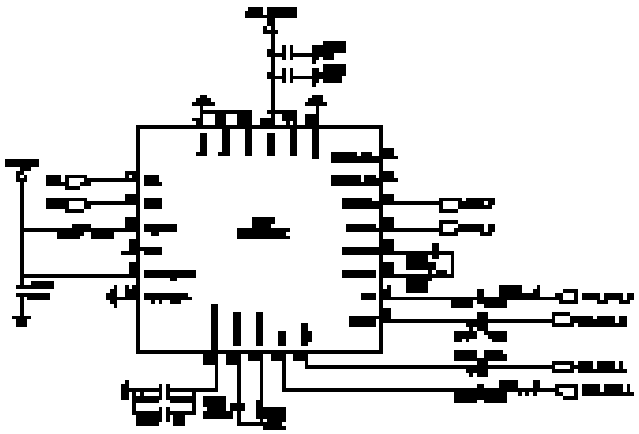


Figure 20 Audio amplifier Sub-system IC

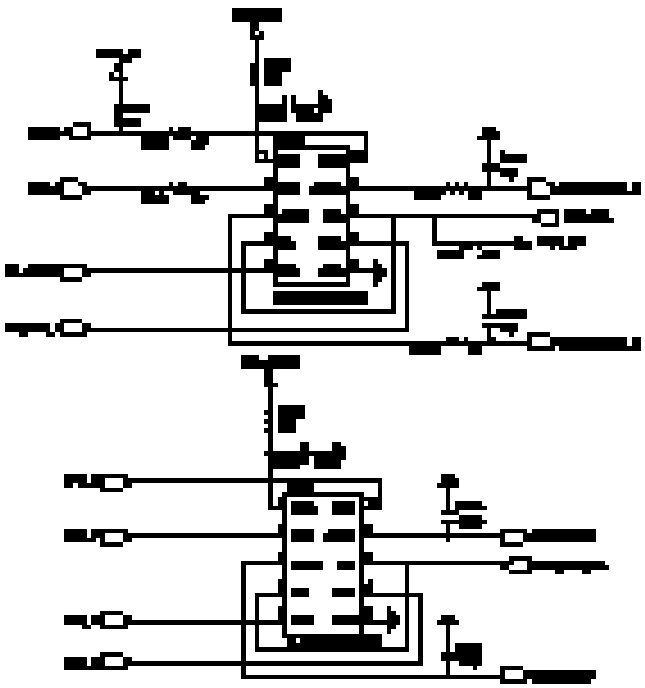


Figure 21 Audio signal distribute analog switch

3.13.2. Microphone with gain switching circuit

When a call is established, MICBIAS signal goes up to '2.5V' in the MME970. PMB8876(S-Gold2) provides both 2.0V and 2.5V for MICBIAS to circuit designer. VA01, VA02 are employed to enhance ESD immunity.

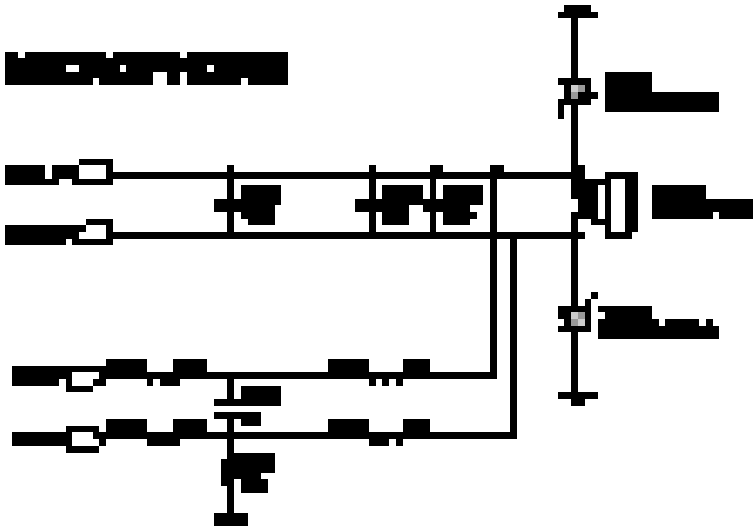


Figure 22 Microphone circuit

3.14. Multi port switch

Multi port switch has employed to decrease MMI(Multi Media Interface) connector's pin number. USB, USART, Remote controlled Headset is connected via this multi port switch. When USB VBUS voltage is detected Multi port 0 and 1 is connected to USB_DP and USB_DM each. If the remote controlled headset is plugged into MMI connector, then multi port 0 and 1 in go through REMOTE_INT and REMOTE_ADC.

Table 9 Multi port switch truth table

	VBUS_USB='L'	VBUS_USB='L'	VBUS_USB='H'
	JACK_DETECT='L'	JACK_DETECT='H'	
Pin6	REMOTE_INT	TXD	USB_DP
Pin7	REMOTE_ADC	RXD	USB_DM

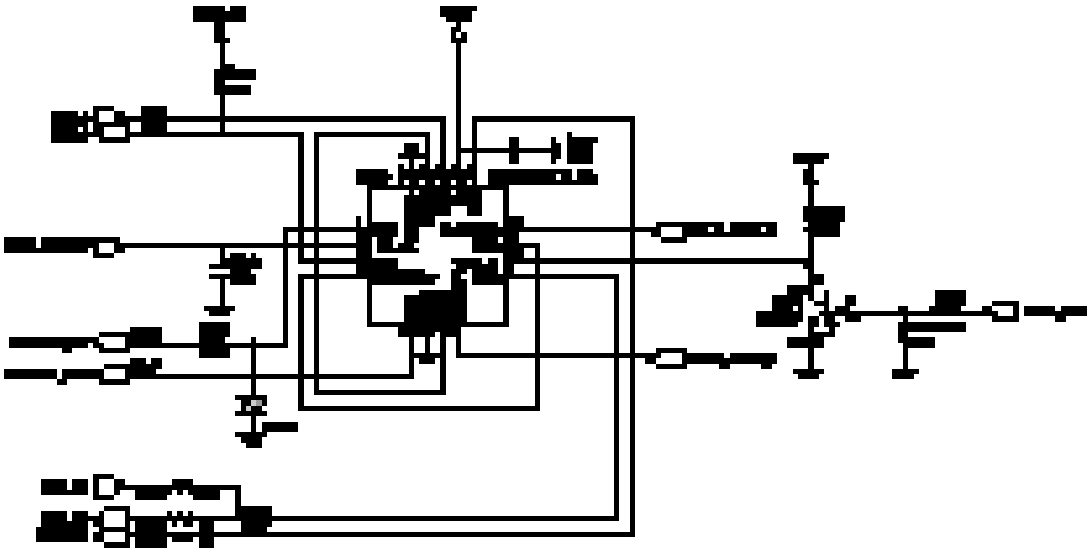


Figure 23 Multi port switch 1

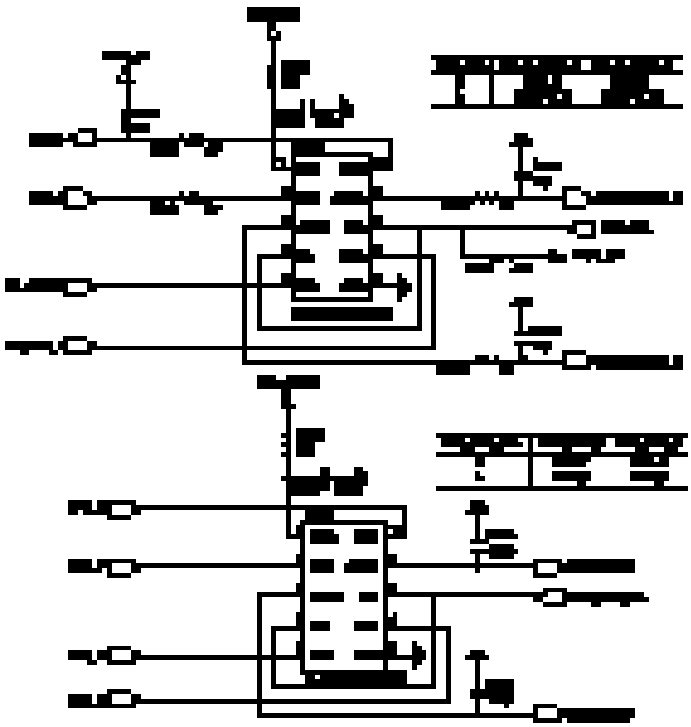


Figure 24 Multi port switch 2

3.15. USB charging circuit

The USB charging circuit is a fully integrated USB VBUS voltage single-cell Li-ion battery charger circuit.
The charger uses a CC/CV charge profile required by Li-ion batteries. CC charging current and End of charging current is programmable I_{REF} & I_{MIN} resistors. I_{REF} resistor between this pin and the GND pin to set the charge current limit determined by the following equation:

I_{CC} = 12089/33K = 366mA

The End Of Charging current is set by I_{MIN} That can be programmed by the as following equation:
I_{EOC} = 11000/220K = 50mA

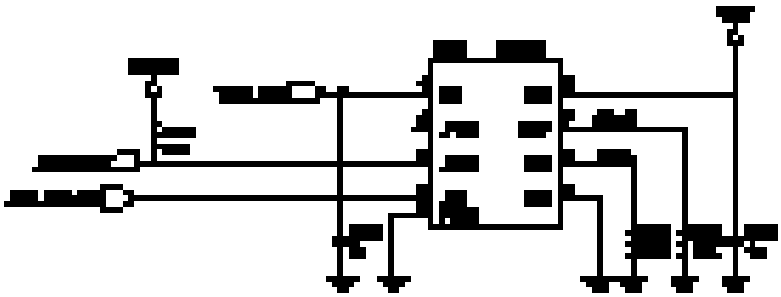


Figure 25 USB charging circuit

Charging indicator LED controlled by two ICs, one is a SM-Power, the other is a ISL6294. When TA(Travel Charger) is plugged in to MMI connector, the LD100 controlled by SM-Power both power off case and power on case. When USB cable is connected via MMI connector, indicator LED is controlled by ISL6294 in power off case and by SM-Power in power on case.

3.16. BLUETOOTH

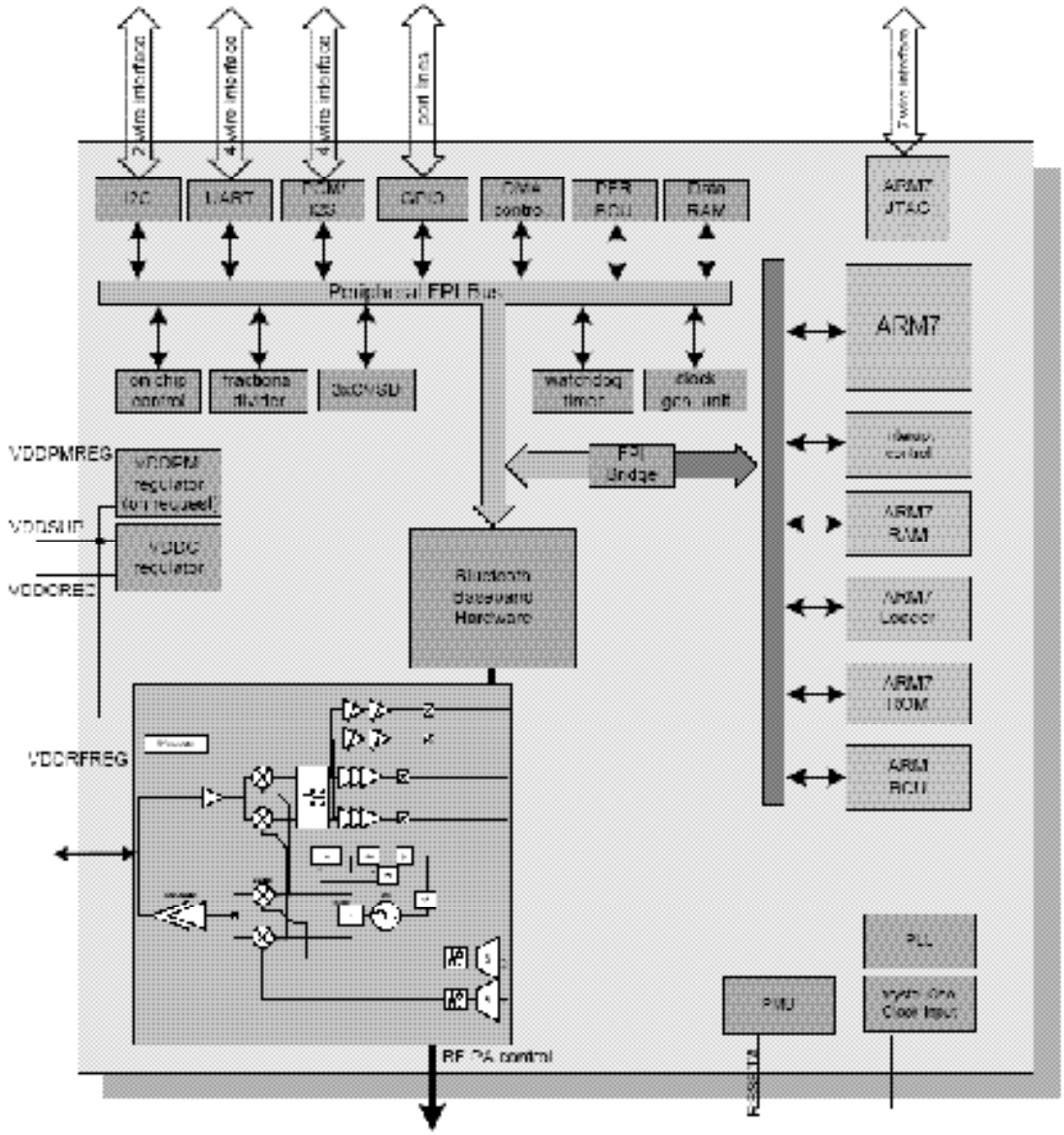


Figure 26 BLUETOOTH Functional block diagram.

3.16.1. General Features

• Single Chip Bluetooth device for cellular applications integrating radio, baseband and memory
• Fabricated in advanced low power 0.13•Ïm CMOS technology
• Very low component count (6 external components)
• Ultra low power design
  - Peak current 40mA for basic data rate
  - Peak current 45mA for enhanced data rate
  - Bluetooth low power mode typ. 25μA
• Multiple input clock signals supported (10-40MHz)
• Supply from external voltage regulator 1.8V..3.6V 1)
• Autonomous power down scenarios of Bluetooth and cellular system supported
• Packages:
  - P-VQFN-48 package
  - P-WFLGA-56 package
• Temperature range from -40°C up to 85°C
• Boundary scan for interface lines via JTAG

3.16.2 Micro-Controller-Section

• ARM7TDMI-STM ARM® Processor for protocol and application software
• Timers + Watchdog + Interrupt Module

3.16.3 Micro-Controller Memory

• 32 KByte RAM
• 256 KByte read only Program Memory
• 8 KByte Patch RAM

3.16.4 Interfaces

• UART (Bluetooth - Interface, support for HCI UART and Three-Wire UART transport layers with/without hardware handshaking) up to 3.25MBaud
• Two channel PCM Audio interface with I2S mode
• I2C Interface
• Three channel full duplex CVSD trans coder
• General Purpose I/Os
  - External interrupt
  - Port output levels available during low-power mode (VDD supplied)
• Separate voltage domains for GPIO, UART and PCM interfaces
• Control signal for requesting external (cellular) system clock
• Multi frequency (e.g. 32.768 kHz) low power clock input

3.16.5. RF-Section

- Integrated antenna switch to minimize external components count
- Programmable RF transmit power between -55dBm...+6dBm
  - Fine tuning in 2dB programmable steps also supported
- 20dBm power class 1 supported with external power amplifier
  - Separate TX output interface to PA (bypass of internal T/R switch)
  - Digital power step control
- Receiver sensitivity typ. -90dBm
- High performance integrated LNA with excellent blocking and inter modulation performance
- Low-IF receiver topology eliminates external IF filters
- Digital demodulation for optimum sensitivity and co- / adjacent channel performance
  - Digital offset compensation, symbol and frame synchronization
- RSSI information for power control

3.16.6 System Integration

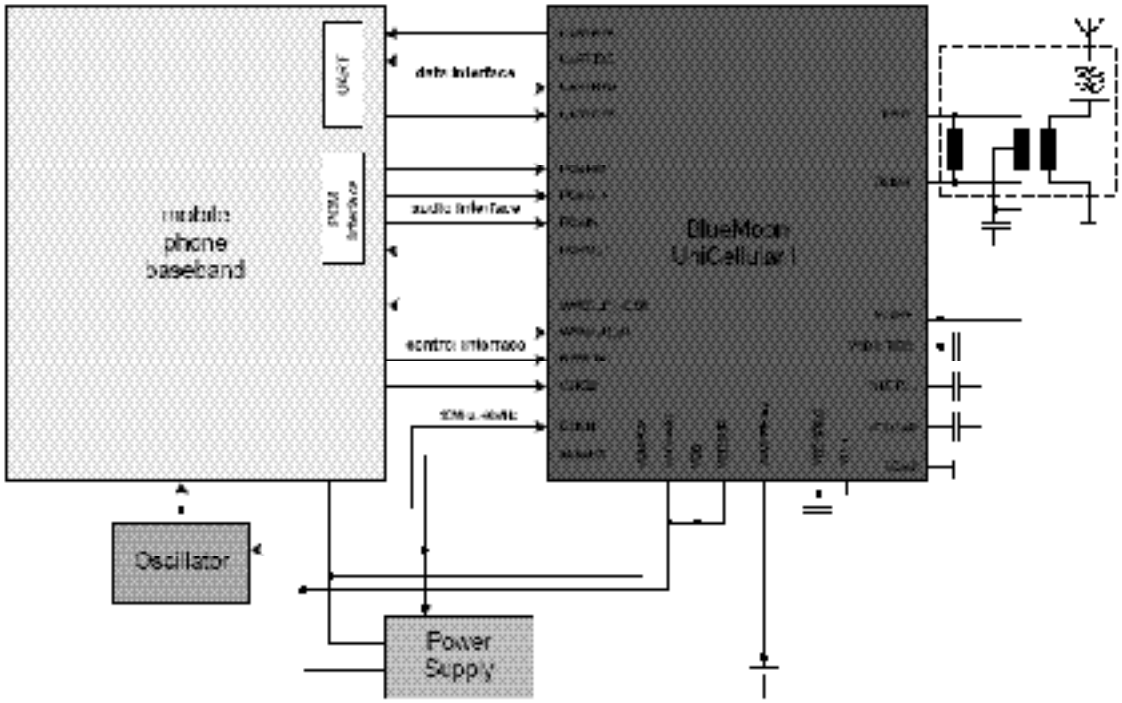


Figure 27 Mobile system integraton

The UART (serial interface) is used for the software interface between S-Gold2 baseband and the Bluetooth chip. For the HCI UART transport layer four interface lines are needed, two for data (UARTTXD and UARTRXD) and two for hardware flow control (UARTRTS and UARTCTS). For the HCI Three-Wire UART transport layer two interface lines (UARTTXD and UARTRXD) are needed. The hardware flow control lines (UARTRTS and UARTCTS) are supported but the use is optional. In ME970 used three-wire UART communication.
The UART interface has its own supply voltage (VDDUART) to ensure compatibility with the I/O voltages used by the S-Gold2.
The PCM/I2S interface is used as audio interface and can handle up to two voice channels. The PCM interface also has its own supply voltage (VDDPCM) to ensure compatibility with the I/O voltages used by the S-Gold2 baseband processor.

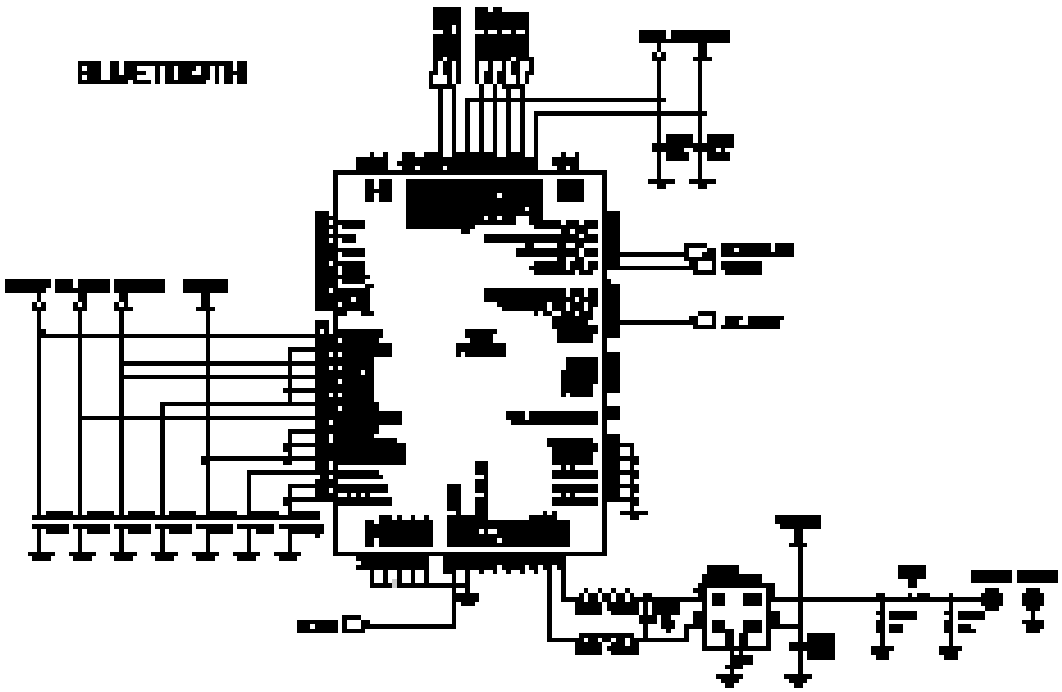


Figure 28 Bluetooth circuit

3.17. Micro SD external memory card slot

The TransFlash Memory Module has eight exposed contacts on one side. The S-Gold2 is connected to the module using a dedicated eight-pin connector

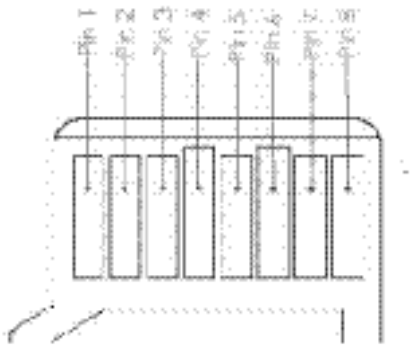


Figure 29 Micro SD pin assignment

Table 10 Micro SD memory pad assign.

SD mode			
Pin No.	Name	Type	Description
1	DAT2	I/O	Data bit [2]
2	CD/DAT3	I/O	Data bit [3]
3	CMD	I/O	Command response
4	VDD	Power	Power supply
5	CLK	I	Clock
6	VSS	Ground	Power ground
7	DAT0	I/O	Data bit [0]
8	DAT1	I/O	Data bit [1]

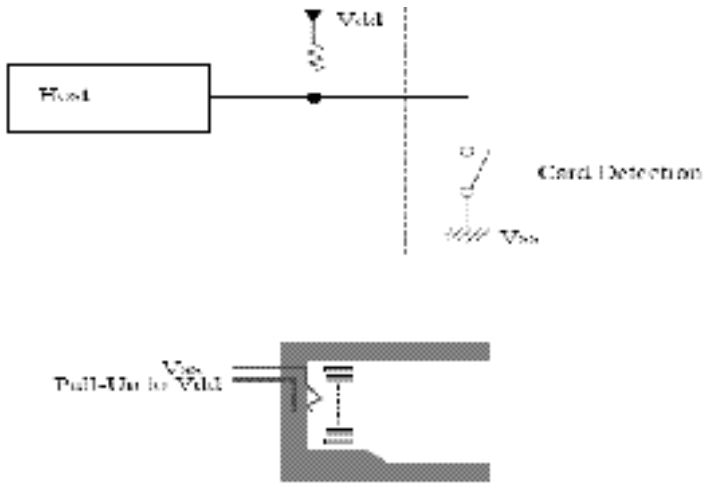


Figure 30 Micro SD memory card detection scheme

Table 11 Micro SD memory card detect truth table.

	Micro SD card status	
	it is removed	it is inserted
TF_DETECT	High	Low

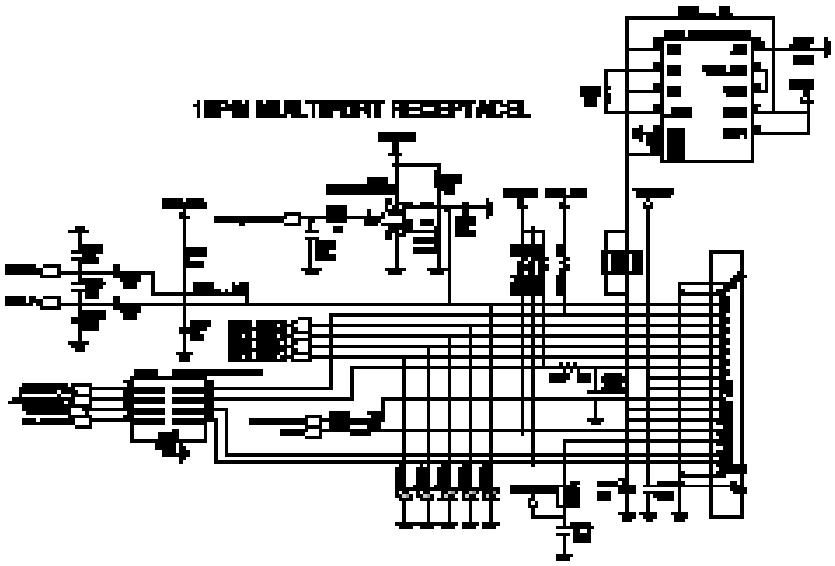


Figure 31 Micro SD socket circuit with power control

3.18. 18pin Multi Media Interface connector

Table 12 Multi media interface pin assign

ME970 MMI		
	Pin Function	**Description**
1	FM_ANT	FM radio antenna / Audio ground
2	HS_MIC	Headset microphone signal
3	JACK_TYPE	Accessory type detect
4	HS_OUT_L / CTS	Headset left sound / CTS
5	HS_OUT_R / RTS	Headset Right sound / RTS
6	TXD / USB_DP / REMOTE_INT	USART / USB/ Remote control interrupt
7	RXD / USB_DM / REMOTE_ADC	USART / USB/ Remote control Key ADC
8	JACK_DETECT	Headset detect (active low)
9	VBAT	Battery voltage
10	VBAT	Battery voltage
11	RPWRON	Remote power on (active high. 2.8V)
12	VCHG	Charger voltage
13	VCHG	Charger voltage
14	DSR	N.C.
15	VBUS_USB	USB VBUS
16	TX_DEBUG	Trace TX data(Debug)
17	RX_DEBUG	Trace RX data(Debug)
18	GND	Power GND

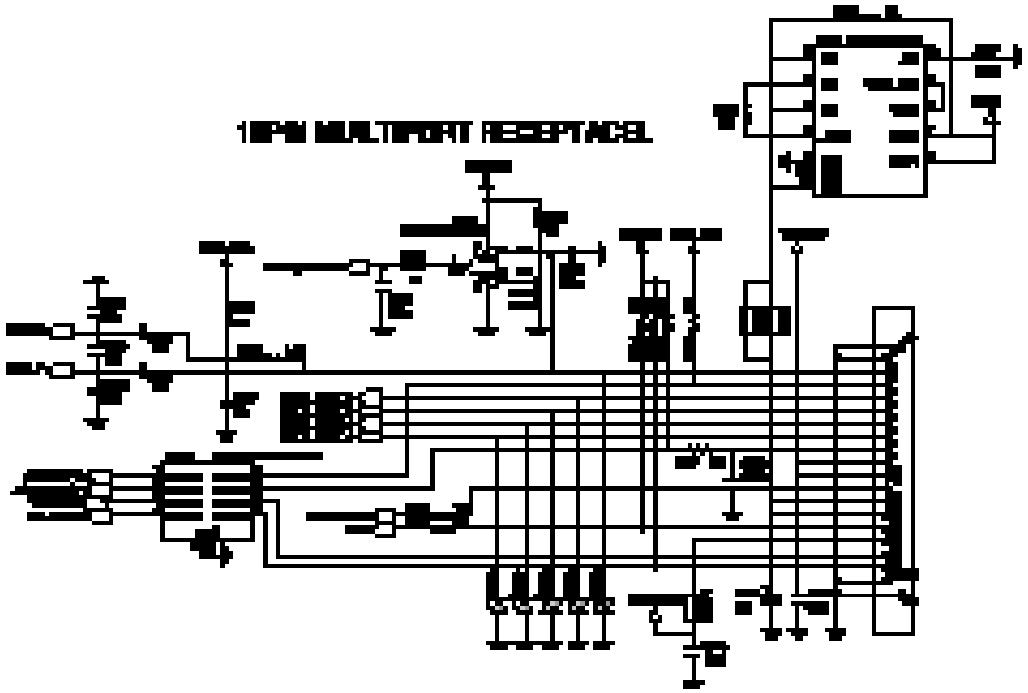


Figure 32 MMI 18pin connector circuit

RF circuit technical brief

3.19. General Description

The RF transceiver (PMB 6272 SMARTi-PM) is an integrated single chip, quad-band transceiver for GSM850/GSM900/GSM1800/GSM1900 designed for voice and data transfer applications. The transceiver provides an analog I/Q baseband interface and consists of a direct conversion receiver and a quad-band polar transmitter for GSM and EDGE with integrated PGA functionality. Further on a completely integrated SD-synthesizer with HSCSD and GPRS/EDGE capability, a digitally controlled reference oscillator with three outputs, a fully integrated quad-band RF oscillator and a three wire bus interface with all necessary control circuits complete the transceiver.

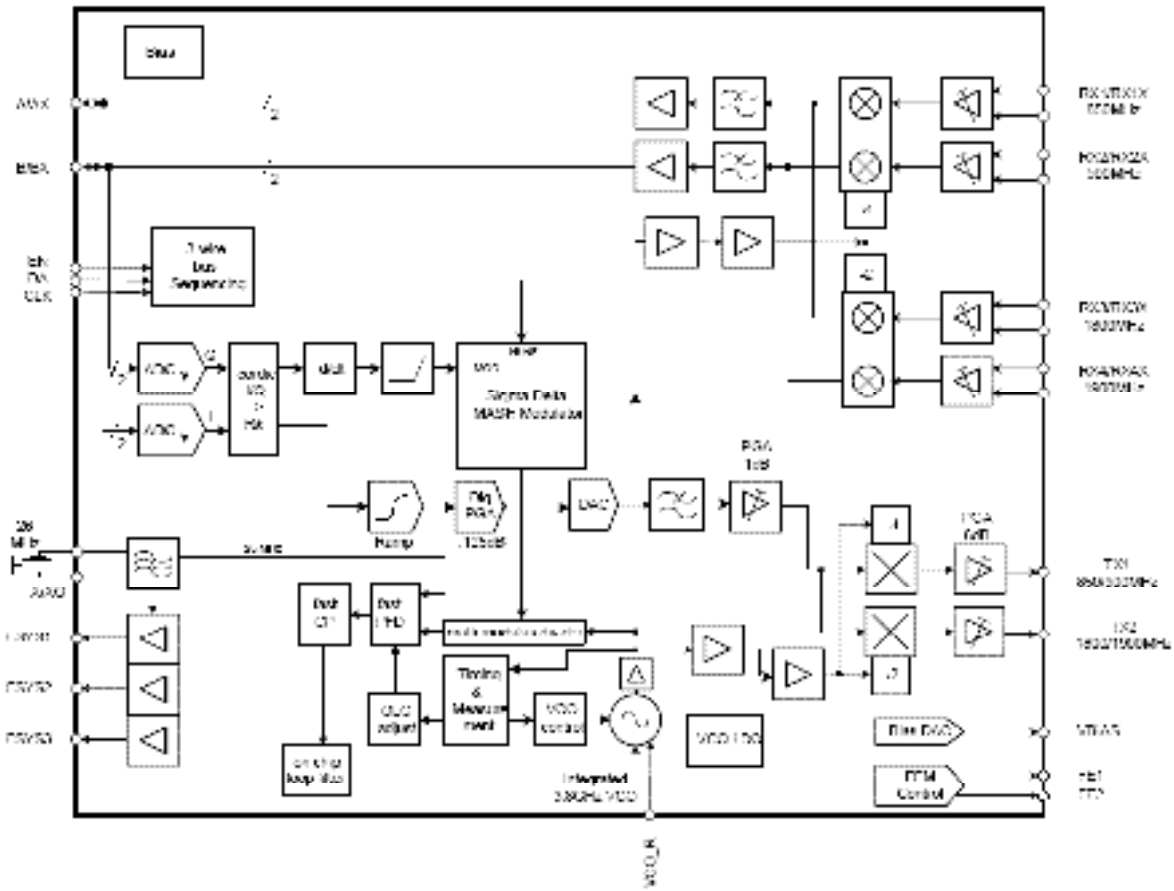


Figure 33 RF transceiver PMB7262 SMARTi-PM functional block diagram

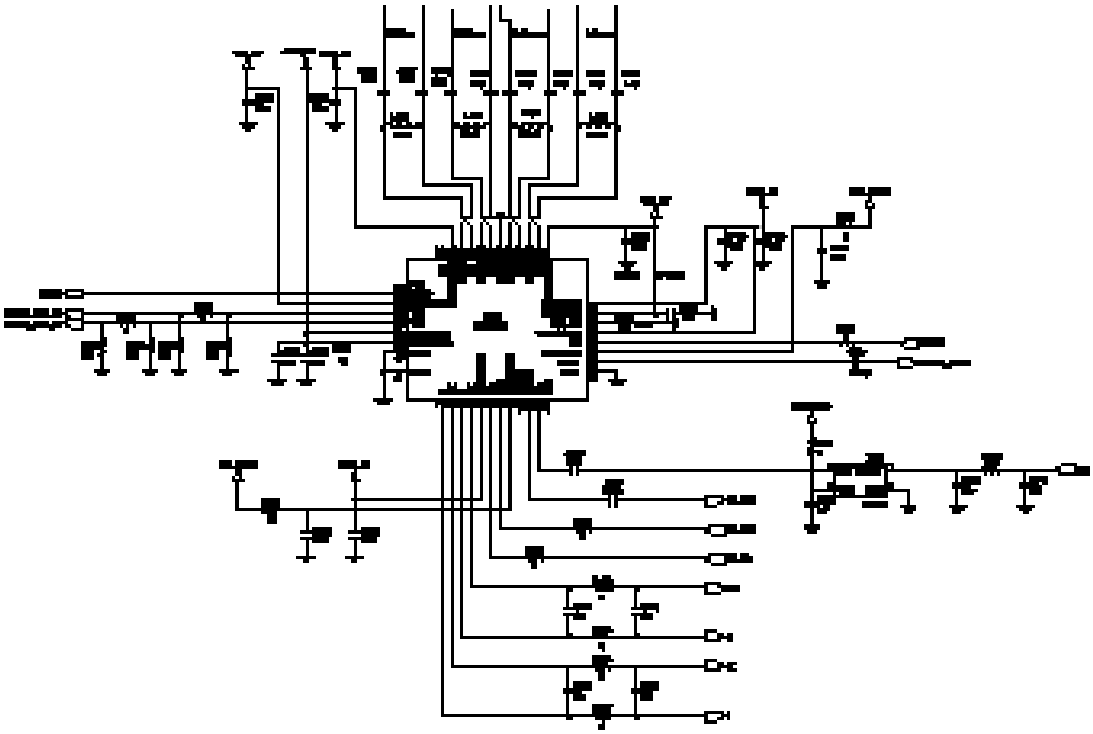


Figure 34 RF transceiver PMB7262 SMARTi-PM schematic

3.20. Receiver part

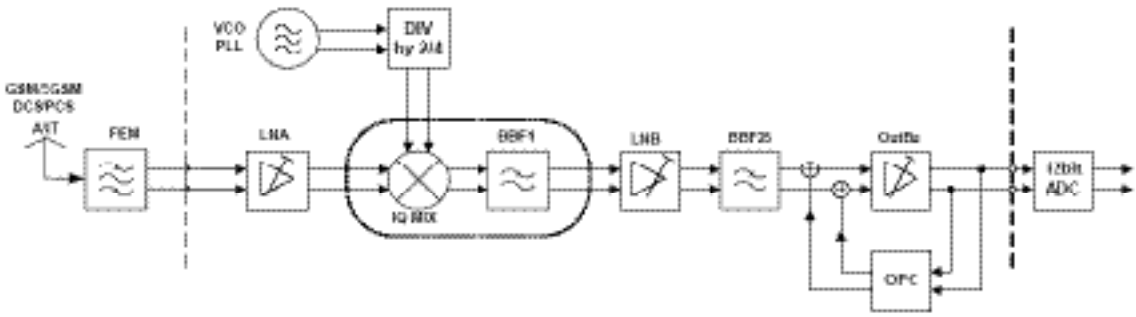


Figure 35 Receiver part block diagram

The constant gain direct conversion receiver contains all active circuits for a complete receiver chain for GSM/GPRS/EDGE (see Figure 39). The GSM850/900/DCS1800/ PCS1900 LNAs with balanced inputs are fully integrated. No inter-stage filtering is needed. The orthogonal LO signals are generated by a divider-by-four for GSM850/900 band and a divider-by-two for the DCS1800/PCS1900 band. Down conversion to baseband domain is performed by low/high band quadrature direct down conversion mixers. The baseband chain contains a LNB (low noise buffer), channel filter, output buffer and DC-offset compensation. The 3rd order low pass filter is fully integrated and provides sufficient suppression of blocking signals as well as adjacent channel interferers and avoids anti-aliasing through the baseband ADC. The receive path is fully differential to suppress on-chip interferences. Several gain steps are implemented to cope with the dynamic range of the input signals. Depending on the baseband ADC dynamic range, single- or multiple gain step switching schemes are applicable. Furthermore an automatic DC-offset compensation can be used (depending on the gain setting) to reduce the DC-offset at baseband-output. A programmable gain correction can be applied to correct for front end- and receiver gain tolerances.

3.21. Transmitter part

The GMSK transmitter supports power class 4 for GSM850 and GSM900 as well as power class 1 for DCS1800 and PCS1900. The digital transmitter architecture is based on a very low power fractional-N Sigma-Delta synthesizer without any external components (see Figure39). The analog I/Q modulation data from the baseband is converted to digital, filtered and transformed to polar coordinates. The phase/frequency signal is further on processed by the Sigma-Delta modulation loop. The output of its associated VCO is divided by four or two, respectively, and connected via an output buffer to the appropriate single ended output pin. This configuration ensures minimum noise level. The 8PSK transmitter supports power class E2 for GSM850 and GSM900 as well as for DCS1800 and PCS1900. The digital transmitter architecture is based on a polar modulation architecture, where the analog modulation data (rectangular I/Q coordinates) is converted to digital data stream and is subsequently transformed to polar coordinates by means of a CORDIC algorithm. The resulting amplitude information is fed into a digital multiplier for power ramping and level control. The ready processed amplitude signal is applied to a DAC followed by a low pass filter which reconstructs the analog amplitude information. The phase signal from the CORDIC is applied to the Sigma-Delta fractional-N modulation loop. The divided output of its associated VCO is fed to a highly linear amplitude modulator, recombining amplitude and phase information. The output of the amplitude modulator is connected to a single ended output RF PGA for digitally setting the wanted transmit power. The PA interface of SMARTi-PM supports direct control of standard dual mode power amplifiers (PA's) which usually have a power control input VAPC and an optional bias

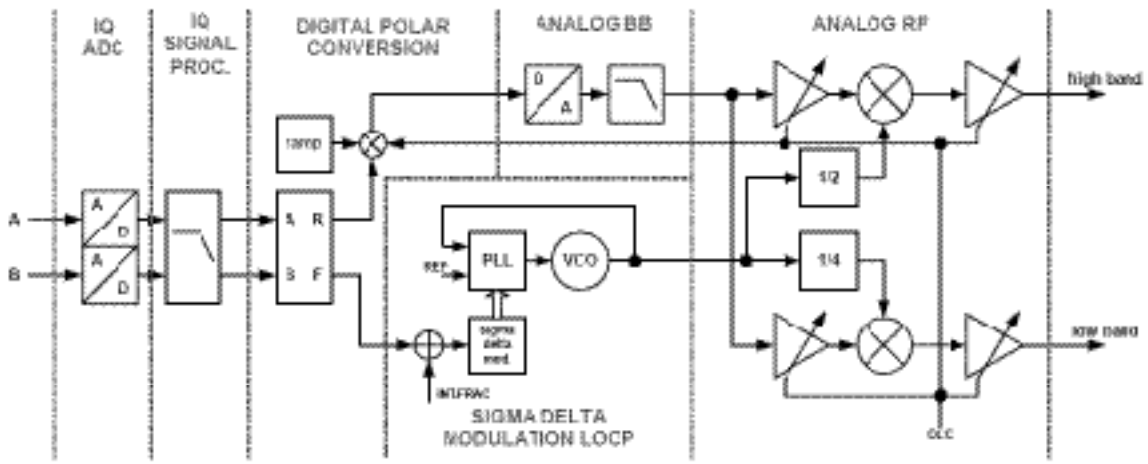


Figure 36 Transmitter part block diagram

control pin VBIAS for efficiency enhancement. In GMSK mode, the PA is in saturated high efficiency mode and is controlled via its VAPC pin directly by the baseband ramping DAC. In this way both up- / down-ramping and output power level are set. In 8PSK mode, the ramping functionality is assured by an on-chip ramping generator, whereas output power is controlled by the PGA's as described above.

