

Service Manual



# Service Manual

## C2500

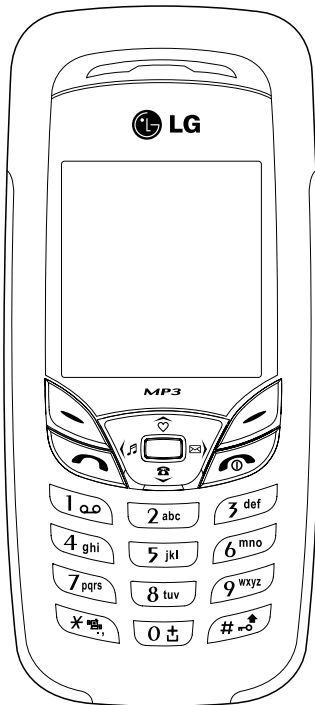


Model : C2500



# Service Manual

Personal Cellular Telephone



# C2500

## WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Every care has been taken to ensure that contents of this service manual give an accurate representation of the equipment. However, DARTS TECHNOLOGIES CORP. accepts no responsibility for inaccuracies which may occur and reserves the right to make changes to the design without prior notice.

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## **IMPORTANT**

**This document is intended for use by qualified service personnel only.**

Our policy is of continuous development; details of all technical modifications will be included with service bulletins.

While every endeavor has been made to ensure the accuracy of this document, some errors may exist. If any errors are found by the reader, please notified it to company

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## **Warnings and Cautions**

Please refer to the phone's user guide for instructions relating to operation, care and maintenance including important safety information. Note also the following:

### **Warnings:**

1. CARE MUST BE TAKEN ON INSTALLATION IN VEHICLES FITTED WITH ELECTRONIC ENGINE MANAGEMENT SYSTEMS AND ANTI-SKID BRAKING SYSTEMS. UNDER CERTAIN FAULT CONDITIONS, EMITTED RF ENERGY CAN AFFECT THEIR OPERATION. IF NECESSARY, CONSULT THE VEHICLE DEALER/MANUFACTURER TO DETERMINE THE IMMUNITY OF VEHICLE ELECTRONIC SYSTEMS TO RFENERGY.
2. THE HANDPORTABLE TELEPHONE MUST NOT BE OPERATED IN AREAS LIKELY TO CONTAIN POTENTIALLY EXPLOSIVE ATMOSPHERES EG PETROL STATIONS (SERVICE STATIONS), BLASTING AREAS ETC.
3. OPERATION OF ANY RADIO TRANSMITTING EQUIPMENT, INCLUDING CELLULAR TELEPHONES, MAY INTERFERE WITH THE FUNCTIONALITY OF INADEQUATELY PROTECTED MEDICAL DEVICES. CONSULT A PHYSICIAN OR THE MANUFACTURER OF THE MEDICAL DEVICE IF YOU HAVE ANY QUESTIONS. OTHER ELECTRONIC EQUIPMENT MAY ALSO BE SUBJECT TO INTERFERENCE.

### **Cautions:**

1. Servicing and alignment must be undertaken by qualified personnel only.
2. Ensure all work is carried out at an anti-static workstation and that an anti-static wrist strap is worn.
3. Ensure solder, wire, or foreign matter does not enter the telephone as damage may result.
4. Use only approved components as specified in the parts list.
5. Ensure all components, modules screws and insulators are correctly re-fitted after servicing and alignment. Ensure all cables and wires are repositioned correctly.

# 1. INTRODUCTION

## 1.1. Purpose of the Manual

This service manual contains the information and procedures required for instilling, operating and servicing the LG GSM Personal Cellular Mobile Telephone system operating on GSM Digital Cellular Networks.

## 1.2. Structure of the manual

The manual is structured to provide service engineering personnel with the following information and procedures:

1. General and technical information - provides a basic understanding of the equipment, kits and options, together with detailed information for each of the major component parts.
2. Installation and operating information - provides instructions for unpacking, installing and operating the equipment.
3. Servicing information - provides complete instructions for testing, disassembly, and reassembly of the product. Step-by-step troubleshooting information is given to enable the isolation and identification of a malfunction, and thus determine what corrective action should be taken. The test information enable verification of the integrity of the equipment after any remedial action has been carried out.
4. Illustrated parts list - provides to enable the identification of all cosmetic and some electrical components, for the ordering of replacement parts.

## 1.3. Servicing Responsibilities

The procedures described in this manual must performed by qualified service engineering personnel, at an authorized service center.

The service engineering personnel are responsible for fault diagnosis and repair of all equipment described in this manual.

## 2. LEVEL 2 SERVICE GUIDELINES

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## 2. LEVEL 2 SERVICE GUIDELINES

### 2.1. Introduction

The document is intended to help you carry out repair up to Level 2 on the C2500 mobile phone. The repair for International version and Asian variants are identical unless otherwise noted, therefore the description herein is confined to C2500 only.



*All repairs have to be carried out in an environment set up according to ESD regulations defined in international standards.*

### 2.2. Level of Repair Guidelines

The following description provides an outline of the level of repairs that could be determined at customers' premises. The level of repairs are highly dependent on the customer's resource and capabilities and are approved by



*Please abide by your service contract agreements in determining the level of repairs that you are capable of conducting. Only qualified personnel shall perform all the related repair procedures based on the service contract*

#### 2.2.1. Level 0

This level **DO NOT** involved any kinds of repair or disassembly of the mobile unit. The customer **ONLY** needs to identify the fault occurred and send back the faulty units with the fault report to DARTS Mobile Service Center. The inventory swap units are available for order.

#### Level 0 Part No.

DARTS P/N	Description	SVC Level	LG P/N
2284-1870-6000	Swap Unit Complete, C2500	L0	

#### 2.2.2. Level 1

This level requires the repair or disassembly of the mobile unit up to a certain specified criteria. This level might requires a specific tools in conducting the Level 1 repair job. All components attached to the upper and lower casings are replaceable.

## 2. LEVEL 2 SERVICE GUIDELINES

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DO NOT remove any components on the PCB board.

If the repaired units still DO NOT function properly, customer needs to attach the fault report together with the units complete with housings and send back to DARTS Mobile Service Center for further investigations. The components listed below are intended for Level 1 repair spares only.

### Level 1 Part No.

DARTS P/N	Description	SVC Level	LG P/N
2207-0030-0003	Vibrator 3V	L1	SJMY0007009
228S-2187-0010	BOTTOM CASE Ass'y Silver	L1	ACGM0071701
221C-BA03-0102	Battery connector Pitch=2.5mm 3Pin PA08303	L1	ENZY0018701
2285-3187-0000	Antenna Ass'y ( w Louder SPK)	L1	SNGF0013601
2206-1110-0001	Receiver Panasonic - EASG1D501E2	L1	SURY0009301
228S-1187-0000	TOP CASE Ass'y LG Silver ( w LENS)	L1	ACGK0073101
2211-DP18-1100	Deco. Plate for Side-L	L1	MDAC0017601
2211-DP18-2100	Deco. Plate for Side-R	L1	MDAC0017701
2211-SE18-0100	SIDEKEY 1 WAY	L1	MBJL0032901
2211-SE18-1100	SIDEKEY 2 WAY	L1	MBJN0008401
2218-1800-6280	Keypad RUS Silver	L1	ABGA0006901
2212-DM18-0000	Metal dome	L1	ADCA0051201
2206-5030-0083	MIC. FPT-22718-3	L1	SUMY0005604
2211-BA18-0100	Battery Cover LG	L1	MCJA0032301
2213-TR18-0100	RF_SW_CAP rubber Grey	L1	MCCF0035601
2214-MF13-3Z80	Screw (M1.6*3.8)°AZN°AWhite	L1	GMZZ0020401
2213-TR18-1100	PHONE JACK CAP	L1	MCCC0036001
2213-TR18-2100	USB CAP	L1	MCCE0029101
225N-TM03-3280	SENSOR VGA TM03-E1-X10	L1	

### 2.2.3. Level 2

This level of repair requires the exchange of the mobile unit main board. There will be non-removal of any components on the faulty main board. The exchanged faulty main boards shall be properly packed in a plastic bulk with the attached IMEI label and fault report and send back to DARTS Mobile Service Center for detailed repairs.



## 2. LEVEL 2 SERVICE GUIDELINES

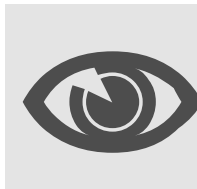
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### Level 2 Part No.

DARTS P/N	Description	SVC Level	LG P/N
2218-18B5-0080	PCB Main Board, C2500	L2	SAFY0159101

### 2.2.4. Level 2.5

This level requires the repair or removal of certain specified discrete components of the mobile units' main board. This level of repair might requires a specific tools and soldering equipments with proper soldering jigs in conducting the repair job.



*ONLY THE QUALIFIED PERSONNEL SHALL BE LIABLE TO PERFORM THIS LEVEL OF REPAIRS UNDER THE SUPERVISION AND APPROVAL OF DARTS TECHNICAL TRAINER.*

### Level 2.5 Part No.

DARTS P/N	Description	SVC Level	LG P/N
2221-1341-0082	LCM STN 128x128dot 26P LKC34TML8Y	L2.5	SVLY0027001
220B-0010-0000	BACKUP BATT D4.8Xh1.4mm 0.06F XC414-II06	L2.5	SBCL0001003
220S-1020-0081	SIDE KEY 20MA/12V 6P	L2.5	ESCY0004301
220S-2010-0081	RF TEST SWITCH 6000MHz 2W 50 OHM MS156	L2.5	ENWY0004101
2212-BC18-0000	BASE BAND COVER FOR ARI	L2.5	MCBA0011201
2212-BF18-0000	BASE BAND FRAME FOR ARI	L2.5	MCBA0011202
2212-RC18-0000	RF COVER FOR ARI	L2.5	MCBA0011301
2212-RF18-0000	RF FRAME FOR ARI	L2.5	MCBA0011302
221C-SC06-0182	SIM CARD CONN PITCH=2.54mm 6P 217-010-60	L2.5	ENSY0017201
221C-SP02-0186	SPEK CONN P=3mm 2P CBE-2809-2258H POGOPI	L2.5	ENZY0018401
221C-PG01-0181	POGO PIN 1P CDR-5815-2961	L2.5	ENZY0018501
221J-EP06-0988	EARPHONE JACK 6P	L2.5	ENJE0005101
221C-IN05-0185	MINI USB CONN 5P US25R05-SBP	L2.5	ENRY0006201
2265-3010-0582	LED R G B HT-372FCH-DT	L2.5	EDLS0001001
221C-sk20-0186	Socket 20p CLE9020-0102F	L2.5	ENSY0017301

## 2. LEVEL 2 SERVICE GUIDELINES



*DO NOT INTEND TO REMOVE ANY ACTIVE COMPONENTS AS THIS WILL CAUSE THE MAIN BOARDS TO MALFUNCTION AND BEYOND THE REPAIR BOUNDARIES*

### 2.3. Level of Repair Service Tools and Interfaces

This section provides an overview of the necessary equipments and tools to conduct the specified levels of repair job accordingly.

Level of Repairs	Tools & Equipments	DARTS P/N	LG P/N
0	Not required		
1	ESD Strap, Tweezer, Power Drill, Air blower, Flux remover, Disassembly tool, Digital Multimeter		
2	ESD Strap		
2.5	As in Level 1 with additional equipment: Soldering and desoldering station, Flux paste, Solder wick, Solder lead, C2500 soldering jigs, CTS 55 GSM Tester, C2500 Testing jigs, Power supply		

The service interface is used for the purpose of communicating with the mobile unit in situation such as software upgrading and testing process. These service interfaces are listed below:

DARTS P/N	Description	SVC Level	LG P/N
	RF Cable	L2.5	
	SW D/L cable :	ALL	

### 2.4. Features

The LG Telephone Model C2500 is a high performance small, light handset for business and domestic use. The following features are provided:

1. Triple Codec which includes Half Rate / Full Rate and Enhanced Full Rate (EFR) speech codec.
2. Tri Band E-GSM900 and DCS1800 operation.
3. GPRS Service.
4. T9 Text Entry.

## 2. LEVEL 2 SERVICE GUIDELINES

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5. Voice Ringer.
6. Wireless Application Protocol (WAP) Browser.
7. Backup Battery.
8. Downloadable polyphonic melody ring tones.
9. Clock, Calculator and Currency Converter.

### 2.5. Mobile Unit Basic Kit

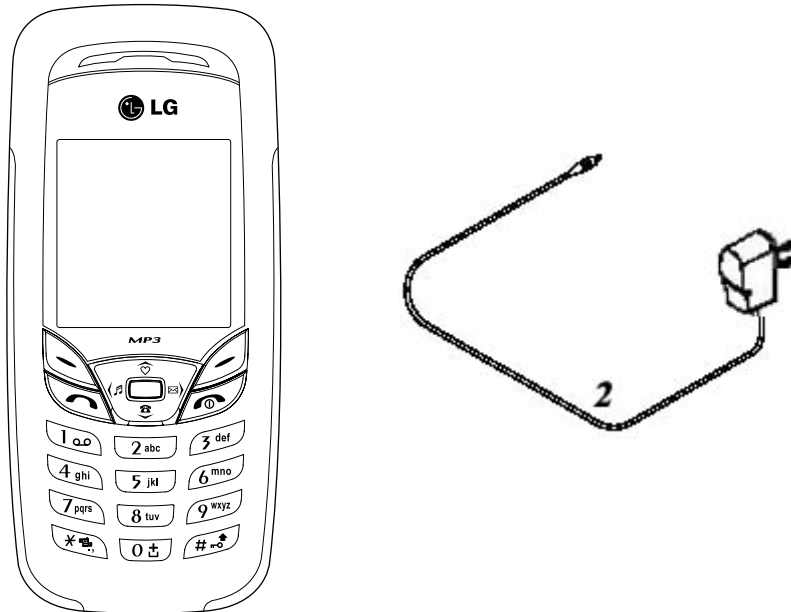


Figure 2.1: Hand portable Main Unit Kit Content

Item	Description	Part Number
1	Handset	2284-1870-A000
2	AC Travel Charger	2237-22T0-1003
3	Standard Battery (Li-Ion 720mAh)	220A-0307-1000

### 3. OPERATING INSTRUCTIONS

#### 3.1. General

This section provides a brief guide to the operation and facilities available on the telephone handset. Refer to the Operating Instruction supplied with the telephone for full operational information.

#### 3.2. Liquid Crystal Display

The telephone handset has a graphical chip on glass display. The following icons are available:



Figure 3.1: Crystal Display

1. Top of the screen shows Essential Indicators. (See table below)
2. Next line displays the operator name
3. shows date/time.
4. To enter **Menu** press left selection key.
5. To use **Name** in the phone book press right selection key.

### 3. OPERATING INSTRUCTIONS

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#### Essential indicators

	Indicates signal strength and alternate line service.
	Shows handset current battery charge strength.
	Indicates the phone keypad is locked.
	Indicates the profiles alert type is Ring
	Indicates the profiles alert type is vibration.
	Indicates the profiles alert type is vibration and ring.
	Indicates the profiles alert type is vibration then ring.
	Indicates the profiles alert type is light only.
	The Alarm clock is set on.
<b>Rm</b>	Indicates "roaming".
	Indicates missed call.
	Indicates Broadcast set on.
	Indicates new text messages.
	Indicates call diverted is set on
	Indicates record function on

3.3. Location of Controls

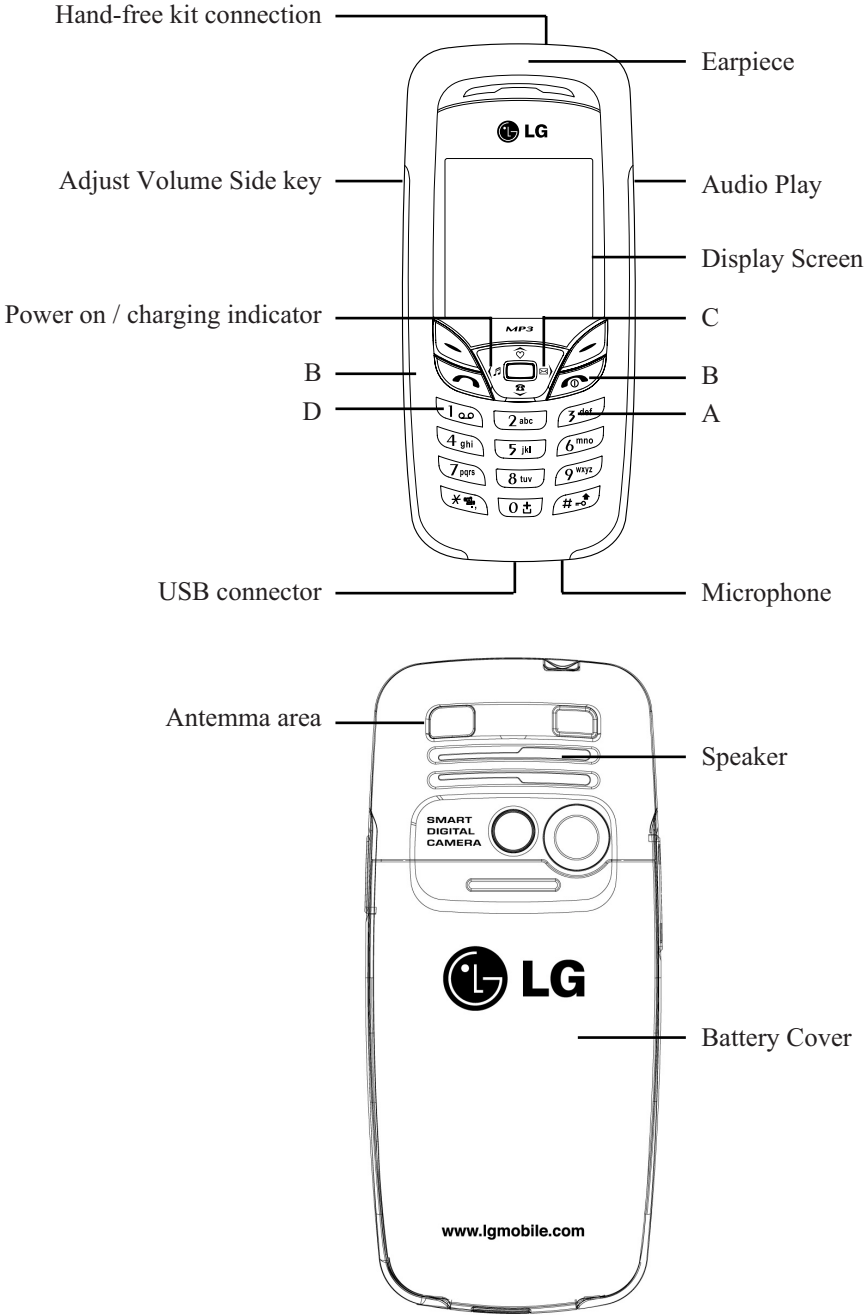


Figure 3.2: Location of Controls

### 3. OPERATING INSTRUCTIONS

#### 3.4. Alpha Entry

##### 3.4.1. Character Set / Key Assignments

There are 20 keys on C2500, including 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, \*, #, SEND, END, Left-Soft-Key (LSK), Right-Soft-Key (RSK), 4-way Navigation Key.

The following ID drawing is only used for Keypad Layout's reference.

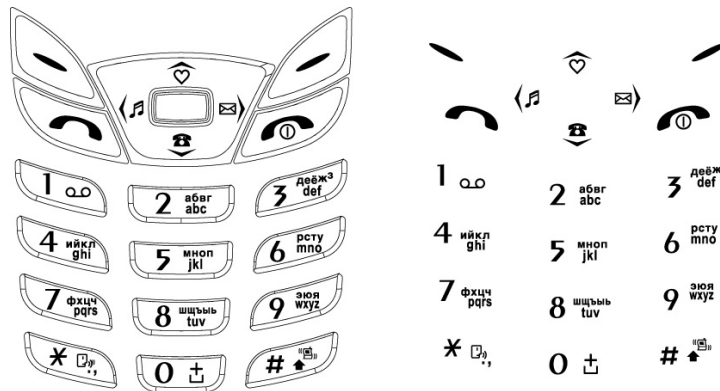


Figure 3.3:C2500 Keypad Layout

### ➤ Key Function List

#### λ A. Power/End key.



- Switch phone on and off. Also, ends a call or Exit from any function and back to Idle mode.

#### λ B. Selection Key



- The function of the keys depends on the text shown on the display above the keys.  
For example, **Menu** and **Name** in Idle mode.

#### λ C. Navigation Key



- Use for quick access to phone functions in Idle mode.
  - ◆ Up key: Access to the **Favorites** menu.
  - ◆ Down key: Access to the **Phone book** menu
  - ◆ Left key: Access to the **Profiles** menu
  - ◆ Right key: Access to the **Messages** menu
- Scroll through names and numbers stored in the phone book or through the phone's menus, submenus, and option list.

#### λ D. Send/Answer Key



- Make and answer calls; press in Idle mode to see recent dialed calls.
- 0-9 input number and character

#### λ E. Left Side Key

- Adjust handset volume

#### λ F. MP3 Play Key

- The shortcut to enter audio player in Idle mode.
- The capture key to take picture in camera mode.



### 3. OPERATING INSTRUCTIONS

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## 3.5. Public Man Machine Interface (MMI)

### 3.5.1. Reading the Phonebook Memory Location

# <MEMORY LOCATION> #

Leading zeros can be left out of the location number, e.g. 007 can be 7.

### 3.5.2. Features for Factory Service

Features	Description
Production or service mode	<p>By 2945## to enter production mode</p> <p><b>A. Version[1]</b>            This displays the version of each item.</p> <ul style="list-style-type: none"> <li>• Version Info Summary: The software version.</li> <li>• MCU SW: The protocol Version.</li> <li>• Melody: Melody version.</li> <li>• Serial No: Phone Serial number.</li> <li>• BB Chip: Base band chipset version.</li> <li>• DSP Code: DSP code compile time.</li> <li>• DSP Patch: DSP patch version.</li> <li>• MS Board: MS board version.</li> <li>• Build No: The SW build time.</li> </ul> <p><b>B. Resource BIN[2]</b>            This displays the resource BIN of each item.</p> <ul style="list-style-type: none"> <li>• AUDIO: The audio resource BIN Version.</li> <li>• IMAGE: The image resource BIN Version.</li> <li>• STR: The string resource BIN Version.</li> <li>• FONT: The font resource BIN Version</li> </ul> <p><b>C. Echo loop[3]</b>            This menu is to test the analog loop back path from MIC to Receiver.</p> <p><b>D. Keypad[4]</b>            This menu is to test all Keypad keys.</p> <p><b>E. Vibrator[5]</b>            This menu is to test the Vibrator.</p> <p><b>F. Loud Spk[6]</b>            This menu is to test the Loud Speaker.</p>

### 3. OPERATING INSTRUCTIONS

	<p><b>G. Ring tone[7]</b> This menu is to test the Ring tone.</p> <p><b>H. LED[8]</b> This menu is to test the LED.</p> <ul style="list-style-type: none"> <li>• Main LCM BL on: Main LCM BL is on.</li> <li>• Main LCM BL off: Main LCM BL is off.</li> <li>• Keypad LED on: Keypad LED is on.</li> <li>• Keypad LED off: Keypad LED is off.</li> </ul> <p><b>I. LCD[9]</b> This menu is to test primary colors of LCD Module.</p> <p><b>J. LCD contrast[10]</b> This menu is to set the LCD contrast.</p> <ul style="list-style-type: none"> <li>• Main LCD [10-1]: Change this value by up and down key.</li> </ul> <p><b>K. Receiver[11]</b> This menu is to test the Receiver.</p> <p><b>L. Charger[12]</b> This displays all the ADC values.</p> <ul style="list-style-type: none"> <li>• VBAT: Main Battery Voltage.</li> <li>• BTemp: Battery Temperature.</li> <li>• VAUX: Headset hook detection voltage.</li> <li>• Current: Charging current.</li> <li>• VChgr: Charging voltage.</li> </ul> <p><b>M. Headset[13]</b> This menu is to test the analog loop back path from headset MIC to headset Receiver.</p> <p><b>N. RTC[14]</b> This menu is to test the real time clock. Set a 3-second alarm and Switch off the MS. After the alarm expires, the MS will power on automatically.</p> <p><b>O. Nand Flash[17]</b> This menu is to test the Nand flash.</p> <p><b>P. CAMERA[18]</b> This menu is the test Camera module by picture preview and parameter setting.</p>
Display IMEI	By *#06#
Reset to default language	*#0000#[SEND]
Set language to Russian	*#0007#[SEND]
Set language to English	*#0044#[SEND]

## 3. OPERATING INSTRUCTIONS

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### 3.5.3. Tips for Call Option

A call can be connected to any single caller by pressing Option key. When user press Option key during active call, user can choose one of those functions from the list:

Hold: put a call on.

Retrieve: reconnect a holding call.

Retrieve All: reconnect all holding call.

Swap: switch between the call on hold and active.

Conference: make a multi-party conversation.

Transfer: transfer a call.

Spilt: to suspend the multi-party call.

End Single: end one of conference call.

End All: end a multi-party call.

End: End a call.

Mute: mute the call during the conversation.

New Call: make a new call during an active call.

Phonebook: shortcut to phonebook menu.

SMS: shortcut to Message menu.

Sound Recorder: shortcut to Sound Recorder submenu.

DTMF: set On / Off for DTMF (Dual Tone Multi-Frequency) tone dialing system.




### 3.6. Security Procedure

Features	Description
PIN 1 and 2	PIN activate, changing and deactivation
PIN control	Menu entry to change PIN2/phone code
Phone code	Manufacture defined codes to protect phone (4 - 8 digits). Changeable by user.
FDN	Fixed Dialled Number for limited Dialling
BDN	Barred Dialled Number for limited Dialling

## 3. OPERATING INSTRUCTIONS

### 3.7. Troubleshooting

The user is given the following information and advised to contact the dealer if the problems persist:

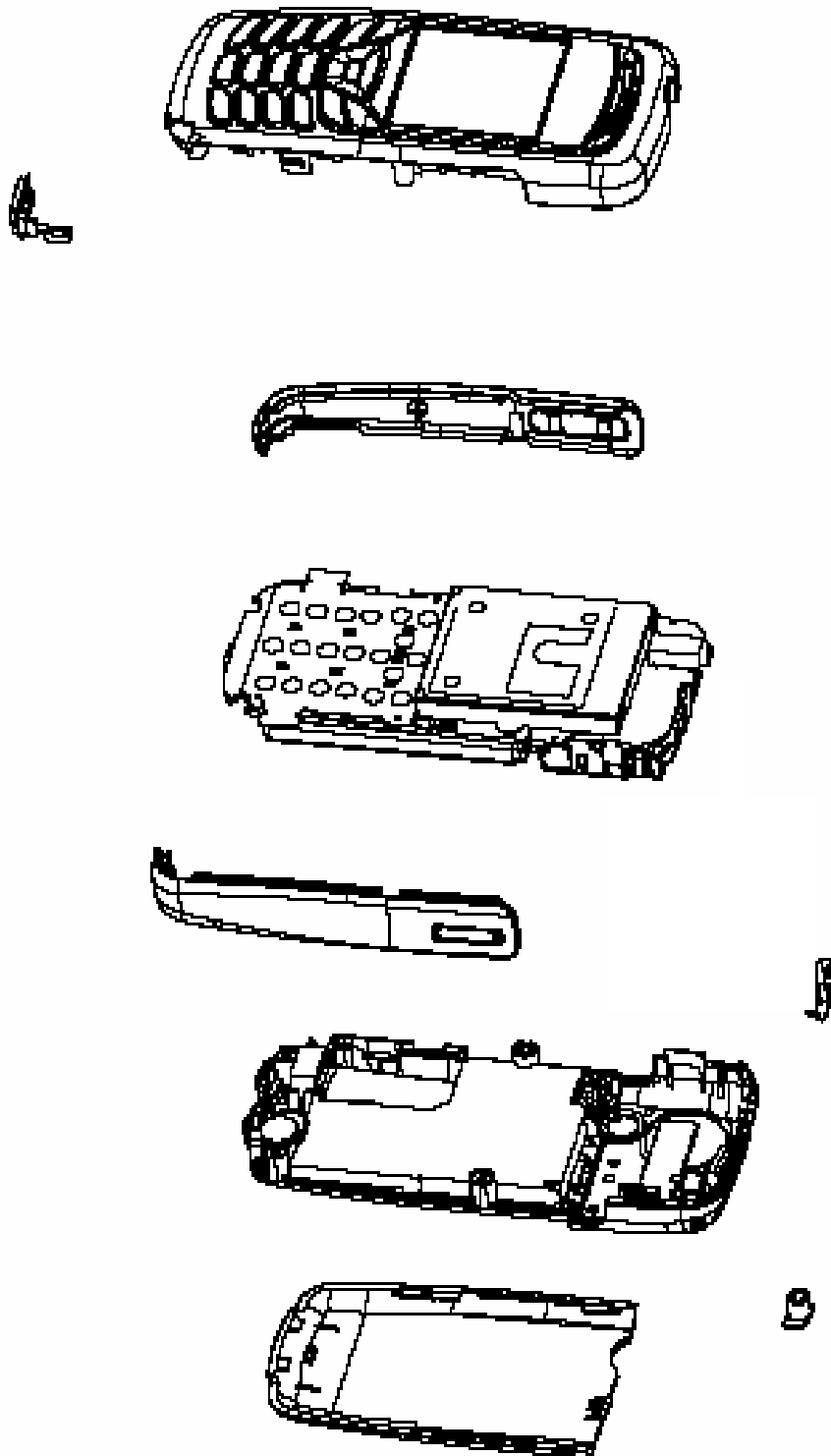
Problem	Cause	Remedy
Telephone will not switch on		Check that the battery pack is fully charged and correctly connected to the telephone.
Extremely short battery life for a new battery pack	The network in use and the condition of the battery pack can affect battery life.	Avoid areas of poor reception. Ensure batteries are fully charged.
Short battery life for an old battery pack	The battery pack was worn out.	Replace with a new one.
The battery level indicator  does not light when charging	If a battery is deeply discharged it will take a short time before there is sufficient owner in the telephone to light the battery level indicator  .	Leave to charge for several minutes in temperatures between +5°C and + 35°C.
Calls cannot be made	The telephone is locked.	Unlock the telephone (Menu: Security: Phone Lock).
	Outgoing calls are barred.	Disable the outgoing call barring (Menu: Security: Call Bar).
	The telephone is not registered to a network.	Move to a coverage area and operate the telephone after it has registered with a network.
Calls cannot be made from Fixed Dial Store		Check that SIM supports Fixed Dial Check if the Fixed Dial is switched on (Menu: Security: Fixed Dial). Check the telephone number is stored in the Fixed Dial.
Calls cannot be received	The telephone is not switched on.	Switch the telephone on.
	Incoming calls are barred.	Disable the incoming call barring (Menu: Security: Call Bar).
	The telephone is not registered to a network.	Move to a coverage area and operate the telephone after it has registered with a network.
Emergency calls cannot be made	User's phone is not in a GSM coverage area.	Check that the antenna symbol  is displayed. Move to coverage are and operate the telephone when the antenna symbol is displayed.
Telephone numbers Cannot be recalled	The telephone is locked.	Unlock the telephone (Menu: Security: Phone Lock).
	Fixed Dial is switched on	Switch off Fixed Dial (Menu: Security: Fixed Dial).