3.22. RF synthesizer

The transceiver contains a fractional-N sigma-delta synthesizer for the frequency synthesis in the RX operation mode. For TX operation mode the fractional-N sigma-delta synthesizer is used as Sigma-Delta modulation loop to process the phase/frequency signal. The 26MHz reference signal is provided by the internal crystal oscillator. This frequency serves as comparison frequency of the phase detector and as clock frequency for all digital circuitry.The divider in the feedback path of the synthesizer is carried out as a multi-modulus divider (MMD). The loop filter is fully integrated and the loop bandwidth is about 100 kHz to allow the transfer of the phase modulation. The loop bandwidth is automatically adjusted prior to each slot (OLGA^2). To overcome the statistical spread of the loop filter element values an automatic loop filter adjustment (ALFA) is performed before each synthesizer startup. The fully integrated quad-band VCO is designed for the four GSM bands (850, 900, 1800, 1900 MHz) and operates at double or four times transmit or receive frequency. To cover the wide frequency range the VCO is automatically aligned by a binary automatic band selection (BABS) before each synthesizer startup.

3.23. TCXO

The transceiver contains a fully integrated 26MHz temperature compensated controlled crystal oscillator (DCXO) with three outputs for the system clock, one output for the GSM baseband and two additional for other subsystems (GPS, Bluetooth, etc.). The only external part of the oscillator is the crystal itself. The overall pulling range of the TCXO consists of eight subranges. The subrange closest to the '0ppm' at the middle AFC-value is selected during the calibration process in the mobile¢•s production and is used for the rest of the lifetime. The frequency tuning is performed along the selected subrange by programming the frequency control word (XO_TUNE) via the three wire bus ("3Wbus").

3.24. Front End Module control

Implemented in the Transceiver are two outputs for direct control of front end modules with two logic input pins to select RX- and TX-mode as well as low- and high band operation.

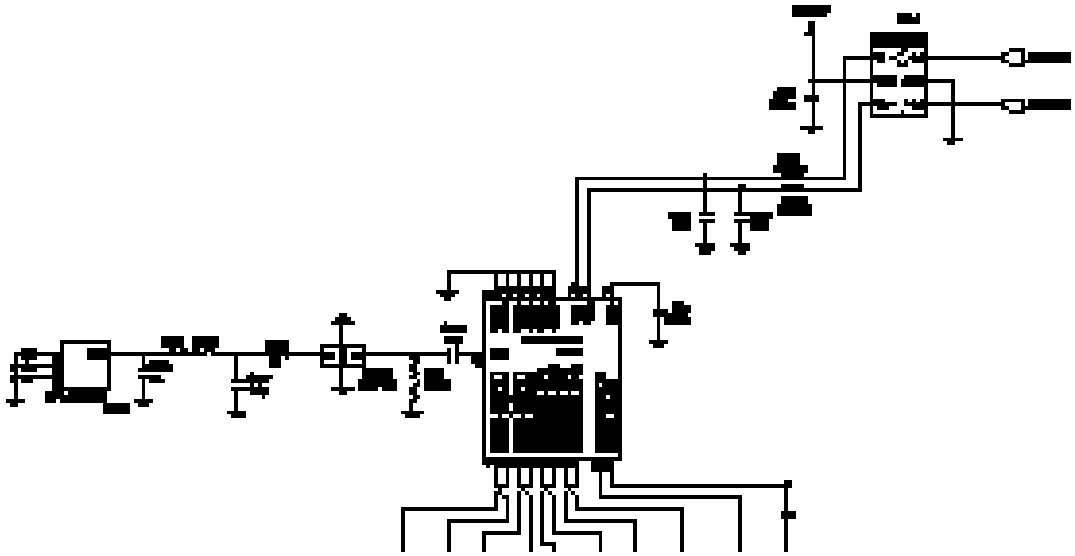


Figure 37 FEM schematic

3.25. Power Amplifier Module

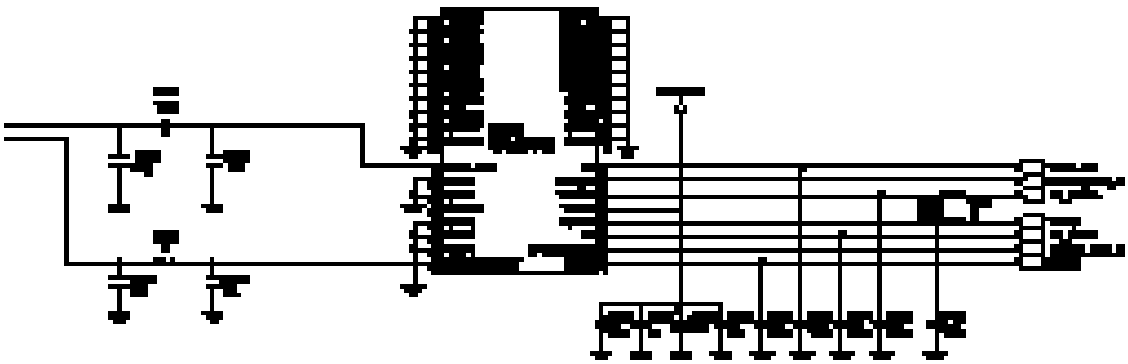


Figure 38 PAM schematic

4. PCB layout

4.1 Main & Sub PCB component placement

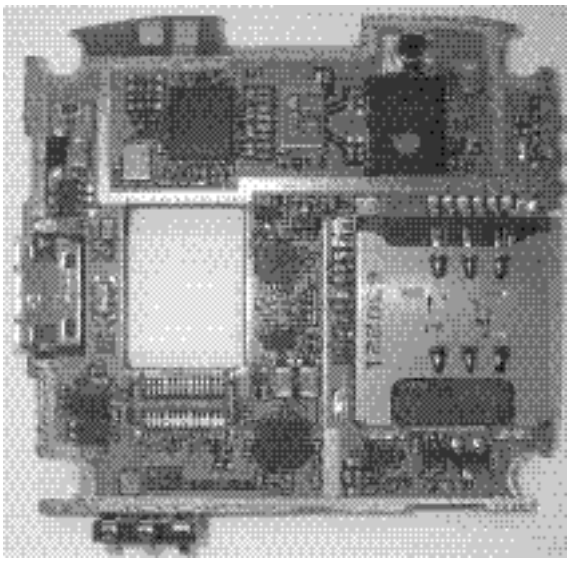


Figure 39 Main PCB top

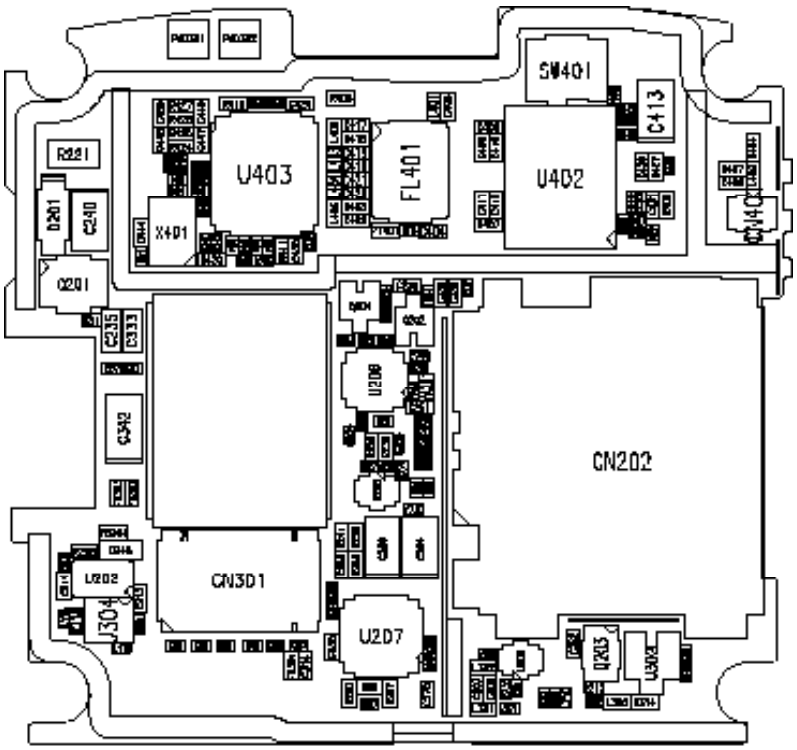


Figure 40 Main PCB top placement

4. PCB layout

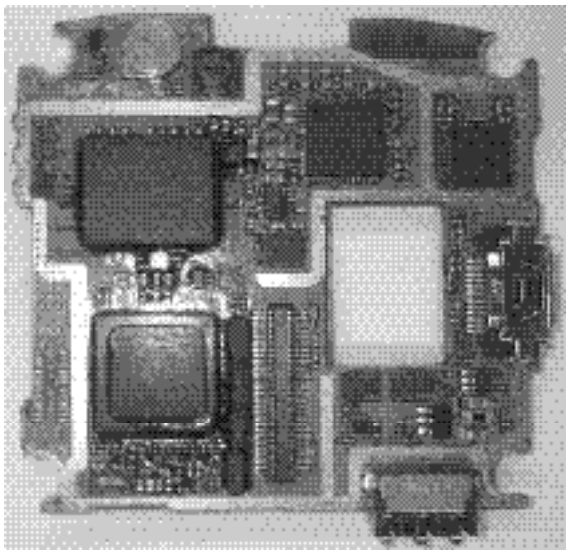


Figure 41 Main PCB bottom

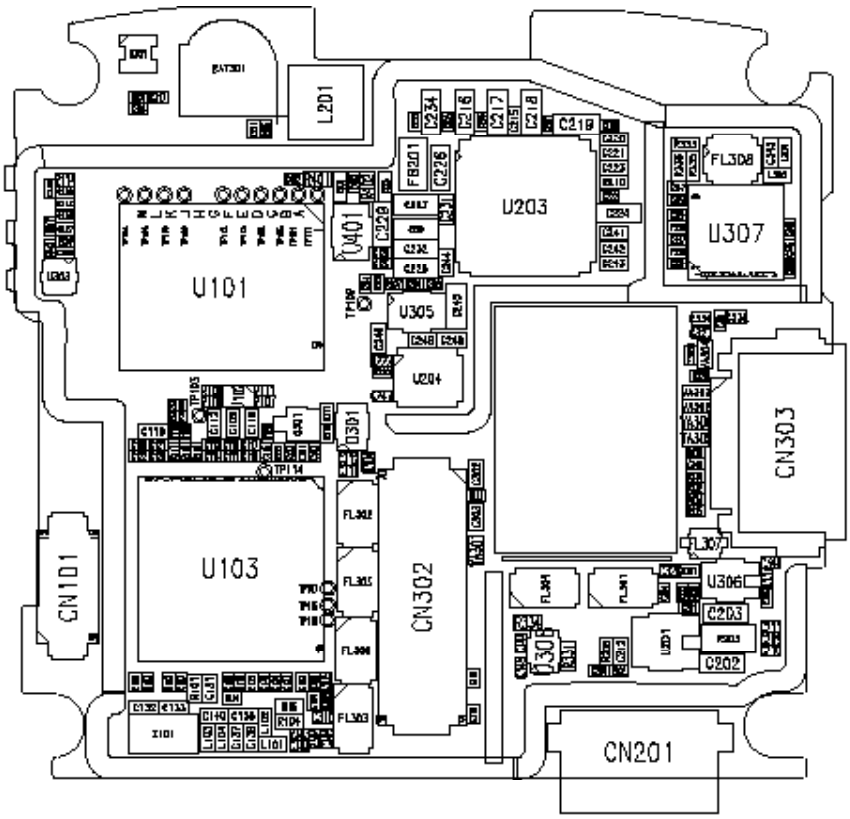


Figure 42 Main PCB bottom placement

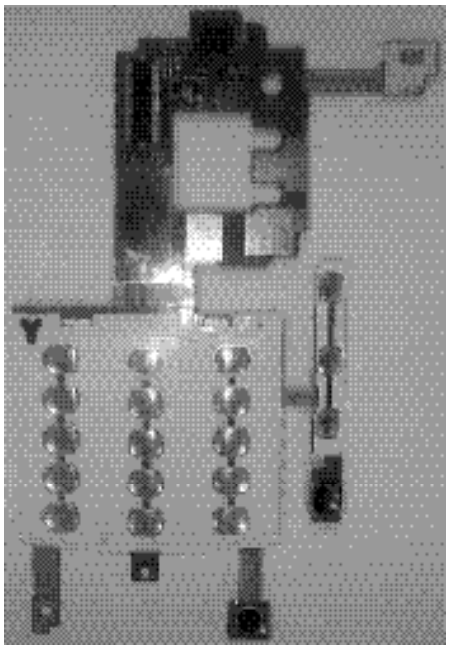


Figure 43 KEY FPCB top

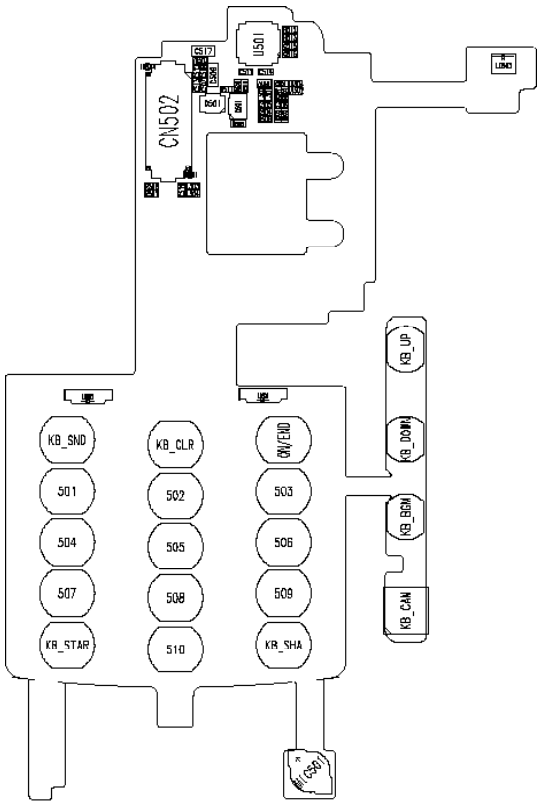


Figure 44 KEY FPCB placement

4. PCB layout

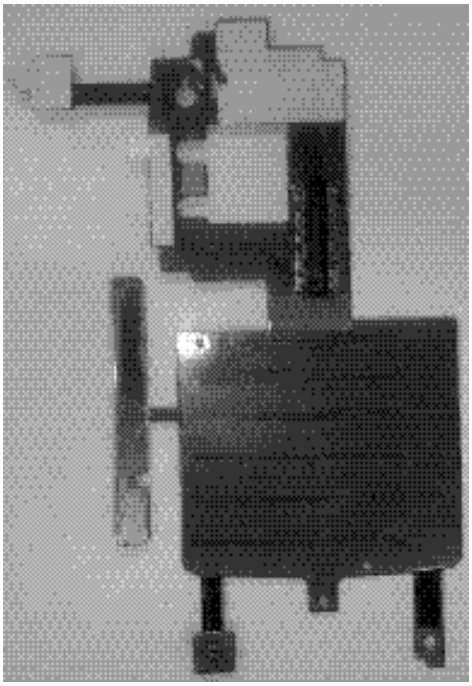


Figure 45 KEY FPCB bottom

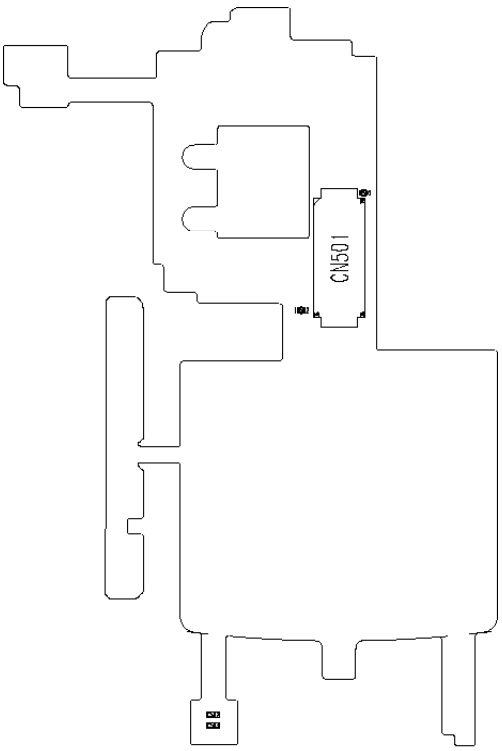
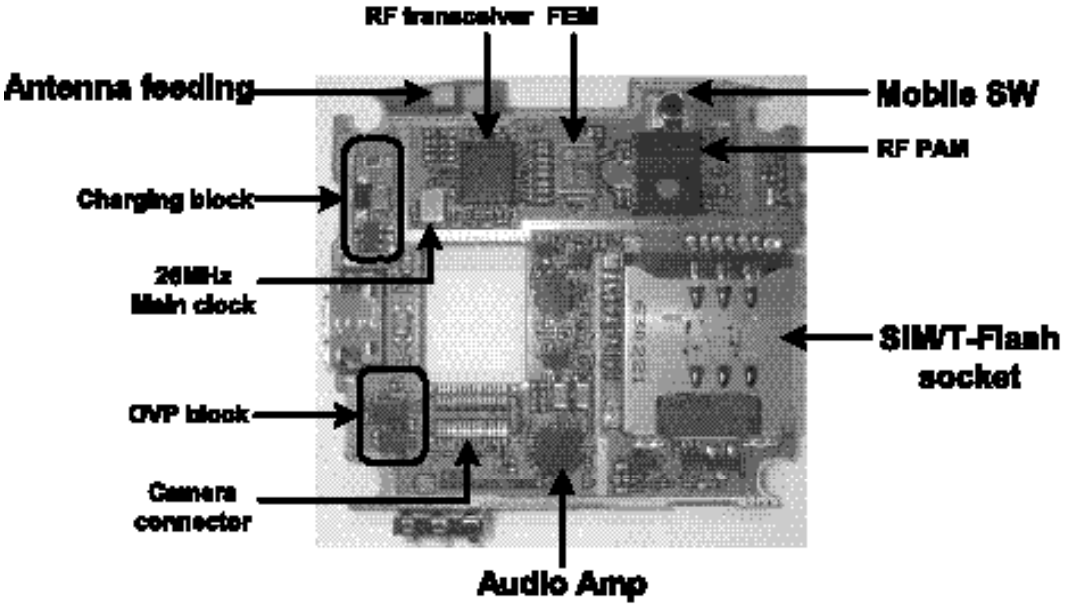
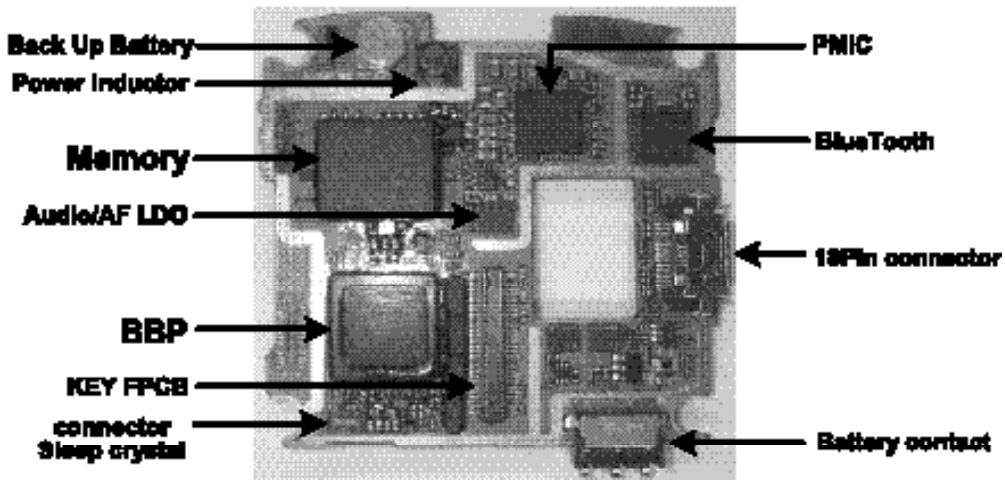
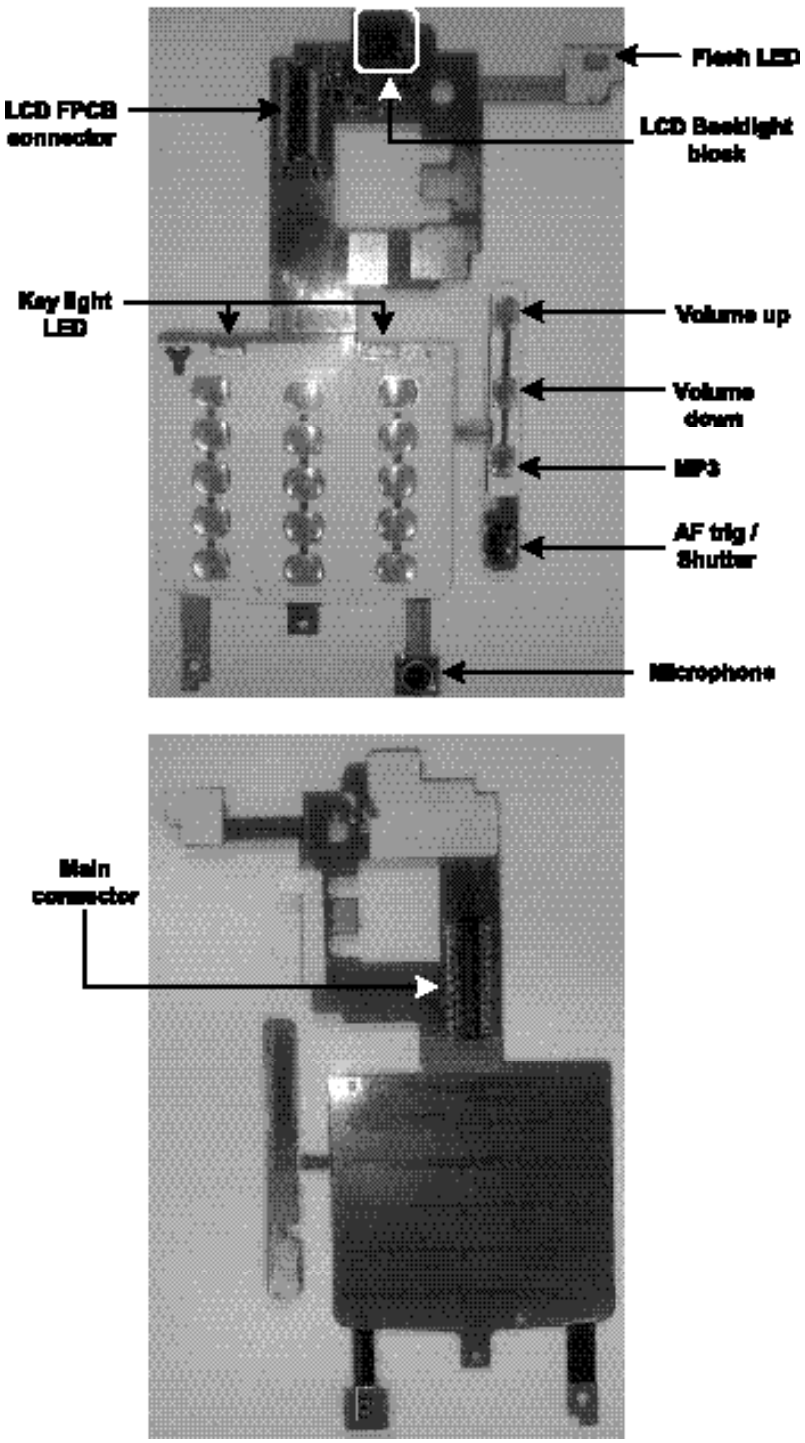


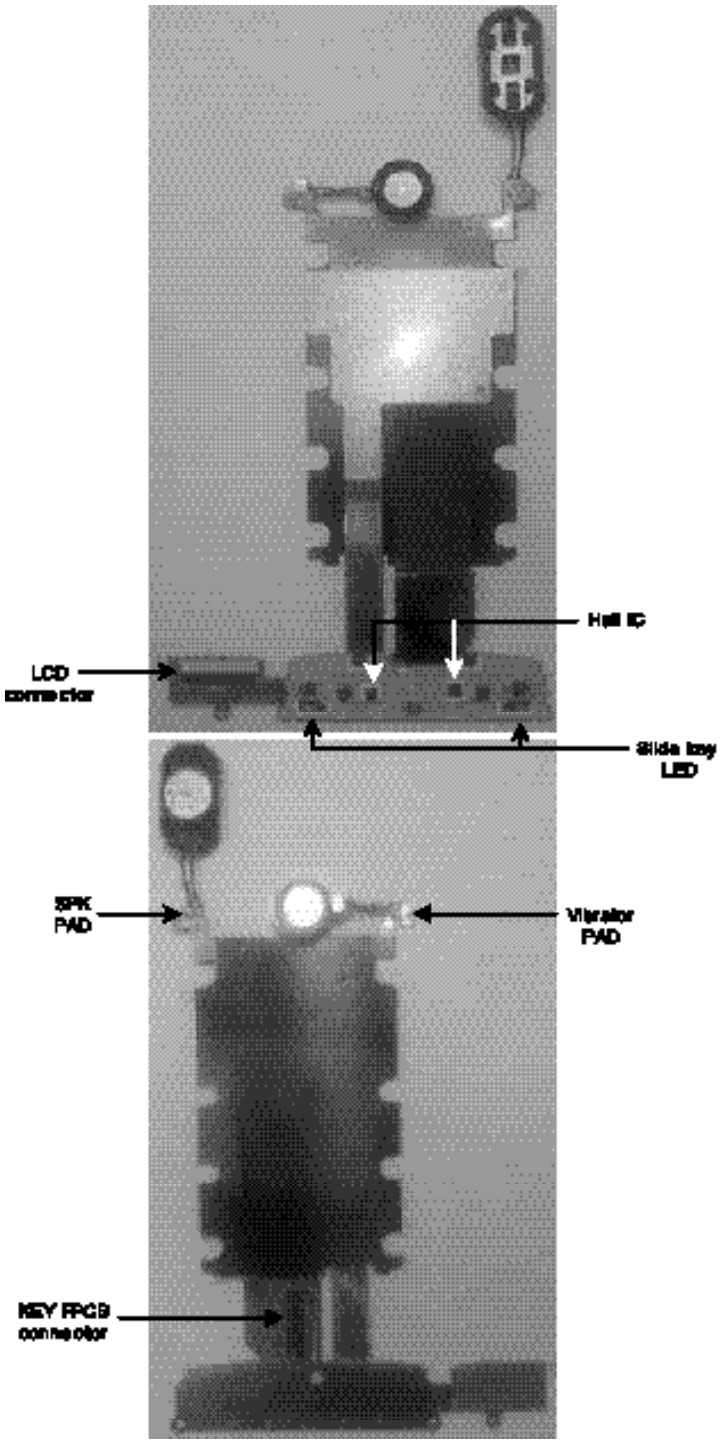
Figure 46 KEY FPCB bottom placement


RF transceiver
FEM
Antenna feeding
Mobile SW
RF PAM
Charging block
26MHz
Main clock
SIM/T-Flash
socket
OVP block
Camera
connector
Audio Amp


Back Up Battery
Power Inductor
Memory
Audio/AF LDO
BBP
KEY FPCB
connector
Sleep crystal
PMIC
BlueTooth
18Pin connector
Battery contact

4. PCB layout


Flash LED
LCD FPCB connector
LCD Backlight block
Key light LED
Volume up
Volume down
MP3
AF trig / Shutter
Microphone
Main connector


Hall IC
LCD connector
Slide key LED
SPK PAD
Vibrator PAD
KEY FPCB connector

5. Trouble shooting

5.1 Trouble shooting test setup

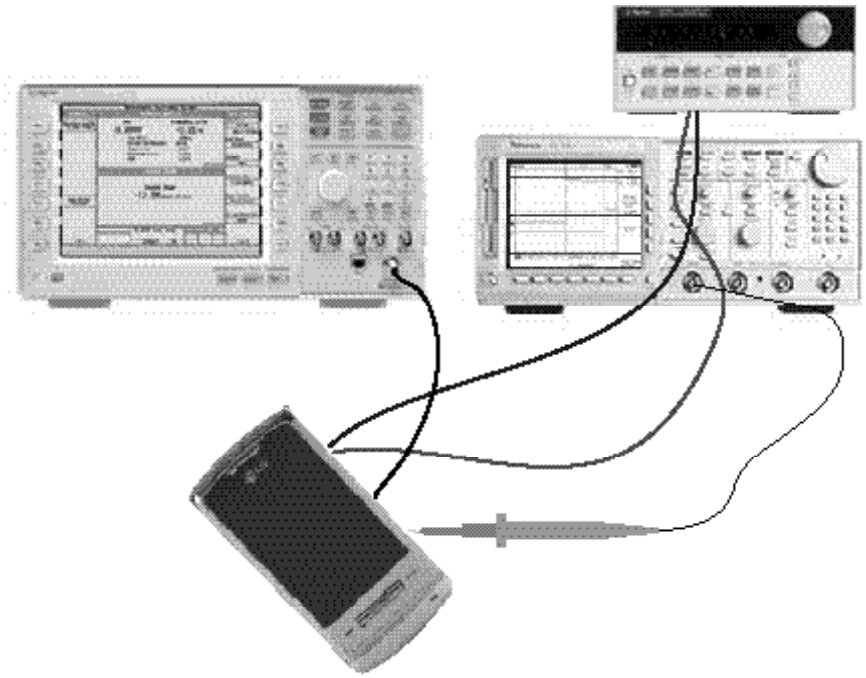


Figure 51 Equipment setup

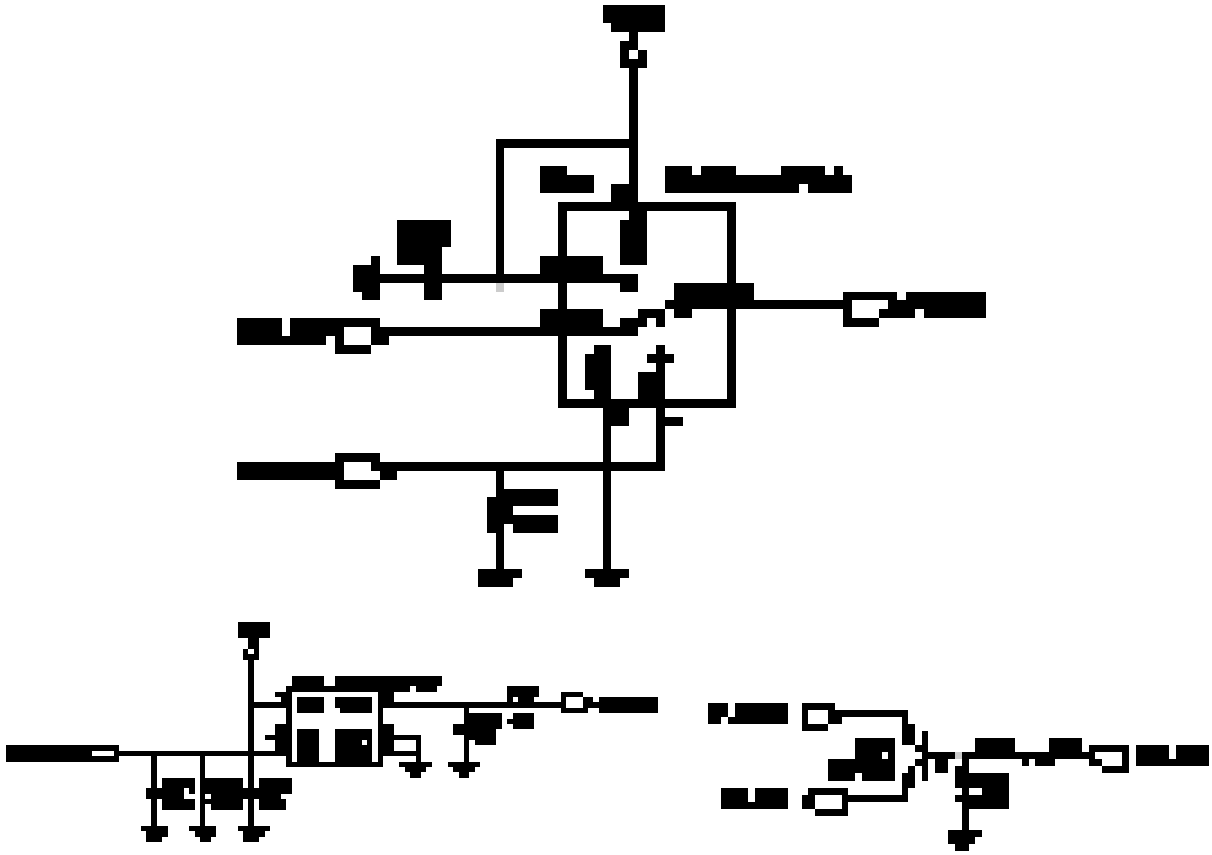
Power on all of test equipment
- Connect PIF-UNION JIG or dummy battery to the DUT for power up.
- Connect mobile switch cable between Communication test set and DUT when you need to make a phone call.

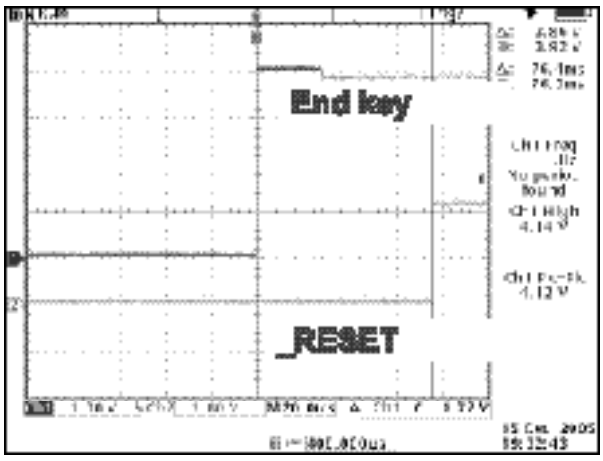
-Follow trouble shooting procedure

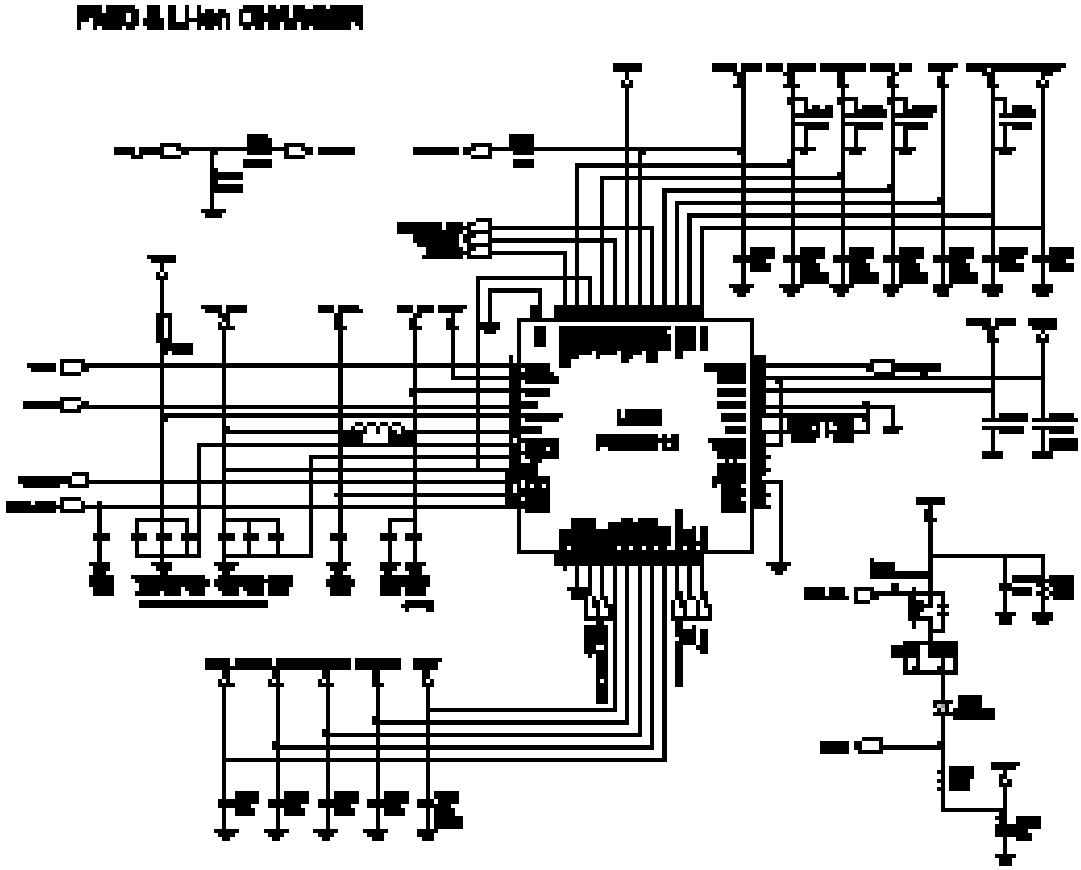
5.2 Power on Trouble

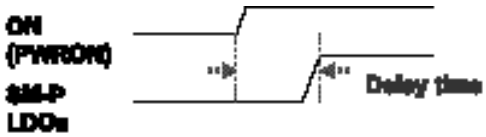
Check Points

-Battery Voltage(Need to over 3.35V)
-Power-On Key detection (PWRON signal)
-Outputs of LDOs from PMIC

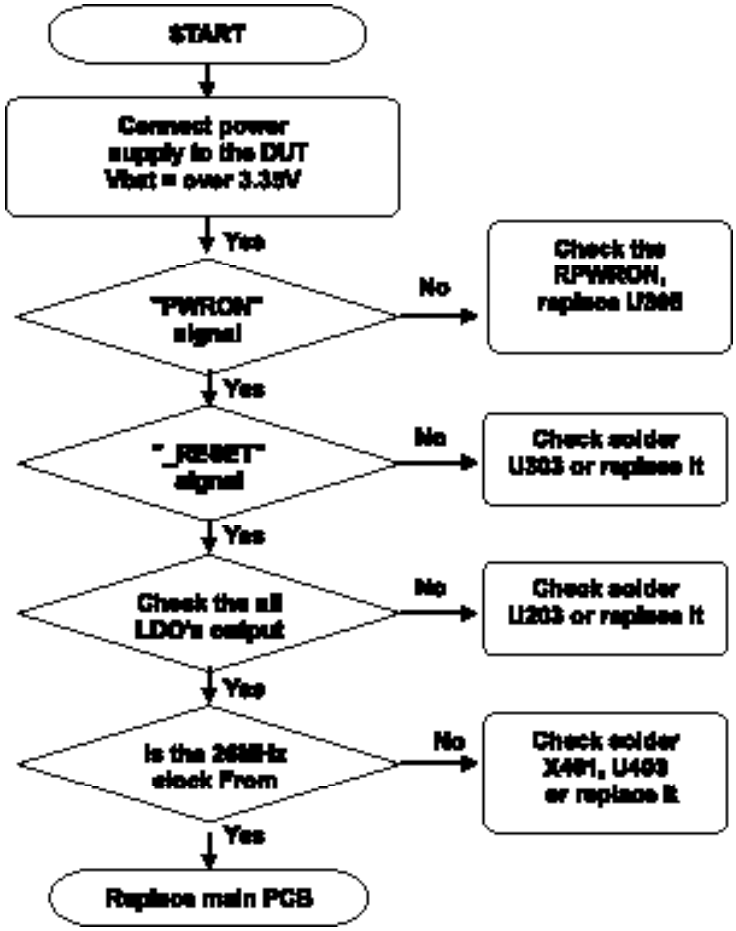



End key
_RESET





LDO NAME	VRF2	VLS B2		VLS B1	VINT	VANA	VSIM 1	VSIM 2	VMMC	VLS B	VRF C	VRF 1
Delay time(msec)	20	24.2	23.7	26.2	26.2	28.1	30.2	32.2	34.3	36.5	628	628


START
Connect power supply to the DUT Vbat = over 3.35V
Yes
"PWRON" signal
No
Check the RPWRON, replace U305
Yes
"_RESET" signal
No
Check solder U303 or replace it
Yes
Check the all LDO's output
No
Check solder U203 or replace it
Yes
Is the 26MHz clock From
No
Check solder X401, U403 or replace it
Yes
Replace main PCB

5.3 Charging trouble

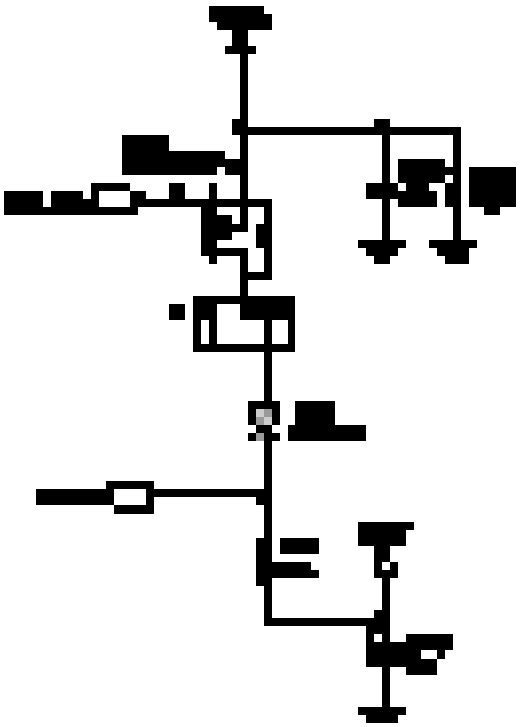
Check Points

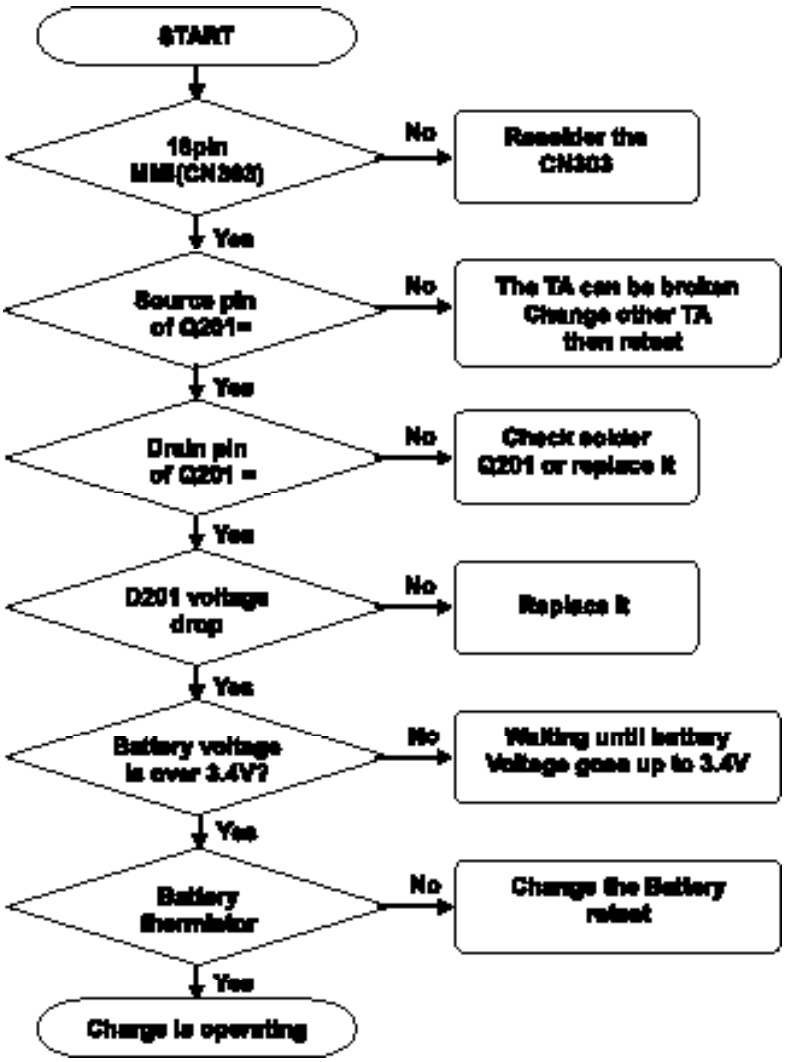
-Connection of TA (check TA voltage 4.8V)

-Charging Current Path component voltage drop

-Battery voltage

- Charging method : CC-CV
- Charger detect voltage : about 4.0V
- Charging time : 3h under
- Charging current : 500mA
- Cutoff current : 100mA
- Low battery alarm
  - -. Idle : 3.62V
  - -. Dedicated : 3.50V
- Switch-off voltage : 3.35V
- Charging temperature ADC range
  - ~ -20°C : small charging operation.
  - -20°C ~ 60°C : charging.
  - 60°C ~ : not charging operation small charging operation.