## 4. ASSEMBLY INSTRUCTIONS

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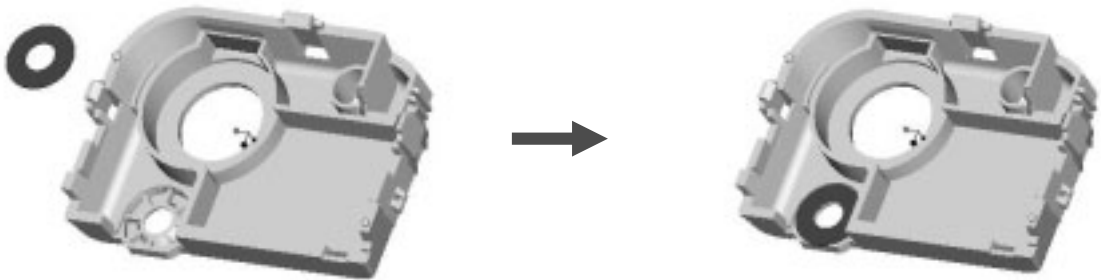
### 4. ASSEMBLY INSTRUCTIONS

#### 4.1. Assembly Structure

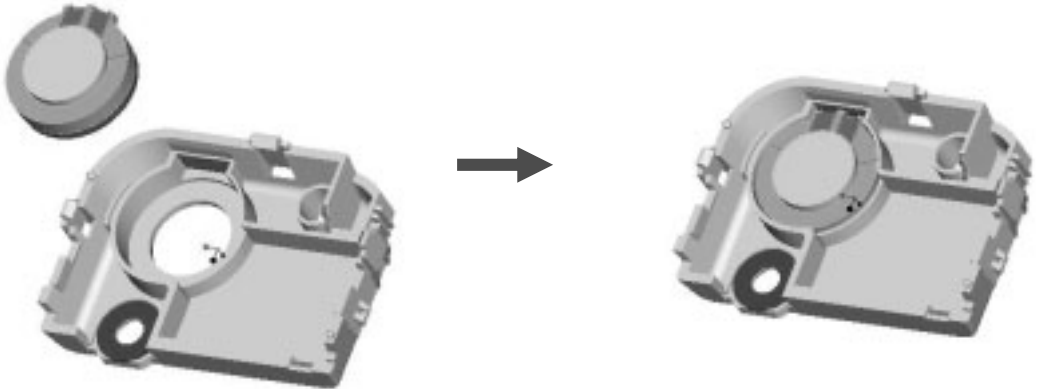


### 4.2. Antenna Base sub assembly

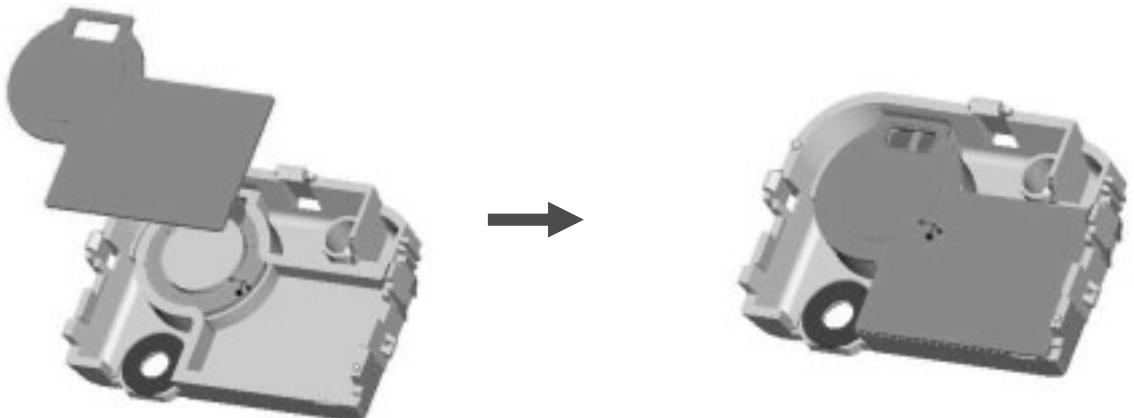
1. To add cmos rubber on antenna base



2. To add speaker on antenna base



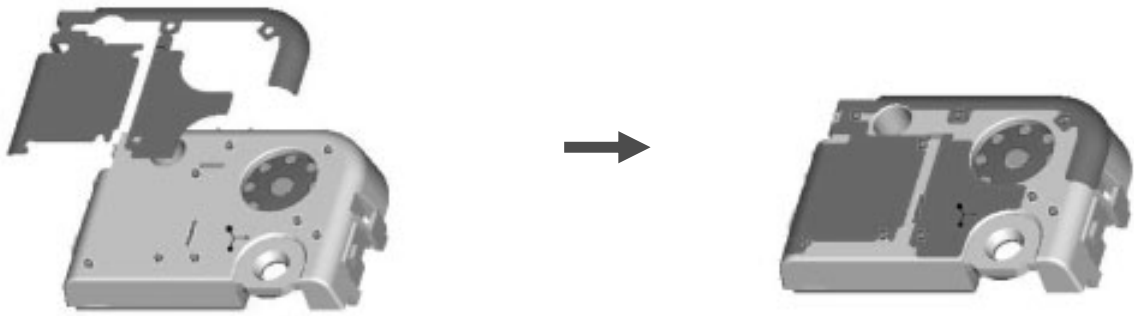
3. To add speaker cover on antenna base



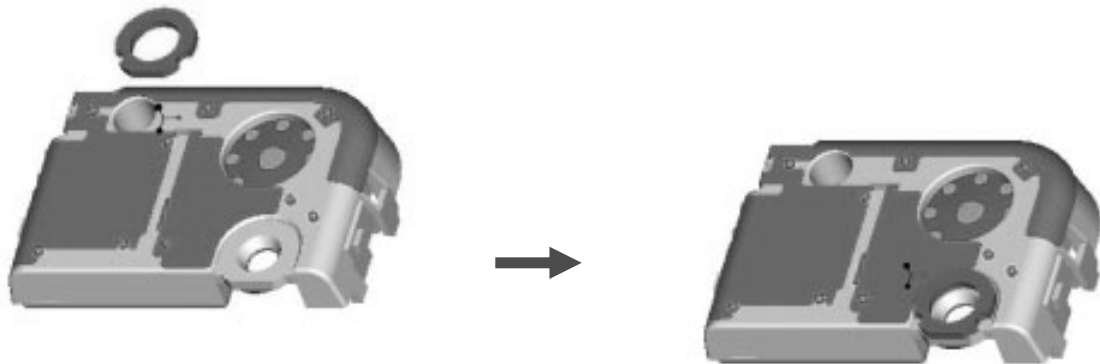
## 4. ASSEMBLY INSTRUCTIONS

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4. To add antenna metal plate on Antenna base

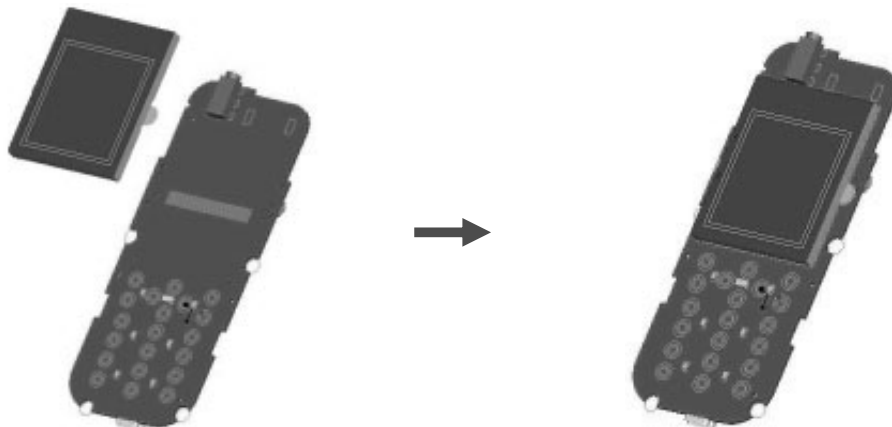


5. To add cmos sponge on Antenna base



### 4.3 PCBA sub assembly

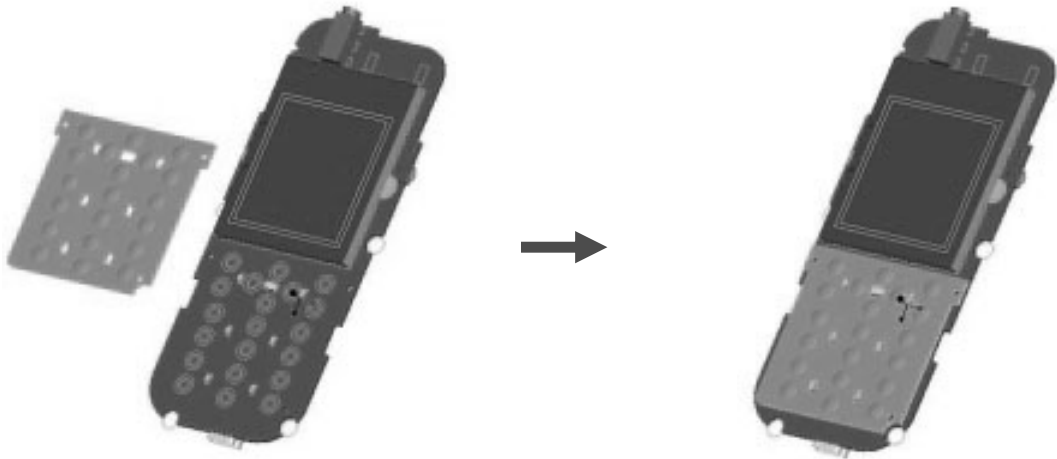
1. To add LCM module on PCBA



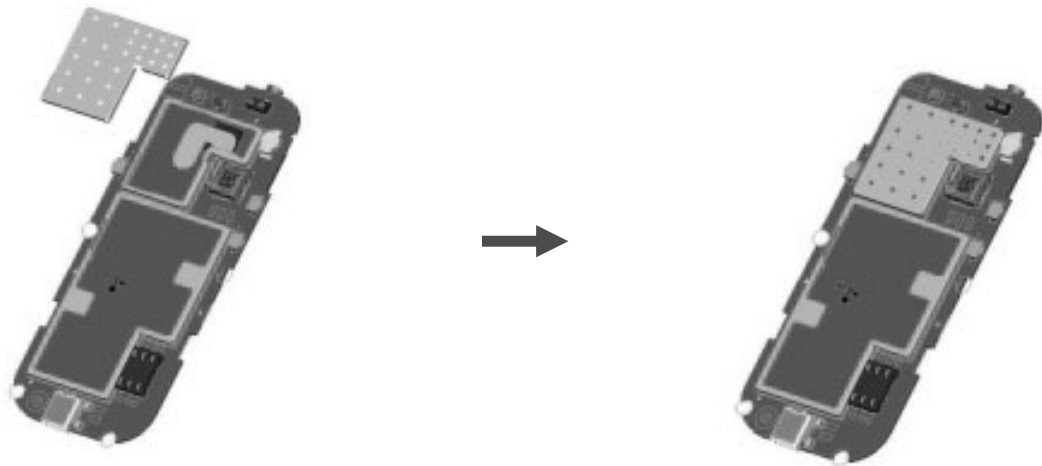
## 4. ASSEMBLY INSTRUCTIONS

---

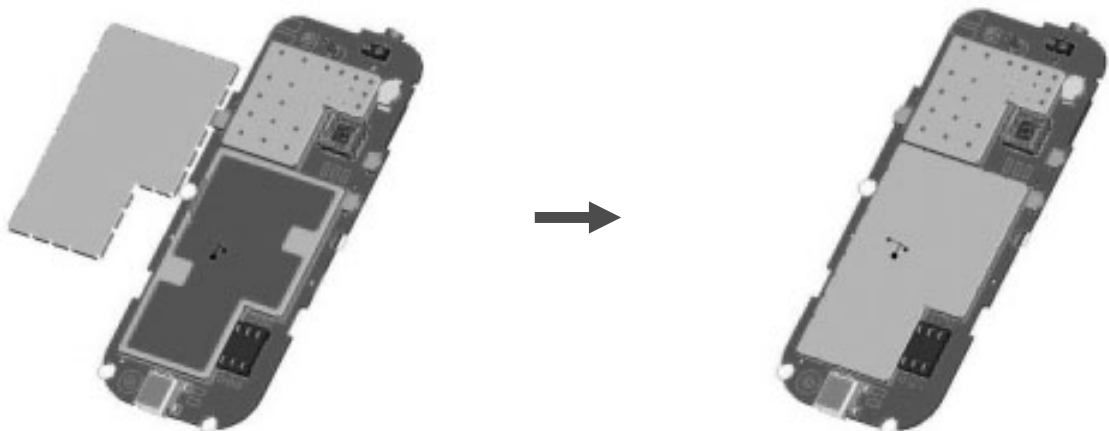
2. To add metal dome on PCBA



3. To add BB shielding cover on PCBA



4. To add RF shielding cover on PCBA

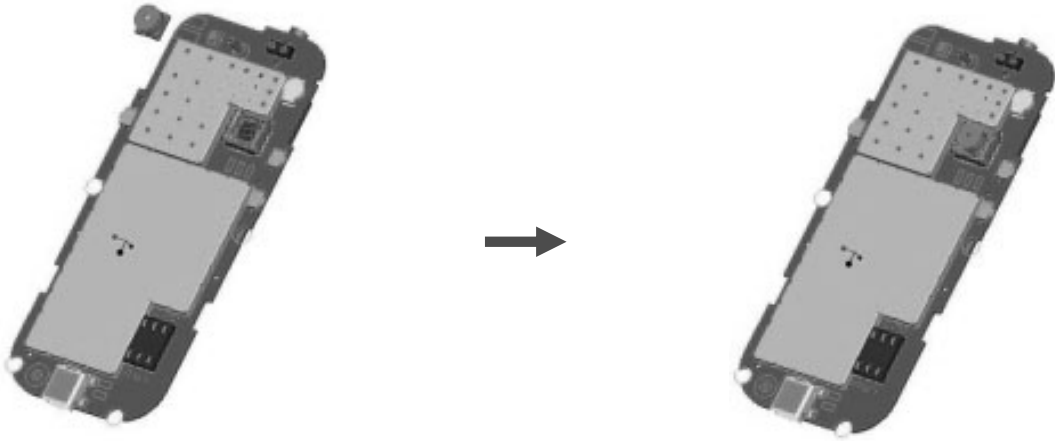




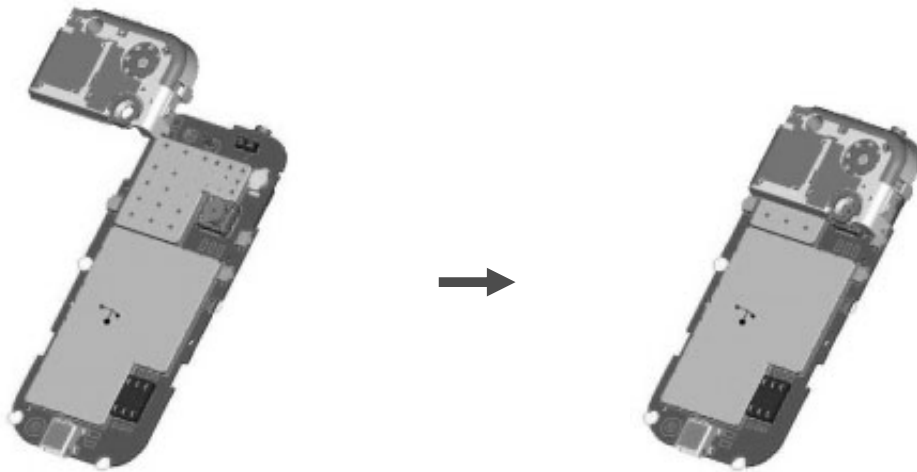
## 4. ASSEMBLY INSTRUCTIONS

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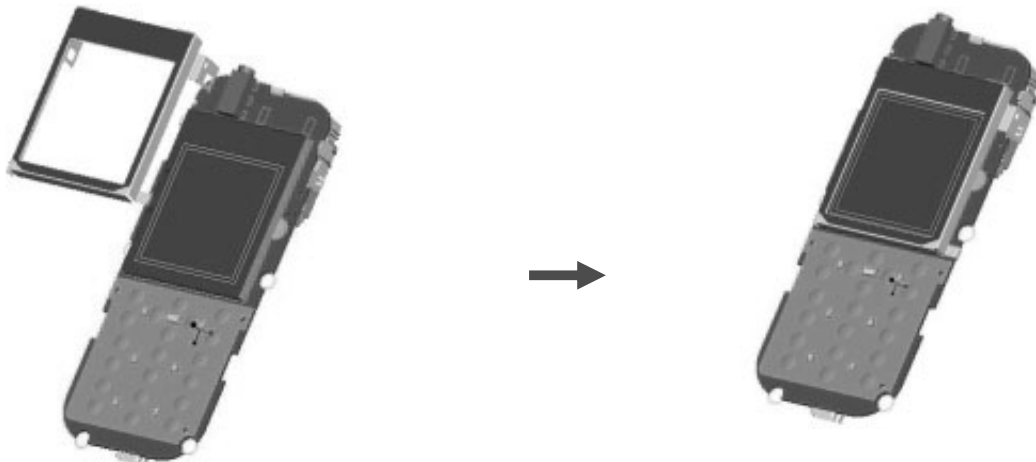
5. To add CMOS on PCBA



6. To add antenna base on PCBA



7. To add LCM shielding on PCBA



### 4.4 Top case sub assembly

1. To add receiver rubber and receiver on top case

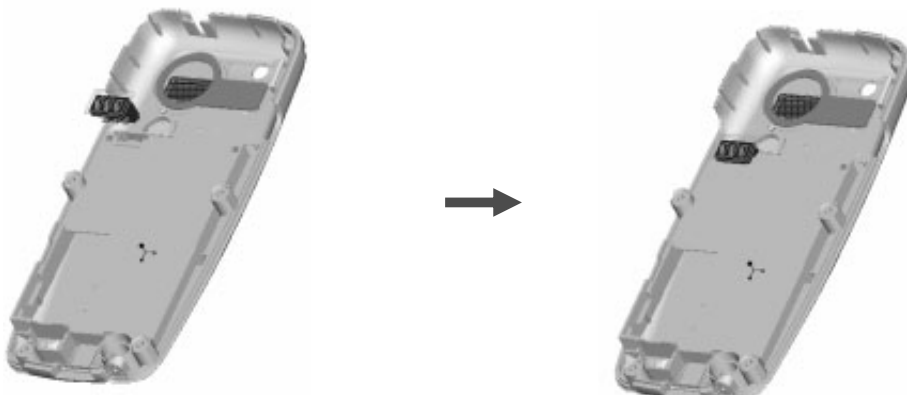


2. To add Keypad on top case



### 4.5 Bottom case sub assembly

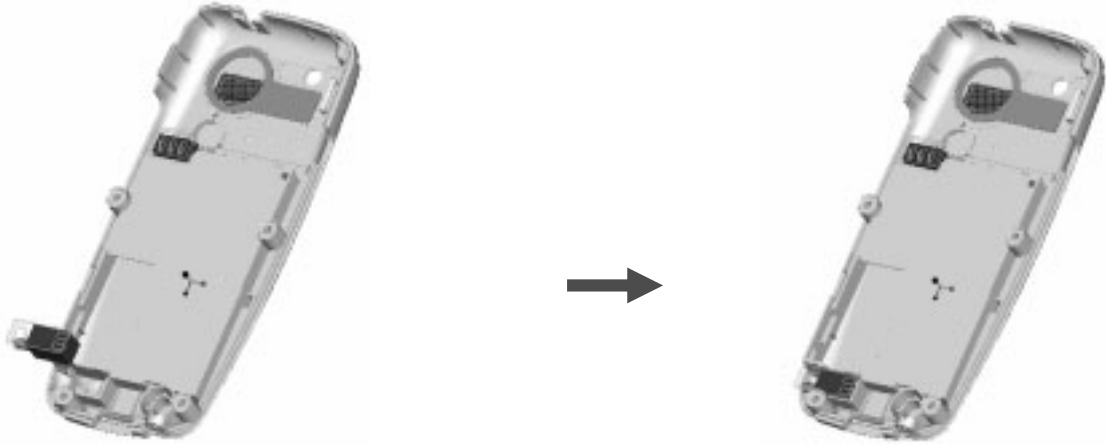
1. To add battery connector on bottom case.



## 4. ASSEMBLY INSTRUCTIONS

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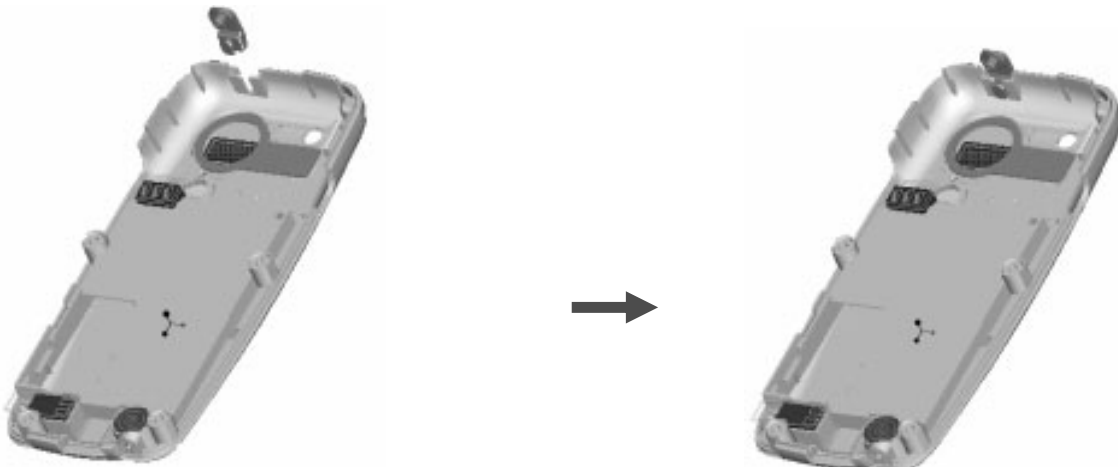
2. To add vibrator on bottom case.



3. To add Mic rubber and Mic on bottom case.



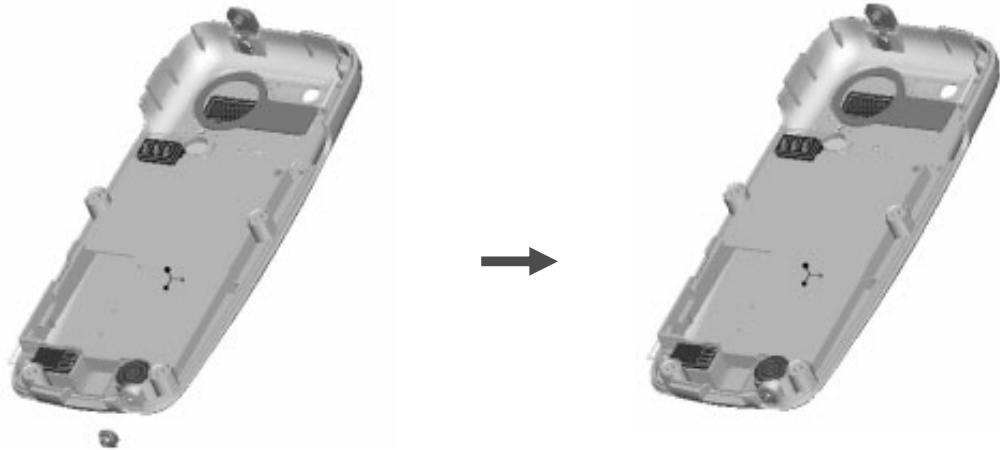
4. To add earphone cap on bottom case.



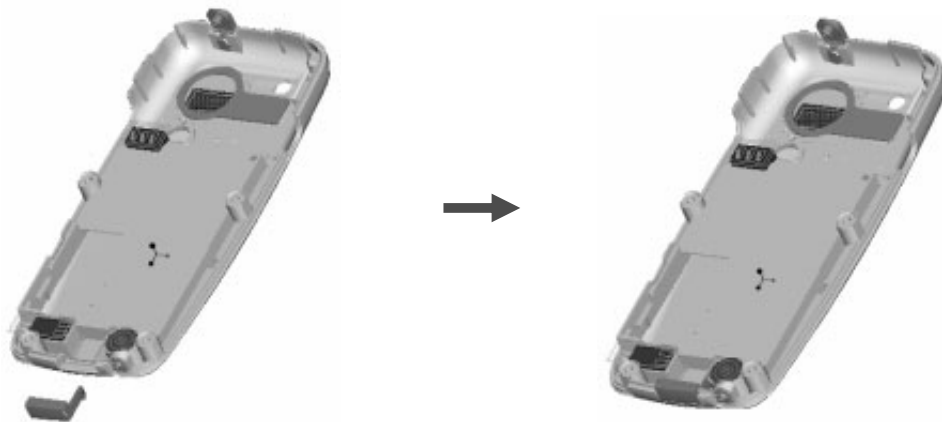
## 4. ASSEMBLY INSTRUCTIONS

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5. To add Mic boot on bottom case

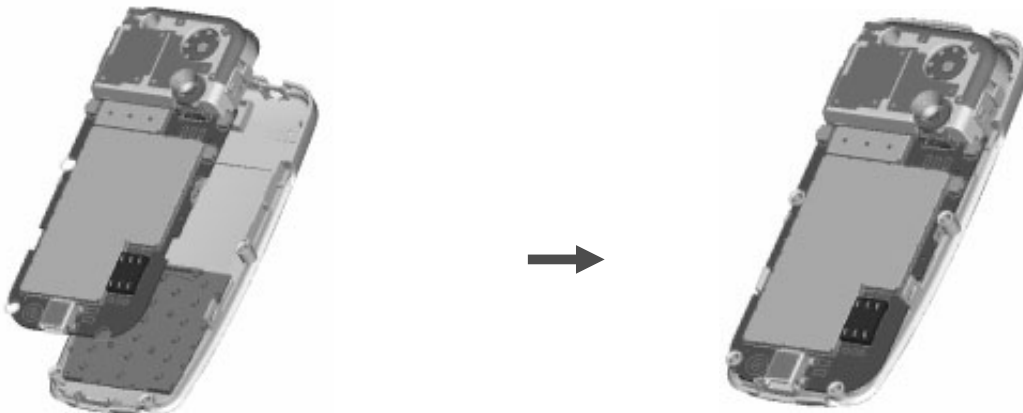


6. To add mini-USB cap on bottom case



### 4.6 Main assembly

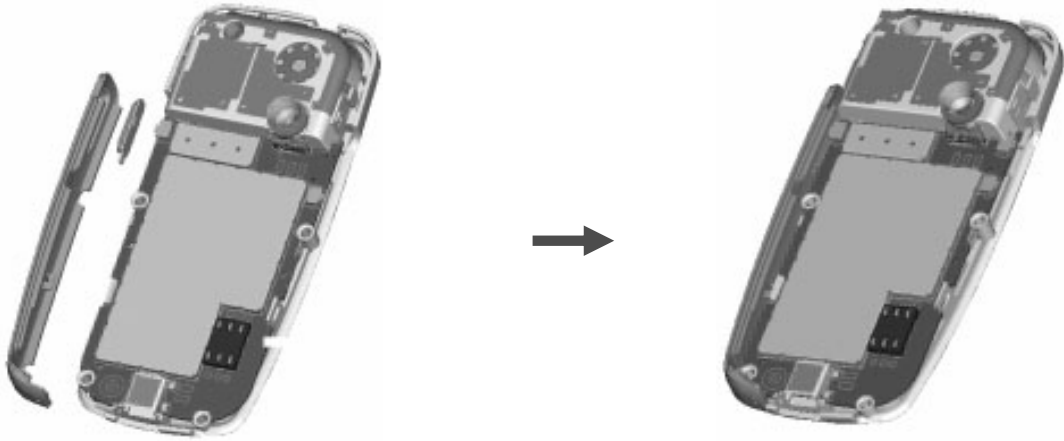
1. To add PCBA sub assembly on top case sub assembly.



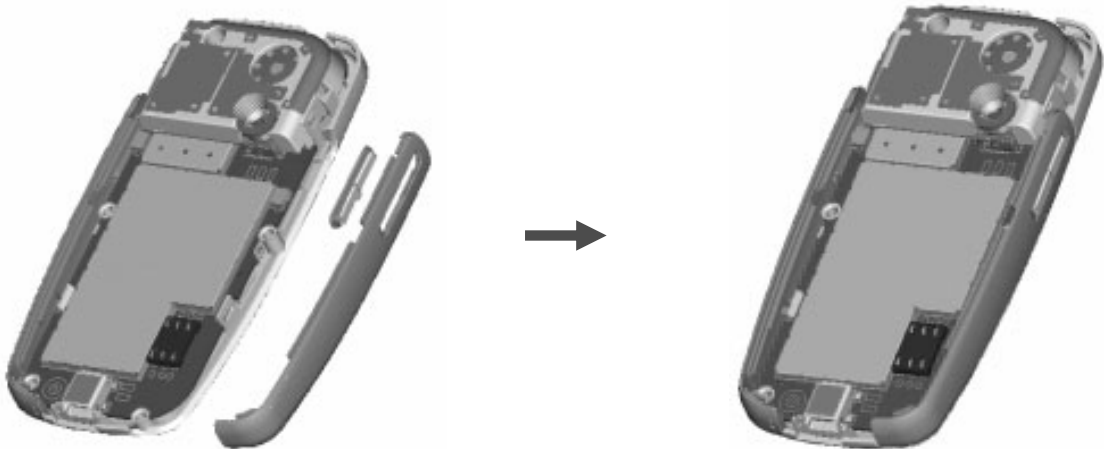
## 4. ASSEMBLY INSTRUCTIONS

---

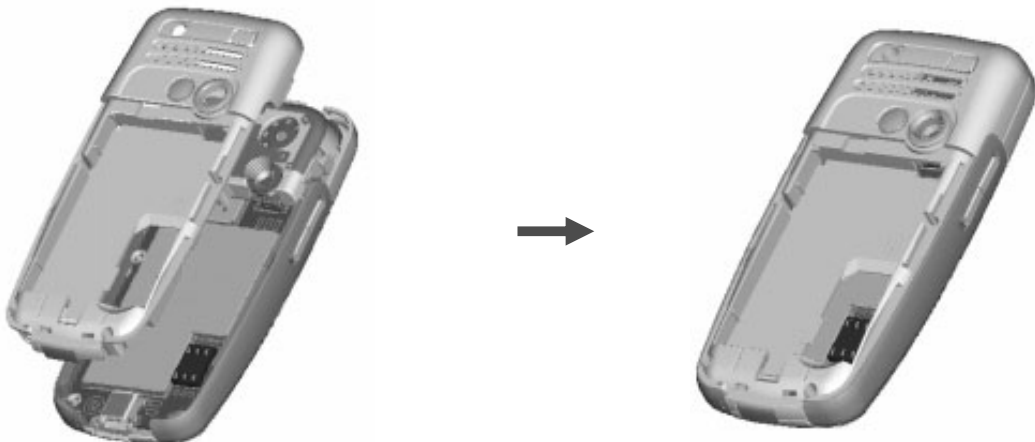
2. To add left side key and strip on main assembly.



3. To add right side key and strip on main assembly.



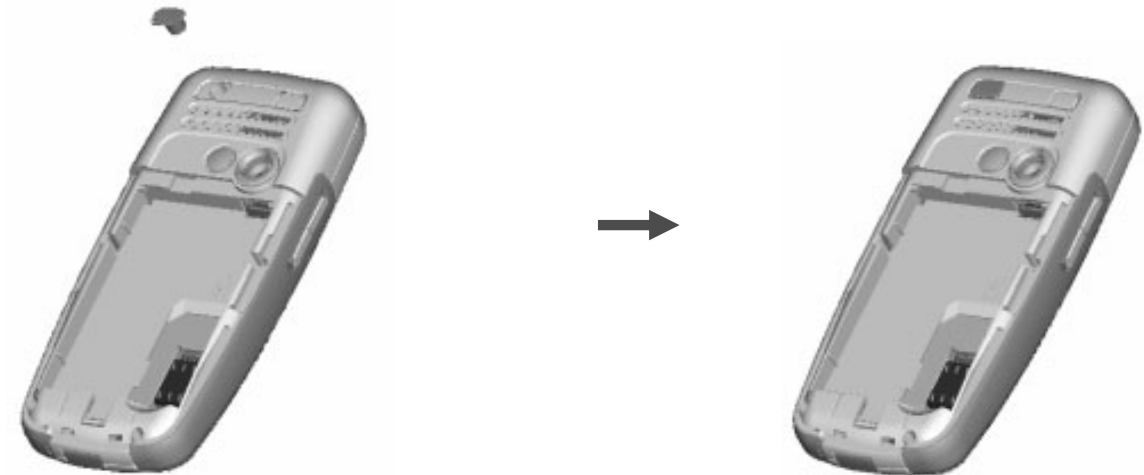
4. To add bottom sub assembly on main assembly.



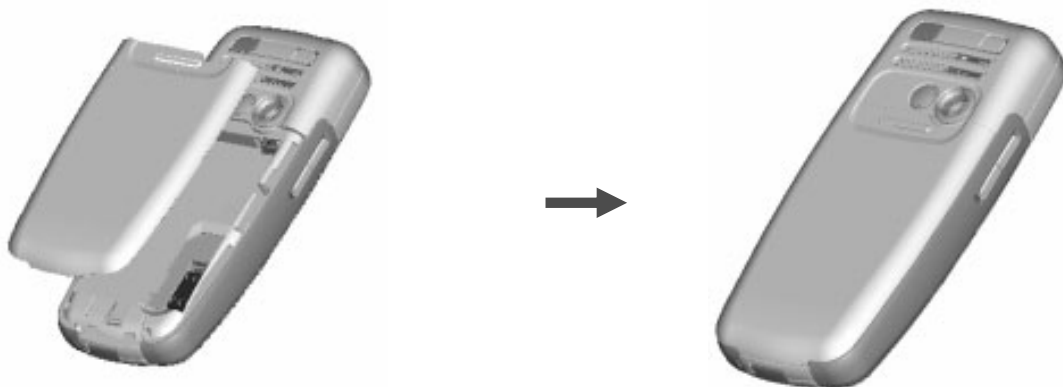
## 4. ASSEMBLY INSTRUCTIONS

---

5. To add RF cap on Main assembly



6. To add battery cover on main assembly.



## 5. TECHNICAL SPECIFICATION

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### 5. TECHNICAL SPECIFICATION

#### 5.1. TX Characteristics

All data is applicable to E-GSM900 and DCS1800 / PCS1900 except where stated.