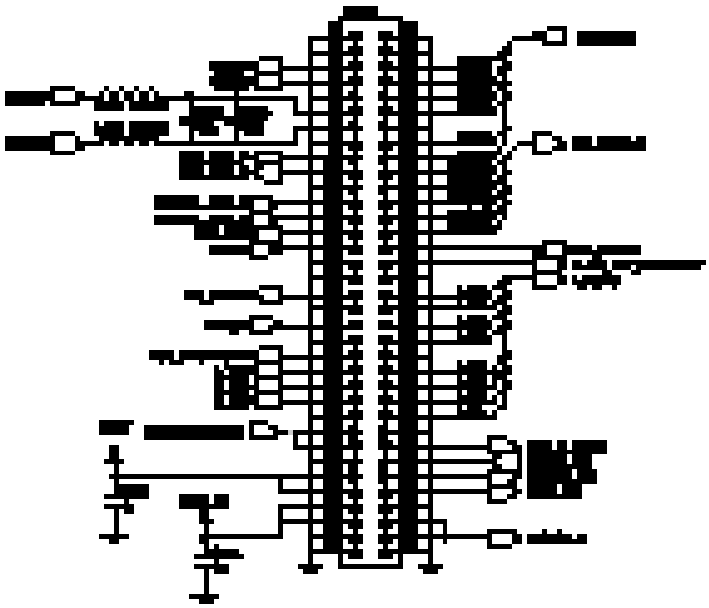

START
18pin MIB(CN303)
No
Resoldier the CN303
Yes
Source pin of Q201=
No
The TA can be broken Change other TA then reboot
Yes
Drain pin of Q201 =
No
Check solder Q201 or replace it
Yes
D201 voltage drop
No
Replace it
Yes
Battery voltage is over 3.4V?
No
Waiting until battery Voltage goes up to 3.4V
Yes
Battery thermistor
No
Change the Battery reboot
Yes
Charge is operating

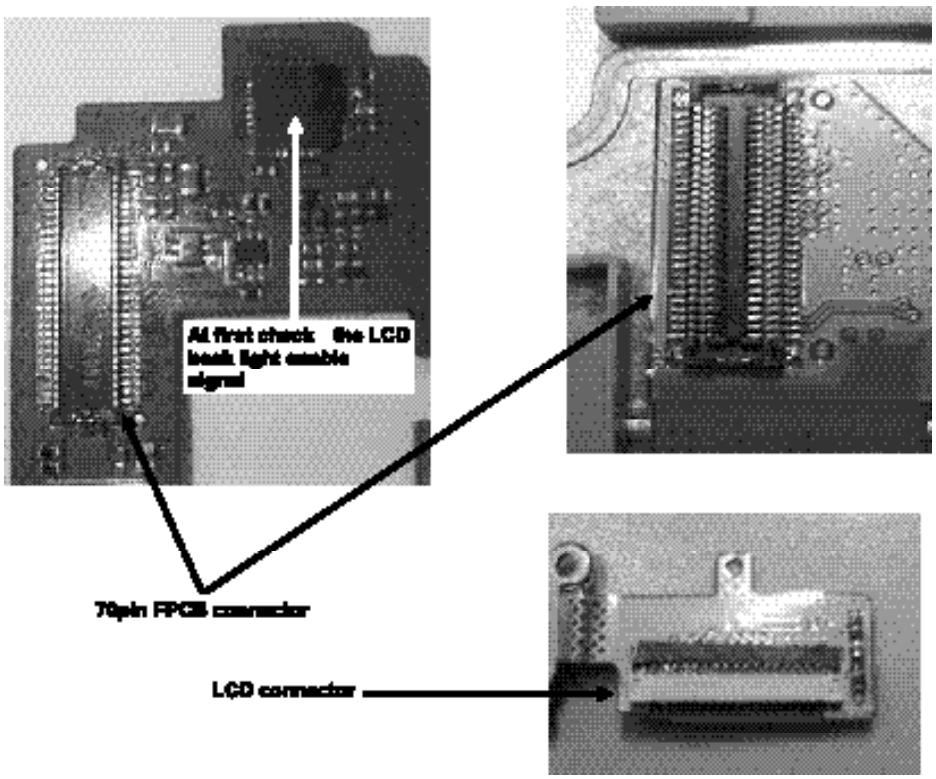
5.4 LCD display trouble

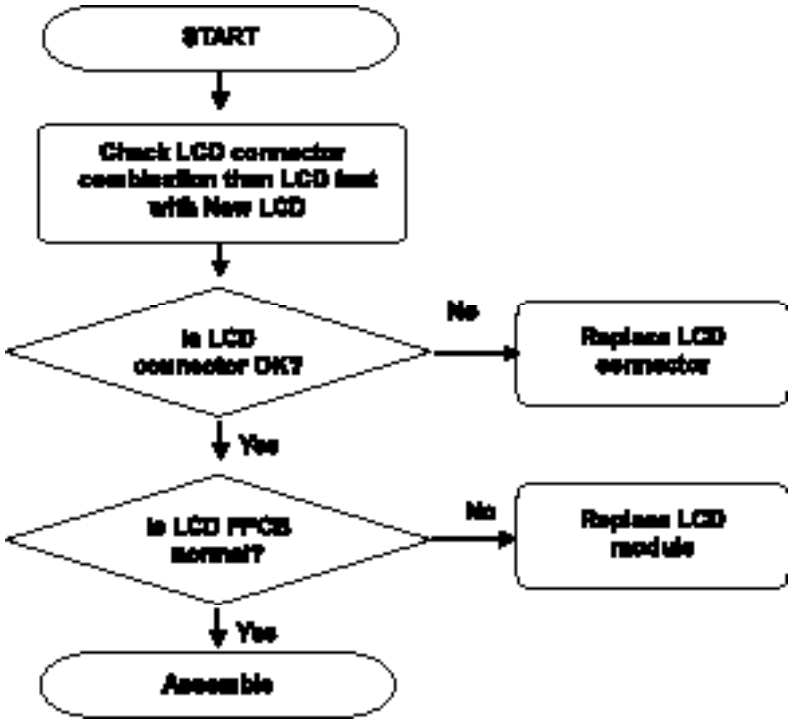
Check Points

-LCD assembly status (FPCB)

-Connector combination





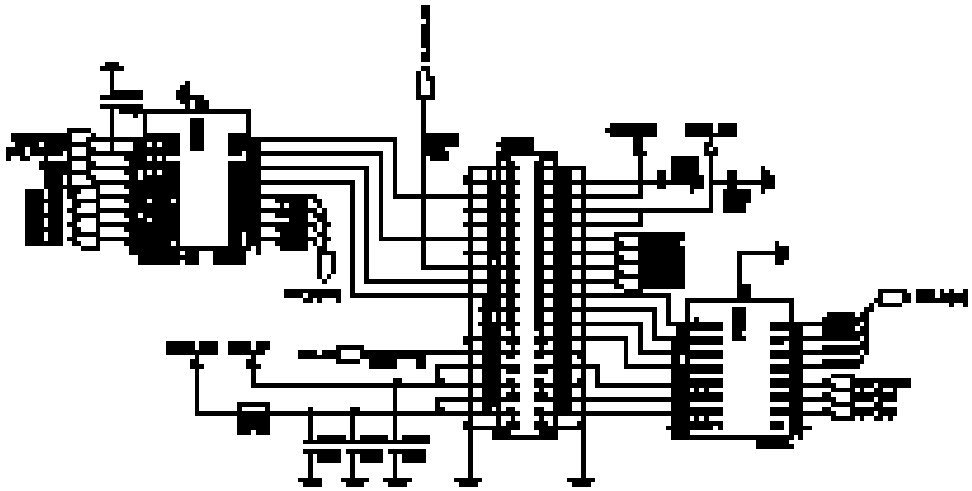

START
Check LCD connector combination then LCD test with New LCD
Is LCD connector OK?
No
Replace LCD connector
Yes
Is LCD FPCB normal?
No
Replace LCD module
Yes
Assemble

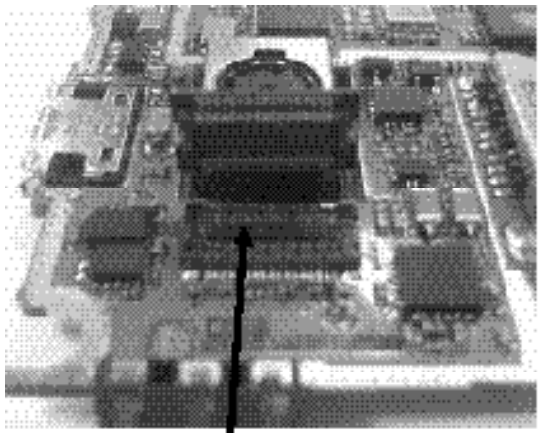
5.5 Camera Trouble

Check Points

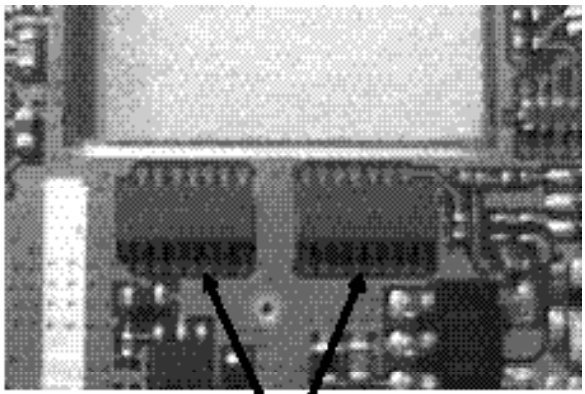
-Connectors combination

-EMI filter soldering

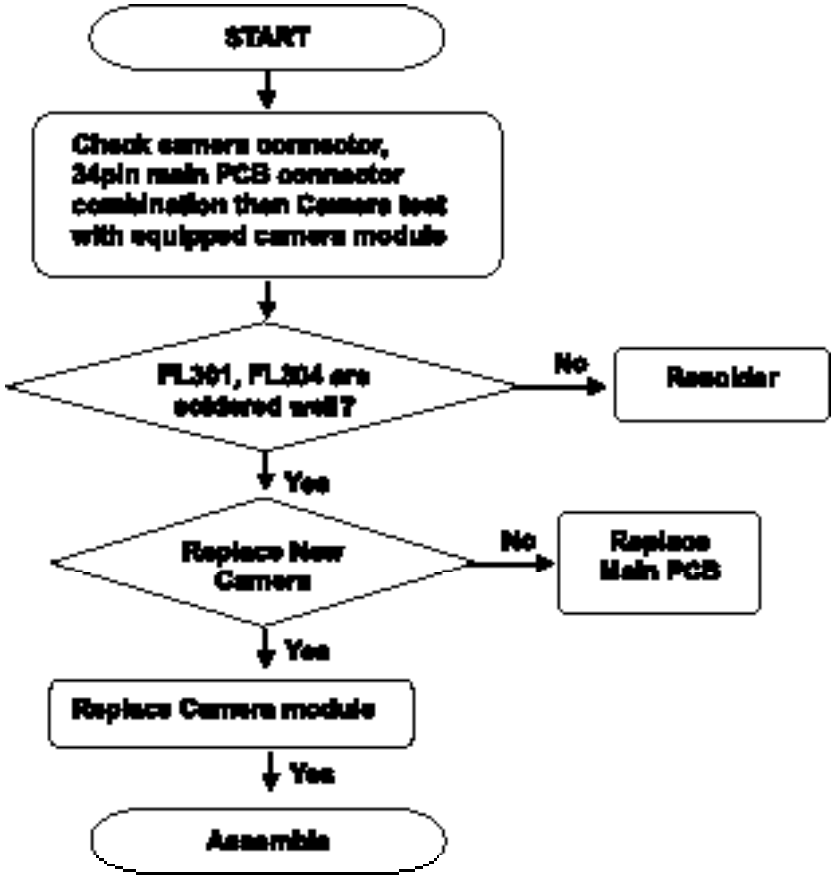




Check the connector combination



Check signal flow via EMI filter

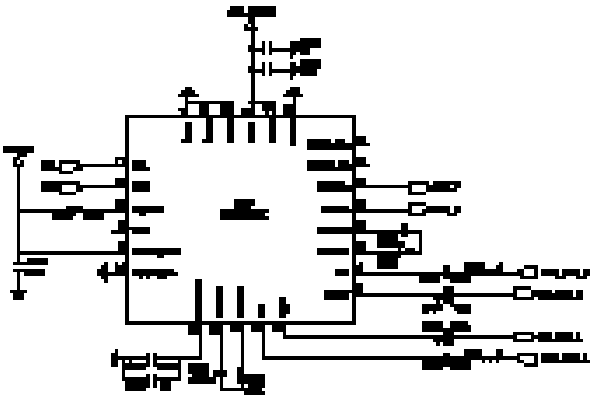

START
Check camera connector, 34pin main PCB connector combination then Camera test with equipped camera module
FL301, FL304 are soldered well?
No
Resolder
Yes
Replace New Camera
No
Replace Main PCB
Yes
Replace Camera module
Yes
Assemble

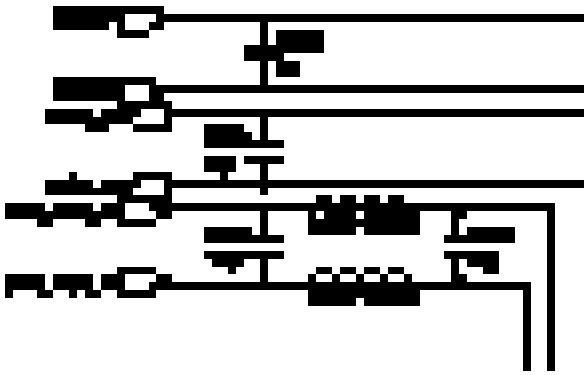
5.6 Receiver & Speaker trouble

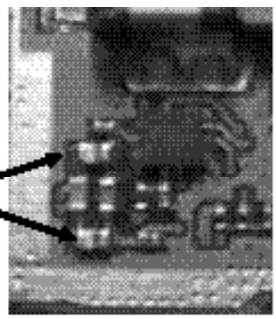
Check Points

-Speaker wire

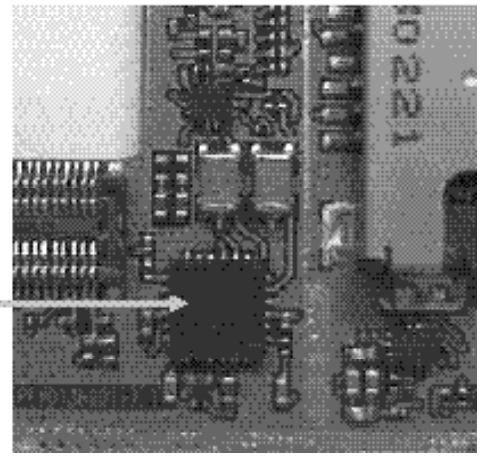
-Audio amp soldering

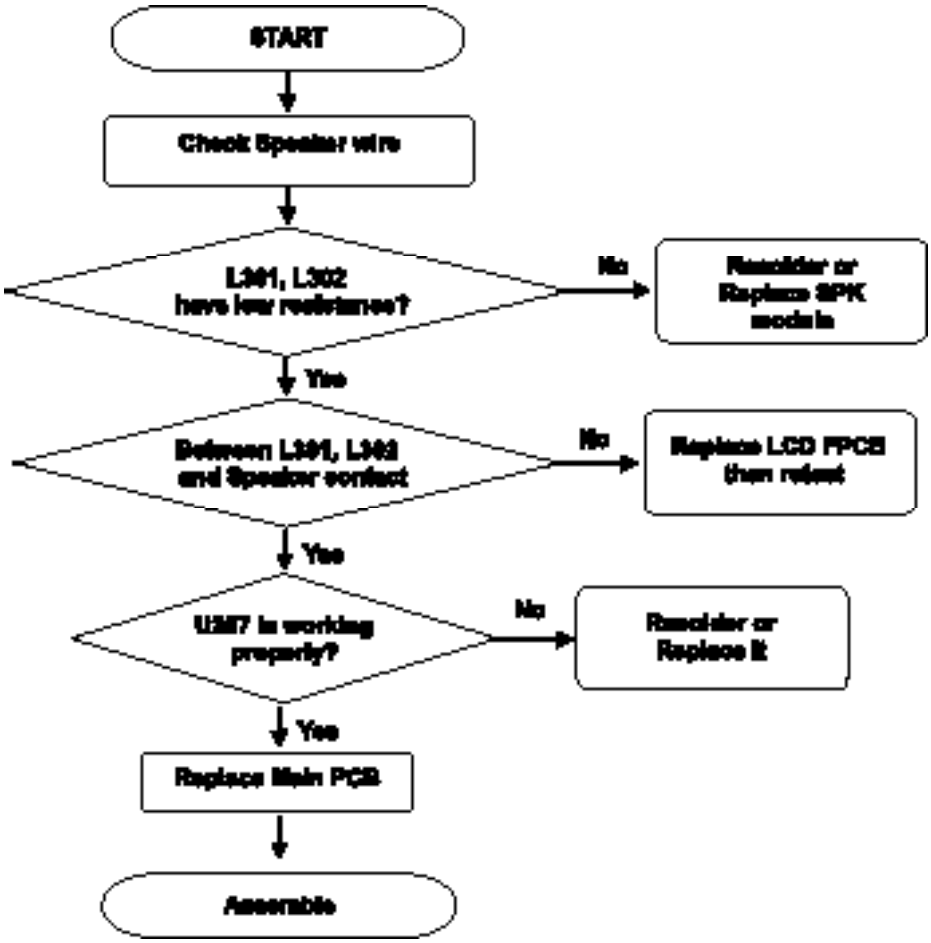






Check the SPK wire and soldering



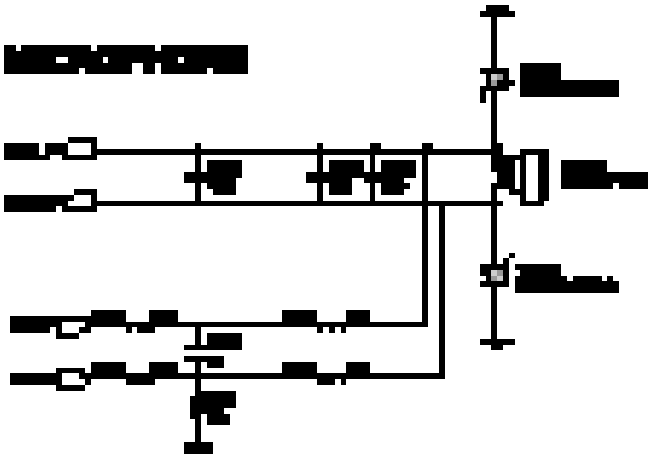

START
Check Speaker wire
L301, L302
have low resistance?
No
Yes
Between L301, L302
and Speaker contact
No
Yes
U307 is working
properly?
No
Yes
Replace Main PCB
Assemble

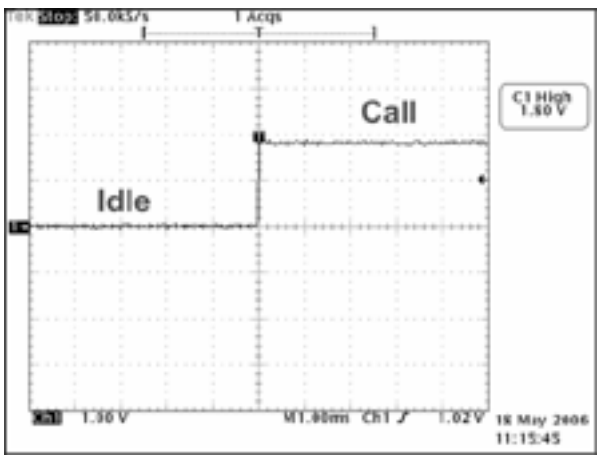
5.7 Microphone trouble

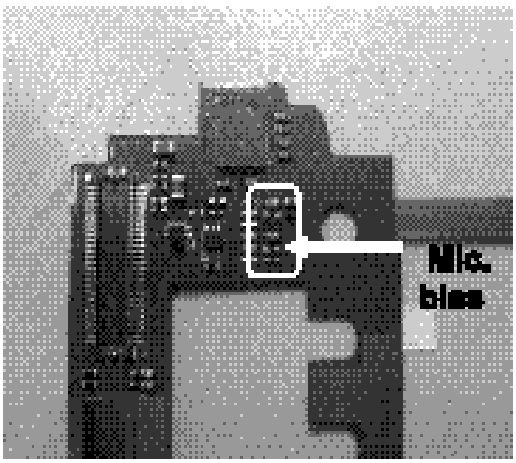
Check Points

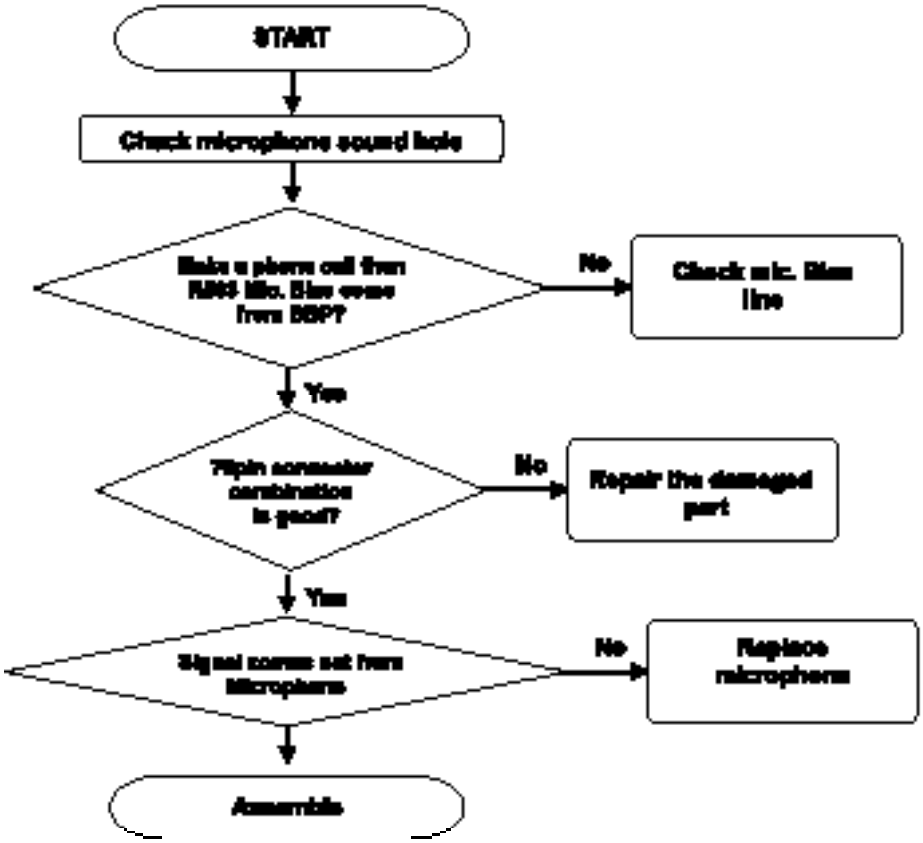
-Microphone hole

-Mic. Bias & signal come from





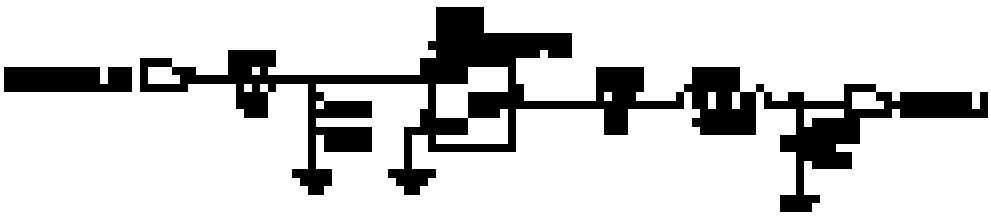


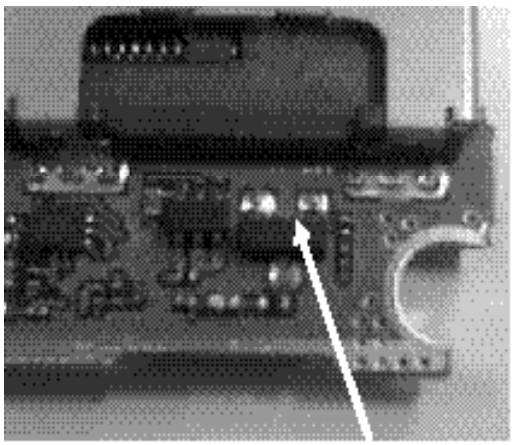

START
Check microphone sound hole
No
Yes
No
Yes
No
Repair the damaged part
Replace microphone
Assemble

5.8 Vibrator trouble

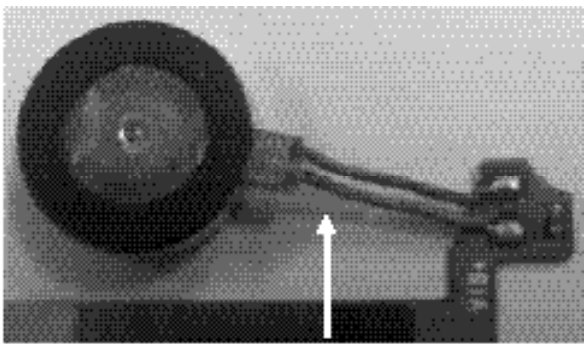
Check Points

- Vibrator contact
- IC is working correct

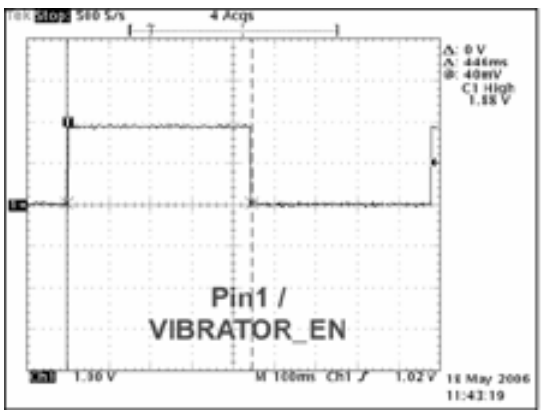


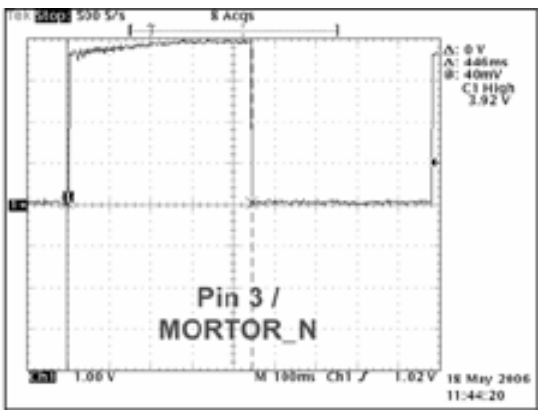


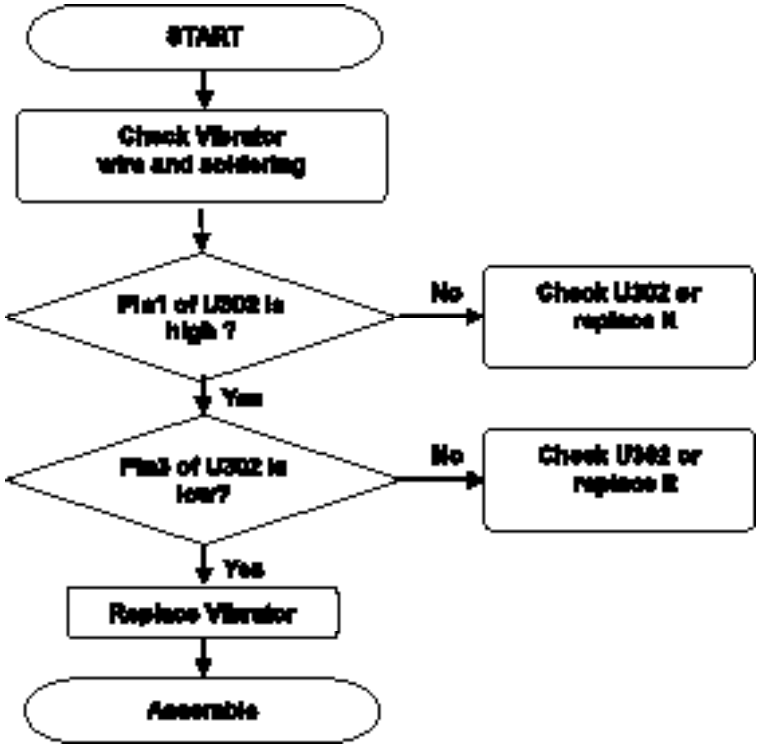
Check the driver IC
Enable signal goes to
high then vibration



Check the wire and soldering





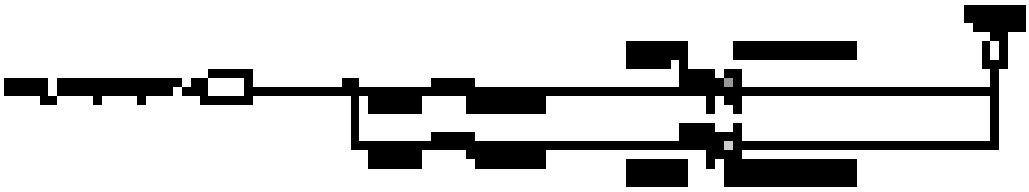

START
Check Vibrator
wire and soldering
Pin1 of U302 is
high ?
No
Check U302 or
replace it
Yes
Pin3 of U302 is
low?
No
Check U302 or
replace it
Yes
Replace Vibrator
Assemble

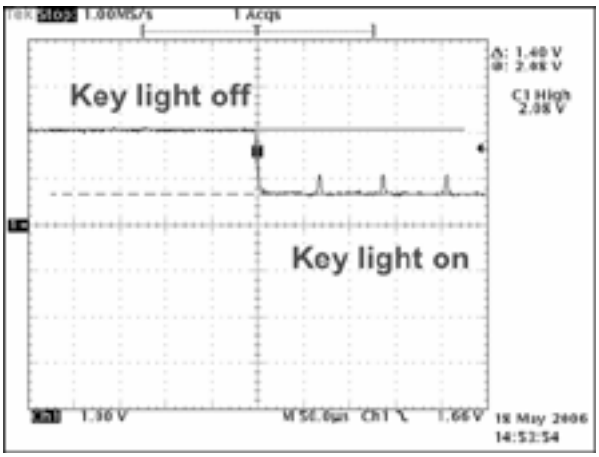
5.9 Keypad back light trouble

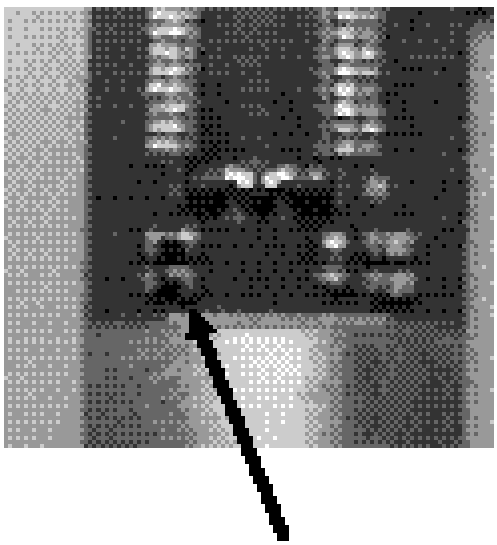
Check Points

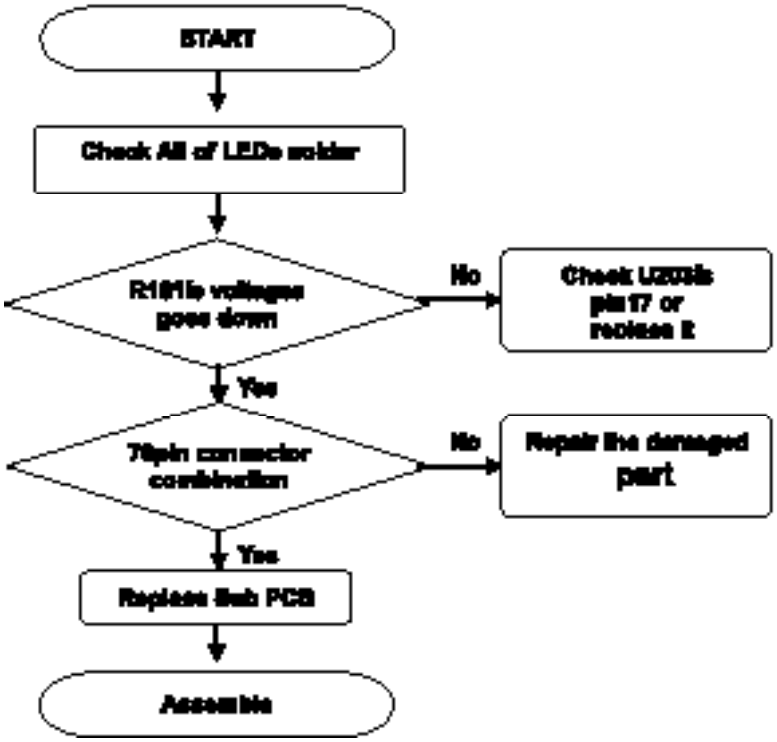
-Signal path is connected well

-Control IC is working properly





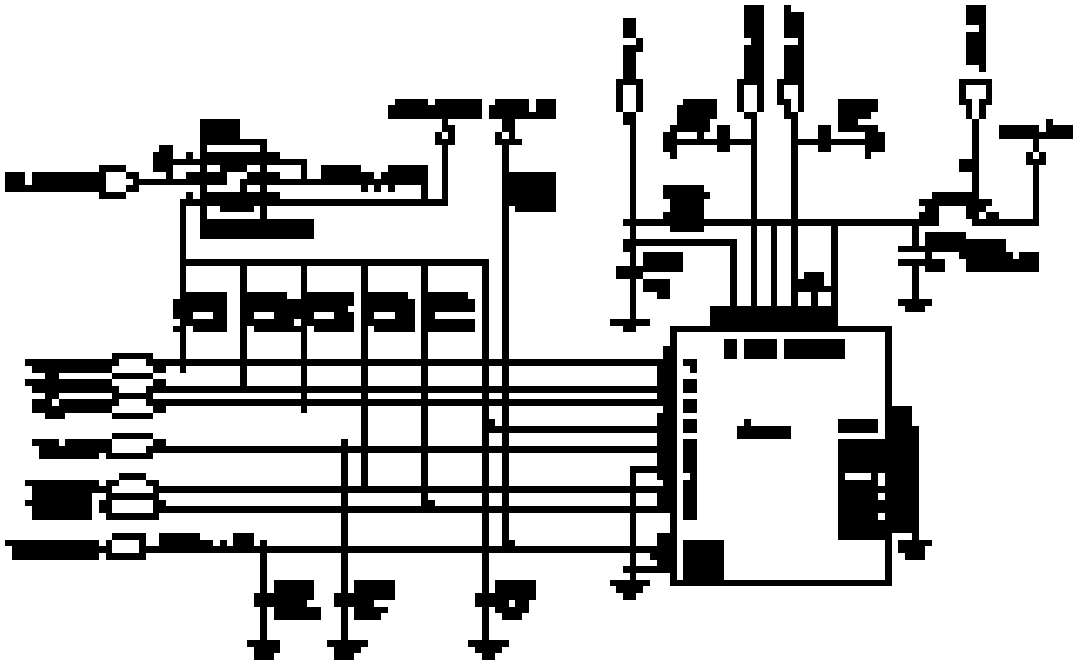


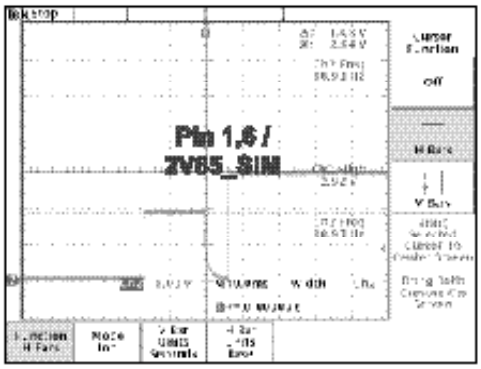

START
Check All of LEDs solder
R181s voltages goes down
No
Yes
70pin connector combination
No
Yes
Replace Sub PCB
Assemble

5.10 Micro SD and SIM card trouble

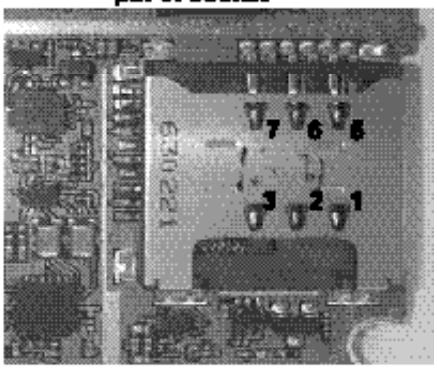
Check Points

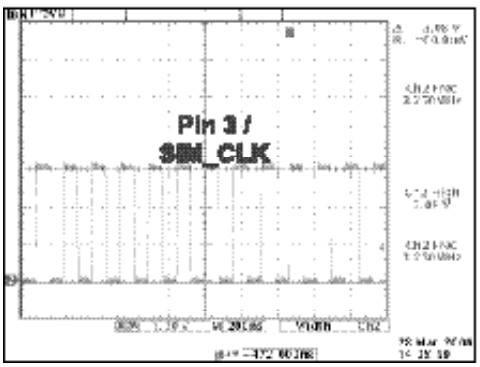
-Power control FET is working
-Socket soldering
-Proper SIM is used
-Card detect is working