##### 5.1.1. Frequency Error

± 0.1 ppm max. relative to base station frequency.

##### 5.1.2. Modulation Phase Error

RMS: Equal to or less than 5°

Peak: Equal to or less than 20°

##### 5.1.3. Output RF Spectrum due to Modulation

Offset from Centre Frequency (kHz)	Maximum Level Relative to Carrier (9dB)
±100	+ 0.5
±200	- 30
±250	- 33
±400	- 60
±600 to 1800	- 60

##### 5.1.4. Output RF Spectrum due to Switching Transients

Offset from Centre Frequency (kHz)	Maximum Level (dBm)		
	E-GSM 900	DCS 1800	PCS 1900
±100	- 19	- 22	- 22
±600	- 21	- 24	- 24
±1200	- 21	- 24	- 24
±1800	- 24	- 27	- 27

## 5. TECHNICAL SPECIFICATION

---

### Measurement conditions for output RF spectrum measurements:

Frequency Spen	0 Hz
Measurement Bandwidth:	30 kHz
Video Bandwidth:	30 kHz (modulation) 100 kHz (switching)
Average (Modulation)	Over 200 burst
Peak Hold (Switching)	Over 10 burst

### 5.1.5. Spurious Emissions at Antenna Connector

Frequency range	Power level in dBm		
	GSM 400, GSM 700, GSM 850, GSM 900	DCS 1 800	PCS 1 900
9 kHz to 1 GHz	-36	-36	-36
1 GHz to 12,75 GHz	-30		-30
1 GHz to 1 710 MHz		-30	
1 710 MHz to 1 785 MHz		-36	
1 785 MHz to 12,75 GHz		-30	



## 5. TECHNICAL SPECIFICATION

Frequency range	Frequency offset	Filter bandwidth	Approx video bandwidth
100 kHz to 50 MHz	-	10 kHz	30 kHz
50 MHz to 500 MHz excl. relevant TX band: GSM 450: 450,4 MHz to 457,6 MHz; GSM 480: 478,8 MHz to 486 MHz, and the RX bands: For GSM 400 MS: 460,4 MHz to 467,6 MHz; 488,8 MHz to 496 MHz.	-	100 kHz	300 kHz
500 MHz to 12,75 GHz,  excl. relevant TX band: GSM 750: 777 MHz to 792 MHz GSM 850: 824 MHz to 849 MHz; P-GSM: 890 MHz to 915 MHz; E-GSM: 880 MHz to 915 MHz; DCS: 1 710 MHz to 1 785 MHz, PCS 1 900: 1 850 MHz to 1 910 MHz;  and the RX bands: For GSM 400 MS, GSM 900 MS and DCS 1 800 MS:  925 MHz to 960 MHz; 1 805 MHz to 1 880 MHz. For GSM 700 MS, GSM 850 MS and PCS 1 900 MS:  747 MHz to 762 MHz; 869 MHz to 894 MHz; 1 930 MHz to 1 990 MHz	0 to 10 MHz ≥ 10 MHz ≥ 20 MHz ≥ 30 MHz  (offset from edge of relevant TX band)	100 kHz 300 kHz 1 MHz 3 MHz	300 kHz 1 MHz 3 MHz 3 MHz
relevant TX band:			
GSM 450: 450,4 MHz to 457,6 MHz	1,8 to 6,0 MHz	30 kHz	100 kHz

## 5. TECHNICAL SPECIFICATION

Frequency range	Frequency offset	Filter bandwidth	Approx video bandwidth
GSM 480: 478,8 MHz to 486 MHz GSM 750: 777 MHz to 792 MHz GSM 850: 824 MHz to 849 MHz P-GSM: 890 MHz to 915 MHz E-GSM: 880 MHz to 915 MHz DCS: 1 710 MHz to 1 785 MHz PCS 1 900: 1 850 MHz to 1 910 MHz	> 6,0 MHz      (offset from carrier)	100 kHz	300 kHz
NOTE 1: The excluded RX bands are tested in sub clause 13.4.			
NOTE 2: The filter and video bandwidths, and frequency offsets are only correct for measurements on an MS transmitting on a channel in the Mid ARFCN range.			
NOTE 3: Due to practical implementation, the video bandwidth is restricted to a maximum of 3 MHz.			

### 5.1.6. Residual Peak Power

Equal to or less than 70 dBc (BW = 300 kHz)

## 5. TECHNICAL SPECIFICATION

### 5.2. Rx Characteristics

#### 5.2.1. Sensitivity

##### *E-GSM 900 Full Rate Speech*

The reference sensitivity performance in terms of frame erasure, bit error, or residual bit error rates (whichever is appropriate) is specified in the following table, according to the propagation conditions.

Channels	Propagation Conditions TUhigh		Propagation Conditions RA		Propagation Conditions HT		Static Conditions	
	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples
TCH/FS FER	6.742	8900					0.122	164000
Class Ib(RBER)	0.42	1000000	7.5	24000	9.333	60000	0.41	20000000
Class II(RBER)	8.33	120000					2.439	8200

The reference sensitivity level is < -102dBm.

##### *E-GSM 900 Half Rate Speech*

The reference sensitivity performance in terms of frame erasure, bit error, or residual bit error rates (whichever is appropriate) is specified in the following table, according to the propagation conditions.

Channels	Propagation Conditions TUhigh		Propagation Conditions RA		Propagation Conditions HT	
	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples
TCH/HS FER	4.598	13050				
TCH/HS Class Ib(BFI=0)	0.404	148500				
TCH/HS Class II(BFI=0)	7.725	25500	8.500	20000	7.600	20000
TCH/HS(UFR)	6.250	9600				
TCH/HSL class Ib((BFI or UFI)=0)	0.269	227000				

## 5. TECHNICAL SPECIFICATION

### *DCS 1800 Full Rate Speech*

The reference sensitivity performance in terms of frame erasure, bit error, or residual bit error rates (whichever is appropriate) is specified in the following table, according to the propagation conditions.

Channels	Propagation Conditions TUhigh		Propagation Conditions RA		Propagation Conditions HT		Static Conditions	
	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples
TCH/FS FER	6.742	8900					0.122	164000
Class Ib(RBER)	0.42	1000000	7.5	24000	9.333	60000	0.41	20000000
Class II(RBER)	8.33	120000					2.439	8200

The reference sensitivity level is < -102dBm.

### *DCS 1800 Half Rate Speech*

The reference sensitivity performance in terms of frame erasure, bit error, or residual bit error rates (whichever is appropriate) is specified in the following table, according to the propagation conditions.

Channels	Propagation Conditions TUhigh		Propagation Conditions RA		Propagation Conditions HT	
	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples
TCH/HS FER	4.598	13050				
TCH/HS Class Ib(BFI=0)	0.404	148500				
TCH/HS Class II(BFI=0)	7.725	25500	8.500	20000	7.600	20000
TCH/HS(UFR)	6.250	9600				
TCH/HSL class Ib((BFI or UFI)=0)	0.269	227000				

## 5. TECHNICAL SPECIFICATION

### *PCS 1900 Full Rate Speech*

The reference sensitivity performance in terms of frame erasure, bit error, or residual bit error rates (whichever is appropriate) is specified in the following table, according to the propagation conditions.

Channels	Propagation Conditions TUhigh		Propagation Conditions RA		Propagation Conditions HT		Static Conditions	
	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples
TCH/FS FER	6.742	8900					0.122	164000
Class Ib(RBER)	0.42	1000000	7.5	24000	9.333	60000	0.41	20000000
Class II(RBER)	8.33	120000					2.439	8200

The reference sensitivity level is < -102dBm.

### *PCS 1900 Half Rate Speech*

The reference sensitivity performance in terms of frame erasure, bit error, or residual bit error rates (whichever is appropriate) is specified in the following table, according to the propagation conditions.

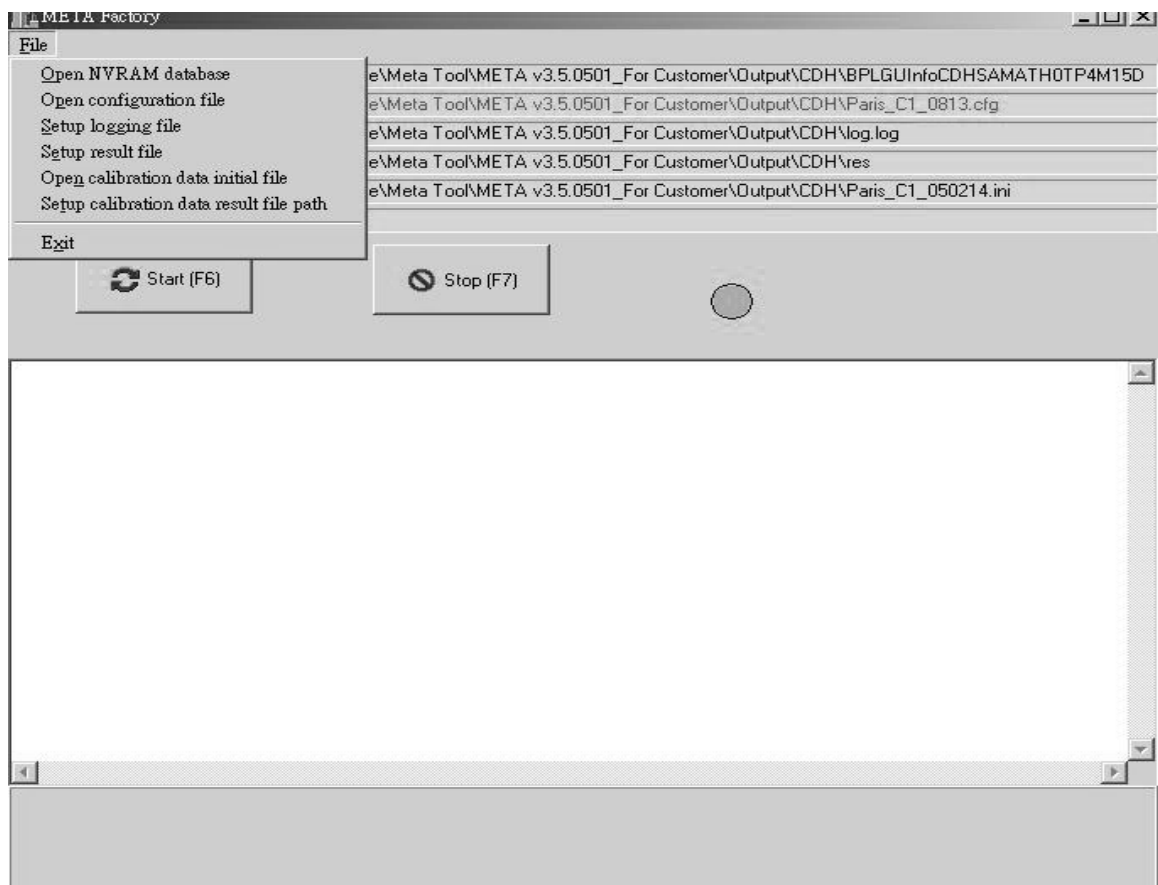
Channels	Propagation Conditions TUhigh		Propagation Conditions RA		Propagation Conditions HT	
	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples	Test Limit error rate %	Minimum No. of samples
TCH/HS FER	4.598	13050				
TCH/HS Class Ib(BFI=0)	0.404	148500				
TCH/HS Class II(BFI=0)	7.725	25500	8.500	20000	7.600	20000
TCH/HS(UFR)	6.250	9600				
TCH/HSL class Ib((BFI or UFI)=0)	0.269	227000				

## 6. Calibration

1. Select the comport no. which connected to mobile or fixture

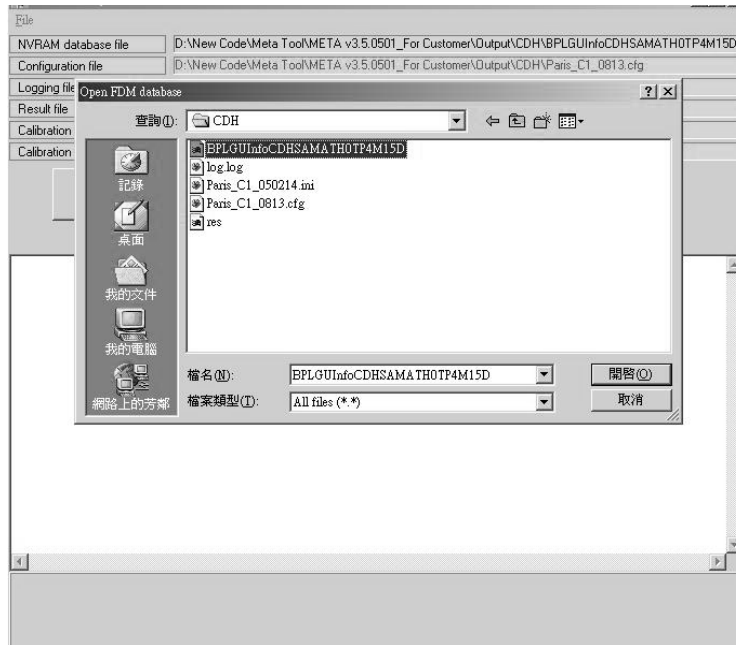


2. Main Form

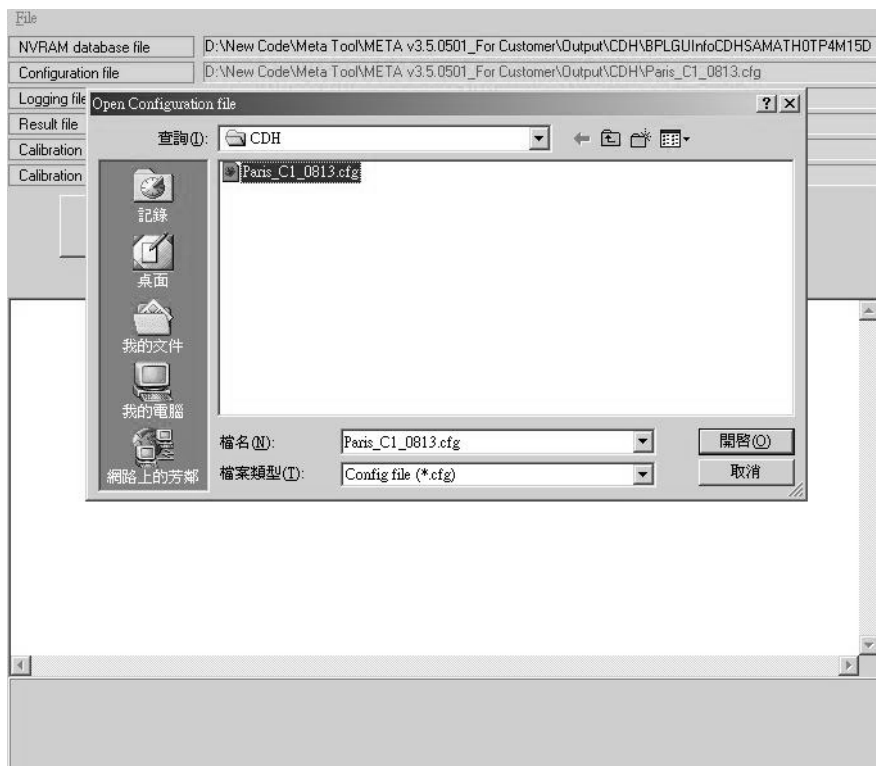


## 6. Calibration

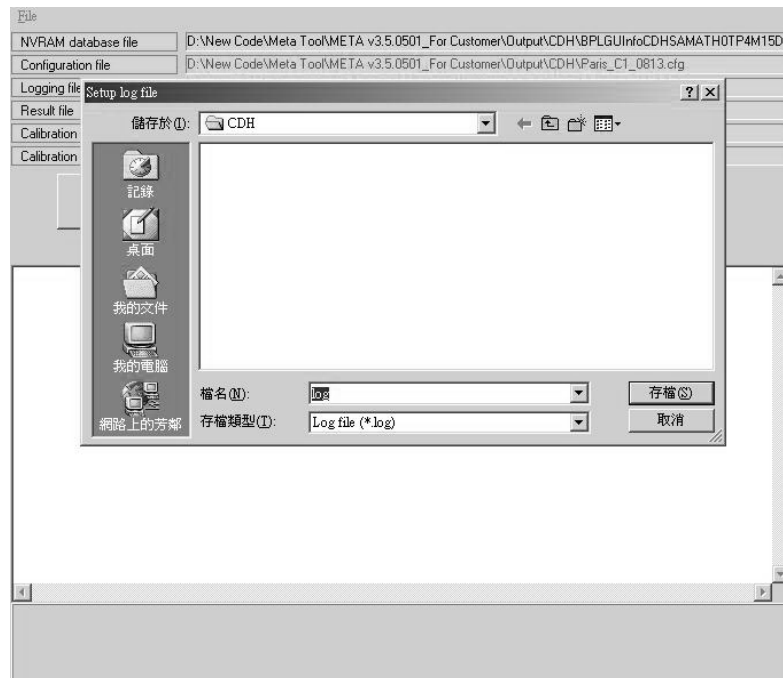
(1) **Open NVRAM database:** Select the NVRAM database



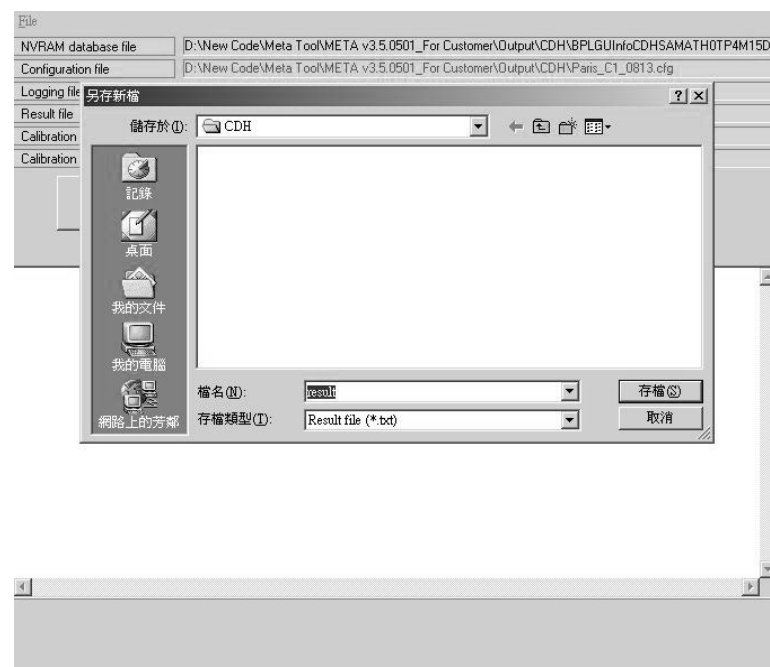
(2) **Open configuration file:** Select configuration file



### (3) Setup logging file: Decide the log file



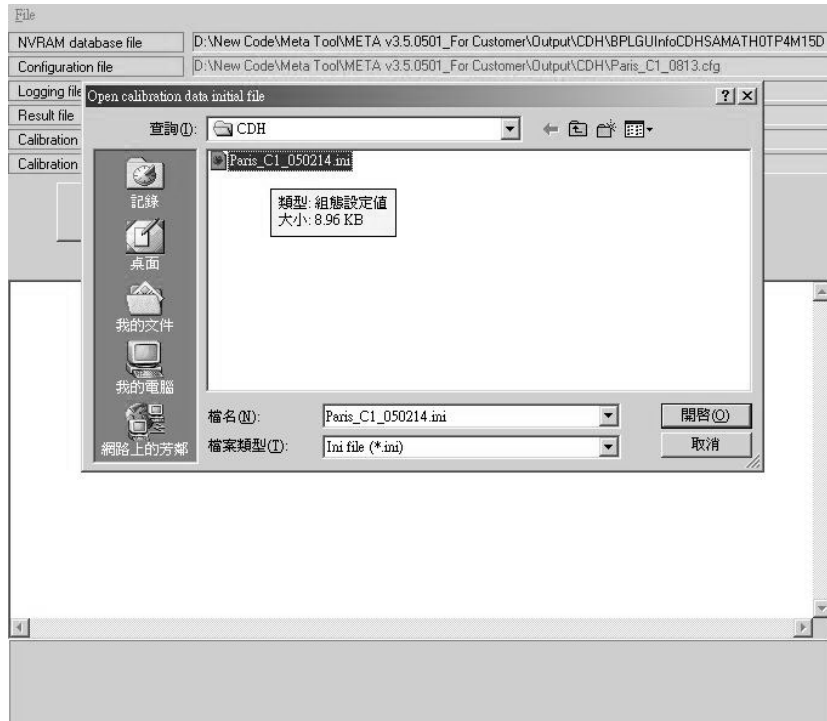
### (4) Setup result file: Decide the result file



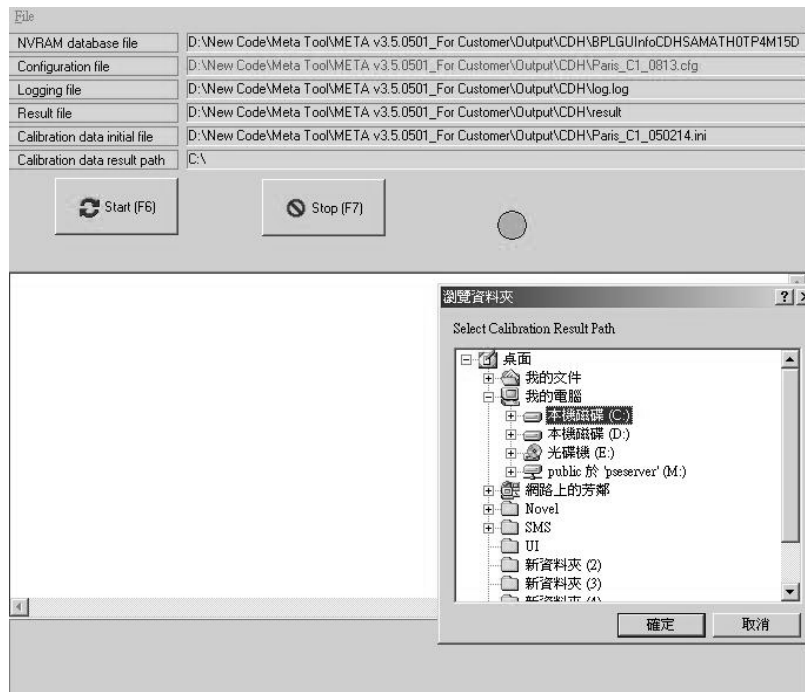


## 6. Calibration

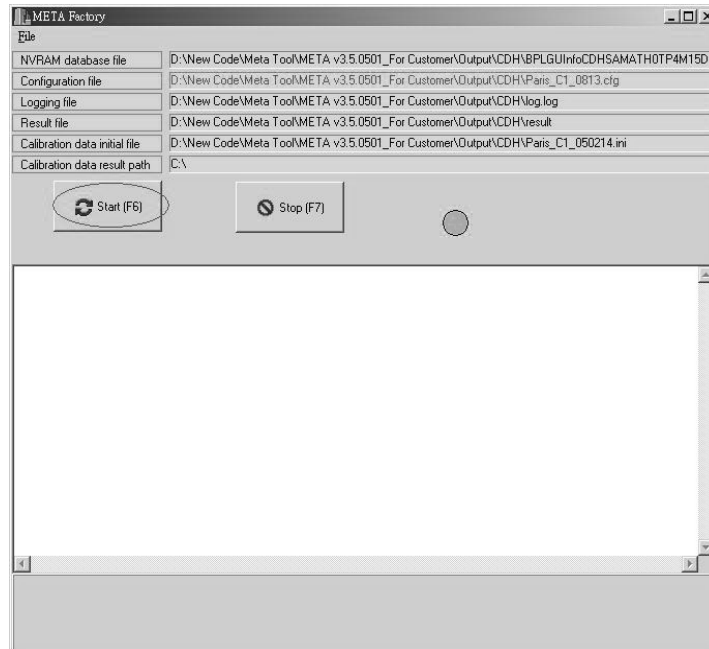
(5) **Open calibration data initial file:** Open data initial file to calibration



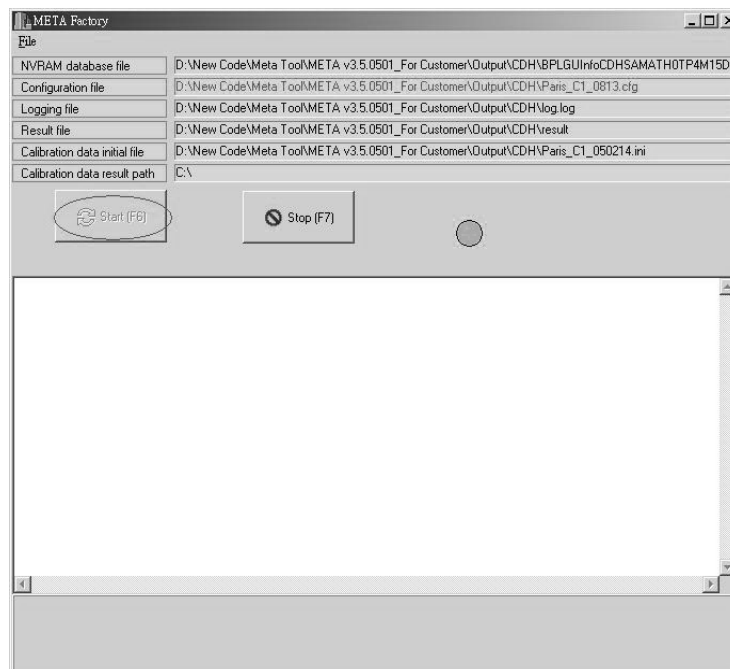
(6) **Setup calibration data result file path:** Decide the data result folder