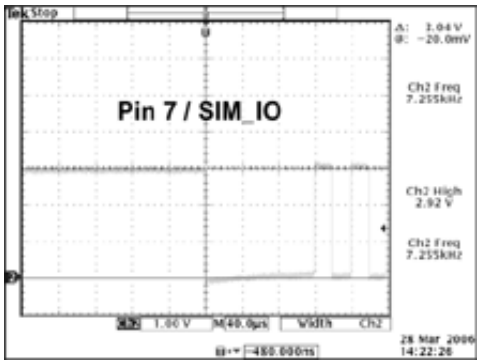




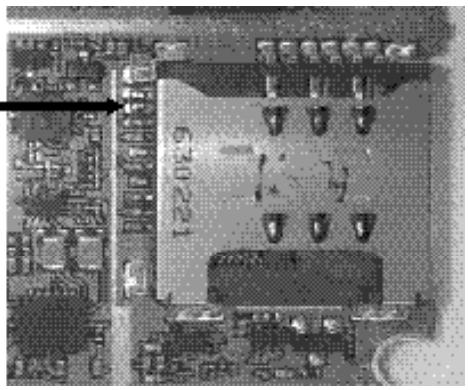
Check soldering all pin of socket

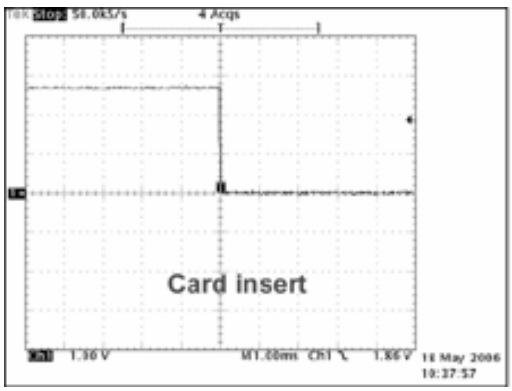


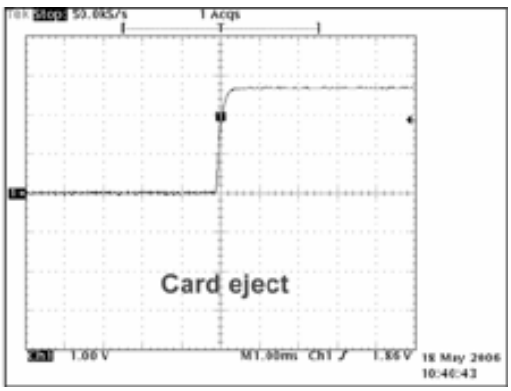


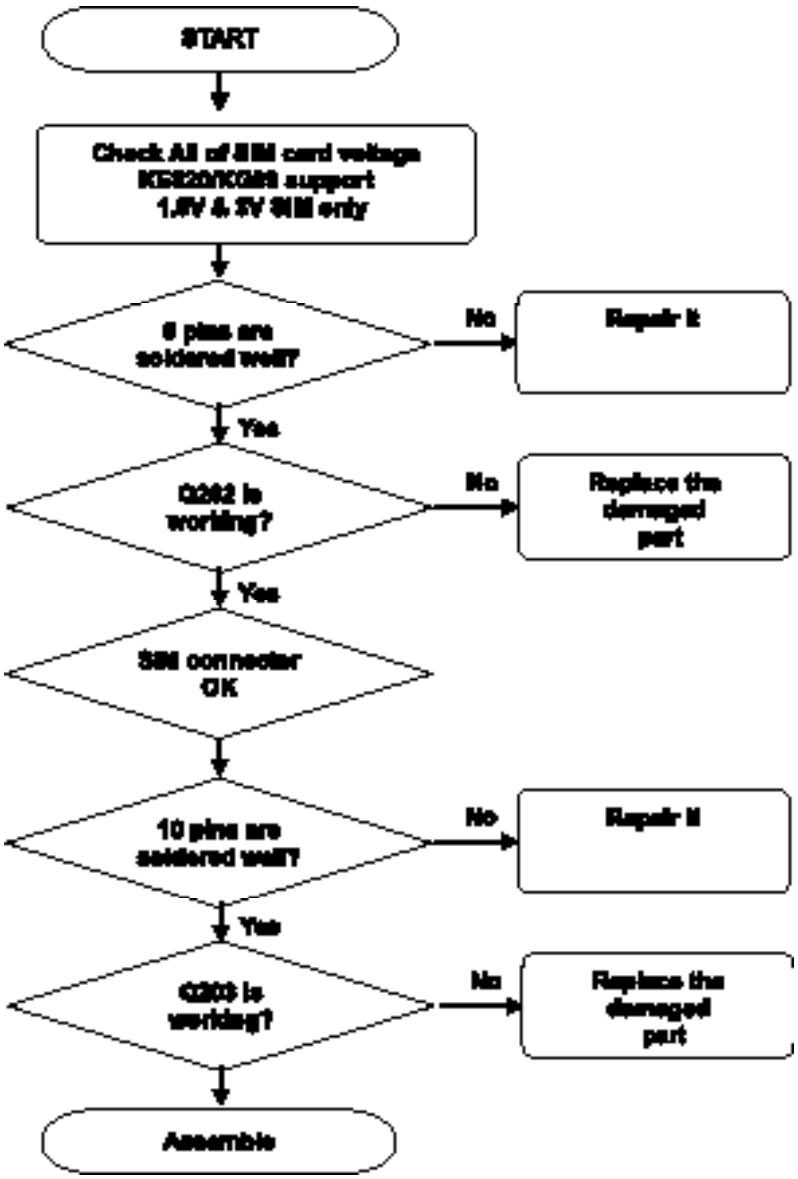


TF_DETECT



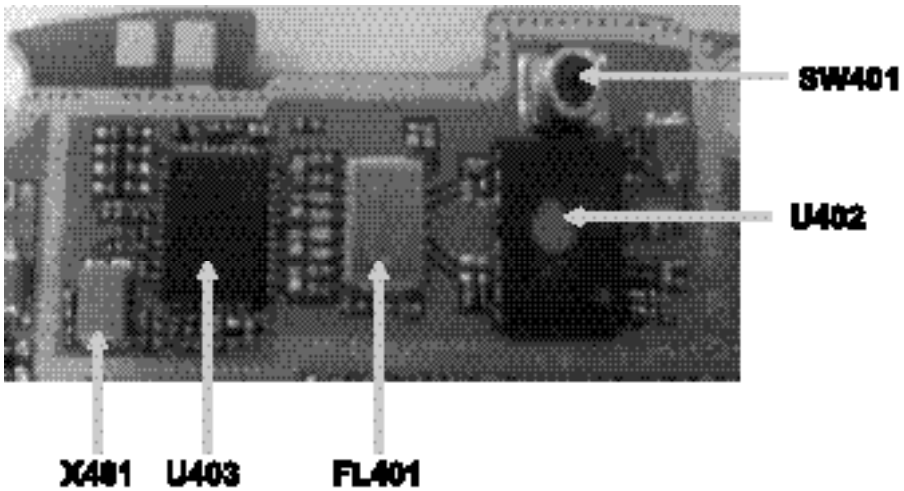





START
Check All of SIM card voltage
KS620/KQ69 support
1.8V & 3V SIM only
6 pins are soldered well?
No
Repair it
Yes
Q262 is working?
No
Replace the damaged part
Yes
SIM connector OK
10 pins are soldered well?
No
Repair it
Yes
Q203 is working?
No
Replace the damaged part
Assemble

5.11 RF PART TROUBLESHOOTING

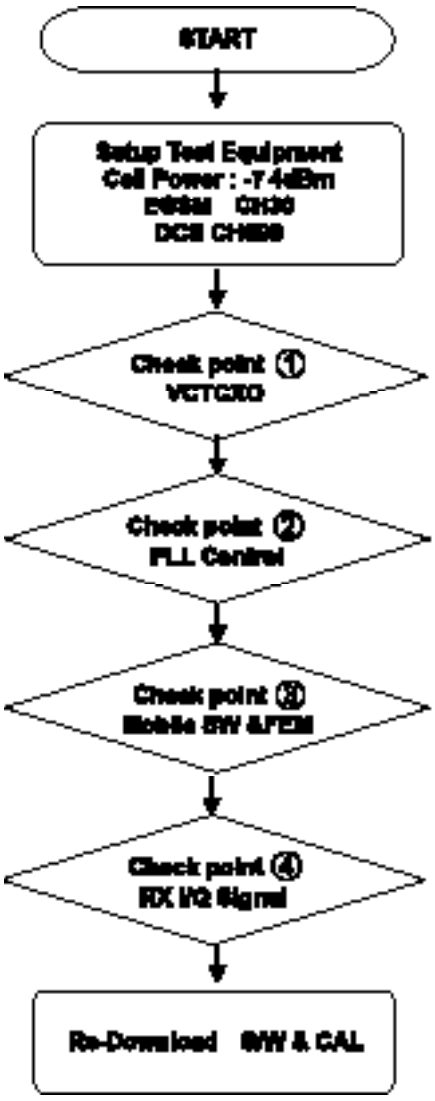
5.11.1 RF Components

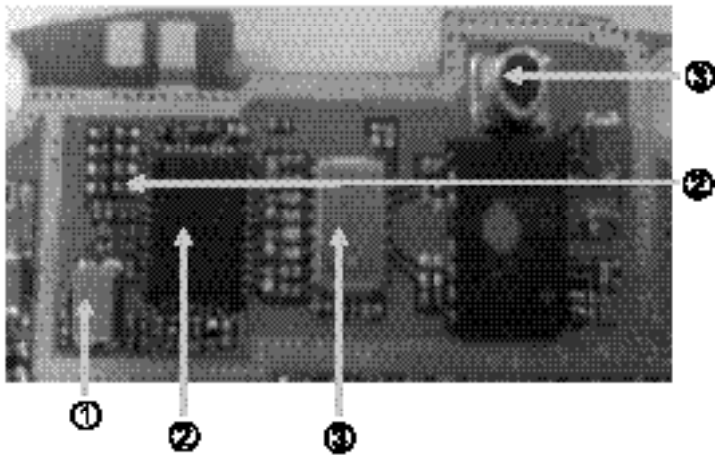


REFERENCE	PART Description
U402	PAM (Power Ampilifier Module)
X401	VCTCXO (26MHz)
FL401	FEM (Front End Module)
U403	Transceiver
SW401	Mobile Switch

5.11.2 Trouble Shooting of Receiver Part

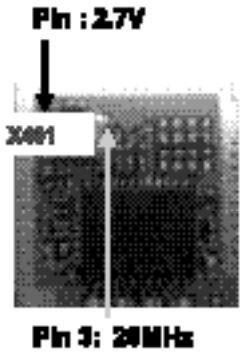
Checking Flow



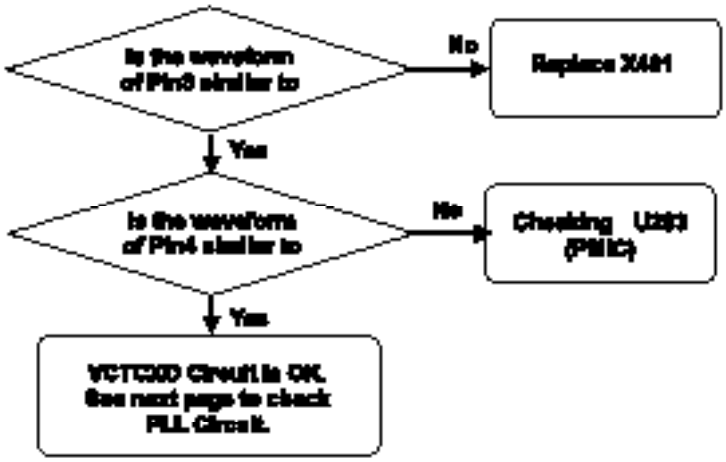


5.11.3 Checking VCTCXO Circuit

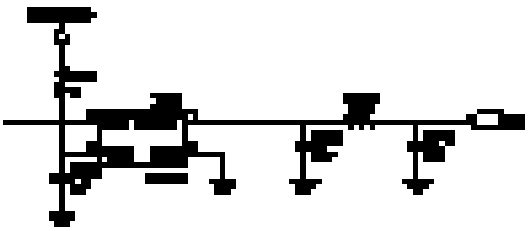
Checking Points



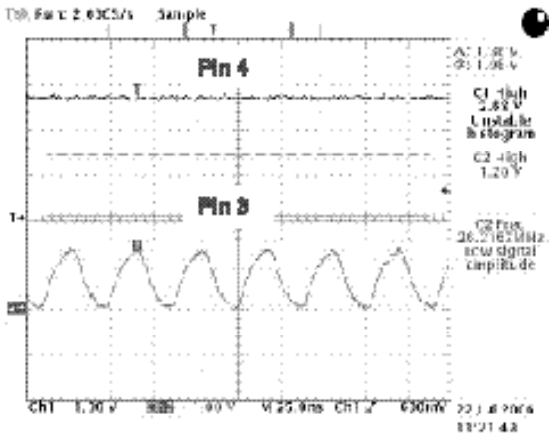
Checking Flow



VCTCXO Circuit Diagram

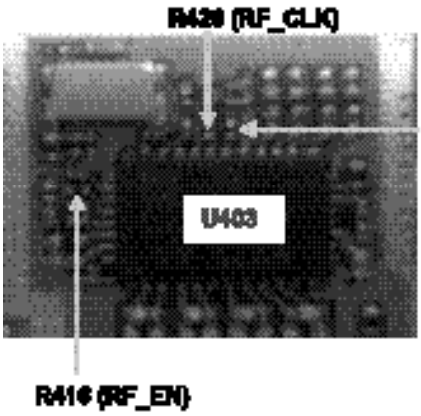


Waveform

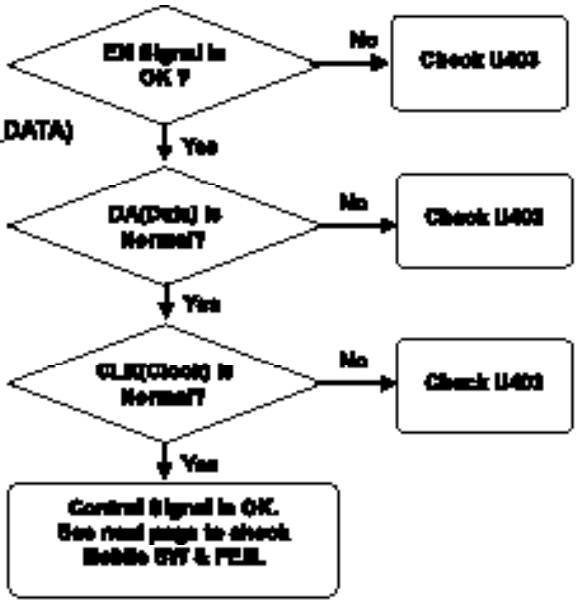


5.11.4 Checking PLL Control signals

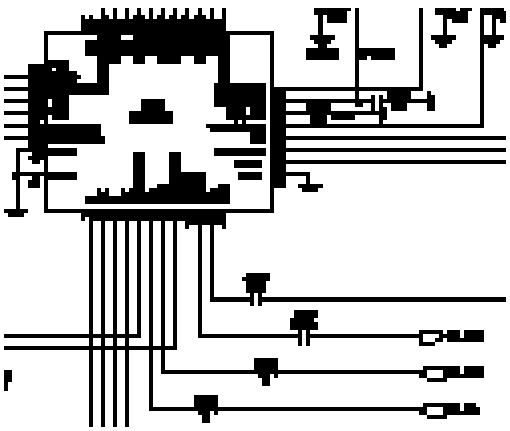
Checking Points



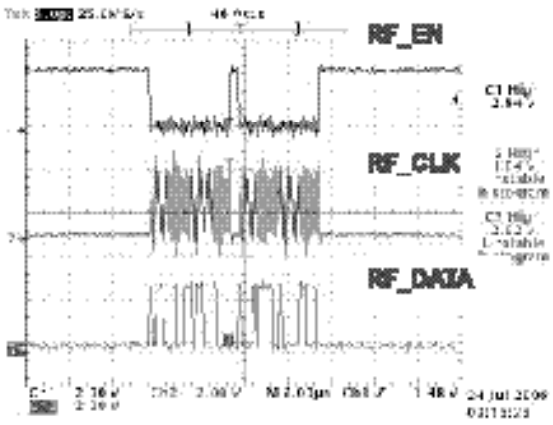
Checking Flow



RF Transceiver Circuit Diagram

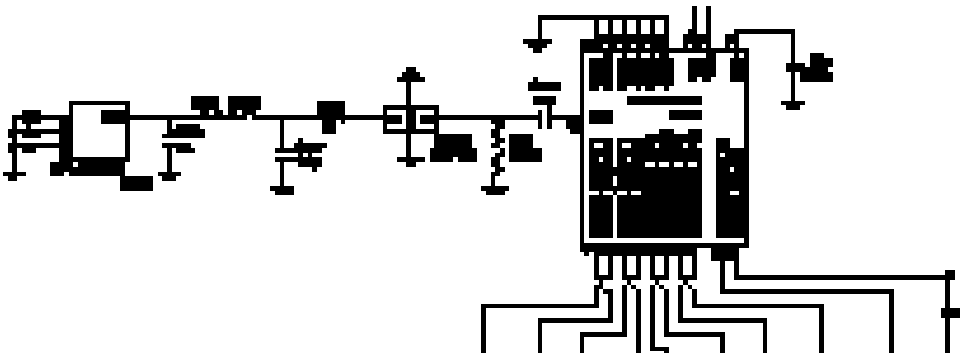


Waveform

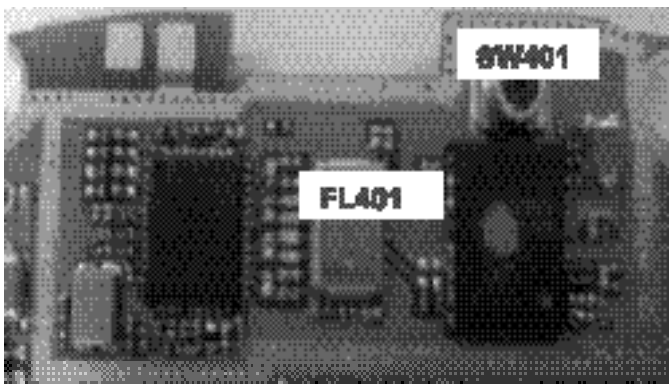


5.11.5 Checking Mobile SW & FEM

Mobile SW & FEM Circuit Diagram

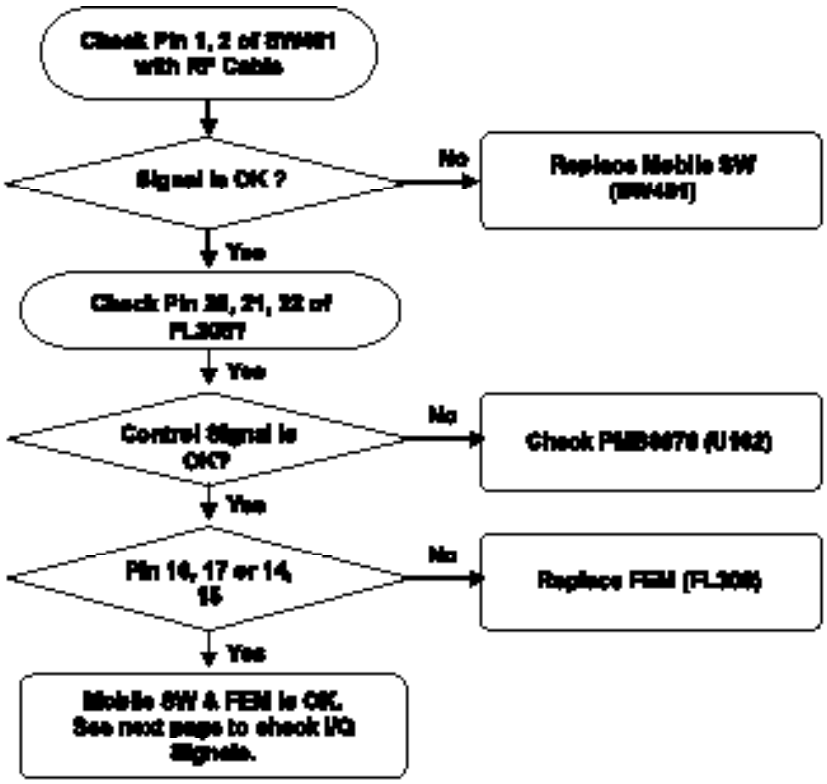


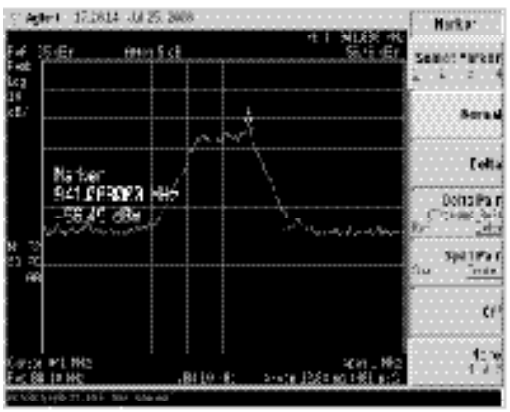
Checking Points

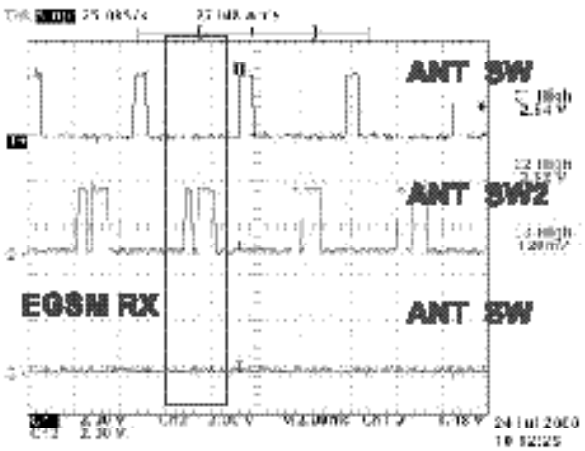


RX Mode	EGSM	DCS	PCS
ANT_SW1	Off	Off	Off
ANT_SW2	On	Off	Off

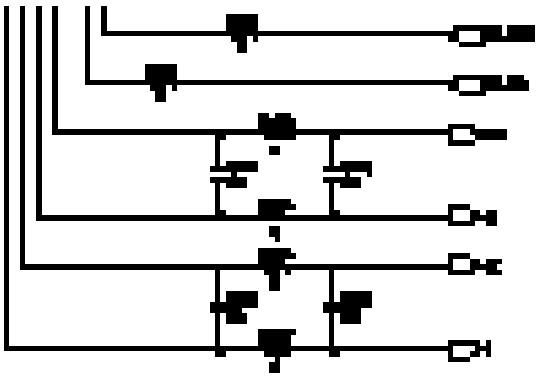
Checking Flow



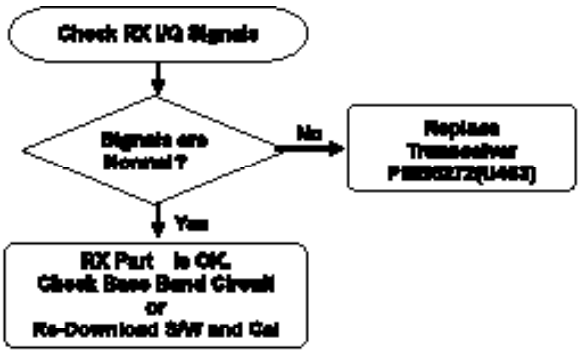




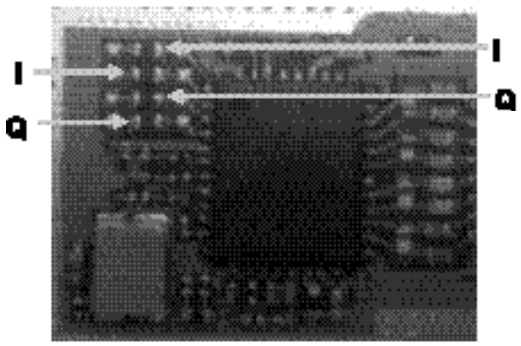
5.11.6 Checking RX I/Q Signals

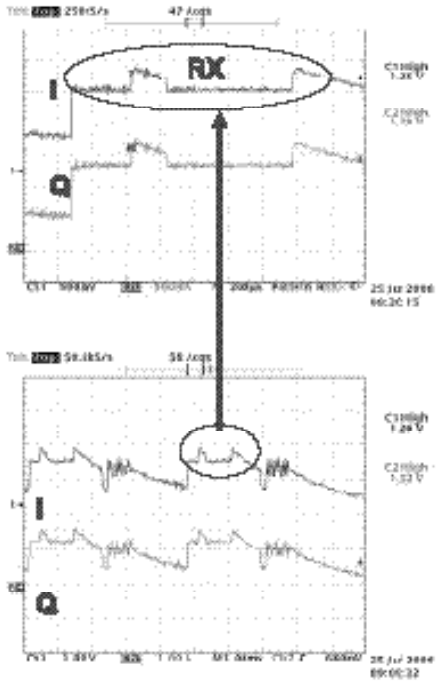


Checking Flow



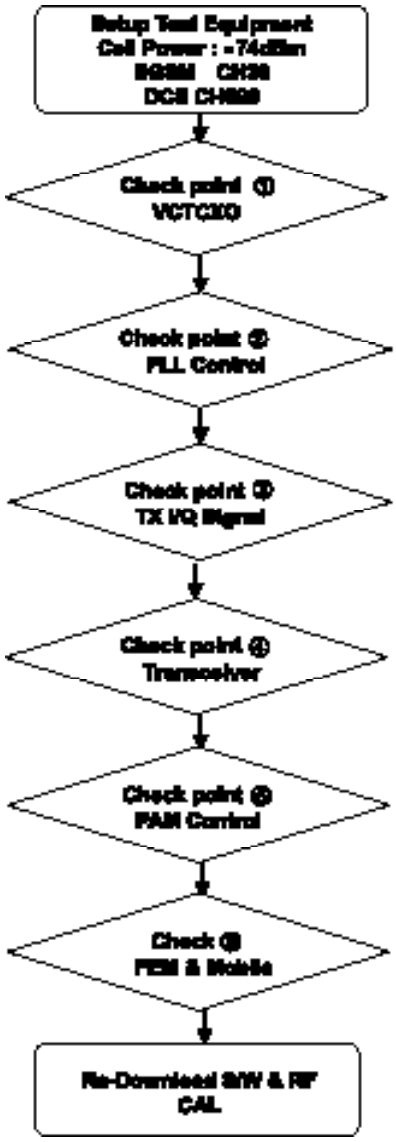
Checking Points



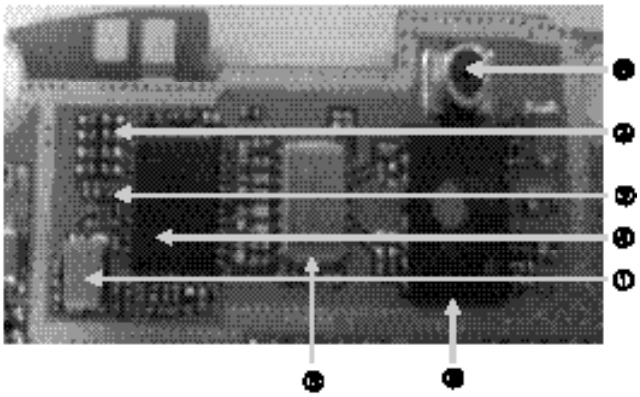


5.11.7 Shooting of Transmitter Part

Checking Flow



Checking Points



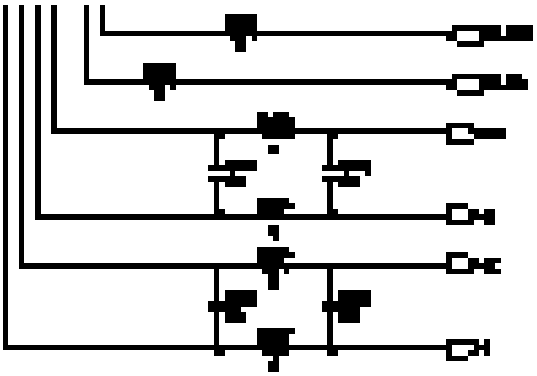
5.11.8 VCTCXO Circuit

See RX Part “1. Checking VCTCXO Circuit”

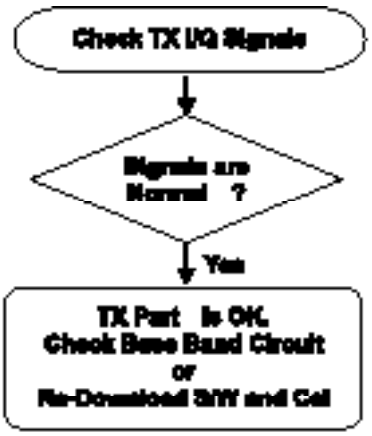
5.11.9 Checking PLL Control Signal

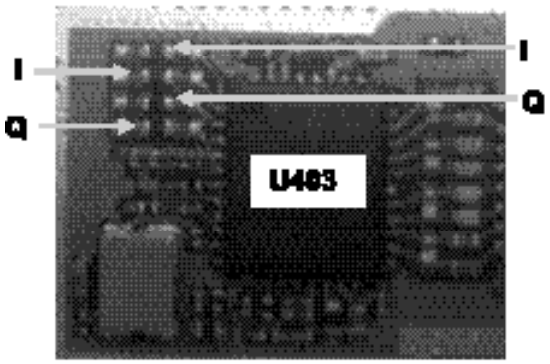
See RX Part “2. Checking PLL Control Signal”

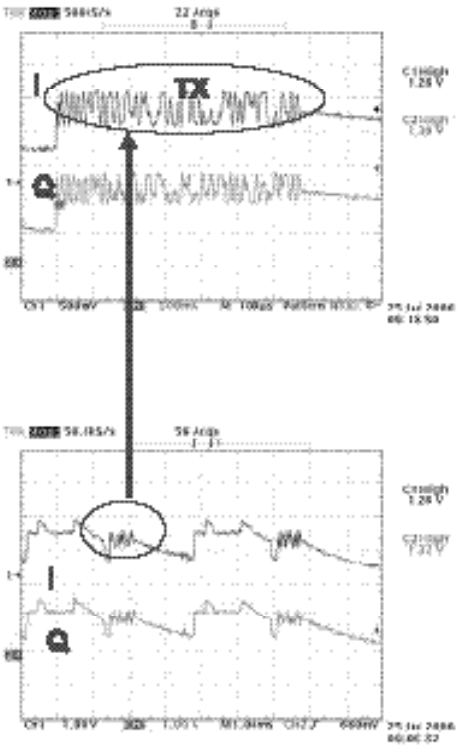
5.11.10 Checking TX I/Q Signals



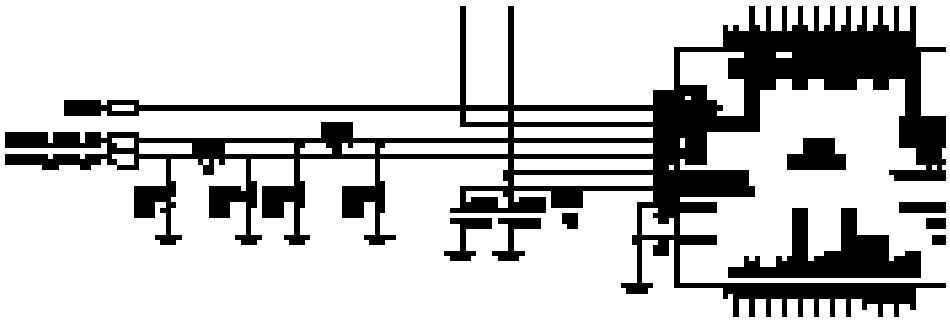
Checking Flow



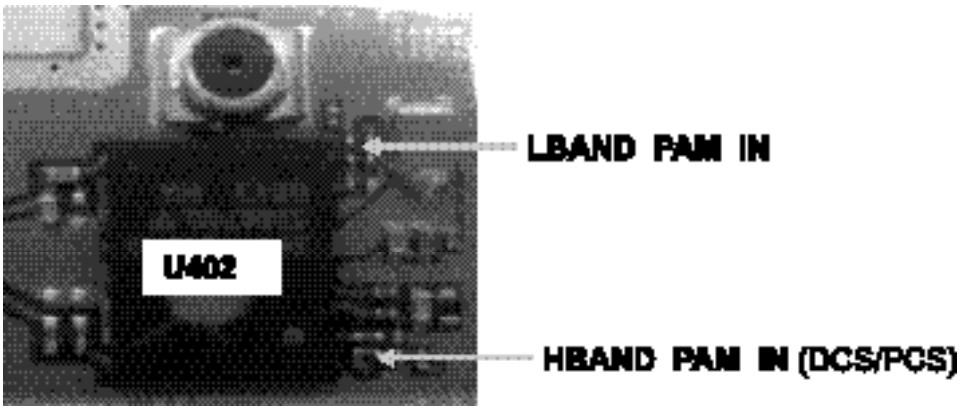




5.11.11 Checking Transceiver Output Signals

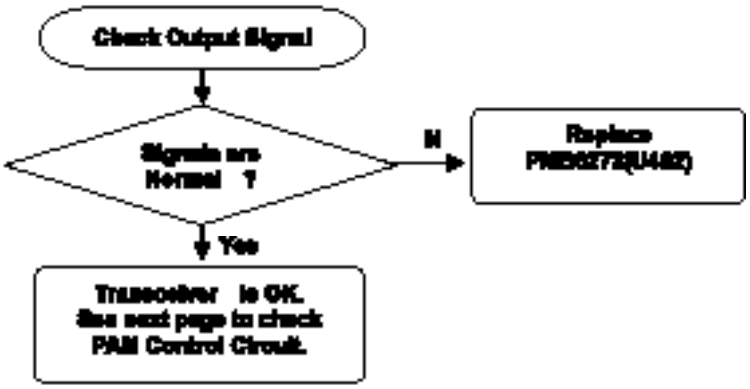


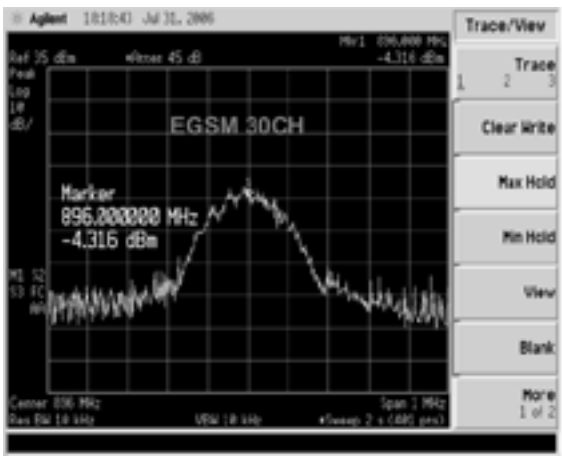
Checking Points



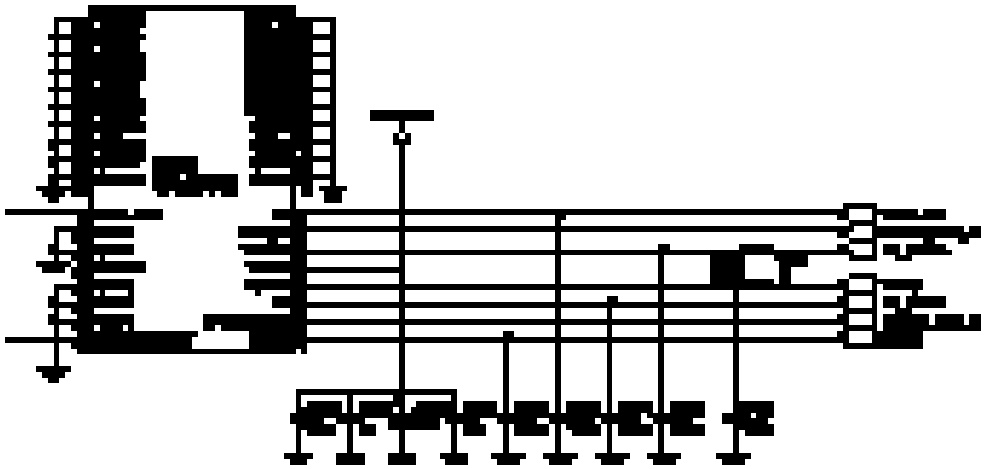
MODE	Transceiver Output
GMSK	Fixed
8PSK	Ramp Burst Control

Checking Flow

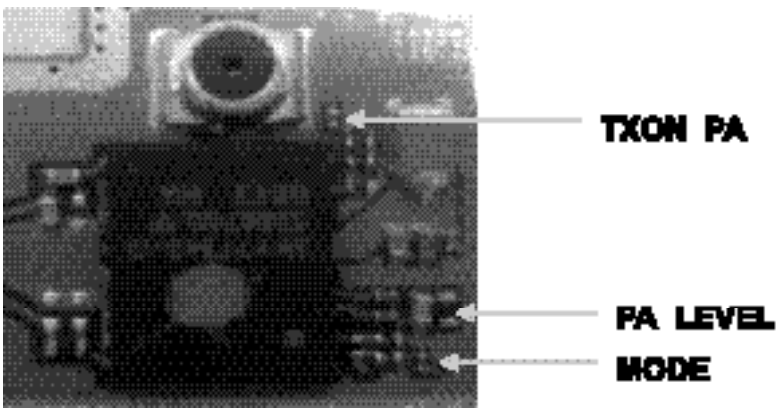




5.11.12 Checking PAM Control Signals

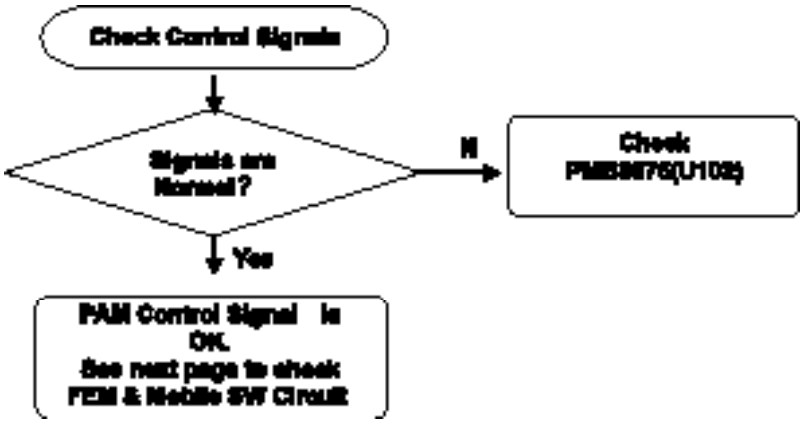


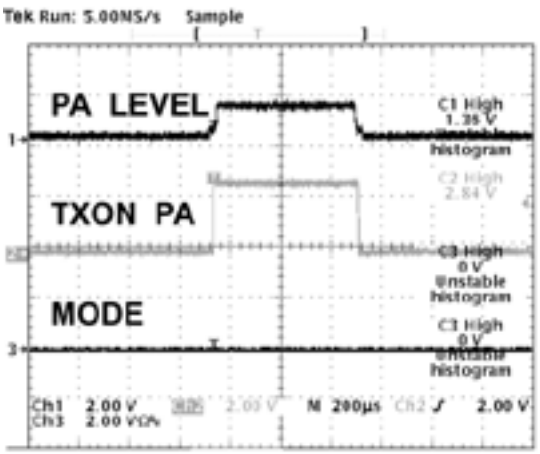
Checking Points

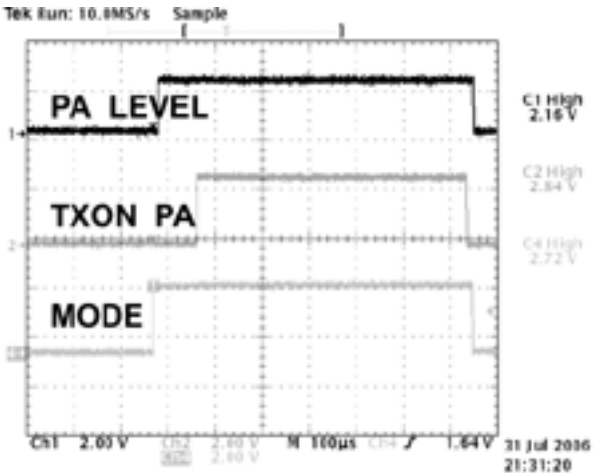


MODE	MODE	PA_LEVEL	TXON_PA
GMSK	LOW	Ramp Burst Control	HIGH
8PSK	HIGH	Control Amp bias	HIGH