3. Keep the mobile power off and put the mobile on fixture or connect mobile with cable then click the start button

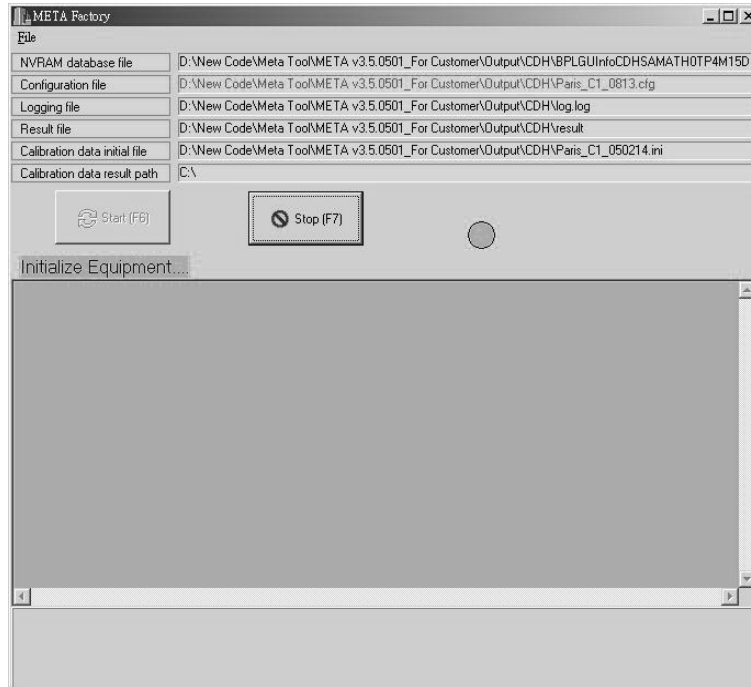


4. After click Start button , waiting for mobile power on



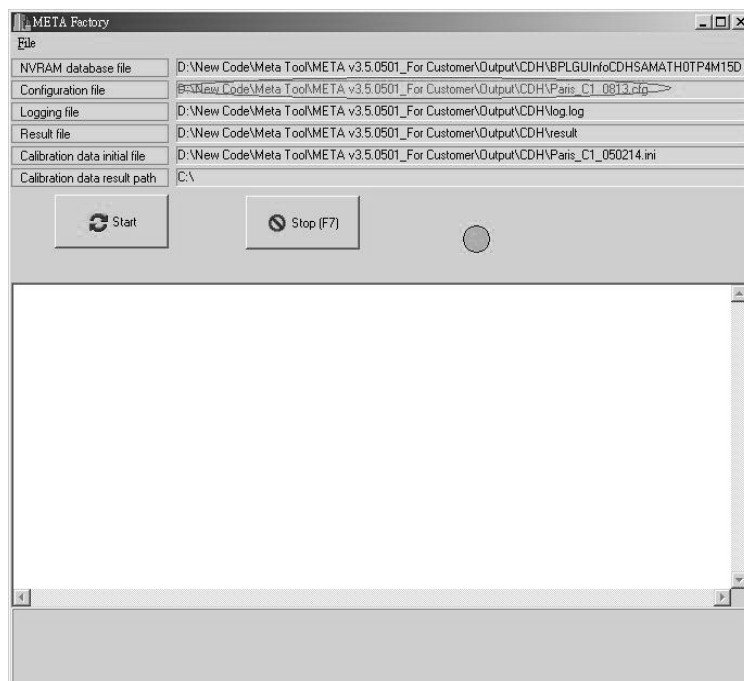
## 6. Calibration

### 5. Calibration begin

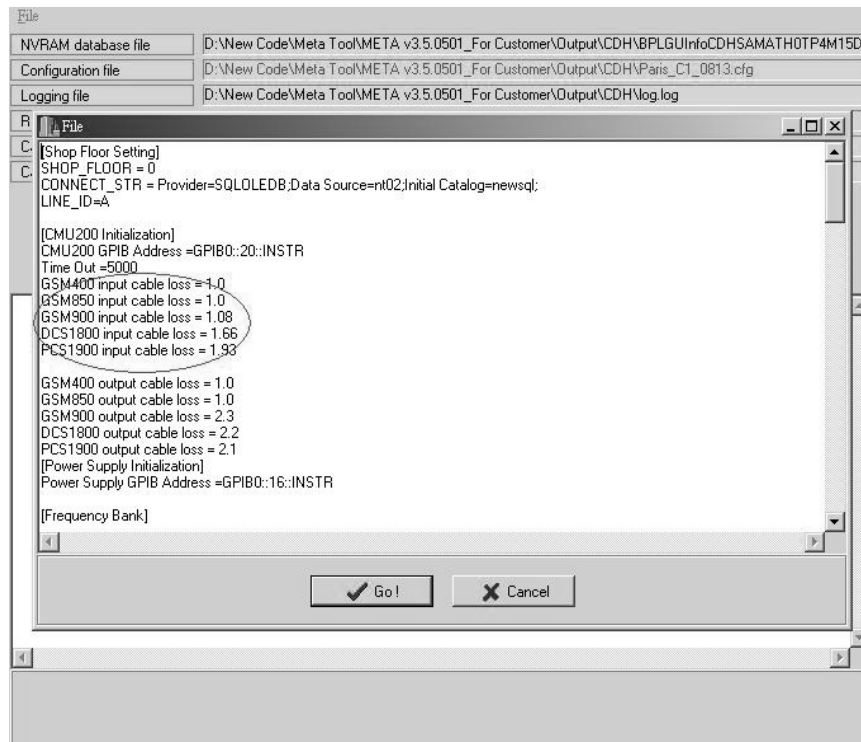


## Appendix :Cable loss

### 1. Click configuration file



### 2. Make up for the cable loss value



## 7. BLOCK DIAGRAM

## 7. BLOCK DIAGRAM

### 7.1. C2500 Base band Hardware Typical application and Block Diagram

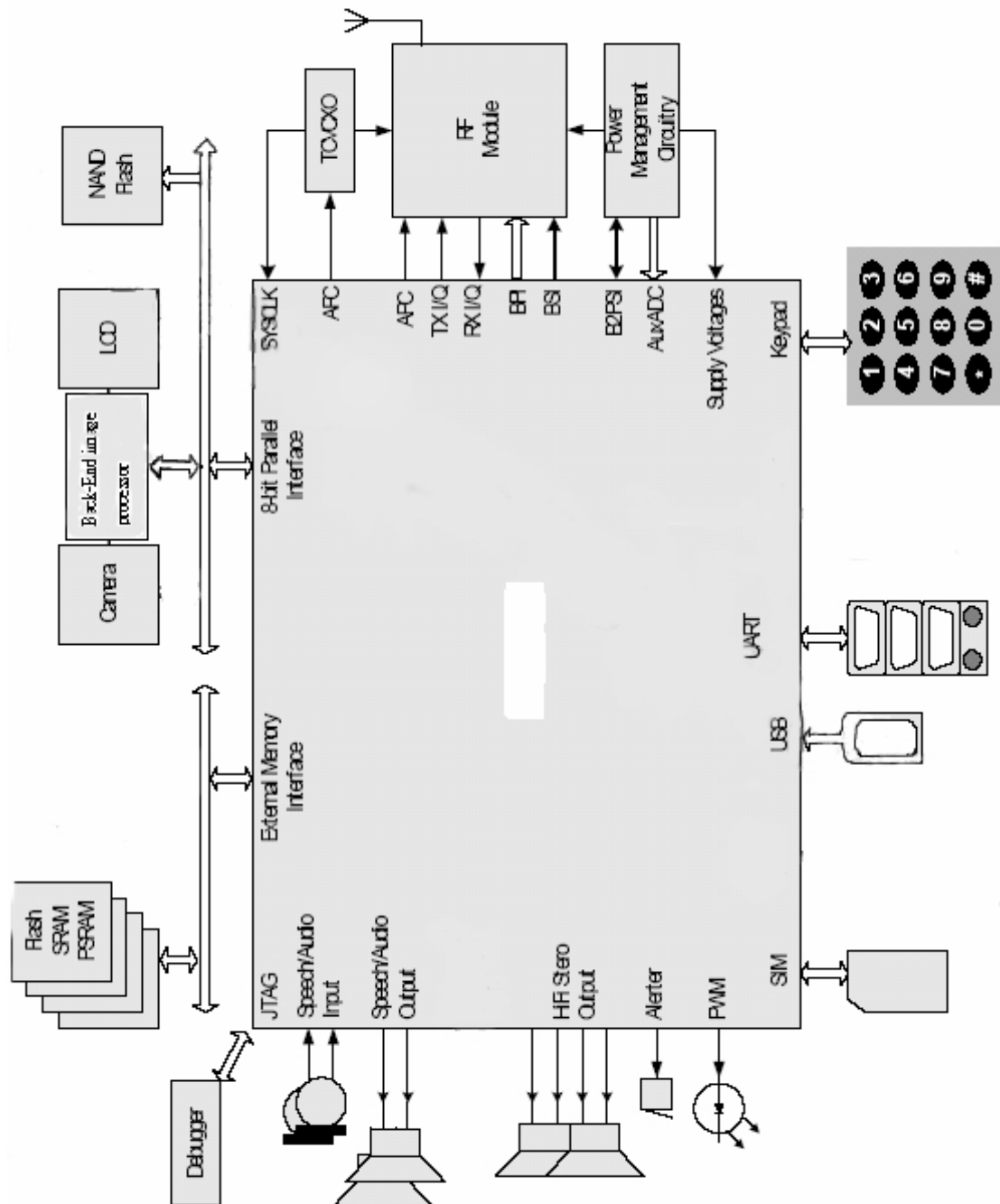


Figure 7.1: Typical application of MT6217

# 7. BLOCK DIAGRAM

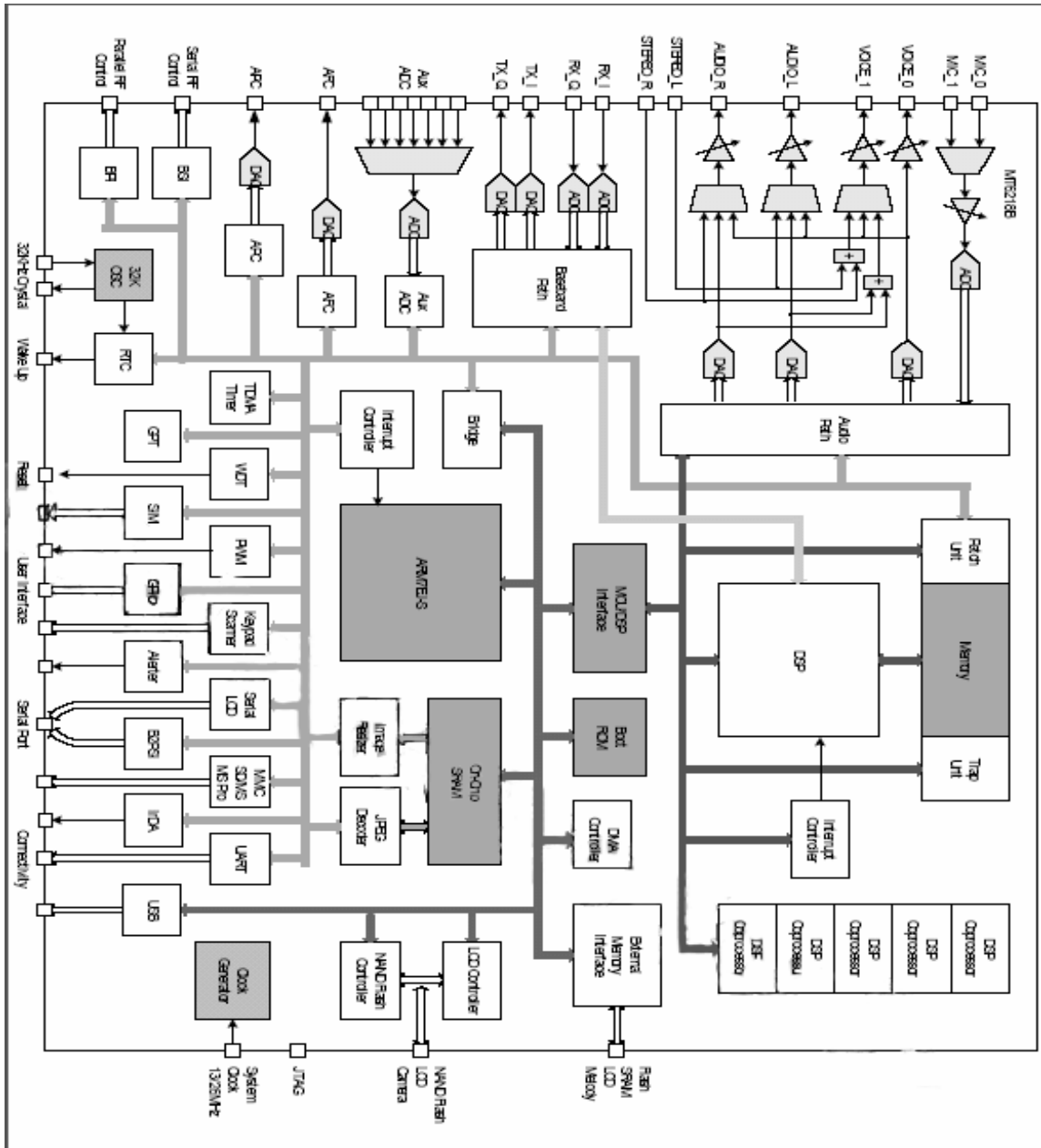


Figure 7.2: MT6217 Block Diagram

## 7. BLOCK DIAGRAM

### 7.2. C2500 RF Block Diagram

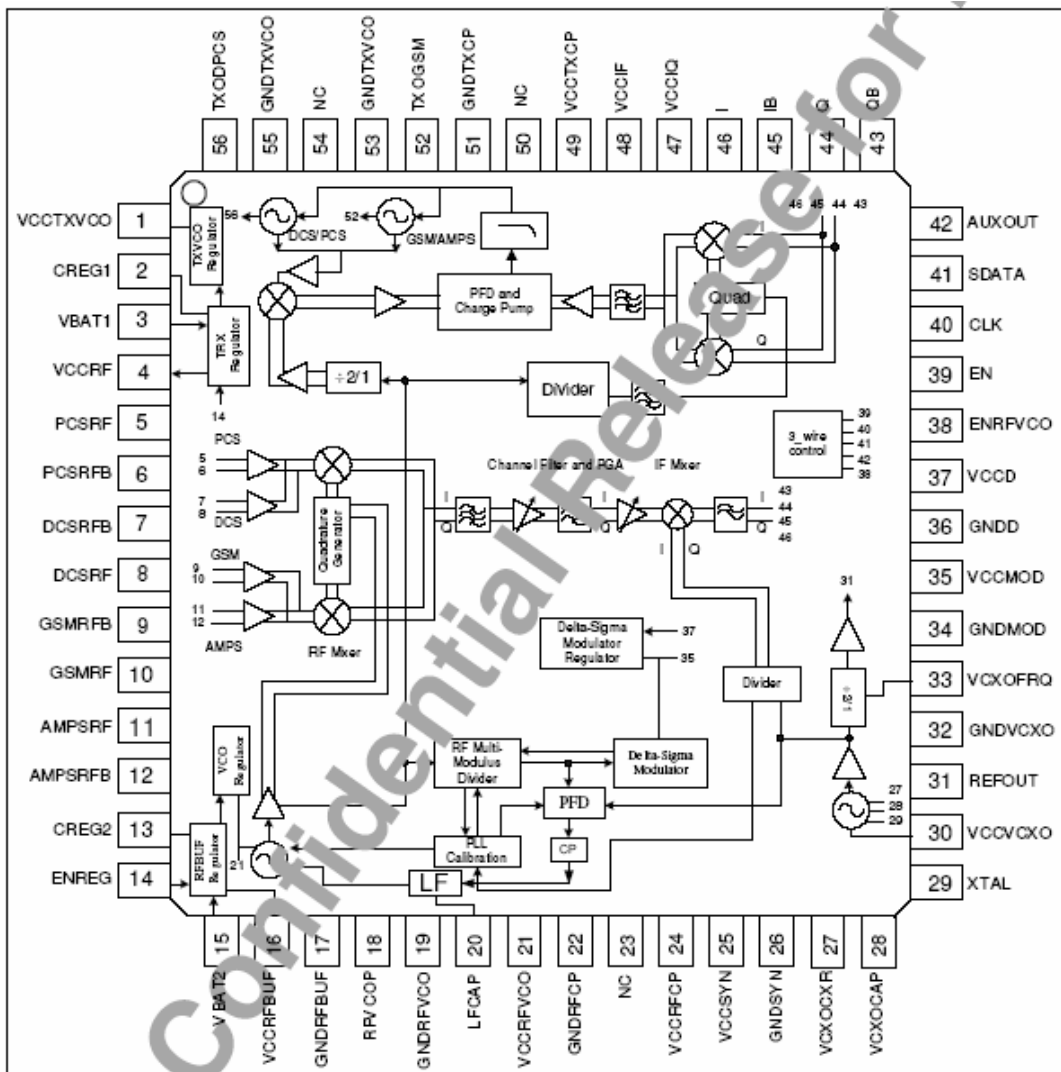
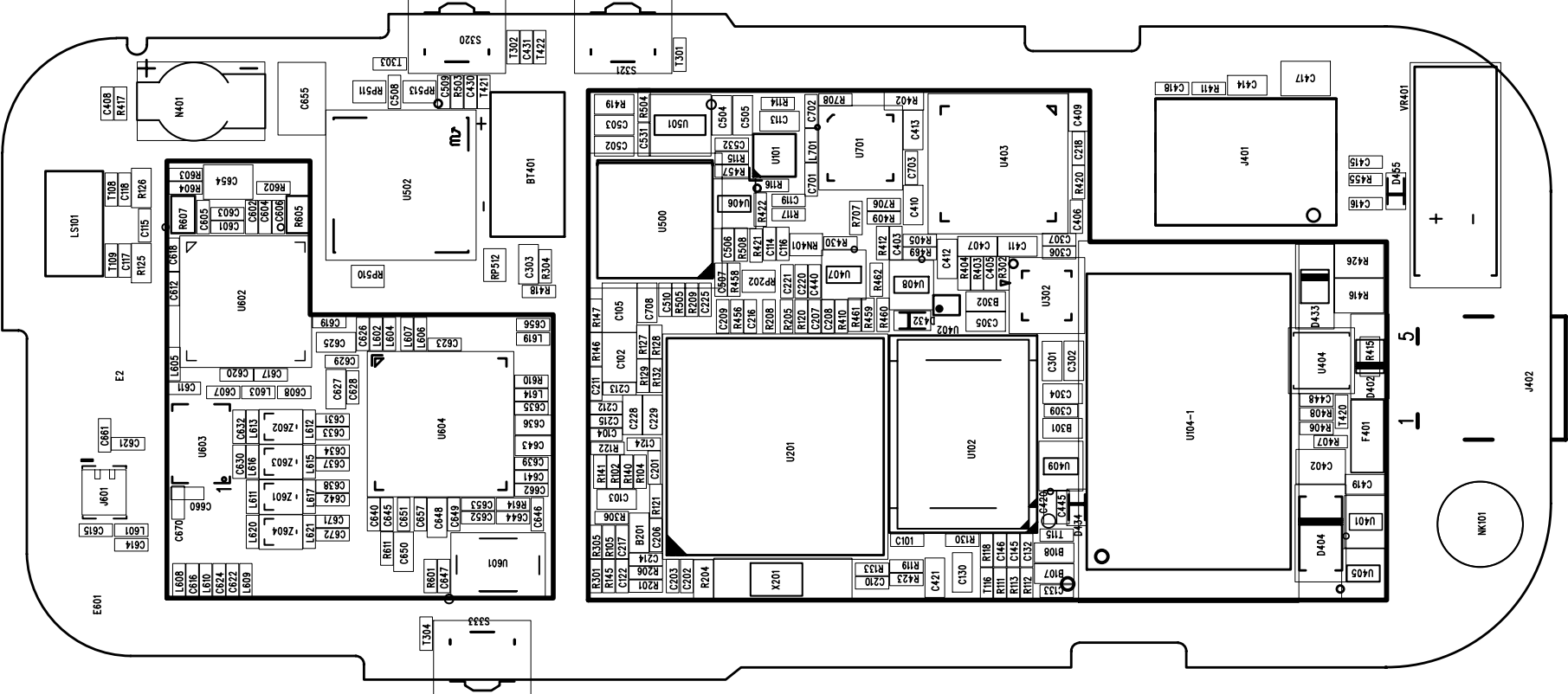