Checking Flow

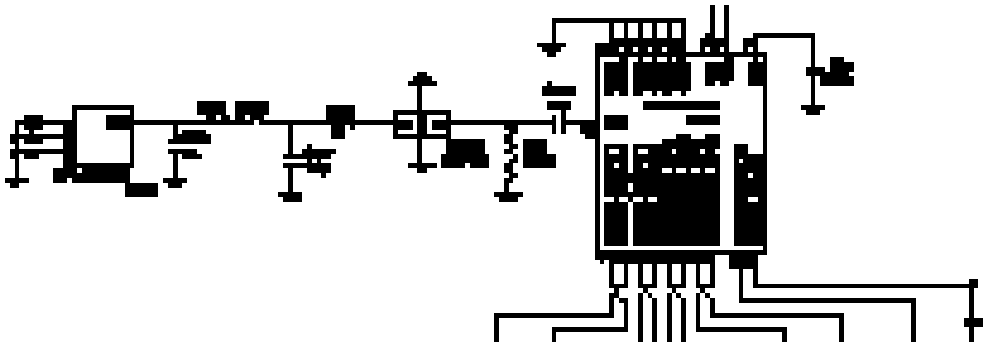




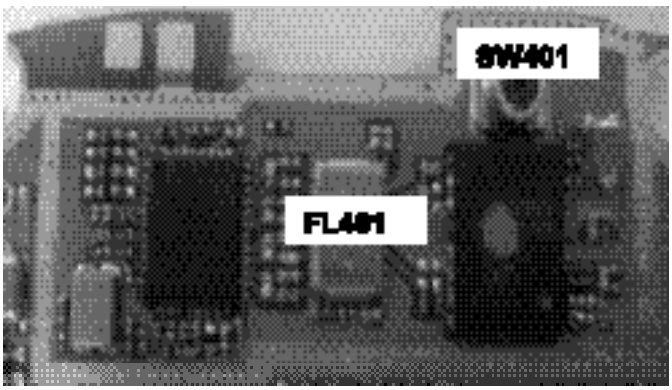


5.11.13 Checking FEM & Mobile SW

Mobile SW & FEM Circuit Diagram

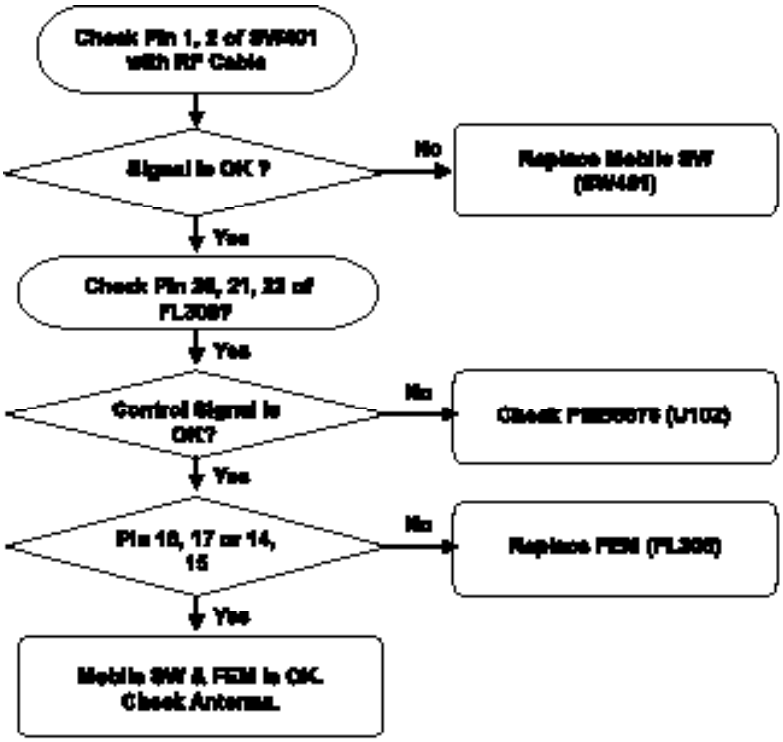


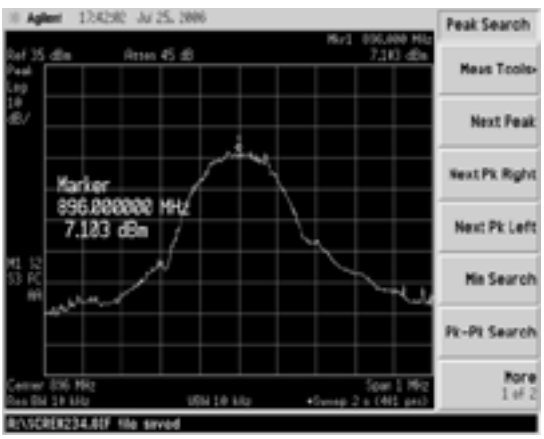
Checking Points

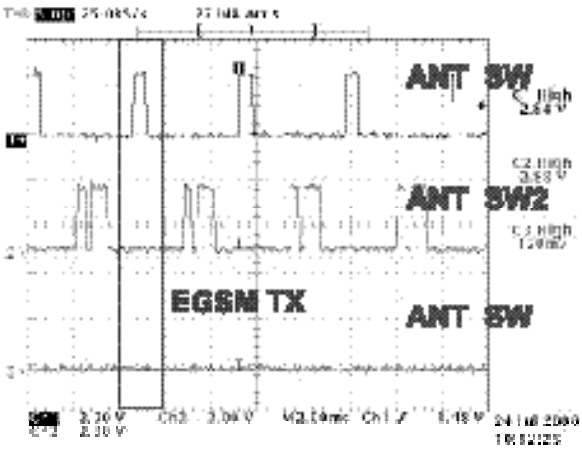


TX Mode	EGSM	DCS	PCS
ANT_SW1	On	Off	Off
ANT_SW2	Off	On	On

Checking Flow

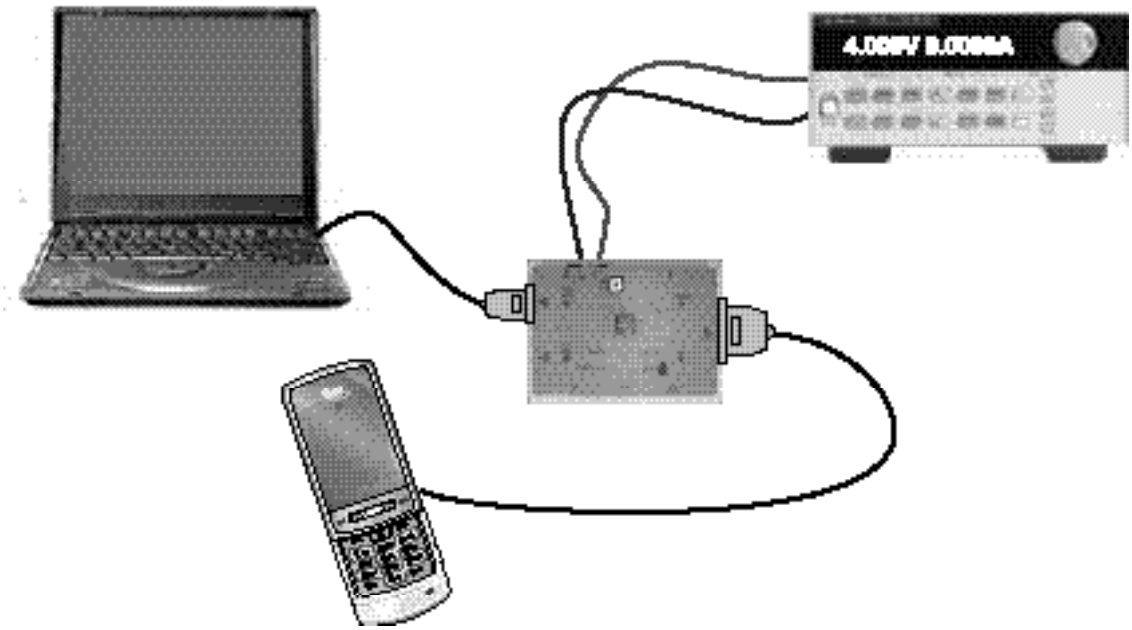






6. Download & S/W upgrade

6.1 S/W download setup



Preparation

- Target terminal
- PIF-Union
- RS-232 Cable and PIF-UNION to Phone interface Cable
- Power Supply or Battery
- IBM compatible PC supporting RS-232 with Windows 98 or newer.

If you are going to use battery, the voltage of the battery should be over 3.7V for stable power supplying during S/W download.

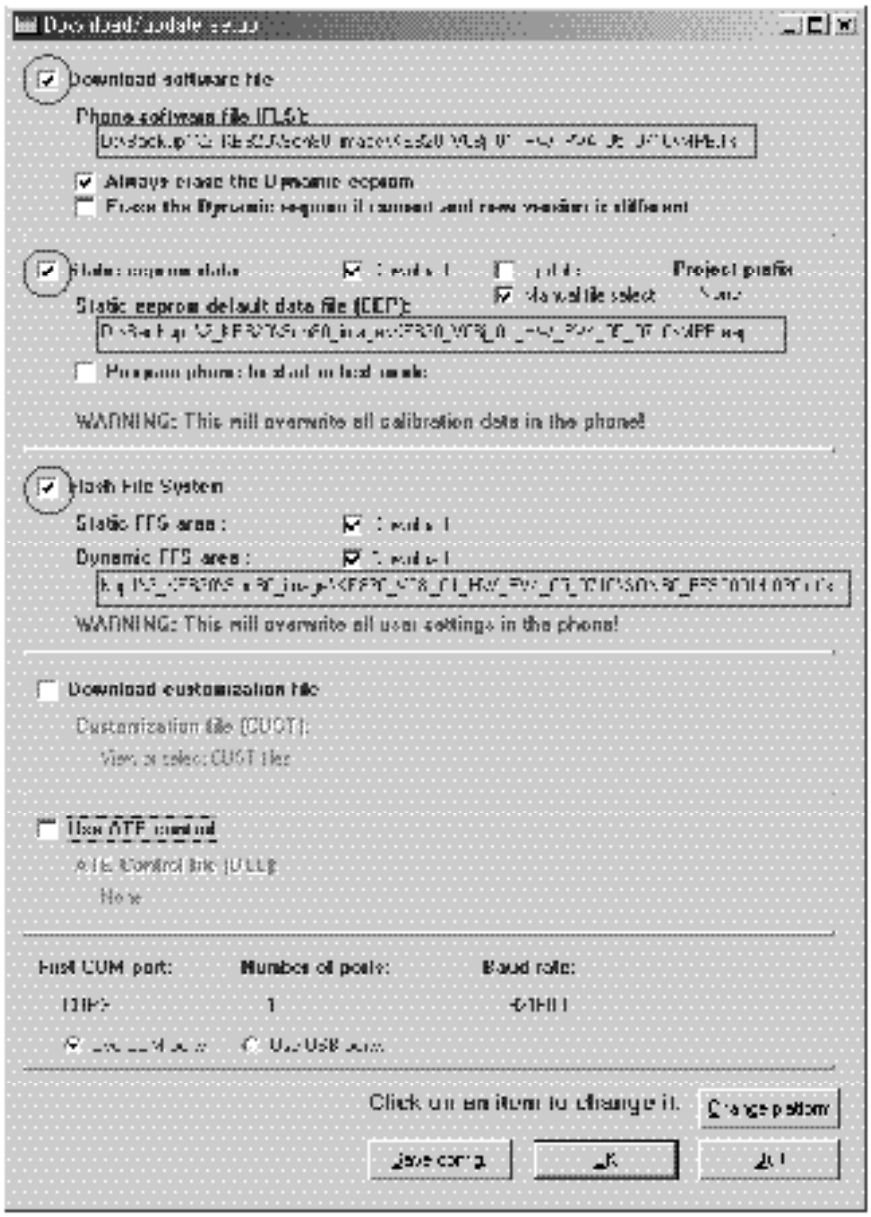
6.2 Download program user guide

Execute Flashtool program, then below window will be appeared.
Click the OK button

6. Download & S/W upgrade

When the application is started first time the following screen appears.
Each section is described in the text below.

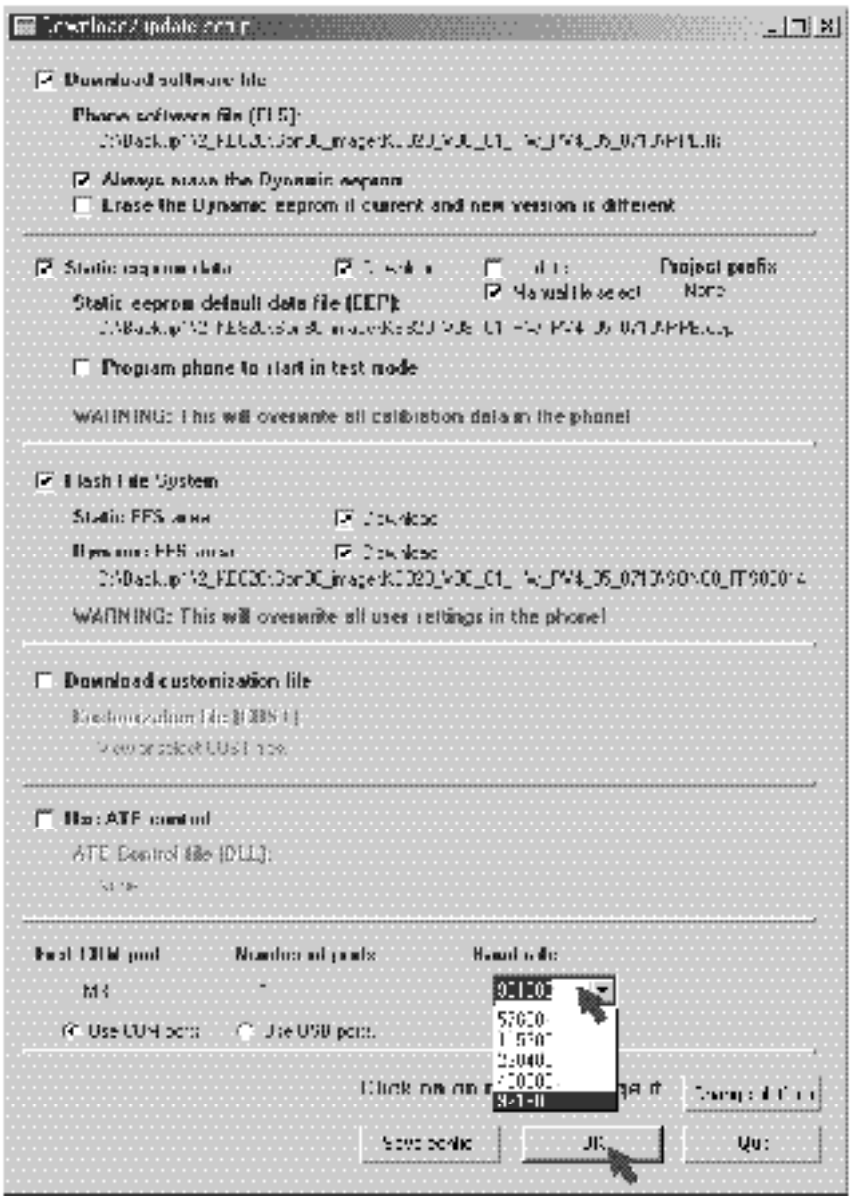
Click the check box to enable or disable file download.
Click on the blue text to select the file to download.
This will open a normal file select box. Select the wanted file.



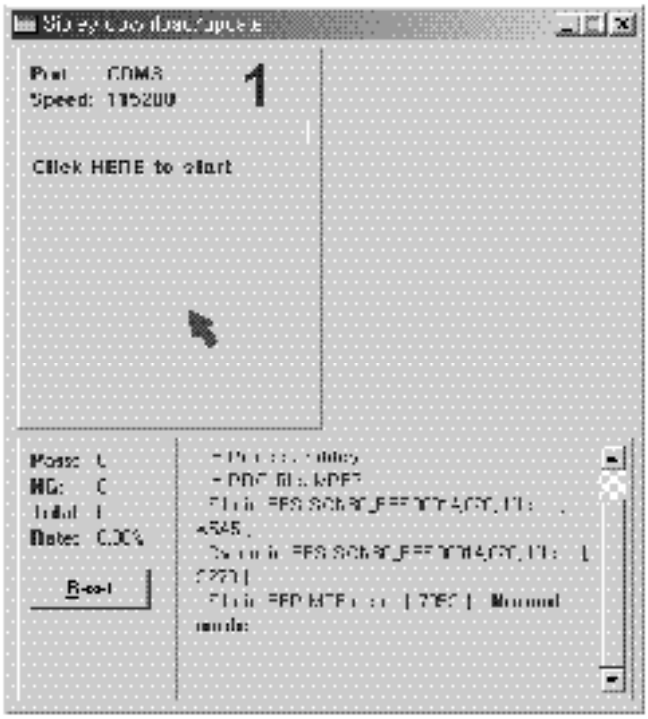
Click on the blue text to select the COM port.

6. Download & S/W upgrade

Click on the blue text to select the Baud rate.
Click OK button to next step.



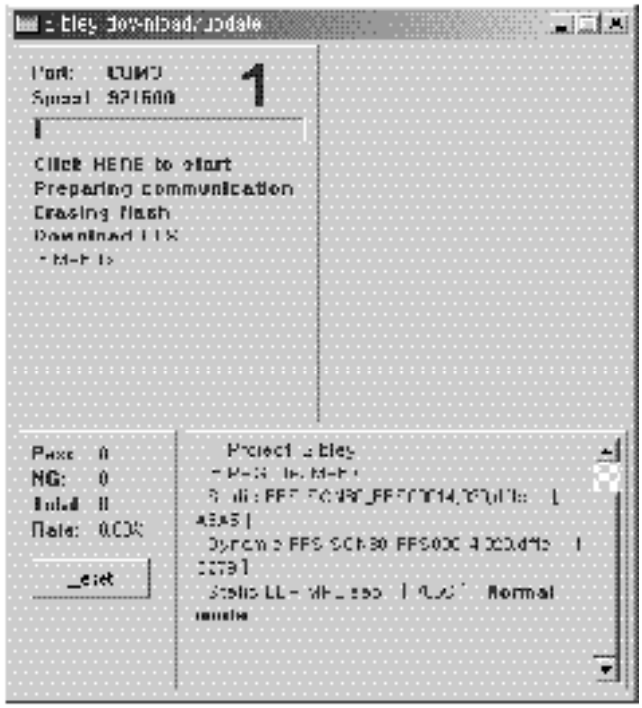
Will change the window as below



Click to anywhere on the control panel to start download.
Can see the “Reset the phone/module” then remote power on the target phone

6. Download & S/W upgrade

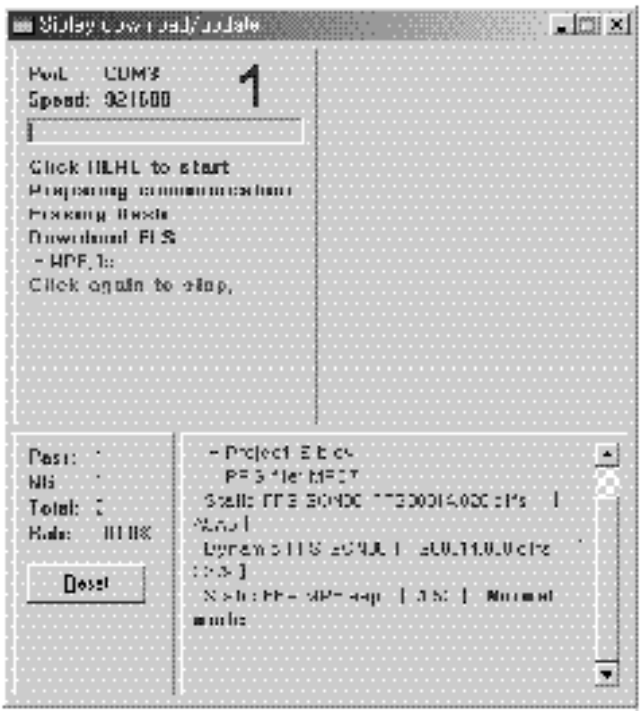
During download, the screen will look something like this:



The blue bar shows the download progress. The FLS filename and the expected checksum are shown. The download statistics are shown. Click “Reset” to reset the counters.

After download, the status is shown.

If there is a need to stop the download process, click on the panel for the channel to be stopped.
To stop the download the panel must be clicked twice.
This is to avoid that the download is stopped accidentally.
Furthermore, to avoid that the download is stopped on a mouse double-click, there must be at least 0.5 second between the two clicks.
If the panel is clicked only once, the text “Click again to stop” will disappear and the download will continue.

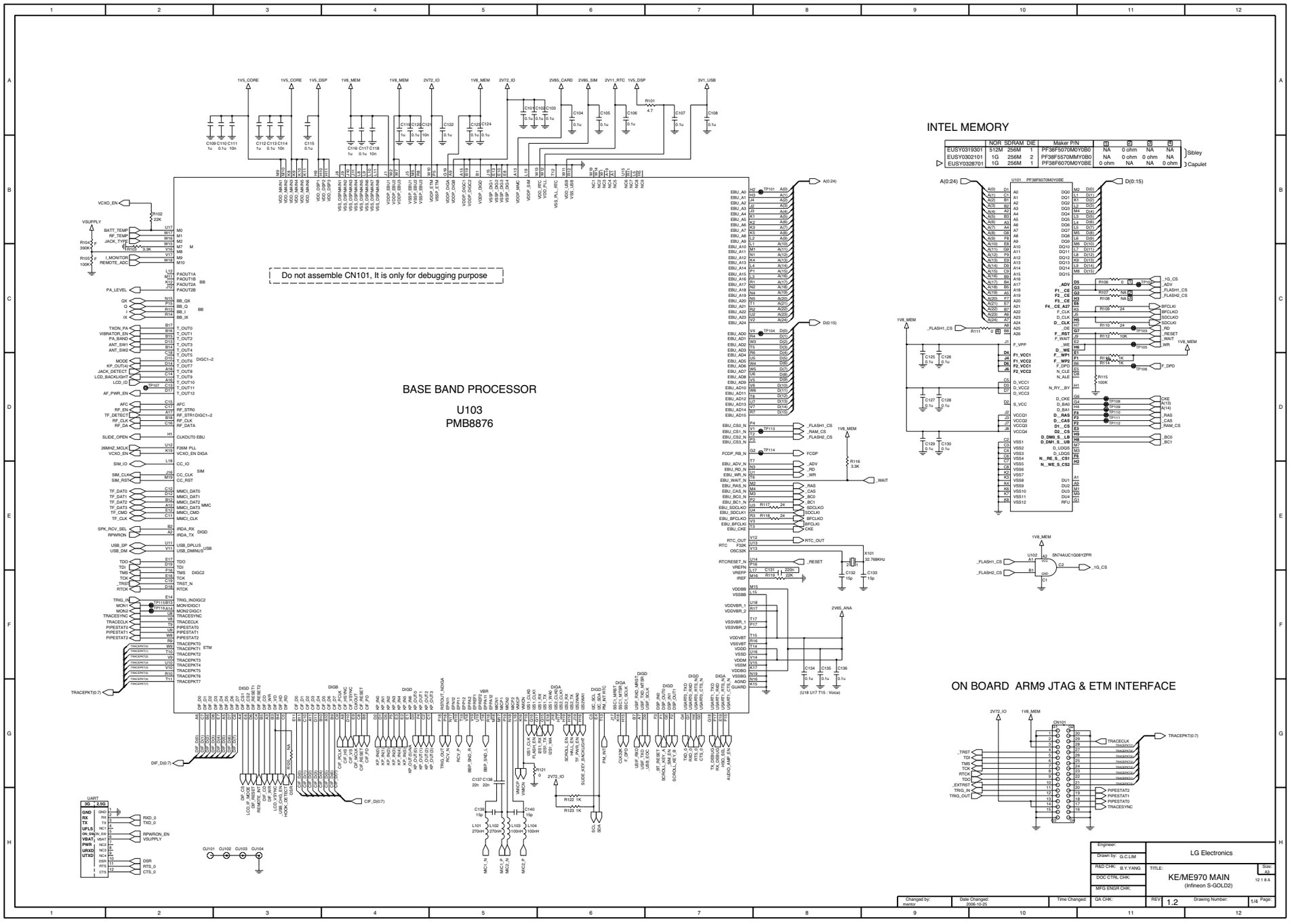


If a valid second click is detected, the download process is stopped and the progress bar turns yellow.
At this point the download can be started from the beginning as usually.

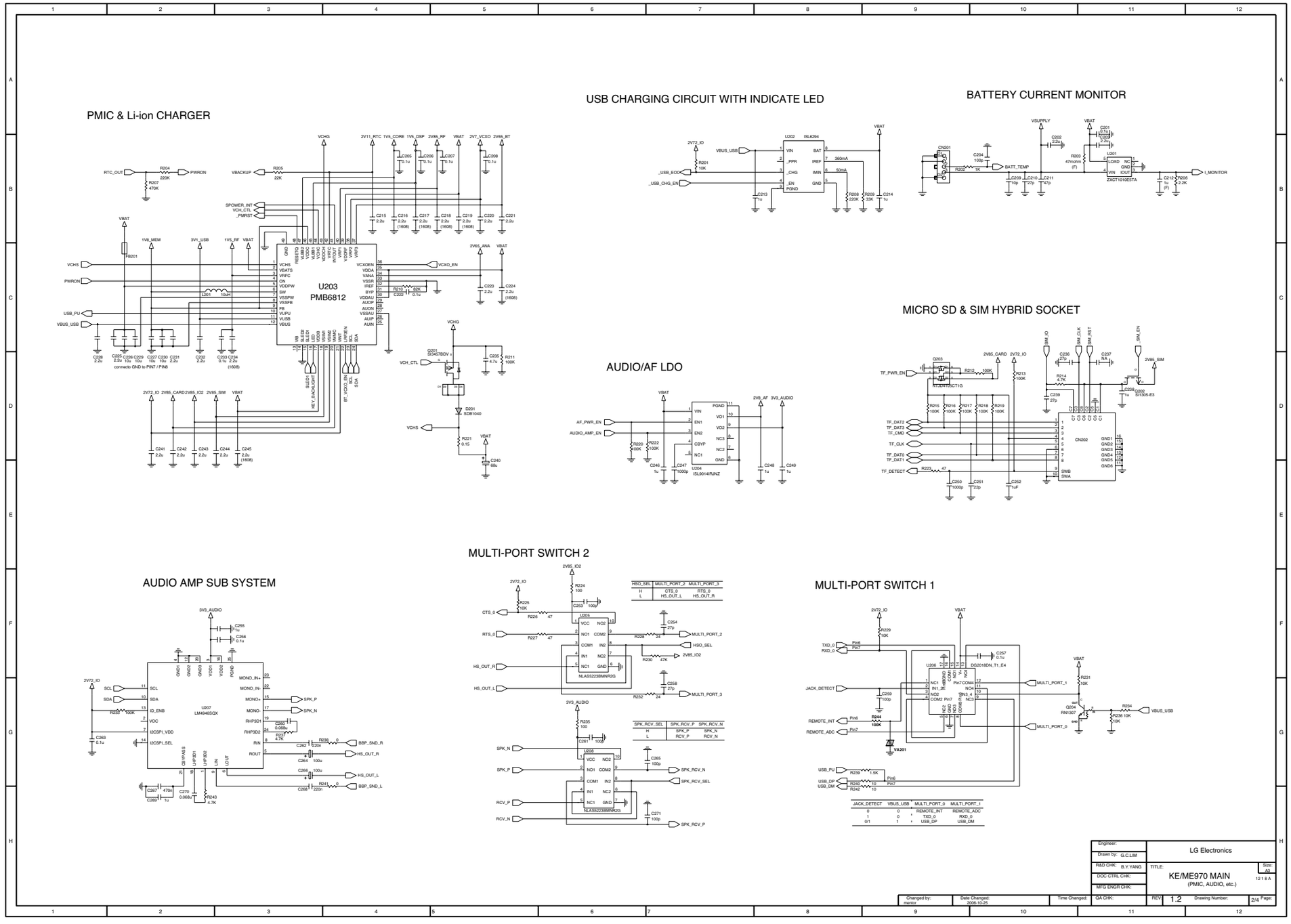
NOTE: That the download statistic is unaffected when the download is stopped manually.

6. Download & S/W upgrade

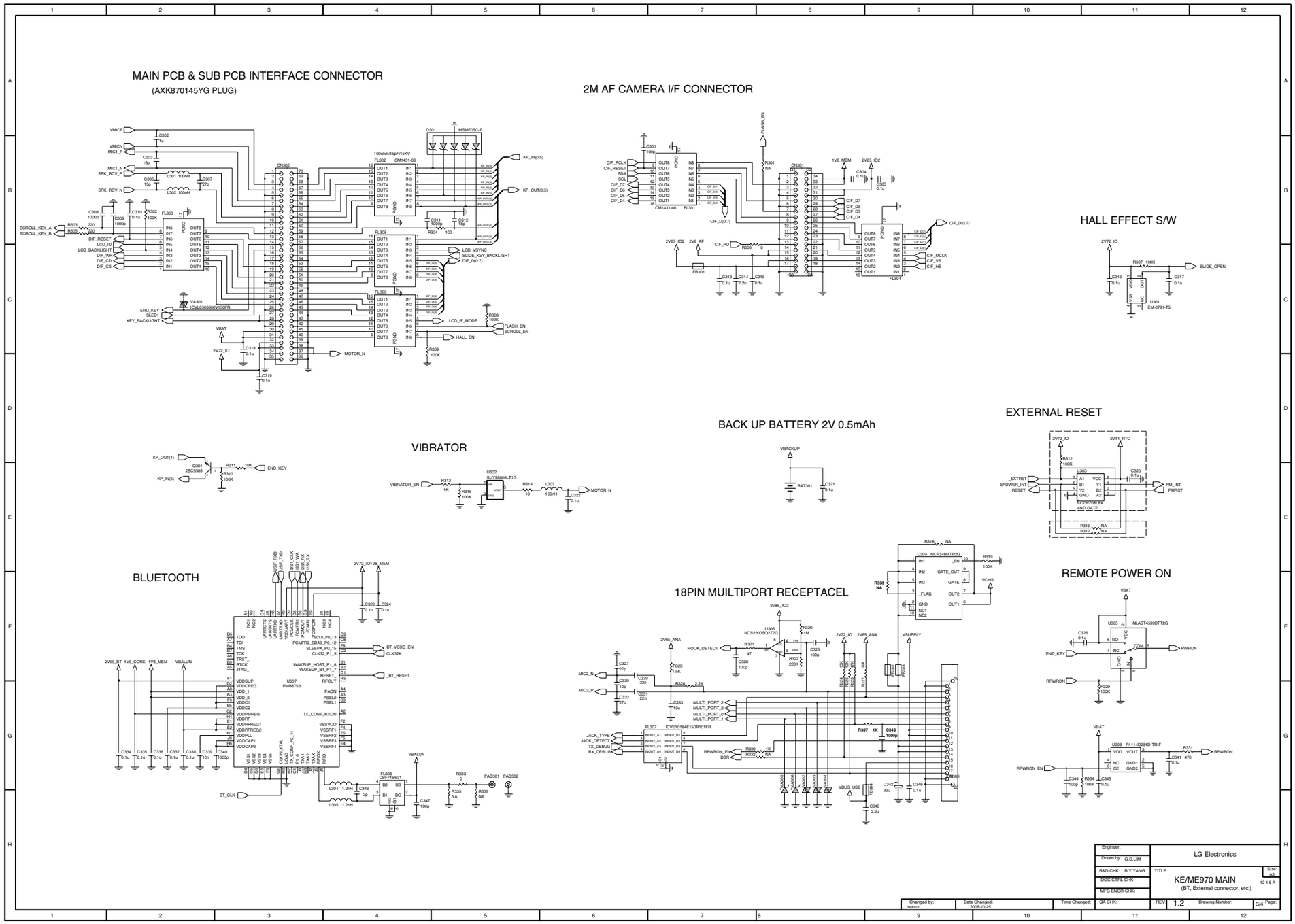
7. CIRCUIT DIAGRAM



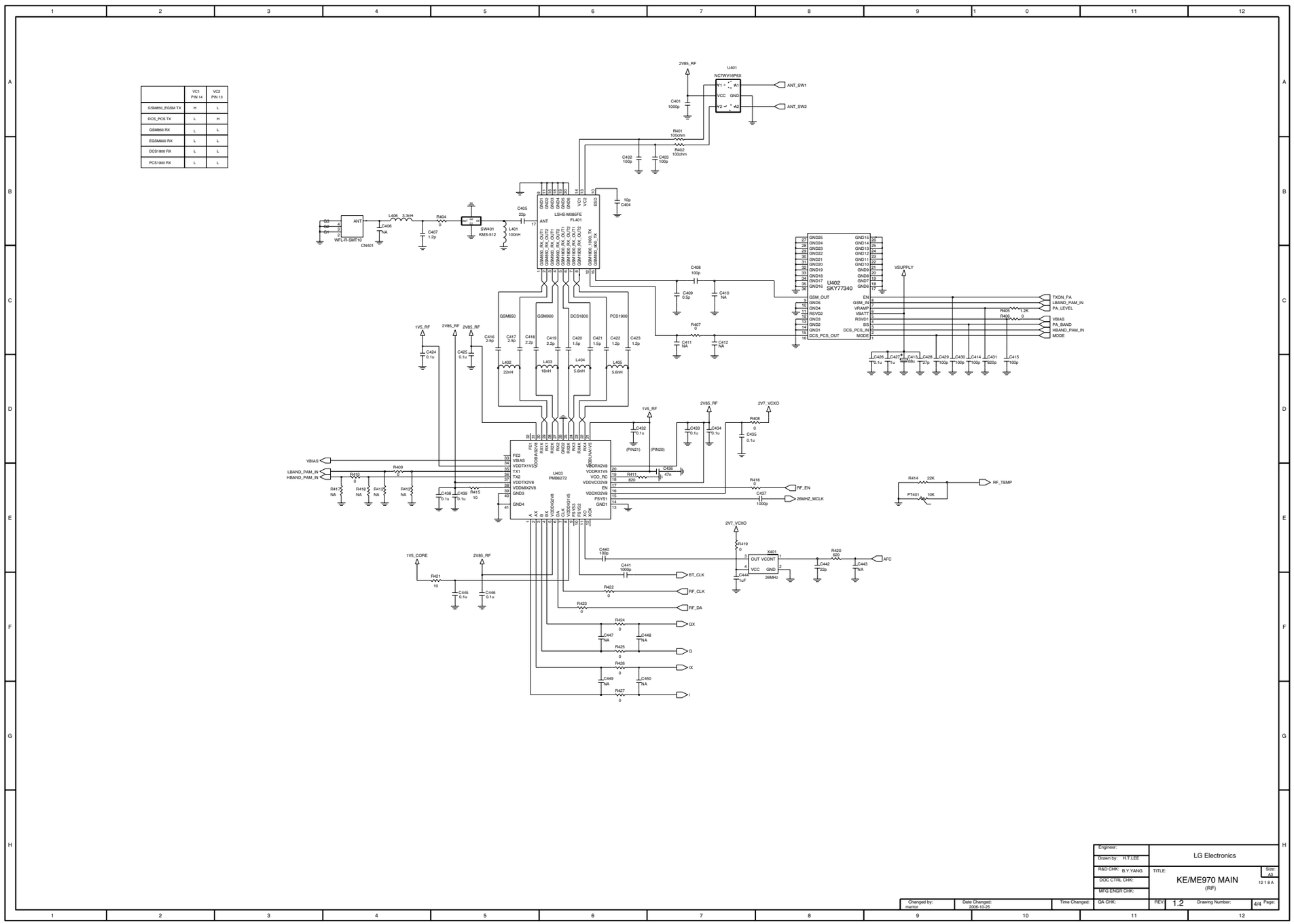
7. CIRCUIT DIAGRAM



7. CIRCUIT DIAGRAM

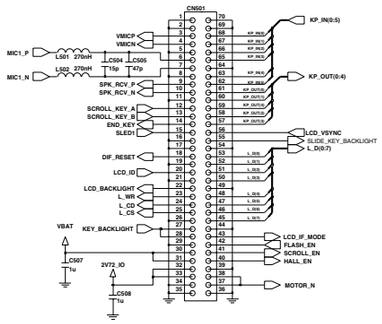


7. CIRCUIT DIAGRAM

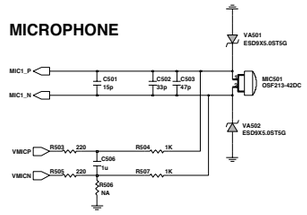


7. CIRCUIT DIAGRAM

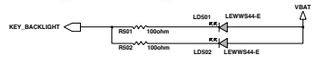
MAIN PCB & SUB PCB INTERFACE CONNECTOR
(SOCKET:AXK770145G)



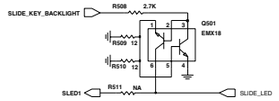
MICROPHONE



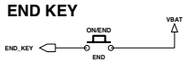
KEY_BACKLIGHT_LED



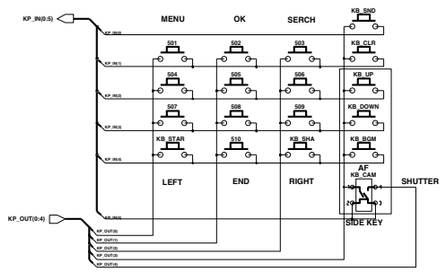
SLIDE_KEYLED_CONTROL



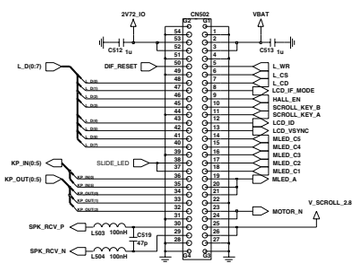
END KEY



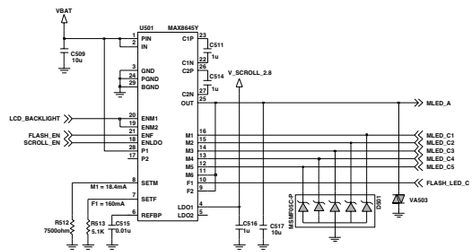
KEYPAD

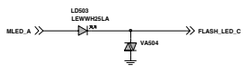


FPCB INTERFACE CONNECTOR
(PLUG)



LCD BACKLIGHT / FLASH



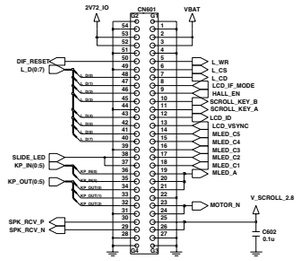


Engineer:	LG Electronics
Drawn by: JASON	
R&D CHK: G.C.Lim	TITLE: KE970/ME970 KEY FPCB
DOC CTRL CHK:	Size: A3 (12.1 8.4)
MFG ENGR CHK:	
QA CHK:	REV: 1.1 Drawing Number: Page: 1/1

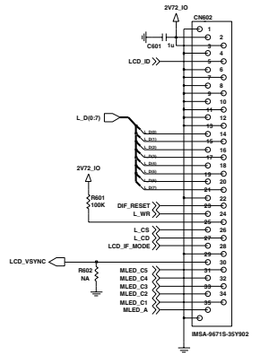
Changed by: mentor | Date Changed: 2006-11-10 | Time Changed:

7. CIRCUIT DIAGRAM

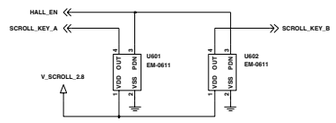
KEY INTERFACE CONNECTOR



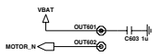
LCD_Connector



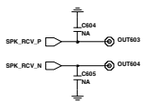
HALL EFFECT S/W(SCROLL)



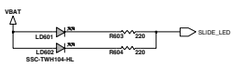
VIBRATOR



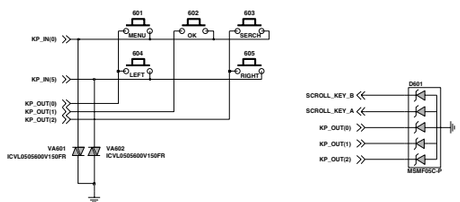
SPEAKER



KEY_BACKLIGHT_LED
PRE_CHARGING_LED



SCROLL_KEY

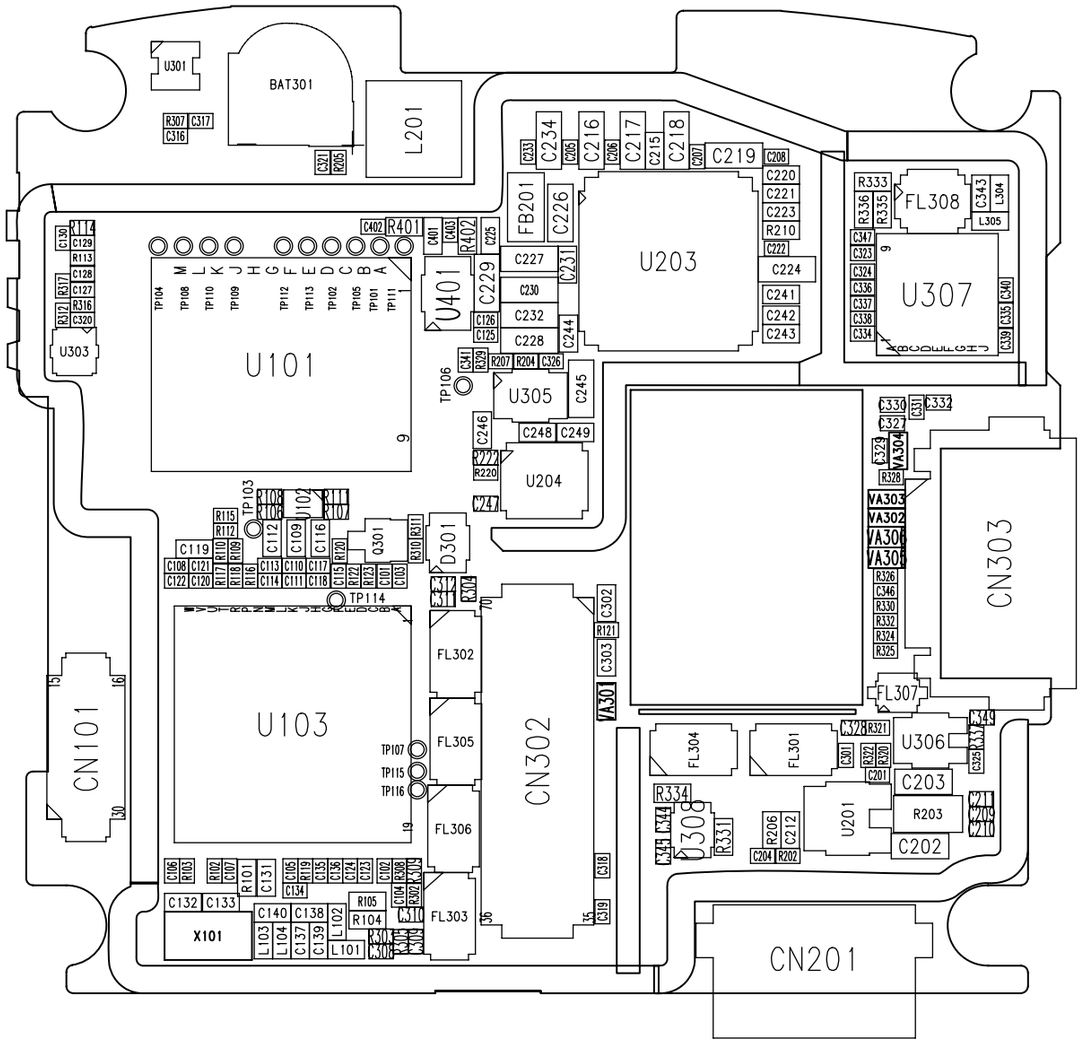


VISION MARK

TP601 TP602

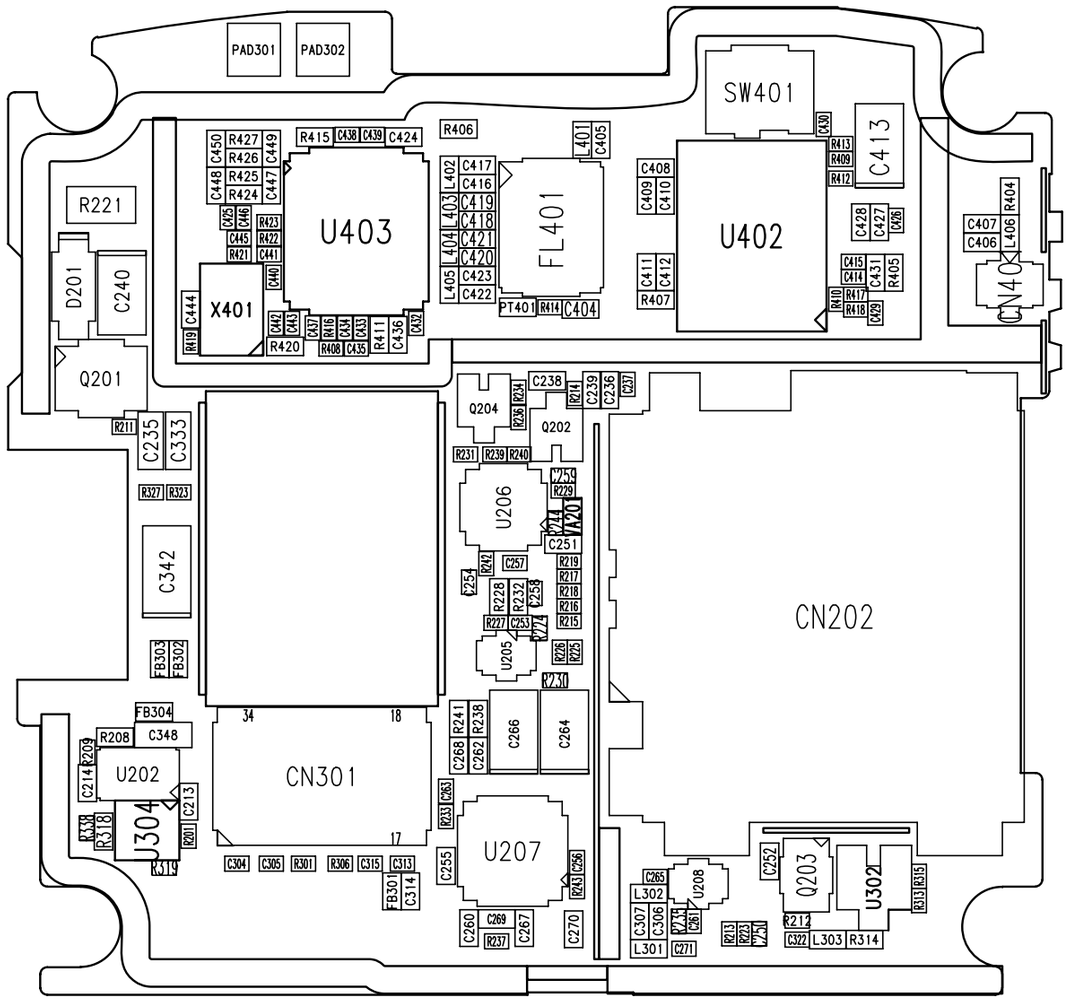
Engineer:		LG Electronics	
Drawn by: JASON			
R&D CHK: G.C.LIM	TITLE: KE970/ME970 LCD FPCB(LGIT/HITACHI)	Size: A3	12 1 8 A
DOC CTRL CHK:			
MFG ENGR CHK:			
QA CHK:	REV 1.1	Drawing Number:	Page: 1/1
Changed by: mentor	Date Changed: 2006-10-15	Time Changed:	

8. PCB LAYOUT



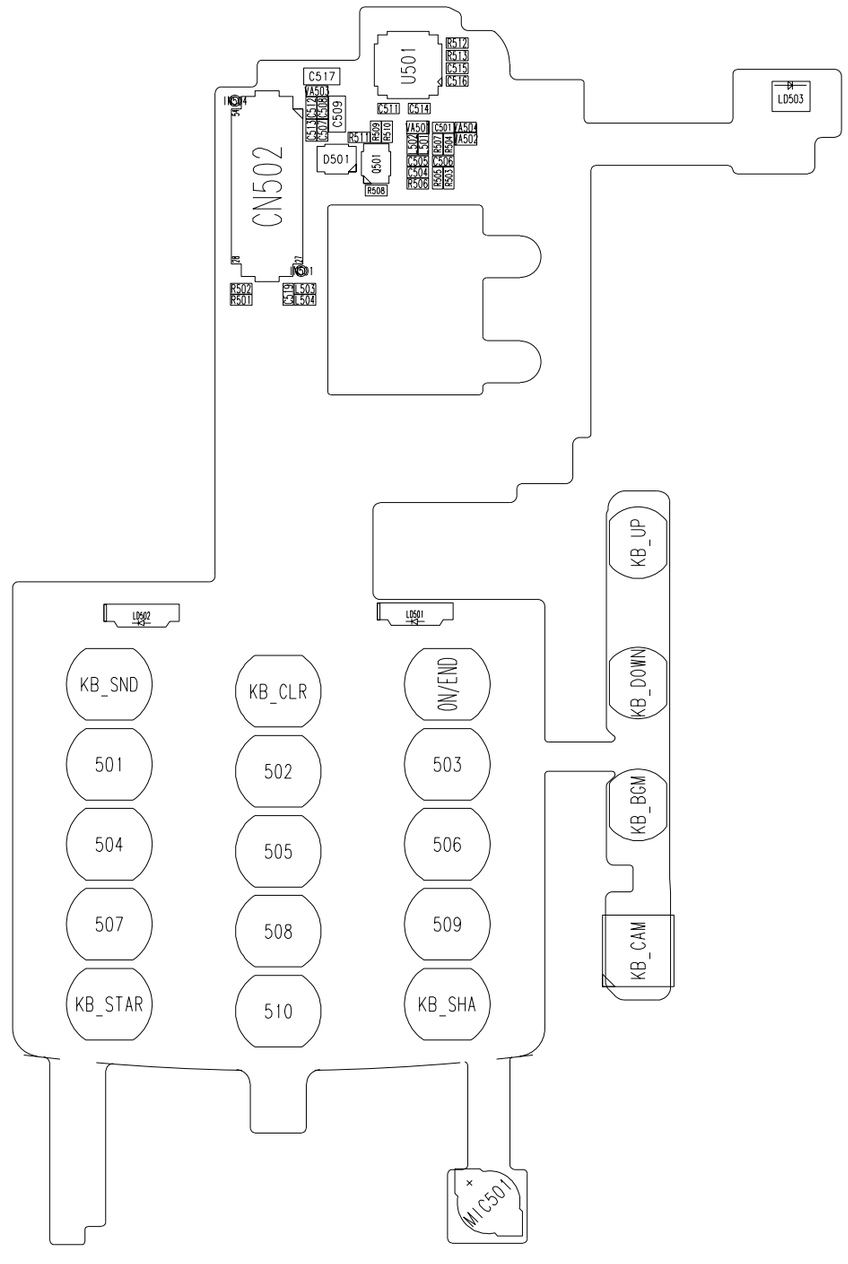
ME970-MAIN-SPFY0136901-1.2-BOTTOM

8. PCB LAYOUT



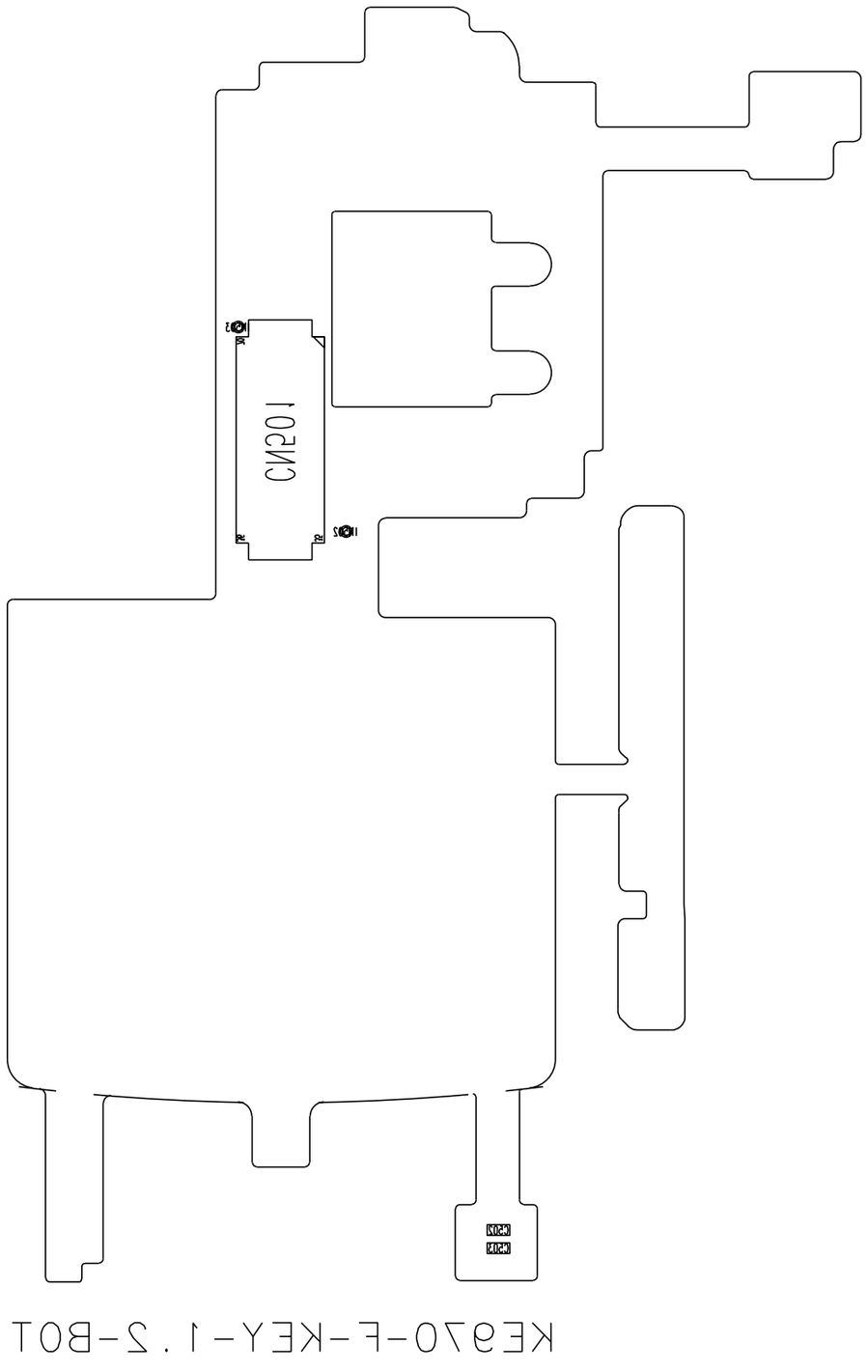
ME970-MAIN-SPFY0136901-1.2-TOP

8. PCB LAYOUT

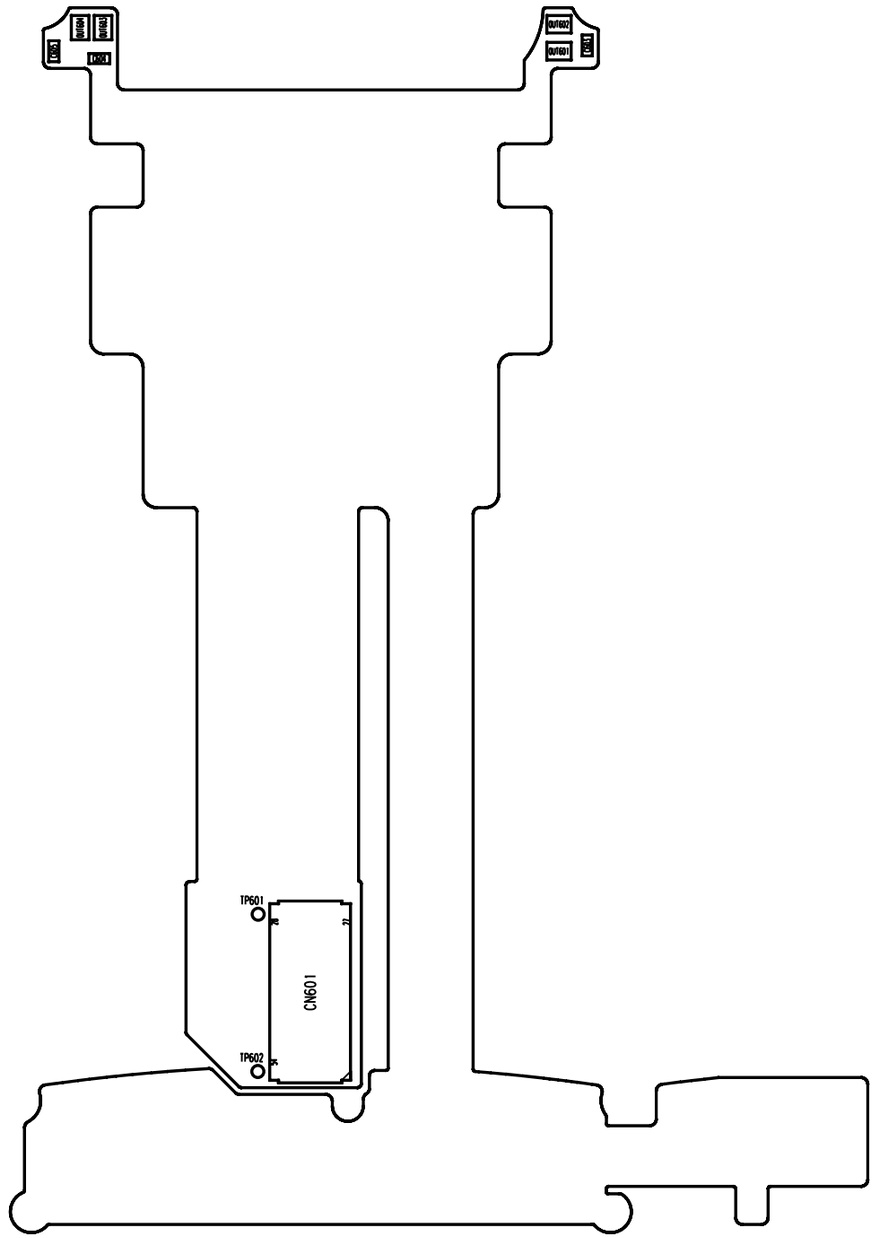


ME970-F-KEY-1.2-TOP

8. PCB LAYOUT

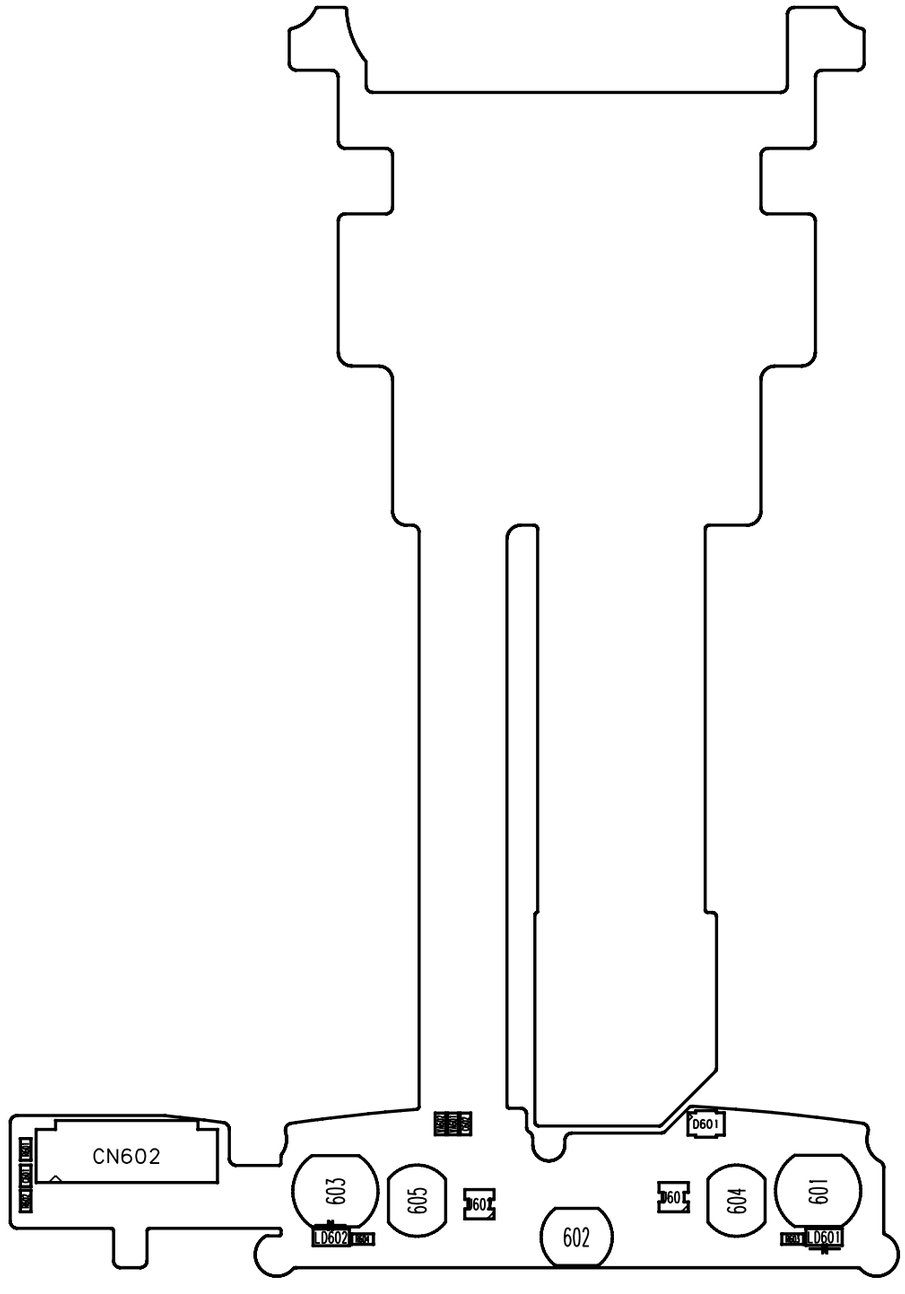


8. PCB LAYOUT



ME970-F_LCD-SPCY0088301-1.1

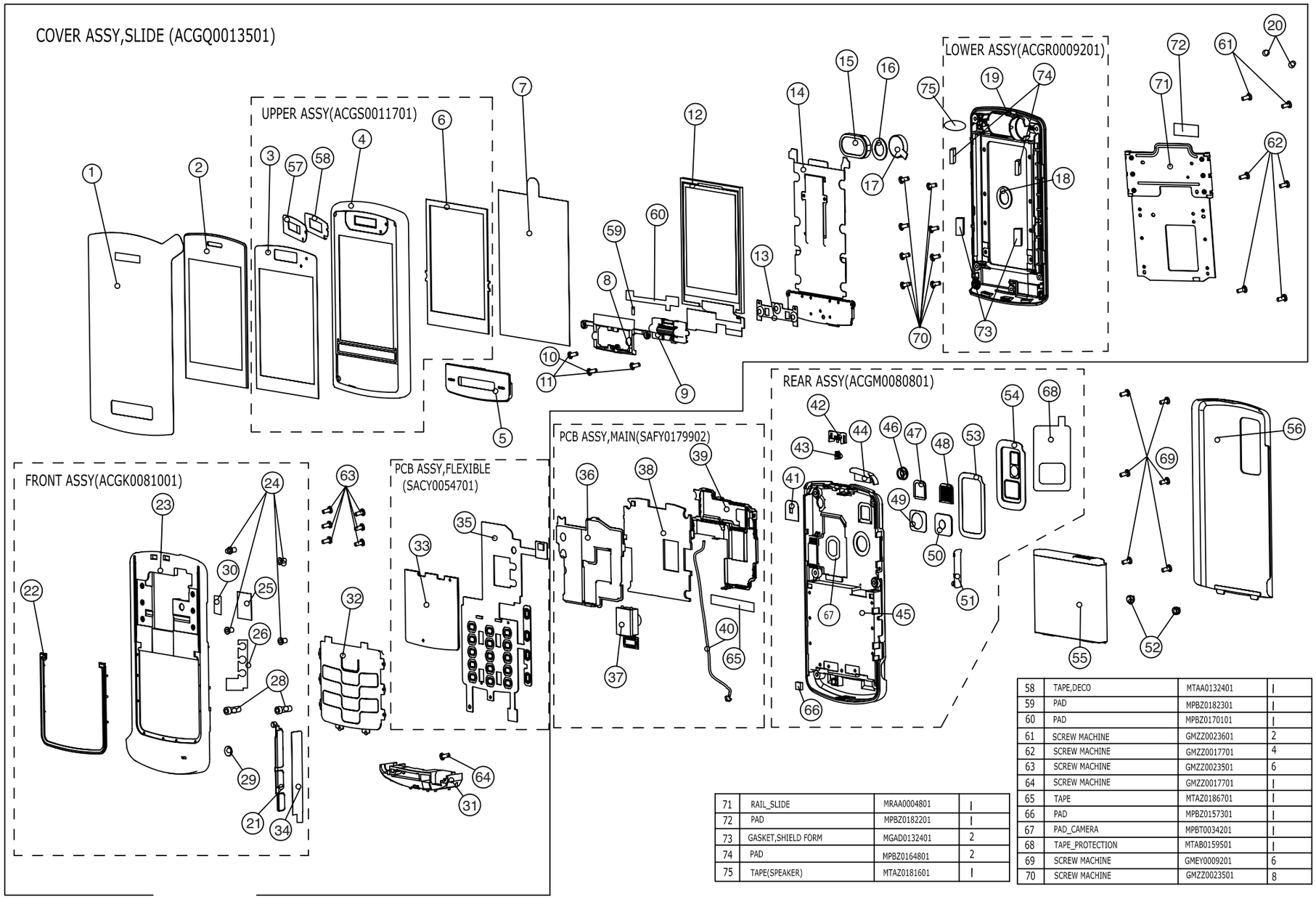
8. PCB LAYOUT



ME970-F_LCD-SPCY0088301-1.1

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW



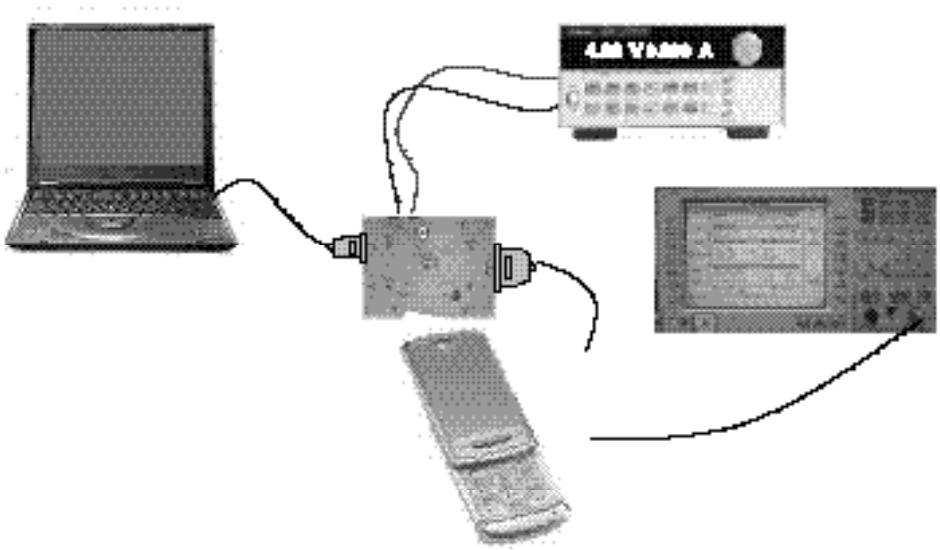
NO	DESCRIPTION	PAERT NO	Q'TY
1	TAPE,PROTECTION	MTAB0166101	1
2	WINDOW,LCD	MWAC0073501	1
3	TAPE,WINDOW	MTAD0064801	1
4	COVER,SLIDE(UPPER)	MCJW0009201	1
5	KEYPAD,FUNCTION	MKAC0009001	1
6	PAD,LCD	MPBG0056801	1
7	TAPE,PROTECTION	MTAB0166201	1
8	DECO	MDAY0035401	1
9	SWITCH,ROTARY	ESQY0000801	1
10	SCREW	GMEY0015401	2
11	SCREW	GMZZ0017701	1
12	LCD	SVLM0021001	1
13	SHEET	MSAZ0042501	1
14	SLIDE-FPCB	SACY0054601	1
15	SPEAKER	SUSY0024101	1
16	PAD,MOTOR	MPBJ0040801	1
17	MOTOR	SJMY0008404	1
18	PAD,MOTOR	MPBJ0039301	1
19	COVER,SLIDE(LOWER)	MCJV0009401	1
20	CAP_SCREW	MCCH0100901	2
21	BUTTON,SIDE	MBJL0036601	1
22	DECO,FRONT	MDAG0024901	1
23	COVER,FRONT	MCJK0065401	1
24	INSERT	MICZ0028901	4
25	TAPE	MTAZ0162701	1
26	TAPE	MTAZ0186101	1
28	INSERT	MICZ0028801	2
29	FILTER,MIKE	MFBD0018901	1
30	GASKET	MGAZ0052401	1
31	INTENNA	SNGF0022501	1
32	BUTTON,DIAL	MBJA0022401	1
33	DOME ASSY METAL	ADCA0060201	1
34	TAPE,PROTECTION	MTAB0140001	1
35	KEY-PCB	SPCY0088201	1
36	CAN,SHIELD	MCBA0012801	1
37	CAMERA	SVCY0012801	1
38	MAIN-PCB	SPFY0136901	1
39	CAN,SHIELD	MCBA0012901	1
40	CABLE	SWCC0003901	1
41	PAD	MPBZ0173201	1
42	LOCKER,BATTERY	MLEA0034801	1
43	SPRING,COIL	MSDB0003701	1
44	BLUETOOTH INTENNA	SNGF0022601	1
45	COVER,REAR	MCJN0059801	1
46	CAP,MOBILE SWITCH	MCCF0037701	1
47	TAPE	MTAZ0162601	1
48	LENS,FLASH	MLCE0007001	1
49	TAPE,WINDOW	MTAD0060201	1
50	WINDOW,CAMERA	MWAE0021701	1
51	CAP,EARPHONE JACK	MCCC0043501	1
52	CAP,SCREW	MCCH0097401	2
53	TAPE,DECO	MTAA0127001	1
54	DECO,CAMERA	MDAD0026901	1
55	INNER-BATTERY	SBPL 0085703	1
56	COVER,BATTERY	MCJA0037301	1
57	FILTER,SPEAKER	MFBC0025301	1

58	TAPE,DECO	MTAA0132401	1
59	PAD	MPBZ0182301	1
60	PAD	MPBZ0170101	1
61	SCREW MACHINE	GMZZ0023601	2
62	SCREW MACHINE	GMZZ0017701	4
63	SCREW MACHINE	GMZZ0023501	6
64	SCREW MACHINE	GMZZ0017701	1
65	TAPE	MTAZ0186701	1
66	PAD	MPBZ0157301	1
67	PAD_CAMERA	MPBT0034201	1
68	TAPE_PROTECTION	MTAB0159501	1
69	SCREW MACHINE	GMEY0009201	6
70	SCREW MACHINE	GMZZ0023501	8

71	RAIL_SLIDE	MRAA0004801	1
72	PAD	MPBZ0182201	1
73	GASKET,SHIELD FORM	MGAD0132401	2
74	PAD	MPBZ0164801	2
75	TAPE(SPEAKER)	MTAZ0181601	1

9. RF Calibration

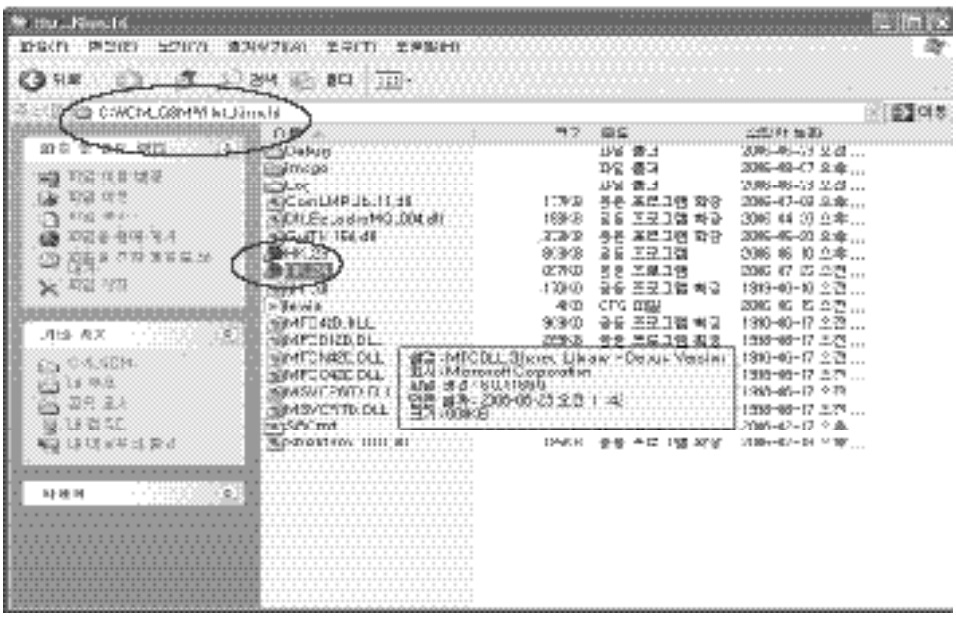
9.1 Test Equipment Setup



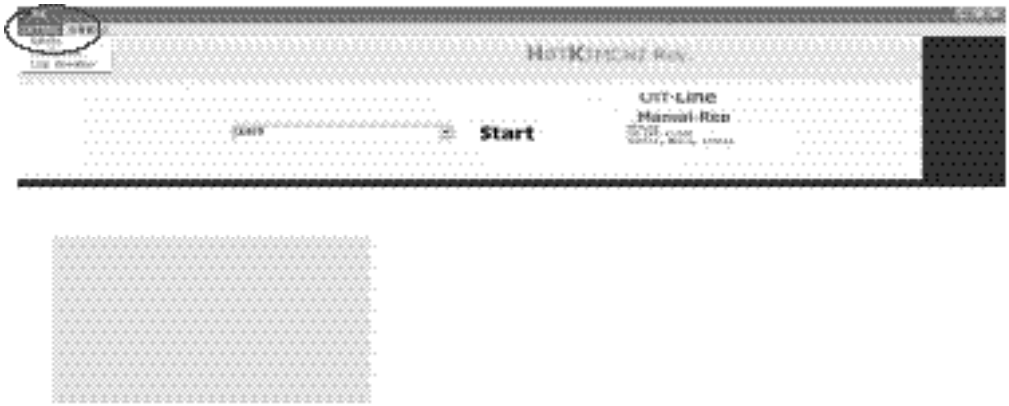
9.2 Calibration Steps

9.2.1. Turn on the Phone.

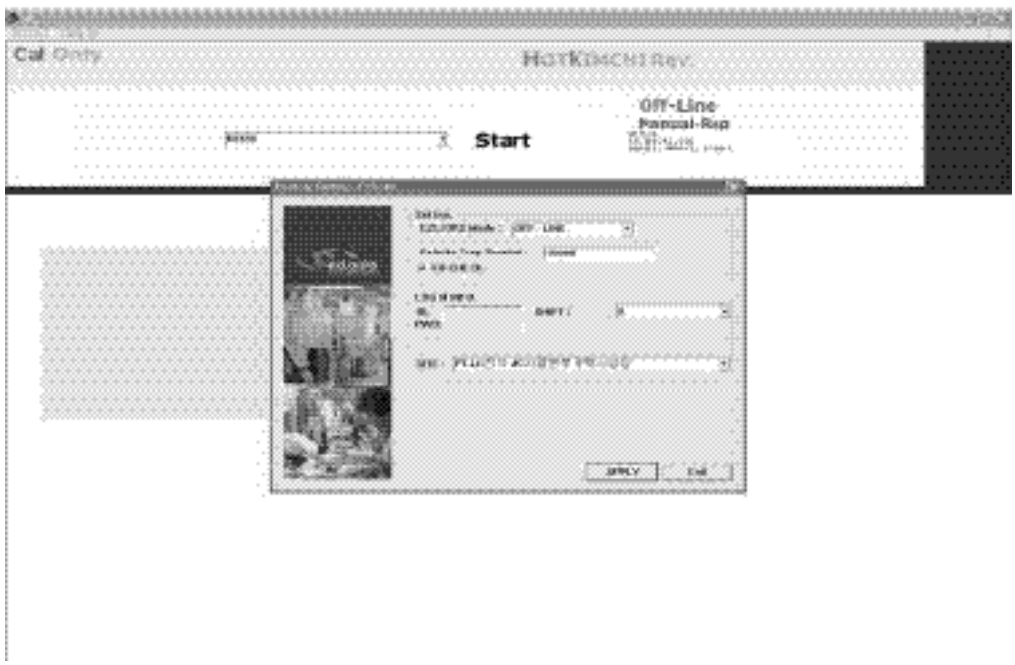
9.2.2. Execute “HK_24.exe”



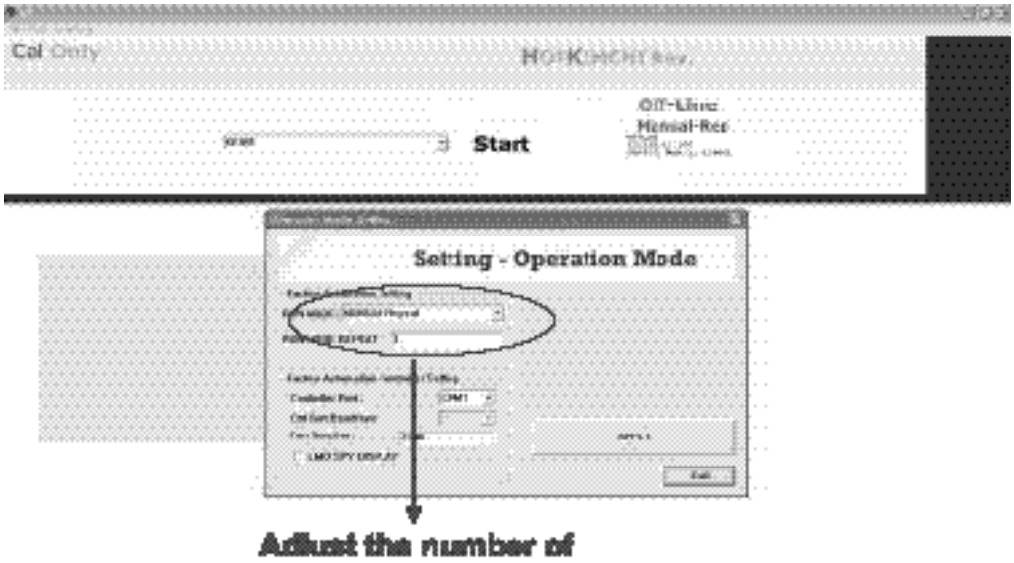
9.2.3. Click “SETTING” Menu



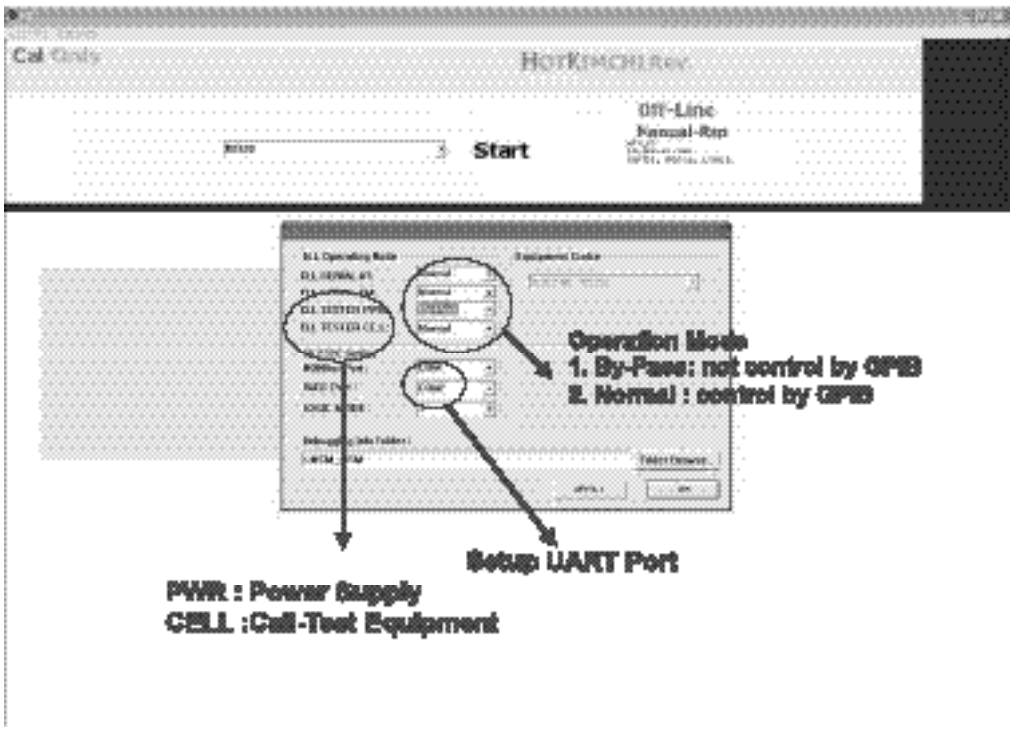
9.2.4. Setup “Ezlooks” menu such as the following figure



9.2.5. Setup “Line System” menu such as the following figure

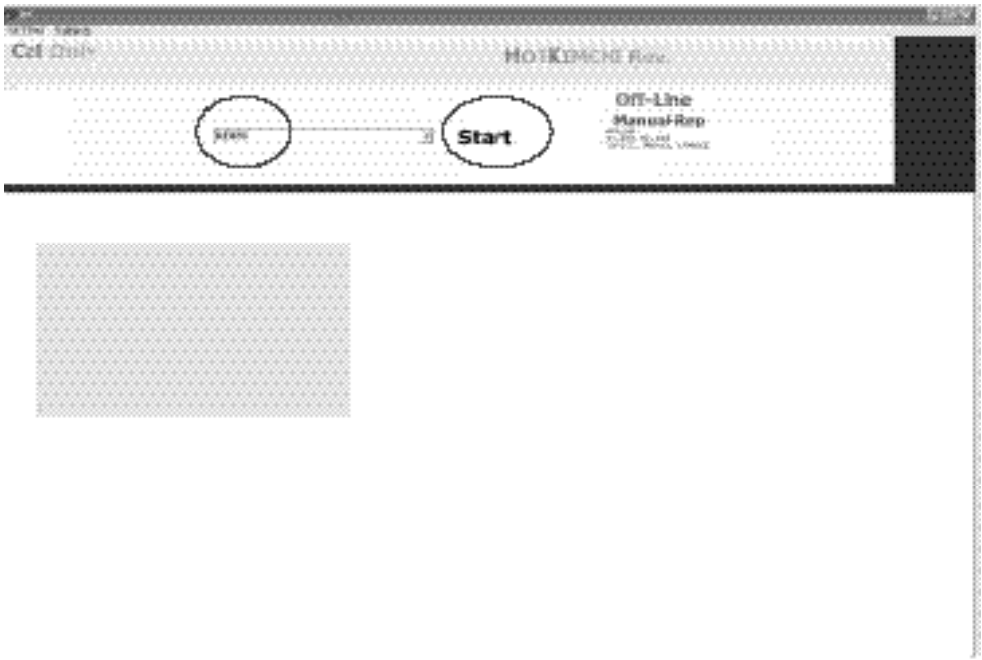


9.2.6. Setup Logic operation such as the following figure.

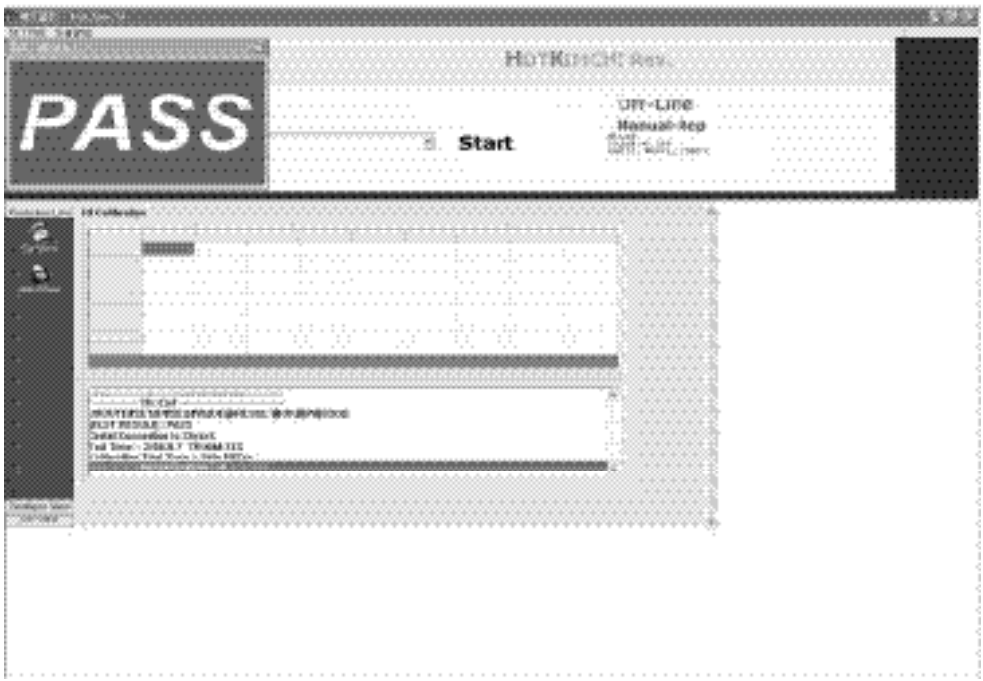


9.2.7. Select “MODEL”.

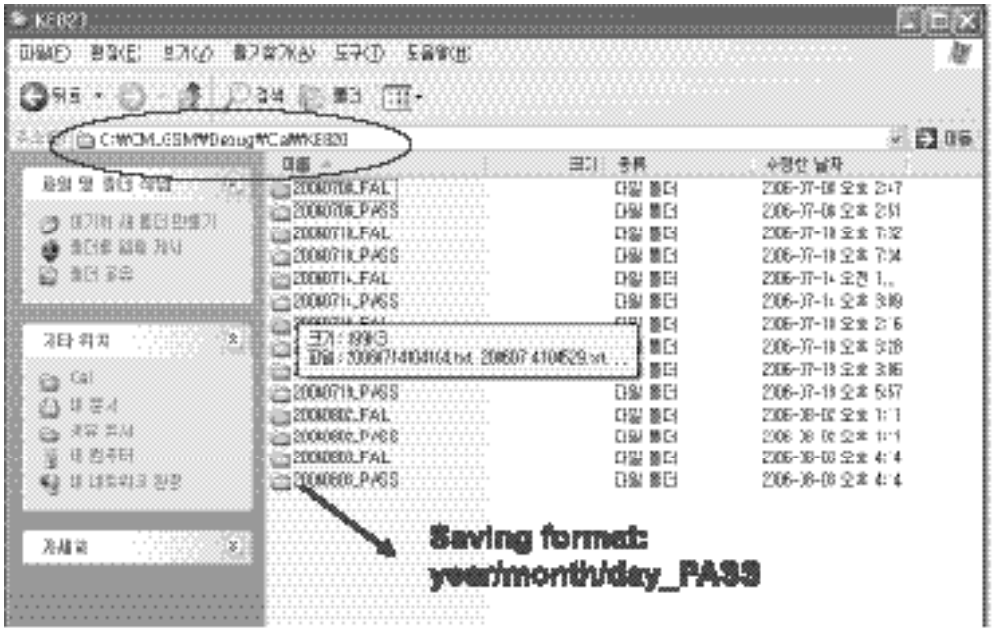
9.2.8. Click “START” for RF calibration



9.2.9. RF Calibration finishes.



9.2.10. Calibration data will be saved to the following folder.



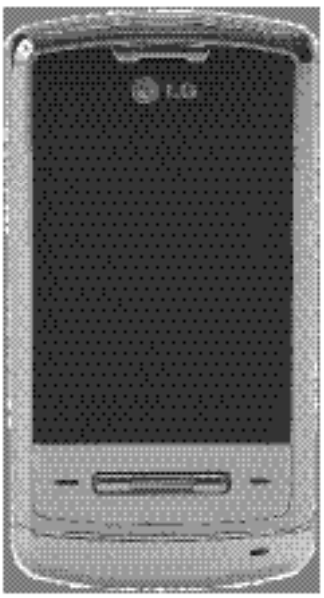
6. Download & S/W upgrade

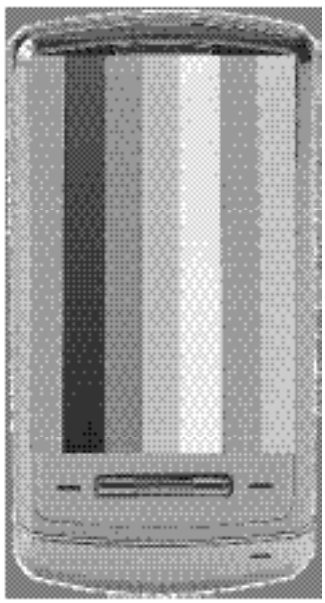
Notices:

1. The state of Phone is “ test mode “ during the CALIBRATION.
2. Calibration program automatically changes either “normal mode” or “ptest mode”.
3. RF Calibration steps as follow:

   TX Channel compensation: EGSM->DCS->PCS->EDGE EGSM->EDGE DCS->EDGE PCS

   RX Channel compensation: EGSM->DCS->PCS
4. Phone Operation Mode





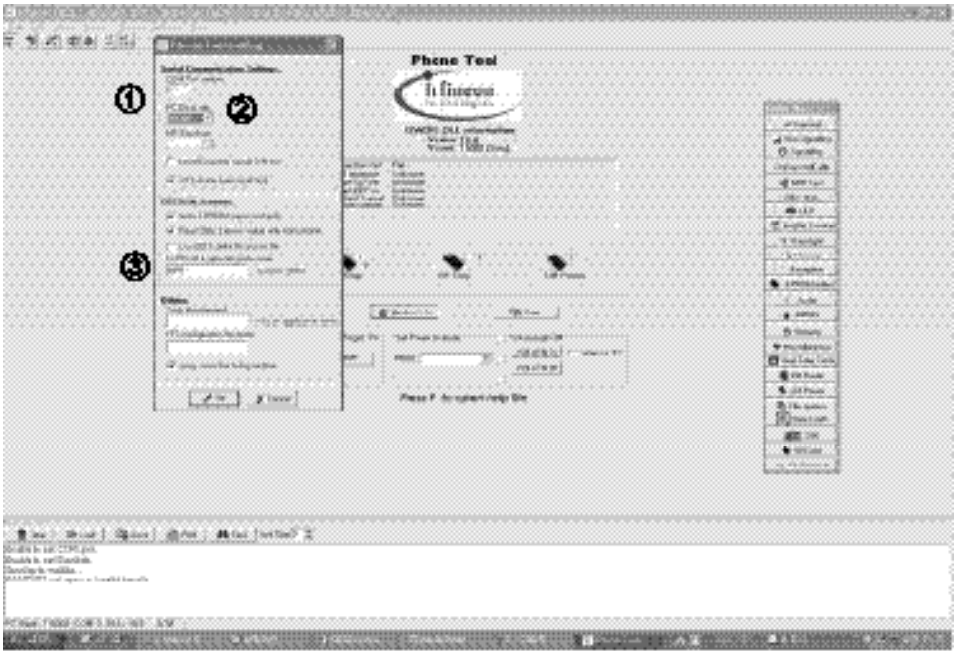
10. Stand along

10.1. Test Program Setting

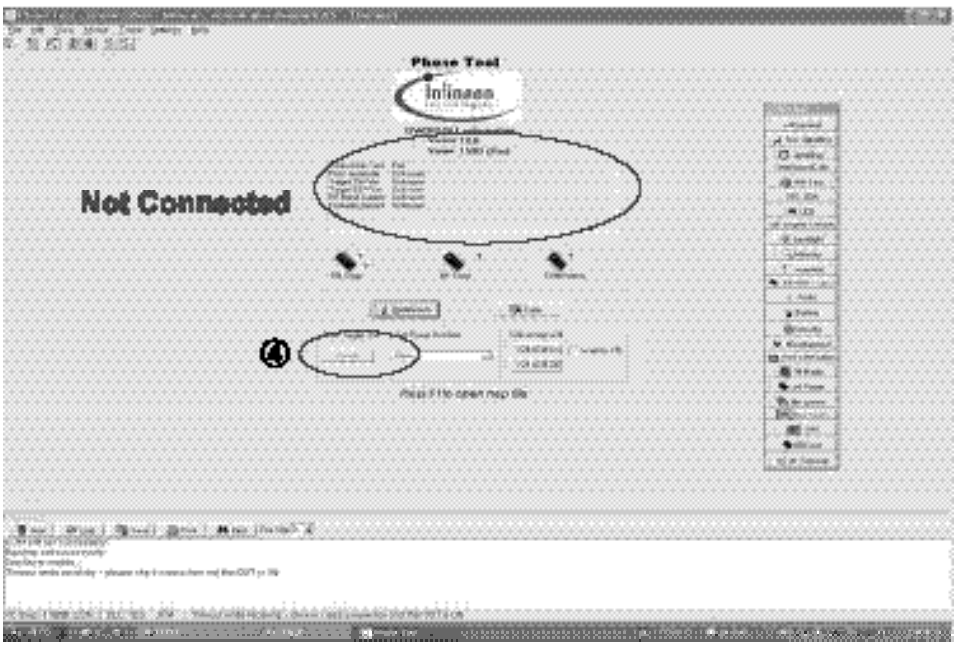
① Set COM Port.

② Check PC Baud rate.

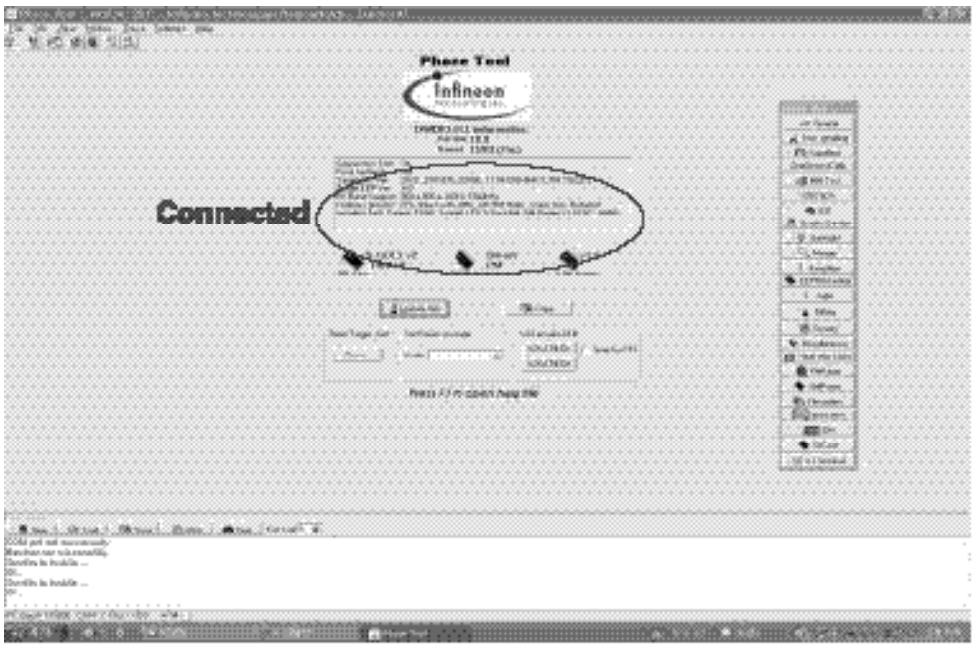
③ Confirm EEPROM & Delta file prefix name.



④ Click “Update Info” for communicating Phone and Test -Program.

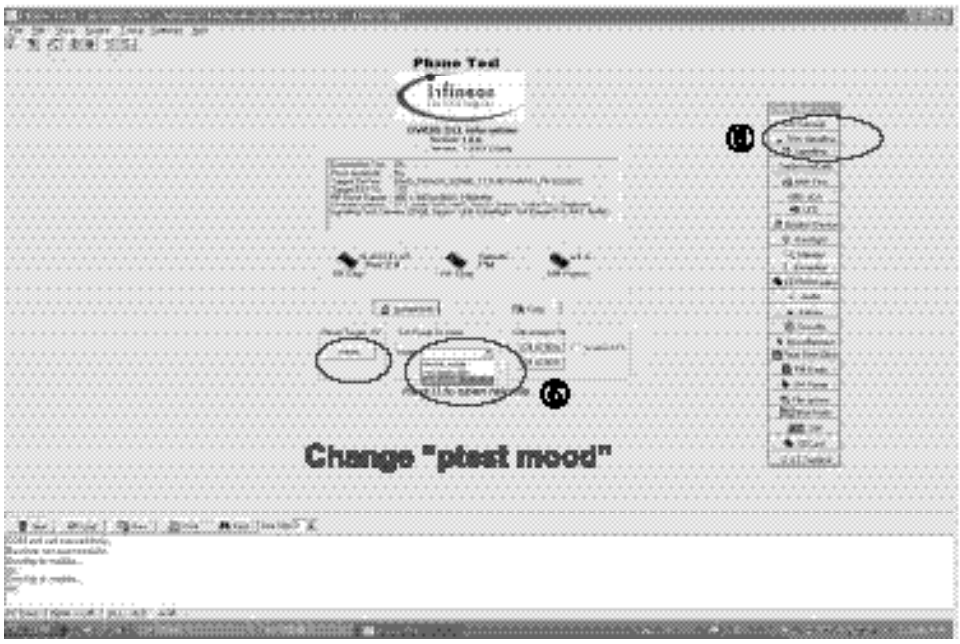


10. Stand along



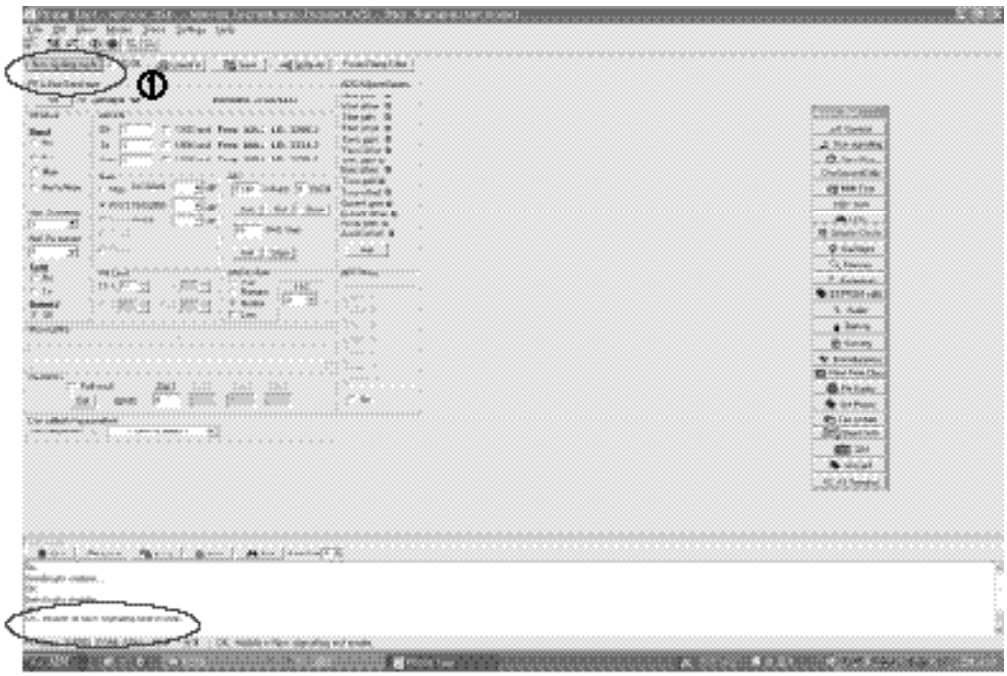
⑤ For the purpose of the Standalone Test, Change the Phone to “ptest mode” and then Click the “Reset” bar.

⑥ Select “Non signaling” in the Quick Bar menu. Then Standalone Test setup is finished.



10.2. Tx Test

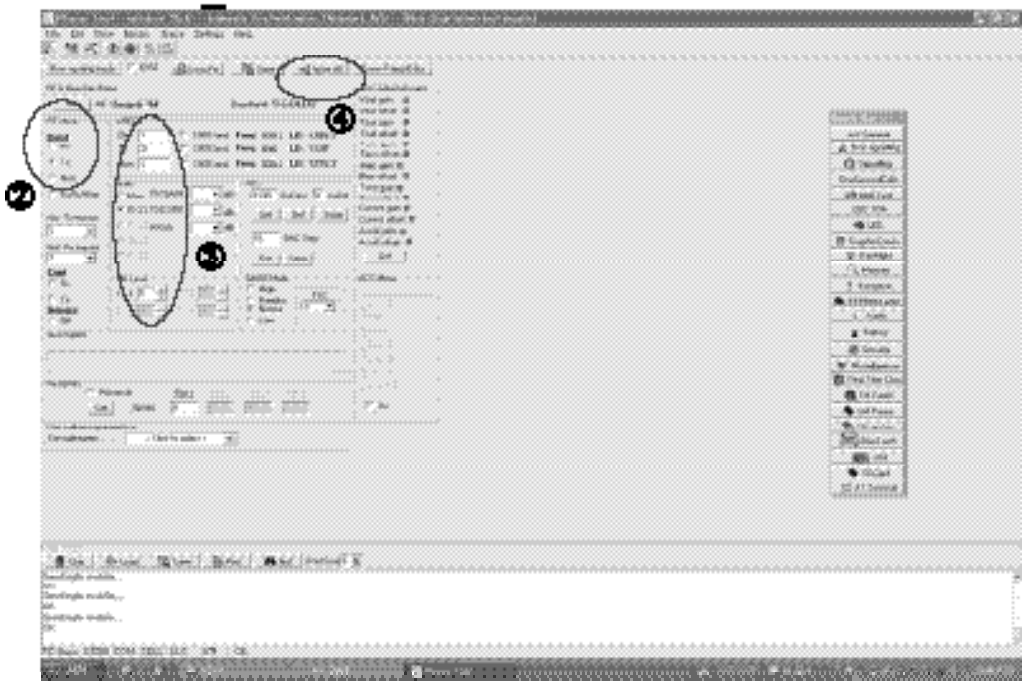
① Click “Non signaling mode” bar and then confirm “OK” text in the command line.



② Put the number of TX Channel in the ARFCN.

③ Select “Tx” in the RF mode menu and “PCL” in the PA Level menu.

④ Finally, Click “Write All” bar and try the efficiency test of Phone.

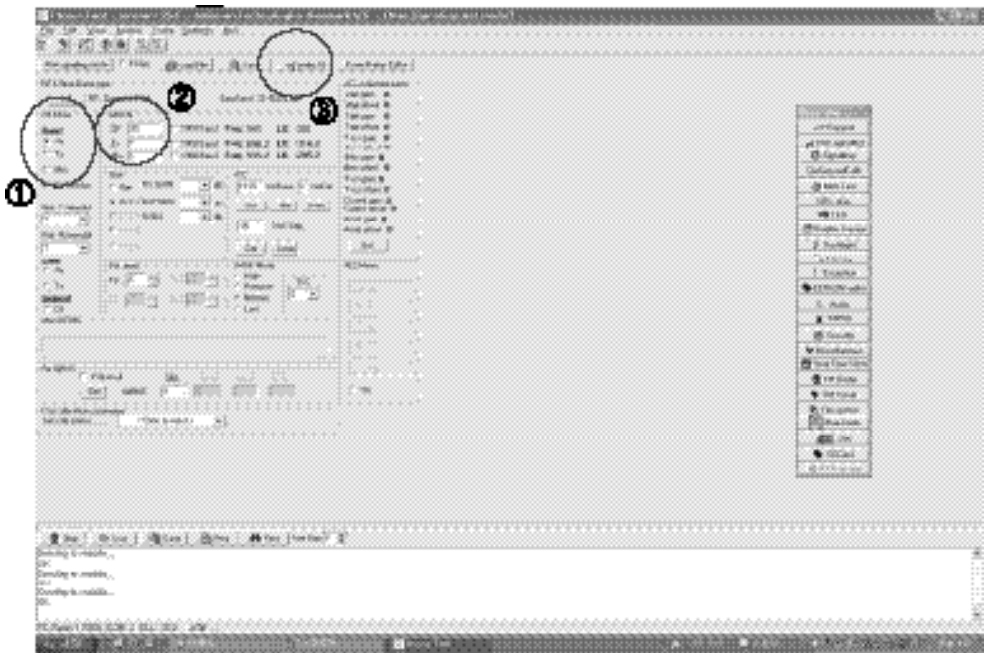


10.3. Rx Test

① Put the number of RX Channel in the ARFCN.

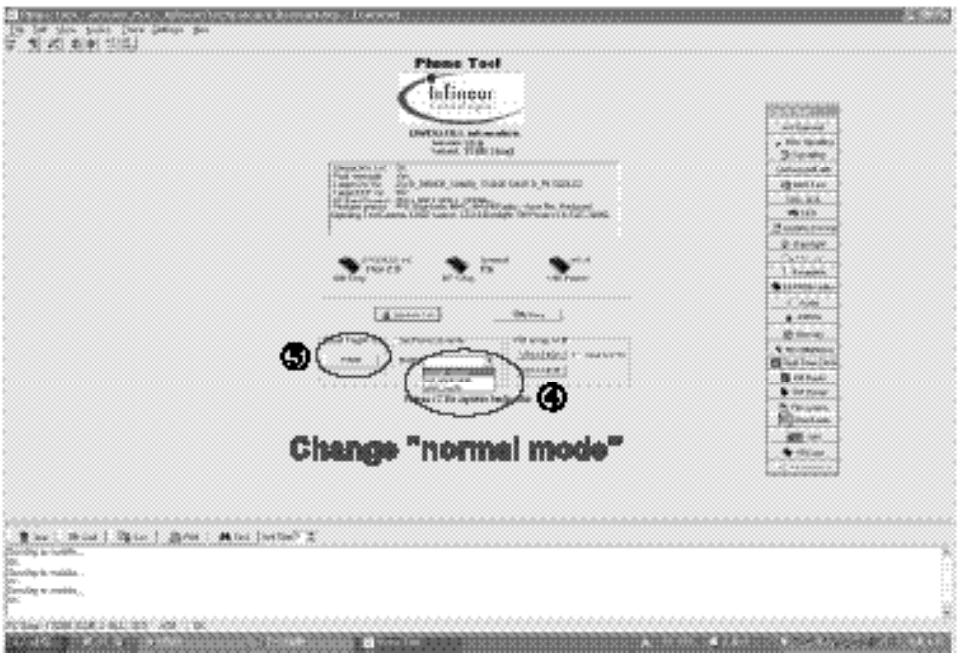
② Select “Rx” in the RF mode menu.

③ Finally, Click “Write All” bar and try the efficiency test of Phone.



④ The Phone must be changed “normal mode” after finishing Test.

⑤ Change the Phone to “normal mode” and then Click the “Reset” bar.



11. ENGINEERING MODE

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset. The key sequence for switching the engineering mode on is “2945#*#” Select. Pressing END will switch back to non-engineering mode operation. Use Up and Down key to select a menu and press ‘select’ key to progress the test. Pressing back key will switch back to the original test menu.

[1] BB test

[1-1] Battery Info

[1-1-1] BattInfo

[1-2] Bluetooth Test

[1-2-1] Enter Test Mode

[1-2-1-1] Audio Test

[1-2-1-2] RF Test

[1-2-2] OnOff Test

[1-2-2-1] Bluetooth On

[1-2-2-1] Bluetooth Off

[1-2-3] Headset Test

[1-2-4] Communication Mode

[1-2-5] Xhtml compose print

[1-2-6] Xhtml Print Test

[2] Model Version test

[2-1] Version

[3] ENG MODE

[3-1] CELL ENVIRON

[3-2] PS Layer Info

[3-2-1] Mobility

[3-2-2] RadioRes

[3-2-3] Gprs

[3-3] LAYER1 INFO

[3-3-1] Close

[3-4] Reset Information

[3-4-1] Excpt

[3-5] Memory Configuration

[3-6] MenGenConf

[3-7] MemAllUse

[3-8] MemDetUse

[3-9] MemDump

[3-0] Change Frequency Band

[3-0-1] Close

[4] Call Timer

[5] Factory Reset

[6] MF Test

[6-1] All Auto Test

[6-2] Backlight

[6-2-1] Backlight On

[6-2-1] Backlight Off

[6-3] Audio

[6-3-1] Audio test

[6-4] Vibrator

[6-4-1] Vibrator on

[6-4-2] Vibrator off

[6-5] LCD

[6-5-1] Auto LCD

[6-6] Key pad

[6-7]Mic Speaker

[6-8] Camera

[6-8-1] Camera Main Preview

[6-8-2] Flash On

[6-8-2] Flash Off

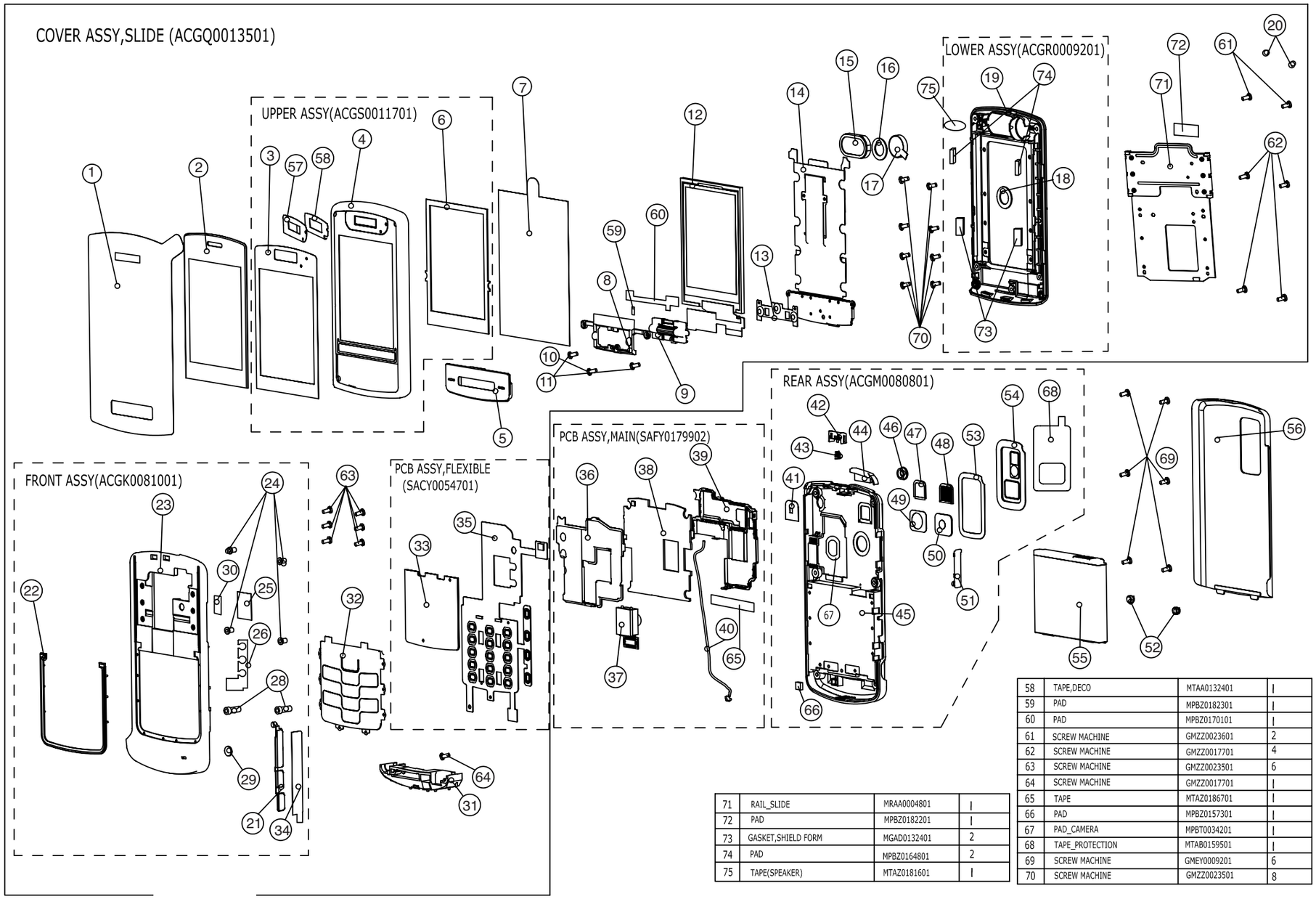
[7] DRM Engineering Mode

[7-1] GetAllRoTable

[7-2] GetRoTable

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW



NO	DESCRIPTION	PAERT NO	Q'TY
1	TAPE,PROTECTION	MTAB0166101	1
2	WINDOW,LCD	MWAC0073501	1
3	TAPE,WINDOW	MTAD0064801	1
4	COVER,SLIDE(UPPER)	MCJW0009201	1
5	KEYPAD,FUNCTION	MKAC0009001	1
6	PAD,LCD	MPBG0056801	1
7	TAPE,PROTECTION	MTAB0166201	1
8	DECO	MDAY0035401	1
9	SWITCH,ROTARY	ESQY0000801	1
10	SCREW	GMEY0015401	2
11	SCREW	GMZZ0017701	1
12	LCD	SVLM0021001	1
13	SHEET	MSAZ0042501	1
14	SLIDE-FPCB	SACY0054601	1
15	SPEAKER	SUSY0024101	1
16	PAD,MOTOR	MPBJ0040801	1
17	MOTOR	SJMY0008404	1
18	PAD,MOTOR	MPBJ0039301	1
19	COVER,SLIDE(LOWER)	MCJV0009401	1
20	CAP_SCREW	MCCH0100901	2
21	BUTTON,SIDE	MBJL0036601	1
22	DECO,FRONT	MDAG0024901	1
23	COVER,FRONT	MCJK0065401	1
24	INSERT	MICZ0028901	4
25	TAPE	MTAZ0162701	1
26	TAPE	MTAZ0186101	1
28	INSERT	MICZ0028801	2
29	FILTER,MIKE	MFBD0018901	1
30	GASKET	MGAZ0052401	1
31	INTENNA	SNGF0022501	1
32	BUTTON,DIAL	MBJA0022401	1
33	DOME ASSY METAL	ADCA0060201	1
34	TAPE,PROTECTION	MTAB0140001	1
35	KEY-PCB	SPCY0088201	1
36	CAN,SHIELD	MCBA0012801	1
37	CAMERA	SVCY0012801	1
38	MAIN-PCB	SPFY0136901	1
39	CAN,SHIELD	MCBA0012901	1
40	CABLE	SWCC0003901	1
41	PAD	MPBZ0173201	1
42	LOCKER,BATTERY	MLEA0034801	1
43	SPRING,COIL	MSDB0003701	1
44	BLUETOOTH INTENNA	SNGF0022601	1
45	COVER,REAR	MCJN0059801	1
46	CAP,MOBILE SWITCH	MCCF0037701	1
47	TAPE	MTAZ0162601	1
48	LENS,FLASH	MLCE0007001	1
49	TAPE,WINDOW	MTAD0060201	1
50	WINDOW,CAMERA	MWAE0021701	1
51	CAP,EARPHONE JACK	MCCC0043501	1
52	CAP,SCREW	MCCH0097401	2
53	TAPE,DECO	MTAA0127001	1
54	DECO,CAMERA	MDAD0026901	1
55	INNER-BATTERY	SBPL 0085703	1
56	COVER,BATTERY	MCJA0037301	1
57	FILTER,SPEAKER	MFBC0025301	1
58	TAPE,DECO	MTAA0132401	1
59	PAD	MPBZ0182301	1
60	PAD	MPBZ0170101	1
61	SCREW MACHINE	GMZZ0023601	2
62	SCREW MACHINE	GMZZ0017701	4
63	SCREW MACHINE	GMZZ0023501	6
64	SCREW MACHINE	GMZZ0017701	1
65	TAPE	MTAZ0186701	1
66	PAD	MPBZ0157301	1
67	PAD_CAMERA	MPBT0034201	1
68	TAPE_PROTECTION	MTAB0159501	1
69	SCREW MACHINE	GMEY0009201	6
70	SCREW MACHINE	GMZZ0023501	8
71	RAIL_SLIDE	MRAA0004801	1
72	PAD	MPBZ0182201	1
73	GASKET,SHIELD FORM	MGAD0132401	2
74	PAD	MPBZ0164801	2
75	TAPE(SPEAKER)	MTAZ0181601	1

12.2 Replacement Parts <Mechanic component>

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

Level	Location No	Description	Part Number	Spec	Color	Remark
1		SSA(SLIDE)	TELL5000001		Aluminum Silver	
2	AAAY00	ADDITION	AAAY0100102		Aluminum Silver	
3	MCJA00	COVER,BATTERY	MCJA0207301	PRESS, STB, ...	Silver	02
2	APEY00	PHONE	APEY0370401	W370 ELM,XV	Aluminum Silver	
3	ACSM00	COVER ASSY,REAR	ACSM0080001	W370_COVER ASSY,REAR	Aluminum Silver	
4	MCCC00	CAP,EARPHONE JACK	MCCC0040501	MOLD, Urethane Rubber S195A, ...	Without Color	51
4	MCCP00	CAP,MOBILE SWITCH	MCCP0057701	MOLD, Urethane Rubber S195A, ...	Silver	48
4	MCJR00	COVER,REAR	MCJR0005801	MOLD, PC LUPOY SC-1084A, ...	Black	45
4	MDAD00	DECO,CAMERA	MDAD0020601	ELECTROFORMING, Ni, ...	Silver	04
4	MLAB00	LABEL,A/S	MLAB0090001	HUMIDITY STICKER	Without Color	
4	MLCB00	LENS,FLASH	MLCB0027001	MOLD, PMMA Hitachi, ...	Transparent	48
4	MLBA00	LOCKER,BATTERY	MLBA0064801	MOLD, POM LUCEL FW-700A, ...	Silver	42
4	MPBT00	PAD,CAMERA	MPBT0094301	(C)MPLEX, (empty)	Black	07
4	MPBB00	PAD	MPBB0187601	COMPLEX, (empty)	Black	06
4	MPBB01	PAD	MPBB0173301	(C)MPLEX, (empty)	Without Color	41
4	MSCB00	SPRING,COIL	MSCB0004701	COMPLEX, (empty)	Without Color	43
4	MTAA00	TAPE,DECO	MTAA0187001	COMPLEX, (empty)	Without Color	09
4	MTAB01	TAPE,PROTECTION	MTAB01xxx01	COMPLEX, (empty)	Without Color	08
4	MTAD00	TAPE,WINDOW	MTAD0000801	COMPLEX, (empty)	Without Color	49
4	MTAZ00	TAPE	MTAZ0188001	COMPLEX, (empty)	Without Color	47
4	MTAZ01	TAPE	MTAZ0171701	COMPLEX, (empty)	Without Color	
4	MWAE00	WINDOW,CAMERA	MWAE0061701	(C)MPLEX, (empty)	Black	09
3	ACSS00	COVER ASSY,SLIDE	ACSS0081401	W370/W370_COVER ASSY,SLIDE	Aluminum Silver	
4	ACEF00	COVER ASSY,FRONT	ACEF0081001	W370_ COVER ASSY,FRONT	Aluminum Silver	
5	MELE00	BUTTON,SIDE	MELE0004501	MOLD, PC LUPOY SC-1084A, ...	Silver	21
5	MDJB00	DOVER,FRONT	MDJB0085401	MOLD, PC LUPOY SC-1084A, ...	Silver	03
5	MDAB00	DECO,FRONT	MDAB0088901	MOLD, POM LUCEL FW-700A, ...	Gray	02
5	MPBD00	FILTER,MIC	MPBD0018601	COMPLEX, (empty)	Black	20
5	MBAZ00	GASKET	MBAZ0088401	COMPLEX, (empty)	Silver	60
5	MICB00	INSERT	MICB0028601	COMPLEX, (empty)	Gold	22

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
5	MIC201	INSERT	[illegible]	COMPLEX, (empty), , , , ,	Gold	34
5	MTAB00	TAPE,PROTECTION	MTAB0146001	COMPLEX, (empty), , , , ,	Green	34
5	MTAZ08	TAPE	[illegible]	COMPLEX, (empty), , , , ,	Without Color	35
5	MTAZ01	TAPE	[illegible]	COMPLEX, (empty), , , , ,	Without Color	[illegible]
4	ACGR00	COVER ASSY,SLIDE(LOWER)	[illegible]		Aluminum Silver	
5	MCJW08	COVER,SLIDE(LOWER)	[illegible]	MOLD, PC LUPOY SC-1004A, , , , ,	Aluminum Silver	19
5	MGAD08	GASKET,SHIELD FORM	[illegible]	COMPLEX, (empty), , , , ,	Aluminum Silver	79
5	MGDA08	GUIDE,LEFT	[illegible]	MOLD, POM LUCEL N109-LD, , , , ,	Gray	
5	MGDB08	GUIDE,RIGHT	[illegible]	MOLD, POM LUCEL N109-LD, , , , ,	Gray	
5	MIC200	INSERT	[illegible]	C4505SD,M1.4x0.3pitch,1.7T,2.5PI	Without Color	
5	MIC201	INSERT	[illegible]	COMPLEX, (empty), , , , ,	Without Color	
5	MMAA08	MAGNET,SWITCH	[illegible]	COMPLEX, (empty), , , , ,	Without Color	
5	MPSJ00	PAD,MOTOR	[illegible]	COMPLEX, (empty), , , , ,	Aluminum Silver	15
5	MPBZ00	PAD	[illegible]	COMPLEX, (empty), , , , ,	Black	74
5	MTAZ00	TAPE	[illegible]	COMPLEX, (empty), , , , ,	Without Color	75
4	ACGS00	COVER ASSY,SLIDE(UPPER)	ACGS0011701		Silver	
5	MCJW08	COVER,SLIDE(UPPER)	[illegible]	PRESS, STS, , , , ,	Without Color	4
5	MDAY00	DECO	[illegible]	PRESS, STS, , , , ,	Without Color	
5	MFEZ00	FRAME	MFEZ0011601	PRESS, STS, , , , ,	Without Color	
5	MIC200	INSERT	[illegible]	PRESS, STS, , , , ,	Without Color	
5	MIC201	INSERT	[illegible]	COMPLEX, (empty), , , , ,	Without Color	
5	MFBC00	FILTER,SPEAKER	[illegible]	PRESS, STS, , , , ,	Black	67
5	MPBG00	PAD,LCD	[illegible]	COMPLEX, (empty), , , , ,	Black	8
5	MTAA00	TAPE,DECO	[illegible]	COMPLEX, (empty), , , , ,	Without Color	[illegible]
5	MTAD00	TAPE,WINDOW	[illegible]	COMPLEX, (empty), , , , ,	Without Color	3
4	GMEY01	SCREW MACHINE,BIND	[illegible]	1.4 mm,2.7 mm,MSWR3(BK) ,N ,+ , , ; (empty) (empty) , , (empty) ,BLACK (empty) (empty)	Black	10
4	GMZZ00	SCREW MACHINE	[illegible]	1.4 mm,3.5 mm,MSWR3 ,N ,+ , , ,	Silver	11,[illegible]
4	GMZZ01	SCREW MACHINE	[illegible]	1.4 mm,1.5 mm,MSWR3(FN) ,B ,+ , , , ; (empty) (empty) , , (empty) ,SILVER (empty) (empty)	Silver	[illegible]
4	GMZZ02	SCREW MACHINE	[illegible]	1.4 mm,3.75 mm,MSWR3(BK) ,N ,+ , , , ; (empty) (empty) , , (empty) ,BLACK (empty) (empty)		61
4	MBJA00	BUTTON,DIAL	[illegible]	COMPLEX, (empty), , , , ,	Without Color	32
4	MCCH08	CAP,SCREW	[illegible]	COMPLEX, (empty), , , , ,	Silver	20
4	MDAY00	DECO	[illegible]	CASTING, Zn Alloy, , , , ,	Silver	9
4	MGAD00	GASKET,SHIELD FORM	[illegible]	COMPLEX, (empty), , , , ,	Gold	

Level	Location No	Description	Part Number	Spec	Color	Remark
4	MKAC00	KEYPAD,FUNCTION	MKAC0800001	COMPLEX, (empty)	Without Color	E
4	MLAC00	LABEL,BARCODE	MLAC0003401	EZ LOCK(laser for mechanical)	Without Color	
4	MPBJ00	PAD,MOTOR	MPBJ0040001	COMPLEX, (empty)	Black	19
4	MPEZ00	PAD	MPEZ0180101	COMPLEX, (empty)	Black	
4	MPSZ01	PAD	MPSZ0170101	COMPLEX, (empty)	Black	60
4	MPEZ00	PAD	MPEZ0180201	COMPLEX, (empty)	Black	72
4	MPEZ00	PAD	MPEZ0180301	COMPLEX, (empty)	Black	69
4	MRAA00	RAIL,SLIDE	MRAA0600001	COMPLEX, (empty)	Aluminum Silver	71
4	MTAB00	TAPE,PROTECTION	MTAB0180101	COMPLEX, (empty)	Without Color	1
4	MTAB01	TAPE,PROTECTION	MTAB0180201	COMPLEX, (empty)	Without Color	7
4	MTAC00	TAPE,SHIELD	MTAC0040001	COMPLEX, (empty)	Blue	
4	MTAZ00	TAPE	MTAZ0180201	COMPLEX, (empty)	Without Color	
4	MWAC00	WINDOW,LCD	MWAC0070B01	COMPLEX, (empty)	Without Color	E
5	ADCA00	DOME Assy,METAL	ADCA0000201		Without Color	33
6	SMSY00	SCREW MACHINE,BIND	SMSY0600001	1.4 mm,M1.7 mm,MSWR6(SR) ,S ,+ ,HEAD D=3.7mm	Black	60
5	MCCH00	CAP,SCREW	MCCH0067401	MOLD, Urethane Rubber 0185A, ...	Without Color	62
5	MLAA00	LABEL,MODEL	MLAA0040001	LB (30.8x21.8 4-UP)	Pearl White	
5	MCBA00	CAN,SHIELD	MCBA0010001	PRESS, STS, ...	Silver	35
6	MPEZ00	PAD	MPEZ0180401	COMPLEX, (empty)	Black	
5	MCBA01	CAN,SHIELD	MCBA0010001	PRESS, STS, ...	Silver	69
5	MGAD00	GASKET,SHIELD FORM	MGAD0130001	COMPLEX, (empty)	Gold	
5	MSAZ00	SHEET	MSAZ0044001	COMPLEX, (empty)	Silver	
5	MTAZ00	TAPE	MTAZ0180701	COMPLEX, (empty)	Without Color	65
5	MLAZ00	LABEL	MLAZ0060001	PID Label 4 Array	Without Color	

12. EXPLODED VIEW & REPLACEMENT PART LIST

<Main component>

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

Level	Location No	Description	Part Number	Spec	Color	Remark
4	ENGP00	ANTENNA,GSM,FIXED	ENGP0025901	3.0 ,-5.0 dBi, ,Heatcoil, Internal ,; ,SINGLE ,-5.0 /89 ,3.0		44
4	SSG109	SWITCH,ROTARY	SSG10096801	1 V,1 A,VERTICAL ,1 G,		9
4	SACYxx	PCB ASSY,FLEXIBLE	SACYxx04xx1	64dot LCD FPCB		14
5	SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0034801	64dot LCD FPCB		
6	MMZ200	SHEET	MMZ0048201	COMPLEX, (empty), , , , ,	Without Color	19
5	SACB00	PCB ASSY,FLEXIBLE,SMT	SACB0049301	64dot LCD FPCB		
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0038401	64dot LCD FPCB		
7	C201	CAP,CERAMIC,CHIP	ECCH2004824	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	C808	CAP,CERAMIC,CHIP	ECCH2000182	0.1 uF,10V ,K ,X5R ,HD ,1608 ,R/TP		
7	CN002	CONNECTOR,FPC/FPC	ENGY001E801	35 PIN,0.3 mm,ETC , ,H=1.8		
7	D801	DIODE,TVS	EDTV0004804	SOT-883 ,5 V,100 W,R/TP ,Pb-FREE		
7	LD001	DIODE,LED,CHIP	EDLH2011901	WHITE ,1608 ,R/TP ,Pb-FREE(ZENER)		
7	LD802	DIODE,LED,CHIP	EDLH2011801	WHITE ,1608 ,R/TP ,Pb-FREE(ZENER)		
7	R801	RES,CHIP,MAXER	ERH-22000808	100 Kohm,1/16W ,J ,1005 ,R/TP		
7	U801	IC	EUSY0011801	,4 PIN,R/TP ,1.8X1.2 size Hall IC for FD JOG Dial		
7	U802	IC	EUSY0011901	,4 PIN,R/TP ,1.8X1.8 size Hall IC for FD JOG Dial		
7	VA801	VARISTOR	SEVY0800802	5.5 V, ,SMD ,1005, 50pF		
7	VA808	VARISTOR	SEVY0800802	5.5 V, ,SMD ,1005, 50pF		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0046801	64dot LCD FPCB		
7	C808	CAP,CERAMIC,CHIP	ECCH2004824	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
7	CN801	CONNECTOR,BOARD TO BOARD	EMBY0036701	34 PIN,0.4 mm,ETC , ,H=0.8, Socket		
5	SACB00	PCB ASSY,FLEXIBLE,INSERT	SACB0034901	Key FPCB Assy		
6	SACC00	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0038501	Key FPCB Assy		
7	C808	CAP,CHIP,MAXER	ECZH2001808	33 pF,50V ,J ,NP0 ,TC ,1608 ,R/TP		
7	C809	CAP,CERAMIC,CHIP	ECCH2000182	47 pF,50V,J,NP0,TC,1608,R/TP		
7	CN801	CONNECTOR,BOARD TO BOARD	EMBYxx17201	70 PIN,0.4 mm,STRAIGHT ,AU ,FEMALE		
6	SACD00	PCB ASSY,FLEXIBLE,SMT TOP	SACD0048901	Key FPCB Assy		
7	C201	CAP,CERAMIC,CHIP	ECCH2000182	10 pF,50V,J,NP0,TC,1608,R/TP		
7	C804	CAP,CERAMIC,CHIP	ECCH2000182	15 pF,50V,J,NP0,TC,1608,R/TP		

Level	Location No	Description	Part Number	Spec	Color	Remark
7	C608	CAP,CERAMIC,CHIP	ECCH0000106	47 pF,50V,J,NP0,TC,1005,R/TP		
7	C609	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C607	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C606	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C605	CAP,CERAMIC,CHIP	ECCH0004804	10 uF,6.3V,M,X5R,TC,1608,R/TP		
7	C611	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C612	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C613	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C614	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C615	CAP,CERAMIC,CHIP	ECCH0000105	10 nF,16V,K,X7R,HD,1005,R/TP		
7	C616	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V,K,X5R,TC,1005,R/TP		
7	C617	CAP,CERAMIC,CHIP	ECCH0004804	10 uF,6.3V,M,X5R,TC,1608,R/TP		
7	C618	CAP,CERAMIC,CHIP	ECCH0000102	47 pF,50V,J,NP0,TC,1005,R/TP		
7	CN602	CONNECTOR,BOARD TO BOARD	EMBY0025601	64 PIN,0.4 mm,ETC , ,H=0.8, Header		
7	D601	DIODE,TVS	EDTV0004804	SOT-363,6 V,100 W,R/TP ,PB-FREE		
7	KB_DM8	SWITCH,TACT	ESCY0004801	12 V,0.05 A,HORIZONTAL,6.2 *6,		
7	L601	INDUCTOR,CHIP	ELCH0010402	270 nH,J,1005,R/TP ,CHIP		
7	L602	INDUCTOR,CHIP	ELCH0010402	270 nH,J,1005,R/TP ,CHIP		
7	L605	INDUCTOR,CHIP	ELCH0000402	150 nH,J,1005,R/TP ,		
7	L604	INDUCTOR,CHIP	ELCH0040049	100 nH,J,1005,R/TP ,		
7	LD601	DIODE,LED,CHIP	EDLH0013701	WHITE,ETC,R/TP ,SIDEVIEW , ,[empty],2.8~3.7[,30mA, , ,180mW,[empty],[empty],2P		
7	LD602	DIODE,LED,CHIP	EDLH0013701	WHITE,ETC,R/TP ,SIDEVIEW , ,[empty],2.8~3.7[,30mA, , ,120mW,[empty],[empty],2P		
7	LD603	DIODE,LED,MODULE	EDLM0006801	WHITE,1 LED,ELCP1,P0.48,R/TP ,PB-FREE		
7	MIC601	MICROPHONE	EJMY0010020	2 PIN,4.2 dB,4*4,SMD Bridge Type		
7	Q601	TR,BJT,NPN	EQBB0018701	SMTR,100 mW,R/TP ,DUAL TRANSISTORS		
7	R601	RES,CHIP	ERHY0003301	100 ohm,1/16W,J,1005,R/TP		
7	R602	RES,CHIP	ERHY0003301	100 ohm,1/16W,J,1005,R/TP		
7	R603	RES,CHIP	ERHY0003601	330 ohm,1/16W,J,1005,R/TP		
7	R604	RES,CHIP,MAKER	ERNB2G000404	1 Kohm,1/16W,J,1005,R/TP		
7	R605	RES,CHIP	ERHY0003601	330 ohm,1/16W,J,1005,R/TP		
7	R607	RES,CHIP,MAKER	ERNB2G000404	1 Kohm,1/16W,J,1005,R/TP		
7	R608	RES,CHIP	ERHY0004601	8700 ohm,1/16W,J,1005,R/TP		
7	R609	RES,CHIP,MAKER	ERNB2G000418	12 ohm,1/16W,J,1005,R/TP		
7	R610	RES,CHIP,MAKER	ERNB2G000548	7500 ohm,1/16W,F,1005,R/TP		
7	R611	RES,CHIP,MAKER	ERNB2G000564	5100 ohm,1/16W,F,1005,R/TP		

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
7	U801	IC	SUEV0805801	TQFN , PIN,3VTP ,8 ELU+2 LDO+1 Flash LED Drv, 4*4		
7	VA809	VARISTOR	SEVY0804801	18 V, ,SMD ,3pF, 1005		
7	VA804	VARISTOR	SEVY0804801	18 V, ,SMD ,3pF, 1005		
6	SPCY00	PCB,FLEXIBLE	SPCY0085801	PCB,TI , 0.20mm,3-1/2 RF ,SEAMLESS SEY FPCB ,;		65
4	SJMY00	VIBRATOR,MOTOR	SJMY0005404	3 V,80 mA,12*2.7 . . ; ,3V ,80mA . . ,12000		17
5	SLCH00	INDUCTOR,CHIP	SLCH0004711	82 nH,J ,1008 ,3VTP ,		
5	SLCH01	INDUCTOR,CHIP	SLCH0005807	5.6 nH,S ,1005 ,3VTP ,		
5	SNAY00	DOMN,RF SWITCH	SNAY0005001	,SMD , dB,		
5	SRH200	RES,CHIP,MAKER	SRH20000801	0 ohm,1/16W ,J ,1005 ,3VTP		
5	SNGP00	ANTENNA,GSM,FIXED	SNGP0005001	2.0 ,-5.0 dBi, ,Internal, GSM900/1800/1900 , ; ,TRIPLE , 2.0 ,50 ,3.0		31
4	SUSY00	SPEAKER	SUSY0004101	ASSY ,8 ohm,90 dB, min, ; . . . . . ,700 ,16*10HET ,WIRE		15
4	SVLM00	LCD MODULE	SVLM0021001	64*64 ,240*320 ,37.8*53.8 ,262k ,TFT , TM ,HM15CP200 ,		12
5	SAPY00	PCB ASSY,MAIN	SAPY0705402			
4	SAFB00	PCB ASSY,MAIN,INVERT	SAFB0004701			
5	SNCY00	CAMERA	SNCY0012001	CMOS ,MEGA ,SM AF (FPCB, 1/4", SOC5030)		37
5	SWCC00	CABLE,COAXIAL	SWCC0005801	91 mm,2 LINE, . ; ,[empty] ,[empty] ,[empty] , . ,WHITE , ,[empty]		40
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0101102			
5	SAPC00	PCB ASSY,MAIN,SMT BOTTOM	SAPC0001001			
6	SBTB01	BATTERY,CELL,LITHIUM	SBCL0001701	3 V,6.5 mAh,CYLINDER ,Rollover type BR, Max T 1.67, ph 4.6, Pb-Free		
9	C101	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C102	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C103	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C104	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C105	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C106	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C107	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C108	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
6	C109	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V ,K ,X5R ,TC ,1005 ,3VTP		
9	C110	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C111	CAP,CERAMIC,CHIP	ECCH0005105	10 nF,16V ,K ,X7R ,TC ,0603 ,3VTP		
6	C112	CAP,CERAMIC,CHIP	ECCH0004804	1 uF,6.3V ,K ,X5R ,TC ,1005 ,3VTP		
9	C113	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		
9	C114	CAP,CERAMIC,CHIP	ECCH0005105	10 nF,16V ,K ,X7R ,TC ,0603 ,3VTP		
9	C115	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0605 ,3VTP		

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C116	CAP,CERAMIC,CHIP	EC0H6004B04	1 uF/6.3V,K,X5R,TD,1005,RTP		
6	C117	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C118	CAP,CERAMIC,CHIP	EC0H6008105	10 nF,16V,K,X7R,TD,0603,RTP		
6	C119	CAP,CERAMIC,CHIP	EC0H6004B04	1 uF/6.3V,K,X5R,TC,1005,RTP		
6	C120	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C121	CAP,CERAMIC,CHIP	EC0H6008105	10 nF,16V,K,X7R,TC,0603,RTP		
6	C122	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C123	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C124	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C125	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C126	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C127	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C128	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C129	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C130	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C131	CAP,CHIP,MARKER	EC2H0B1211	220 uF,10V,Z,Y5V,HD,1825,RTP		
6	C132	CAP,CERAMIC,CHIP	EC0H6000112	15 pF,50V,J,NP0,TC,1005,RTP		
6	C133	CAP,CERAMIC,CHIP	EC0H6000112	15 pF,50V,J,NP0,TC,1005,RTP		
6	C134	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C135	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C136	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C137	CAP,CERAMIC,CHIP	EC0H6000179	68 nF,16V,K,X5R,HD,1608,RTP		
6	C138	CAP,CERAMIC,CHIP	EC0H6000179	22 nF,16V,K,X5R,HD,1608,RTP		
6	C139	CAP,CERAMIC,CHIP	EC0H6000112	15 pF,50V,J,NP0,TC,1005,RTP		
6	C140	CAP,CERAMIC,CHIP	EC0H6000112	15 pF,50V,J,NP0,TC,1005,RTP		
6	C201	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C202	CAP,CERAMIC,CHIP	EC0H6000182	2.2 nF,16V,K,X5R,HD,1608,RTP		
6	C203	CAP,CERAMIC,CHIP	EC0H6000182	2.2 nF,16V,K,X5R,HD,1608,RTP		
6	C204	CAP,CERAMIC,CHIP	EC0H6000106	100 pF,50V,J,X7R,TC,0603,RTP		
6	C205	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C206	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C207	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TC,0603,RTP		
6	C208	CAP,CERAMIC,CHIP	EC0H6009101	0.1 uF,6.3V,K,X5R,TD,0603,RTP		
6	C209	CAP,CERAMIC,CHIP	EC0H6008104	10 pF,25V,D,X7R,HD,0603,RTP		
6	C210	CAP,CERAMIC,CHIP	EC0H6008B06	27 pF,25V,J,NP0,TD,0603,RTP		
6	C211	CAP,CERAMIC,CHIP	EC0H6008B08	47 pF,25V,J,NP0,TC,0603,RTP		
6	C212	CAP,CERAMIC,CHIP	EC0H6004B04	1 uF/6.3V,K,X5R,TD,1005,RTP		

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C216	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TD ,1608 ,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH6006502	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C217	CAP,CERAMIC,CHIP	ECCH6004602	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH6006502	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C218	CAP,CERAMIC,CHIP	ECCH6004602	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C221	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C223	CAP,CERAMIC,CHIP	ECCH6000101	0.1 uF,6.3V ,K ,X6R ,TD ,0603 ,R/TP		
6	C229	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C234	CAP,CERAMIC,CHIP	ECCH6004602	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C238	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C239	CAP,CERAMIC,CHIP	ECCH6004604	10 uF,6.3V ,M ,X6R ,TD ,1608 ,R/TP		
6	C257	CAP,CERAMIC,CHIP	ECCH6007601	10 uF,4V ,M ,X6R ,TC ,1608 ,R/TP		
6	C258	CAP,CERAMIC,CHIP	ECCH6004602	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C259	CAP,CERAMIC,CHIP	ECCH6004604	10 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C260	CAP,CERAMIC,CHIP	ECCH6007601	10 uF,4V ,M ,X6R ,TC ,1608 ,R/TP		
6	C261	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TD ,1608 ,R/TP		
6	C262	CAP,CERAMIC,CHIP	ECCH6006502	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C263	CAP,CERAMIC,CHIP	ECCH6005101	0.1 uF,6.3V ,K ,X6R ,TD ,0603 ,R/TP		
6	C264	CAP,CERAMIC,CHIP	ECCH6006502	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C341	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TD ,1608 ,R/TP		
6	C266	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C343	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TC ,1608 ,R/TP		
6	C344	CAP,CERAMIC,CHIP	ECCH6000196	2.2 uF,6.3V ,M ,X6R ,TD ,1608 ,R/TP		
6	C345	CAP,CERAMIC,CHIP	ECCH6006502	2.2 uF,10V ,K ,X6R ,HD ,1608 ,R/TP		
6	C346	CAP,CERAMIC,CHIP	ECCH6004604	1 uF,6.3V ,K ,X5R ,TD ,1608 ,R/TP		
6	C347	CAP,CERAMIC,CHIP	ECCH6005102	1000 pF,50V ,K ,X7R ,HD ,0603 ,R/TP		
6	C348	CAP,CERAMIC,CHIP	ECCH6004604	1 uF,6.3V ,K ,X5R ,TD ,1608 ,R/TP		
6	C349	CAP,CERAMIC,CHIP	ECCH6004604	1 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C351	CAP,CERAMIC,CHIP	ECCH6005103	100 pF,50V ,J ,X7R ,TD ,0603 ,R/TP		
6	C352	CAP,CERAMIC,CHIP	ECCH6004604	1 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C308	CAP,CERAMIC,CHIP	ECCH6005112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH6005612	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH6005612	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH6005101	0.1 uF,6.3V ,K ,X6R ,TD ,0603 ,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH6005612	1000 pF,25V ,K ,X7R ,HD ,0603 ,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH6004604	15 pF,25V ,J ,NP0 ,TD ,0603 ,R/TP		

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C316	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C317	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C318	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C319	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C320	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C321	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C322	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C323	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C324	CAP,CERAMIC,CHIP	ECCH6009103	100 pF,50V ,J ,X7R ,TC ,0603 ,RTP		
6	C325	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C327	CAP,CERAMIC,CHIP	ECCH6009505	27 pF,25V ,J ,NP0 ,TC ,0603 ,RTP		
6	C328	CAP,CERAMIC,CHIP	ECCH6009103	100 pF,50V ,J ,X7R ,TC ,0603 ,RTP		
6	C329	CAP,CERAMIC,CHIP	ECCH6009110	68 nF,6.3V ,K ,X7R ,TC ,0603 ,RTP		
6	C330	CAP,CERAMIC,CHIP	ECCH6009514	10 pF,25V ,D ,X7R ,HD ,0603 ,RTP		
6	C331	CAP,CERAMIC,CHIP	ECCH6009110	68 nF,6.3V ,K ,X7R ,TC ,0603 ,RTP		
6	C332	CAP,CERAMIC,CHIP	ECCH6009505	27 pF,25V ,J ,NP0 ,TC ,0603 ,RTP		
6	C334	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C335	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C336	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C337	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C338	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C339	CAP,CERAMIC,CHIP	ECCH6009106	10 nF,16V ,K ,X7R ,TC ,0603 ,RTP		
6	C340	CAP,CERAMIC,CHIP	ECCH6009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,RTP		
6	C341	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C342	CAP,CHIP,MARKER	ECZH0000003	2 pF,50V ,C ,NP0 ,TC ,1005 ,RTP		
6	C344	CAP,CERAMIC,CHIP	ECCH6009103	100 pF,50V ,J ,X7R ,TC ,0603 ,RTP		
6	C345	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C346	CAP,CERAMIC,CHIP	ECCH6009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,RTP		
6	C347	CAP,CERAMIC,CHIP	ECCH6009103	100 pF,50V ,J ,X7R ,TC ,0603 ,RTP		
6	C348	CAP,CERAMIC,CHIP	ECCH6009512	1000 pF,25V ,K ,X7R ,HD ,0603 ,RTP		
6	C401	CAP,CERAMIC,CHIP	ECCH6000146	1 nF,50V,K,X7R,HD,1005,RTP		
6	C402	CAP,CERAMIC,CHIP	ECCH6009103	100 pF,50V ,J ,X7R ,TC ,0603 ,RTP		
6	C403	CAP,CERAMIC,CHIP	ECCH6009103	100 pF,50V ,J ,X7R ,TC ,0603 ,RTP		
6	CN201	CONNECTOR,ETC	EKZY0019401	9 PIN,3.0 mm,ETC , J1=5.3		
6	CN202	CONNECTOR,BOARD TO BOARD	EKBY0017301	70 PIN,0.4 mm,STRAIGHT ,AU ,MALE		
6	CN999	CONNECTOR,I/O	EKRY0060501	15 PIN,0.4 mm,ETC , ,1.5 Offset		

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
0	D201	DIODE,TVS	EDTV0000004	SOT-363 ,5 V,100 W,R/TP ,PB-FREE		
0	FB801	FILTER,BEAD,CHIP	SFBH0001003	220 ohm,0718 ,		
0	FL202	FILTER,EMI/POWER	SFEY0012501	SMD ,TDFN,1000ohm & 18pF / 16V		
0	FL205	FILTER,EMI/POWER	SFEY0012501	SMD ,TDFN,1000ohm & 18pF / 16V		
0	FL204	FILTER,EMI/POWER	SFEYxxxxxxx1	SMD ,TDFN,100ohm & 18pF / 16V		
0	FL205	FILTER,EMI/POWER	SFEY0012501	SMD ,TDFN,1000ohm & 18pF / 16V		
0	FL209	FILTER,EMI/POWER	SFETxxxxxx1	SMD ,TDFN,100ohm & 18pF / 16V		
0	FL205	FILTER,DIELECTRIC	SFDY0001001	2480 MHz,2.0*1.25 /SMD ,Pb-free_Bluetooth_Dielectric		
0	L101	INDUCTOR,CHIP	ELCH0010402	270 nH,J ,1005 ,R/TP ,CHIP		
0	L102	INDUCTOR,CHIP	ELCH0010402	270 nH,J ,1005 ,R/TP ,CHIP		
0	L103	INDUCTOR,CHIP	ELCHxxxxxx9	100 nH,J ,1005 ,R/TP ,		
0	L104	INDUCTOR,CHIP	ELCHxxxxxx9	100 nH,J ,1005 ,R/TP ,		
0	L201	INDUCTOR,SMD,POWER	ELCP0008104	10 uH,M ,ELP63LF1.5 ,R/TP ,power inductor 850mA		
0	L204	INDUCTOR,CHIP	ELCHxxxx411	1.2 nH,B ,1005 ,R/TP ,PBFREE		
0	L205	INDUCTOR,CHIP	ELCHxxxx411	1.2 nH,B ,1005 ,R/TP ,PBFREE		
0	Q201	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY		
0	R101	RES,CHIP,MAKER	ERHZxxxxxx8	4.7 ohm,1/16W ,J ,1005 ,R/TP		
0	R102	RES,CHIP	ERHY0009517	82 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R103	RES,CHIP	ERHY0009502	3.3 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R104	RES,CHIP	ERHY0009109	680 Kohm,1/16W ,F ,1005 ,R/TP		
0	Rxxx	RES,CHIP,MAKER	ERHZxxxxxx4	100 Kohm,1/16W ,F ,1005 ,R/TP		
0	R107	RES,CHIP	ERHY0009001	0 ohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R108	RES,CHIP	ERHY0009001	0 ohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R109	RES,CHIP	ERHY0009503	64 ohm,1/8W(0.05W) ,F ,0603 ,R/TP		
0	R110	RES,CHIP	ERHY0009505	24 ohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R113	RES,CHIP	ERHY0009503	10 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R119	RES,CHIP	ERHY0009504	1 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R11x	RES,CHIP	ERHY0009xx8	100 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R116	RES,CHIP	ERHY0009503	8.2 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R117	RES,CHIP	ERHYxxxxxx5	24 ohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R118	RES,CHIP	ERHY0009503	64 ohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R121	RES,CHIP	ERHY0009001	0 ohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R123	RES,CHIP	ERHY0009504	1 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R202	RES,CHIP	ERHY0009504	1 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R203	RES,CHIP	ERHY0011001	47 mohm,1/4W ,F ,2012 ,R/TP		
0	R804	RES,CHIP	ERHY0009518	680 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		
0	R20x	RES,CHIP	ERHY0009517	82 Kohm,1/8W(0.05W) ,J ,0603 ,R/TP		

Level	Location No	Description	Part Number	Spec	Color	Remark
6	R210	RES,CHIP	ERHY0000278	62K ohm,1/16W,J,1005,R/TP		
6	R300	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R302	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R303	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R303	RES,CHIP	ERHY0009515	220 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R304	RES,CHIP	ERHY0009508	100 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R305	RES,CHIP	ERHY0009515	220 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R307	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R309	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R310	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R311	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R312	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R320	RES,CHIP	ERHY0009507	1 Mohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R321	RES,CHIP	ERHY0009524	4.7 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R323	RES,CHIP	ERHY0009518	330 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R324	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R325	RES,CHIP	ERHY0009505	10 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R326	RES,CHIP	ERHY0009527	4.7 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R328	RES,CHIP	ERHY0009518	2.2 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R329	RES,CHIP	ERHY0009506	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R330	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R334	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R337	RES,CHIP	ERHY0009504	1 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R401	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R402	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	U101	IC	EUSY0382101	BGA ,105 PIN,R/TP ,1G Nor+256M SDRAM, 1.8V MD(Stacked)		
6	U103	IC	EUSY0374001	BGA ,208 PIN,R/TP ,EDGE BASE BAND S-GOLD2		
6	U301	IC	EUSY0359901	SOT23-5 ,5 PIN,R/TP ,2.4V Sense voltage(fixed), current monitor		
6	U303	IC	EUSY0369101	PG-VQFN-48 ,48 PIN,R/TP ,PMIC, Pb Free		
6	U304	IC	EUSY0364401	DFN ,10 PIN,R/TP ,LDO,3.3V 300mA Dual LDO		
6	U305	IC	EUSY0330301	SC70 ,5 PIN,R/TP ,Comparator, pin compatible to EUSY0277701		
6	U401	IC	EUSY0375801	SC70 ,6 PIN,R/TP ,Dual Buffer, Pb Free		
6	VA301	VARISTOR	SEVY0003502	5.5 V, ,SMD ,1005, 50pF		
6	VA302	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	VA303	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	VA308	DIODE,TVS	EDTY0000181	SOD-323 ,5 V,150 mW,R/TP ,1.6*0.8*0.4		
6	VA309	DIODE,TVS	EDTY0000181	SOD-323 ,5 V,150 mW,R/TP ,1.6*0.8*0.4		
6	X101	X-TAL	EXXY0000701	32.768 KHz,50 PPM,12.5 pF,70 Kohm,SMD ,3.2*1.5*0.9		
5	SAFD60	PCB ASSY,MAIN,SMT TOP	SAFD0000001			
6	C219	CAP,CERAMIC,CHIP	ECCH0004004	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C220	CAP,CERAMIC,CHIP	ECCH0007001	4.7 nF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C300	CAP,CHIP,MAKER	EEZH0000009	27 pF,50V ,J ,NP0 ,TC ,1608 ,R/TP		
6	C340	CAP,TANTAL,CHIP,MAKER	ECTZ0004009	68 uF,6.3V ,M ,STD ,3216 ,R/TP		
6	C350	CAP,CERAMIC,CHIP	ECCH0006012	1000 pF,50V ,K ,X7R ,HD ,2009 ,R/TP		
6	C351	CAP,CERAMIC,CHIP	ECCH0002115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C352	CAP,CHIP,MAKER	EEZH0000009	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C354	CAP,CERAMIC,CHIP	ECCH0000005	27 pF,50V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C355	CAP,CERAMIC,CHIP	ECCH0004004	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C356	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C357	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C358	CAP,CERAMIC,CHIP	ECCH0005005	27 pF,50V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C359	CAP,CERAMIC,CHIP	ECCH0005105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C360	CAP,CHIP,MAKER	EEZH0000101	68 nF,10V ,K ,X7R ,HD ,1608 ,R/TP		
6	C361	CAP,CERAMIC,CHIP	ECCH0005105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C362	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C364	CAP,TANTAL,CHIP,MAKER	ECTZ0005001	100 uF,4V ,M ,L_ESR ,3216 ,R/TP		
6	C365	CAP,CERAMIC,CHIP	ECCH0005105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C366	CAP,TANTAL,CHIP,MAKER	ECTZ0005001	100 uF,4V ,M ,L_ESR ,3216 ,R/TP		
6	C367	CAP,CHIP,MAKER	EEZH0001219	470 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C368	CAP,CHIP,MAKER	EEZH0001211	330 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C369	CAP,CERAMIC,CHIP	ECCH0004004	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C370	CAP,CHIP,MAKER	EEZH0000101	68 nF,10V ,K ,X7R ,HD ,1608 ,R/TP		
6	C371	CAP,CERAMIC,CHIP	ECCH0005105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C504	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C505	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C506	CAP,CERAMIC,CHIP	ECCH0000112	15 pF,50V,J,NP0,TC,1005,R/TP		
6	C507	CAP,CHIP,MAKER	EEZH0000009	27 pF,50V ,J ,NP0 ,TC ,1608 ,R/TP		
6	C510	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0000106	2.2 nF,50V ,M ,X5R ,TC ,1608 ,R/TP		
6	C515	CAP,CERAMIC,CHIP	ECCH0005101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C551	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

Level	Location No	Description	Part Number	Spec	Color	Remark
6	C338	CAP,CERAMIC,CHIP	ECCH0007901	10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP		
6	C340	CAP,TANTAL,CHIP,MARKER	ECTZD000019	33 uF,10V ,M ,STD ,3216 ,R/TP		
6	C341	CAP,CERAMIC,CHIP	ECCH0004002	2.2 uF,16V ,K ,X5R ,HD ,1608 ,R/TP		
6	C404	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C406	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C408	CAP,CHIP,MARKER	EC2H0000513	100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C409	CAP,CHIP,MARKER	EC2H0001008	0.5 pF,50V ,B ,NP0 ,TC ,1005 ,R/TP		
6	C410	CAP,TANTAL,CHIP,MARKER	ECTZD0K0E9	68 uF,6.3V ,M ,STD ,3216 ,R/TP		
6	C414	CAP,CERAMIC,CHIP	ECCH0009105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C416	CAP,CERAMIC,CHIP	ECCH0009103	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C416	CAP,CERAMIC,CHIP	ECCH0004005	0.5 pF,50V ,D ,X7R ,TC ,1005 ,R/TP		
6	C417	CAP,CERAMIC,CHIP	ECCH0004005	0.5 pF,50V ,C ,X7R ,TC ,1005 ,R/TP		
6	C418	CAP,CERAMIC,CHIP	ECCH0000001	2.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C419	CAP,CERAMIC,CHIP	ECCH0000801	0.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C420	CAP,CHIP,MARKER	EC2H0000502	1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C421	CAP,CHIP,MARKER	EC2H0000503	1.5 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP		
6	C422	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C423	CAP,CERAMIC,CHIP	ECCH0000701	1.2 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP		
6	C424	CAP,CERAMIC,CHIP	ECCH0000102	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C425	CAP,CERAMIC,CHIP	ECCH0000101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C427	CAP,CERAMIC,CHIP	ECCH0004004	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C428	CAP,CHIP,MARKER	EC2H0000508	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C429	CAP,CERAMIC,CHIP	ECCH0009105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C430	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C434	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C435	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C436	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,16V ,K ,B ,HD ,1608 ,R/TP		
6	C437	CAP,CERAMIC,CHIP	ECCH0009102	1000 pF,50V ,K ,X7R ,HD ,0603 ,R/TP		
6	C438	CAP,CERAMIC,CHIP	ECCH0000101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C439	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C440	CAP,CERAMIC,CHIP	ECCH0009105	100 pF,50V ,J ,X7R ,TC ,0603 ,R/TP		
6	C441	CAP,CERAMIC,CHIP	ECCH0009102	1000 pF,50V ,K ,X7R ,HD ,0603 ,R/TP		
6	C442	CAP,CERAMIC,CHIP	ECCH0005005	22 pF,25V ,J ,NP0 ,TC ,0603 ,R/TP		
6	C444	CAP,CHIP,MARKER	EC2H0000502	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C445	CAP,CERAMIC,CHIP	ECCH0009101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		
6	C446	CAP,CERAMIC,CHIP	ECCH0000101	0.1 uF,6.3V ,K ,X5R ,TC ,0603 ,R/TP		

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	CN302	CONN,SOCKET	EMBY0017501	14 PIN,STD , 2.54 mm,Micro-SD, USB Dual Socket		
6	CN901	CONNECTOR,BOARD TO BOARD	EMBY0015901	64 PIN,0.4 mm,STRAIGHT ,AU ,0.8MM HEIGHT		
6	CN-ant	CONN,RF SWITCH	EMAYxxxxxxx	,SMD ,1.3 dB,		
6	D201	DIODE,SWITCHING	EDBY0017701	SOD-128 ,40 V,1 A,R/TP , , , , , , , , ,Single(),Single(),SP ,1		
6	FB301	FILTER,BEAD,CHIP	EFBHD0607102	10 ohm,1608 ,Ferrite Bead		
6	FB302	FILTER,BEAD,CHIP	EFBHD0607102	10 ohm,1608 ,Ferrite Bead		
6	FB303	FILTER,BEAD,CHIP	EFBHD0607102	10 ohm,1608 ,Ferrite Bead		
6	FB304	FILTER,BEAD,CHIP	EFBHxxxx7102	10 ohm,1608 ,Ferrite Bead		
6	FL401	FILTER,SEPERATOR	EFRY0003401	850,900 ,1800,1900 ,3.8 dB,3.6 dB, dB, dB,ETC ,0.903.501.8 Max, Quad PBA		
6	L201	INDUCTOR,CHIP	ELCHD056089	100 nH,J ,1005 ,R/TP ,		
6	L202	INDUCTOR,CHIP	ELCHD056089	100 nH,J ,1005 ,R/TP ,		
6	L203	INDUCTOR,CHIP	ELCHD060089	100 nH,J ,1005 ,R/TP ,		
6	L401	INDUCTOR,CHIP	ELCHxxxx089	100 nH,J ,1005 ,R/TP ,		
6	L402	INDUCTOR,CHIP	ELCHD061419	82 nH,J ,1005 ,R/TP ,PBFREE		
6	L403	INDUCTOR,CHIP	ELCHD031482	15 nH,J ,1005 ,R/TP ,Pb Free		
6	L404	INDUCTOR,CHIP	ELCHD031089	8.8 nH,S ,1005 ,R/TP ,PBFREE		
6	L405	INDUCTOR,CHIP	ELCHD031089	8.8 nH,S ,1005 ,R/TP ,PBFREE		
6	PT401	THERMISTOR	METYB004501	NTC ,10000 ohm,SMD ,1005, 4250-4550K, J, R/T, PBFREE		
6	Q201	TR,FET,P-CHANNEL	EQFP0066901	TSOP-6 ,1.14 W,-20 V,-6.7 A,R/TP ,P-Channel FET		
6	Q202	TR,FET,P-CHANNEL	EQFP0061501	SOT-323 ,.29 W,1.8 V,.69 A,R/TP ,P-Channel MOSFET, Pb free		
6	R209	RES,CHIP	ERJHY0068068	39 Kohm,1/20W(0.05W) ,F ,0603 ,R/TP		
6	R211	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R212	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R216	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R214	RES,CHIP	ERJHY0068068	4.7 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R215	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R216	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R217	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R218	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R219	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R221	RES,CHIP	ERJHY0066716	0.15 ohm,1/8W ,F ,0612 ,R/TP		
6	R223	RES,CHIP	ERJHY0068024	4.7 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R224	RES,CHIP	ERJHY0068008	100 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R225	RES,CHIP	ERJHY0068008	100 Kohm,1/20W(0.05W) ,J ,0603 ,R/TP		

Level	Location No	Description	Part Number	Spec	Color	Remark
0	R838	RES,CHIP	ERHY0008564	47 ohm,1/16W(5.08W) ,J ,0603 ,R/TP		
0	R837	RES,CHIP	ERHY0008564	47 ohm,1/16W(5.08W) ,J ,0603 ,R/TP		
0	R836	RES,CHIP,MAKER	ERHE0008402	24 ohm,1/16W ,J ,1608 ,R/TP		
0	R835	RES,CHIP	ERHY0008608	10 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R833	RES,CHIP	ERHY0008627	4.7 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R851	RES,CHIP	ERHY0008608	10 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R832	RES,CHIP,MAKER	ERHE0008402	24 ohm,1/16W ,J ,1608 ,R/TP		
0	R830	RES,CHIP	ERHY0008608	100 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R834	RES,CHIP	ERHY0008605	10 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R838	RES,CHIP	ERHY0008603	100 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R826	RES,CHIP	ERHY0008608	10 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R827	RES,CHIP	ERHY0008628	4.7 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R824	RES,CHIP,MAKER	ERHE0008401	0 ohm,1/16W ,J ,1608 ,R/TP		
0	R822	RES,CHIP	ERHY0008611	1.5 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R840	RES,CHIP	ERHY0008608	10 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R841	RES,CHIP,MAKER	ERHE0008401	0 ohm,1/16W ,J ,1608 ,R/TP		
0	R848	RES,CHIP	ERHY0008608	10 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R849	RES,CHIP	ERHY0008628	4.7 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R844	RES,CHIP	ERHY0008608	100 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R806	RES,CHIP	ERHY0008601	0 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R802	RES,CHIP	ERHY0008604	1 Mohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R814	RES,CHIP,MAKER	ERHE0008408	10 ohm,1/16W ,J ,1608 ,R/TP		
0	R816	RES,CHIP	ERHY0008608	100 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R818	RES,CHIP	ERHY0008608	100 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R820	RES,CHIP	ERHY0008611	1.5 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R404	RES,CHIP,MAKER	ERHE0008401	0 ohm,1/16W ,J ,1608 ,R/TP		
0	R405	RES,CHIP,MAKER	ERHE0008418	1800 ohm,1/16W ,J ,1608 ,R/TP		
0	R406	RES,CHIP	ERHY0008601	0 ohm,1/16W,F,1608,R/TP		
0	R407	RES,CHIP	ERHY0008601	0 ohm,1/16W,F,1608,R/TP		
0	R408	RES,CHIP	ERHY0008601	0 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R409	RES,CHIP	ERHY0008601	0 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R410	RES,CHIP	ERHY0008601	0 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R411	RES,CHIP	ERHY0008168	820 ohm,1/16W ,F ,1608 ,R/TP		
0	R414	RES,CHIP	ERHY0008617	22 Kohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R418	RES,CHIP,MAKER	ERHE0008402	10 ohm,1/16W ,J ,1608 ,R/TP		
0	R416	RES,CHIP	ERHY0008601	0 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		
0	R418	RES,CHIP	ERHY0008601	0 ohm,1/8W(0.05W) ,J ,0805 ,R/TP		

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No	Description	Part Number	Spec	Color	Remark
6	R420	RES,CHIP,MAKER	[illegible]	820 ohm,1/16W ,J ,1005 ,R/TP		
6	R421	RES,CHIP	ERHY000[illegible]	10 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R422	RES,CHIP	ERHY000[illegible]	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	[illegible]	RES,CHIP	ERHY000[illegible]	0 ohm,1/20W(0.05W) ,J ,0603 ,R/TP		
6	R424	RES,CHIP,MAKER	[illegible]	0 ohm,1/16W ,J ,1005 ,R/TP		
6	[illegible]	RES,CHIP,MAKER	[illegible]	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R426	RES,CHIP,MAKER	[illegible]	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R427	RES,CHIP,MAKER	[illegible]	0 ohm,1/16W ,J ,1005 ,R/TP		
6	SPFY00	PCB,MAIN	SPFY0130901	FR-4 ,0.8 mm,STAGGERED-16 , . , ...		39
6	SW401	CONN,RF SWITCH	[illegible]	STRAIGHT ,SMD ,0.8 dB,MULTI MODEL		
6	U204	IC	EUSY[illegible]	DFN ,8 PIN,R/TP ,Li-Ion charger IC, 3 L/d 2 x 3 DFN, Pb-free		
6	U205	IC	EUSY[illegible]	WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free		
6	U206	IC	EUSY0214401	QFN ,16 PIN,R/TP ,		
6	U207	IC	EUSY[illegible]	Output capless audio subsystem with 3D ,24 PIN,R/TP ,MS subsystem audio amp		
6	U208	IC	EUSY[illegible]	WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free		
6	U302	IC	[illegible]	SOT-23 ,5 PIN,R/TP ,DC MOTOR DRIVER / INTEGERATED RELAY		
6	U304	IC	EUSY[illegible]	DFN ,10 PIN,R/TP ,OVP		
6	U402	PAM	SMPY0012301	dBm, %, A, dBc, dB, ,SMD ,		
6	U403	IC	EUSY0274401	VQFN ,48 PIN,R/TP ,GPRS, EDGE TRANSCEIVER		
6	VA201	VARISTOR	SEVY0004001	18 V, ,SMD ,3pF, 1005		
6	X401	VCTCXO	[illegible]	26 MHz,2 PPM,10 pF,SMD ,3.2*2.5*0.9 ,2.5ppm at -30 to +75, AFC 0.5V to 2.5V, Supply 2.8V		

12.3 Accessory

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

Level	Location No	Description	Part Number	Spec	Color	Remark
3	[illegible]	BATTERY PACK,LI-ION	[illegible]	3.7 V,800 mAh,1 CELL,PRISMATIC ,CMW PJT BATT, Innerpack, Europe Label, Pb-Free ,; ,3.7 ,800 ,3.20 ,PRISMATIC ,43x34x10 , ,ALLTEL SILVER ,Innerpack ,CMW Slide & Folder	AIRY BLUE	85
3	[illegible]	DATA CABLE	[illegible]	LG-Lizard ,10pin USB DataCable		
4	[illegible]	EAR PHONE,EAR MIKE SET	[illegible]	; ,40mW ,16 OHM ,100dB ,F0 ,100 HZ ,[empty] ,[empty] ,1.5F MMI CONNECTOR ,SILVER,LG MARK		
3	[illegible]	ADAPTOR,AC-DC	[illegible]	100-240V ,50/60 Hz,4.6 V,0.8 A,CE & CE ,10pin plug		

Note