Figure 7.3: MT6120 Block Diagram

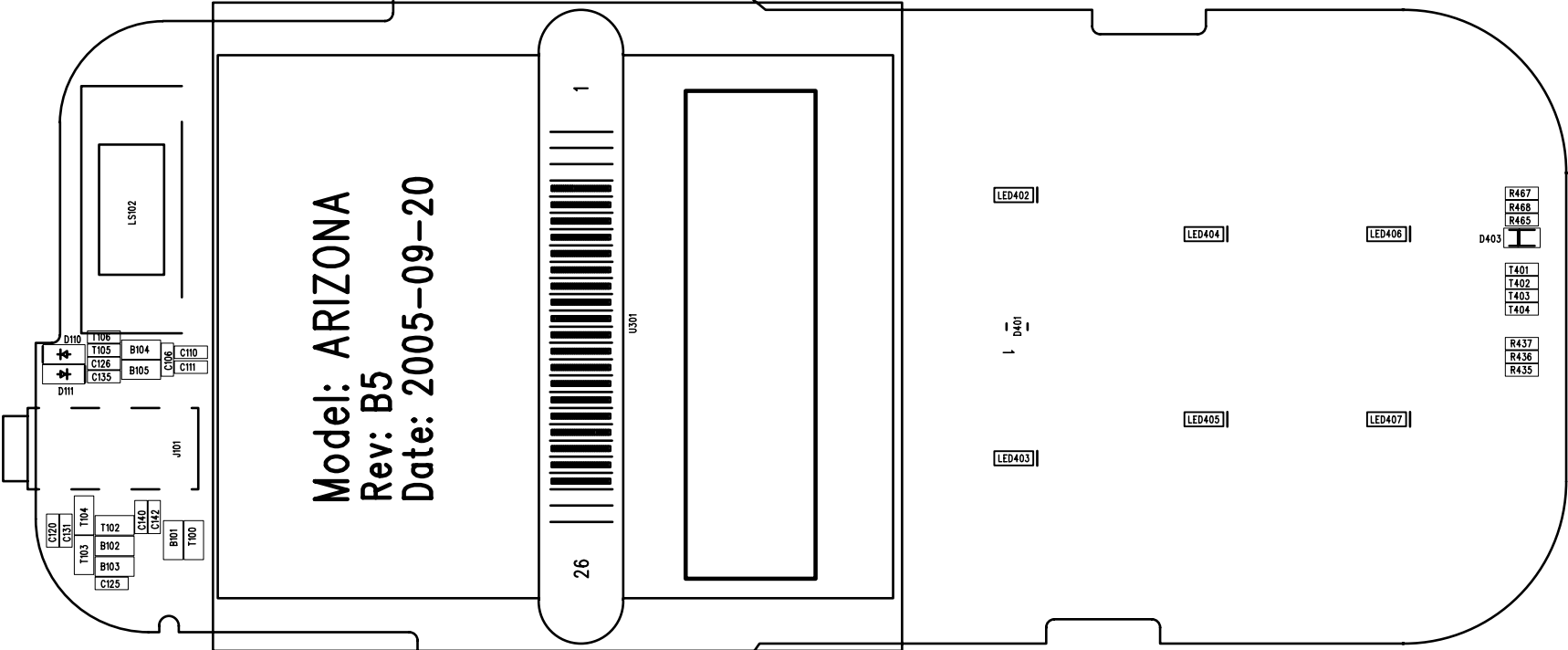
# 8. C2500 PCB PLACEMENT



L126 SILKSCREEN TOP



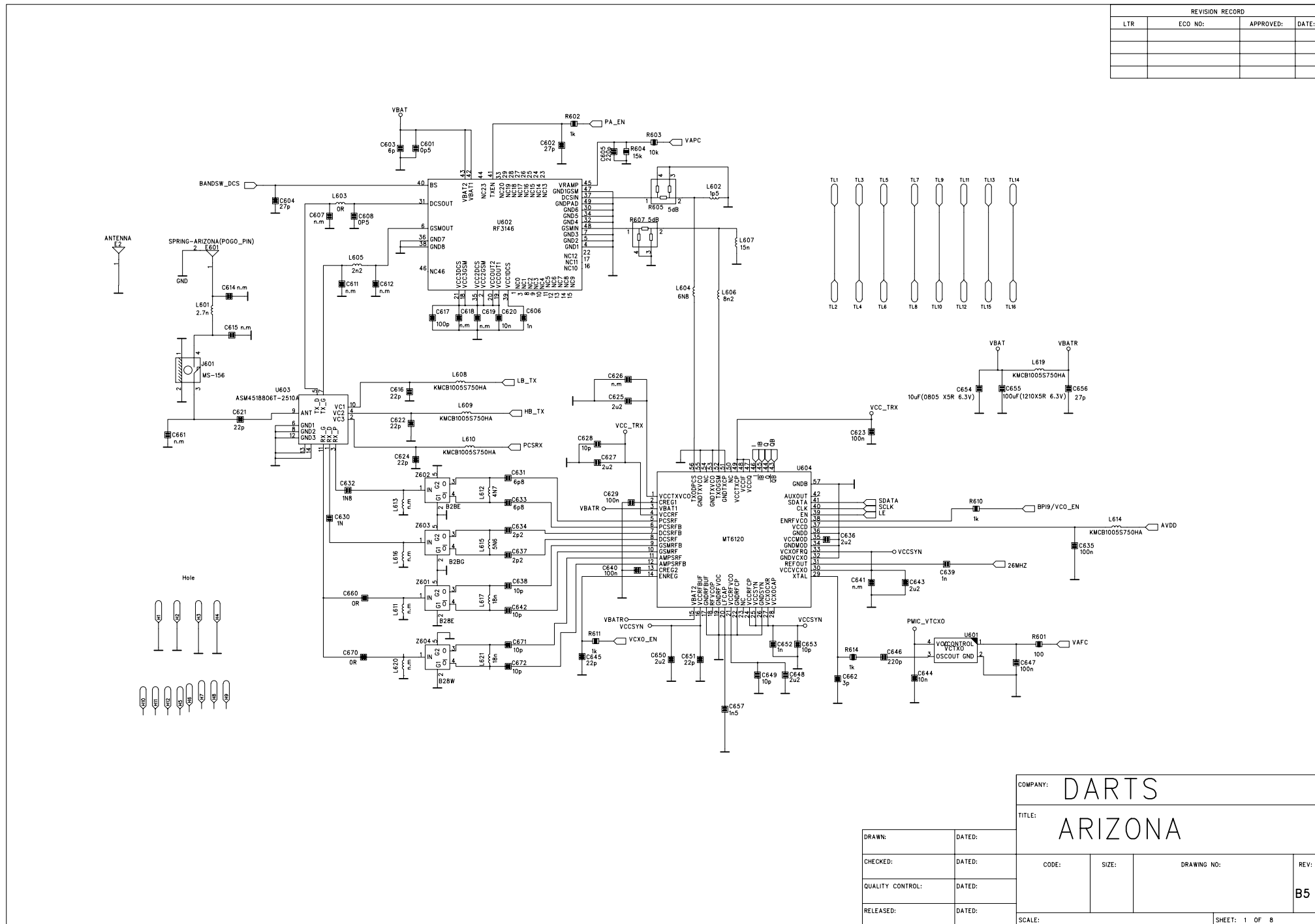
# 8. C2500 PCB PLACEMENT



L129 SILKSCREEN BOT

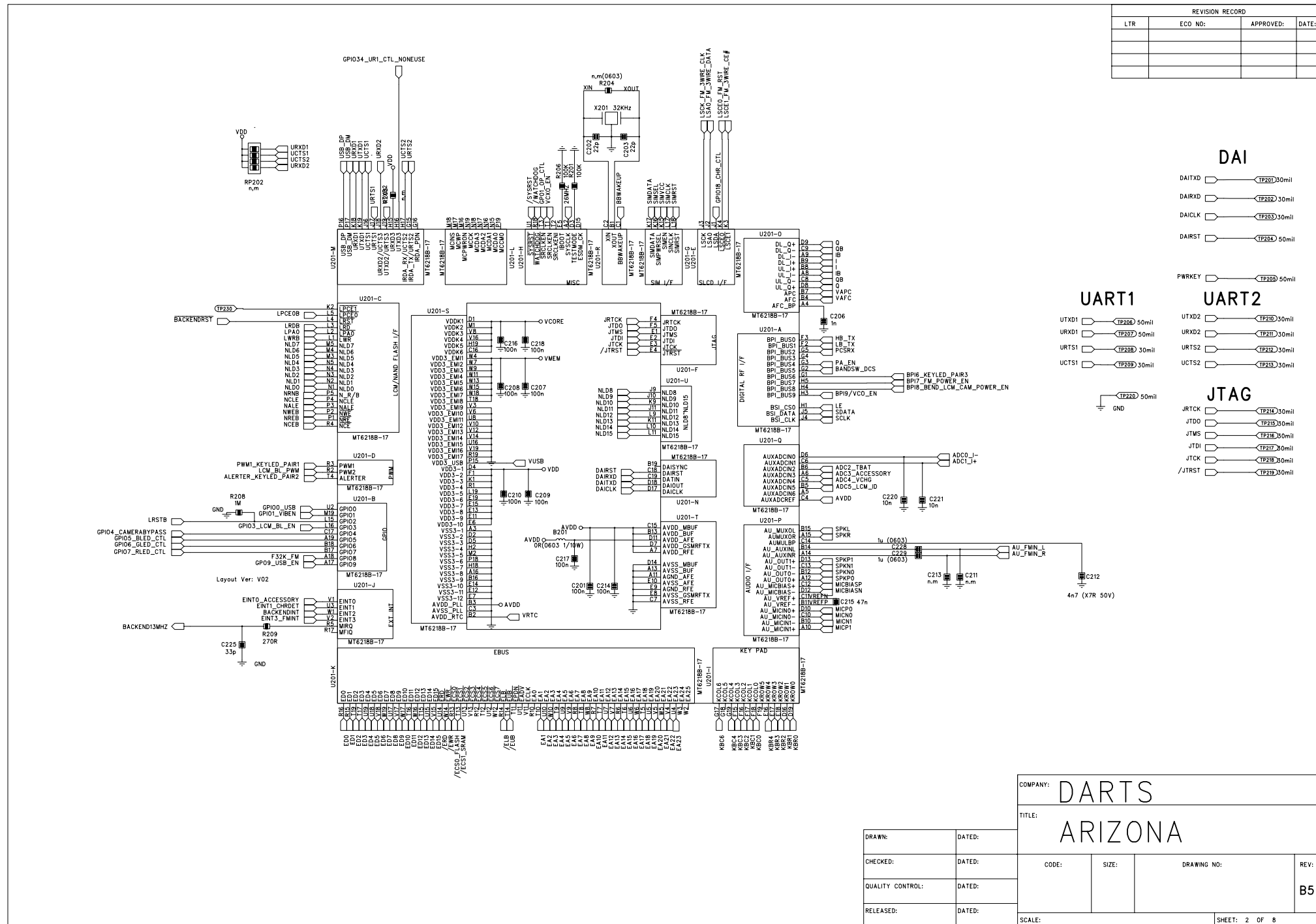
# 9. CIRCUIT DIAGRAM

RF



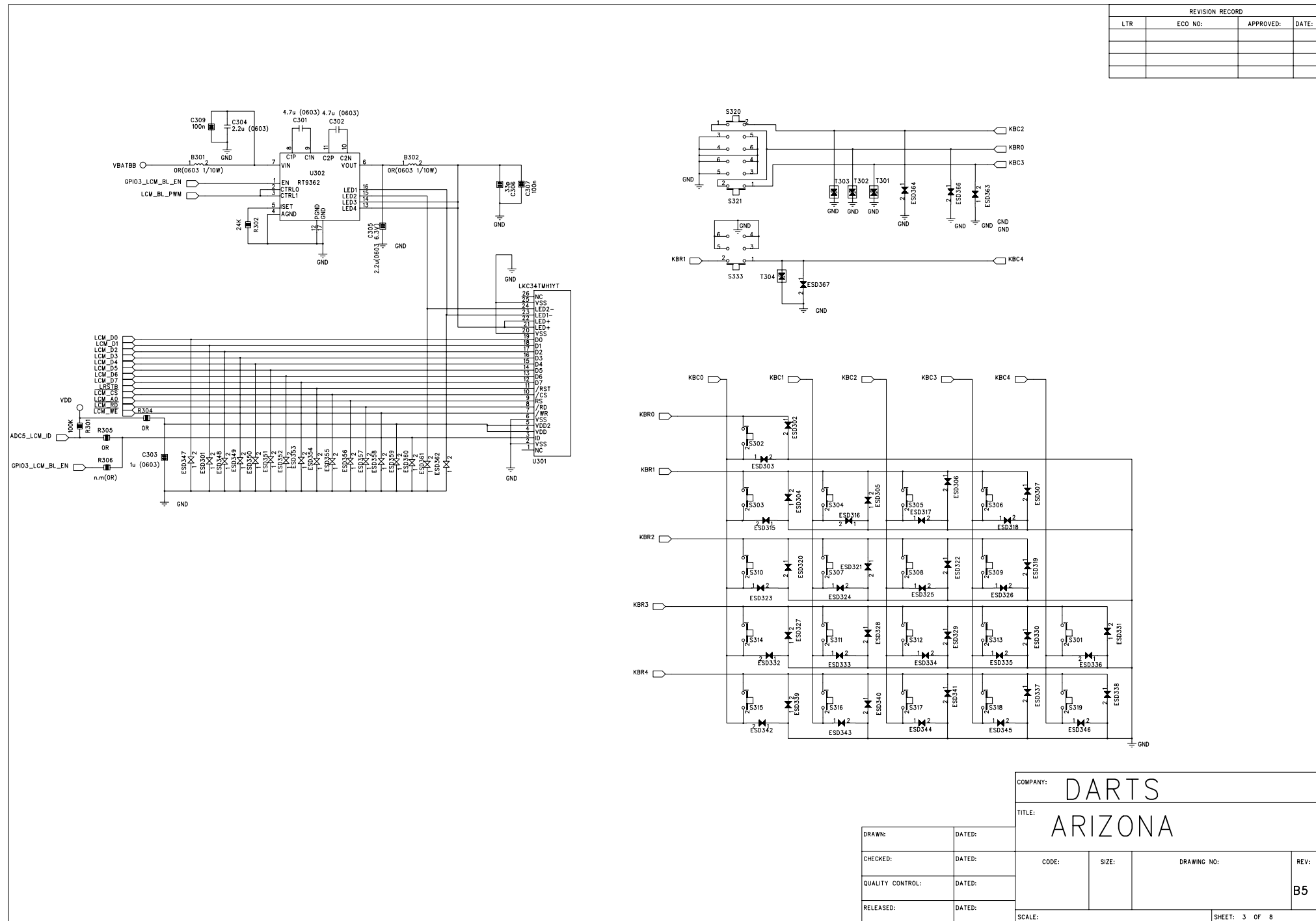
# 9. CIRCUIT DIAGRAM

## BB\_Main



# 9. CIRCUIT DIAGRAM

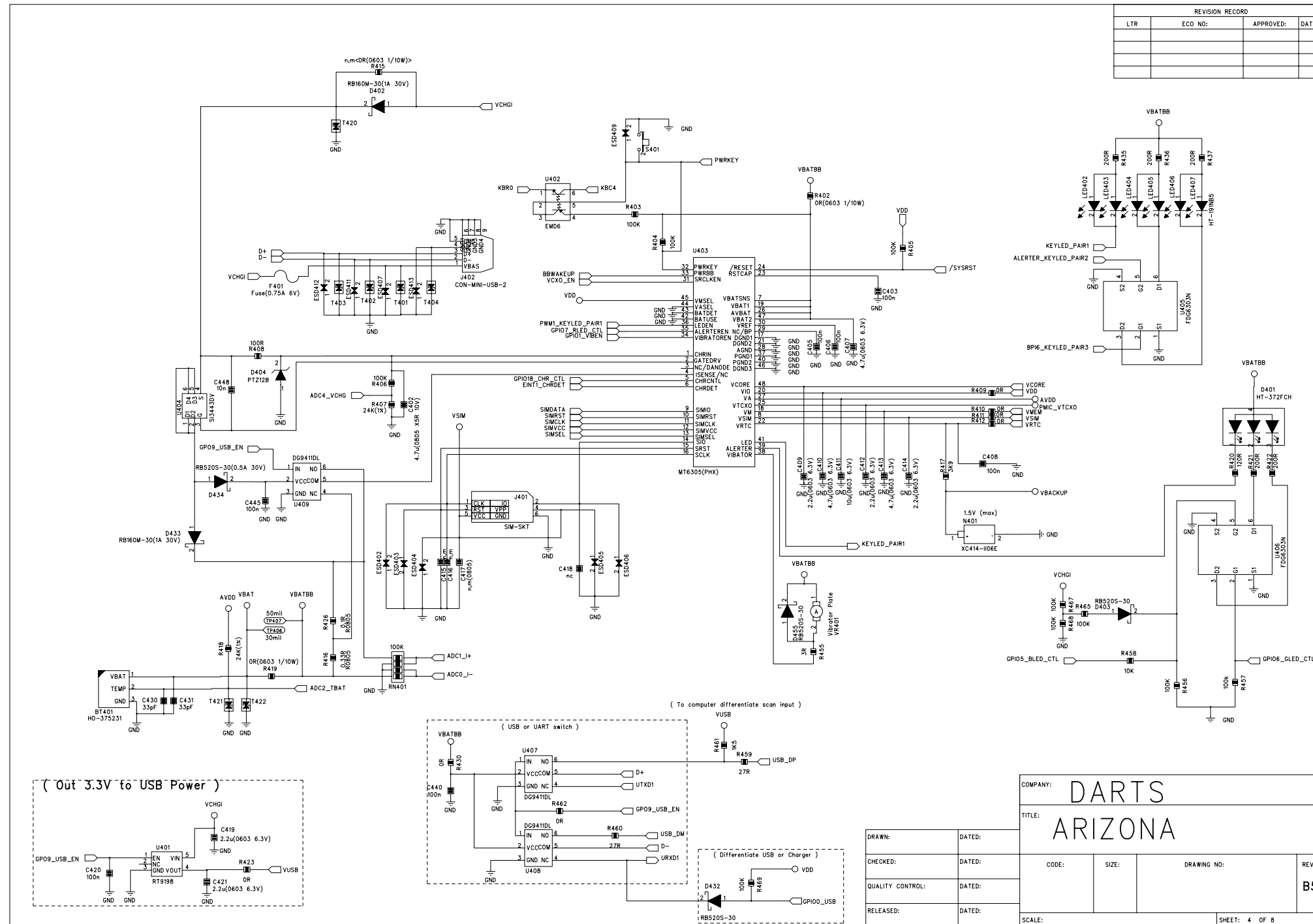
## LCD & Keypad



COMPANY: DARTS			
TITLE: ARIZONA			
DRAWN:	DATED:	CODE:	SIZE:
CHECKED:	DATED:	DRAWING NO:	
QUALITY CONTROL:	DATED:	REV: B5	
RELEASED:	DATED:	SCALE:	SHEET: 3 OF 8

# 9. CIRCUIT DIAGRAM

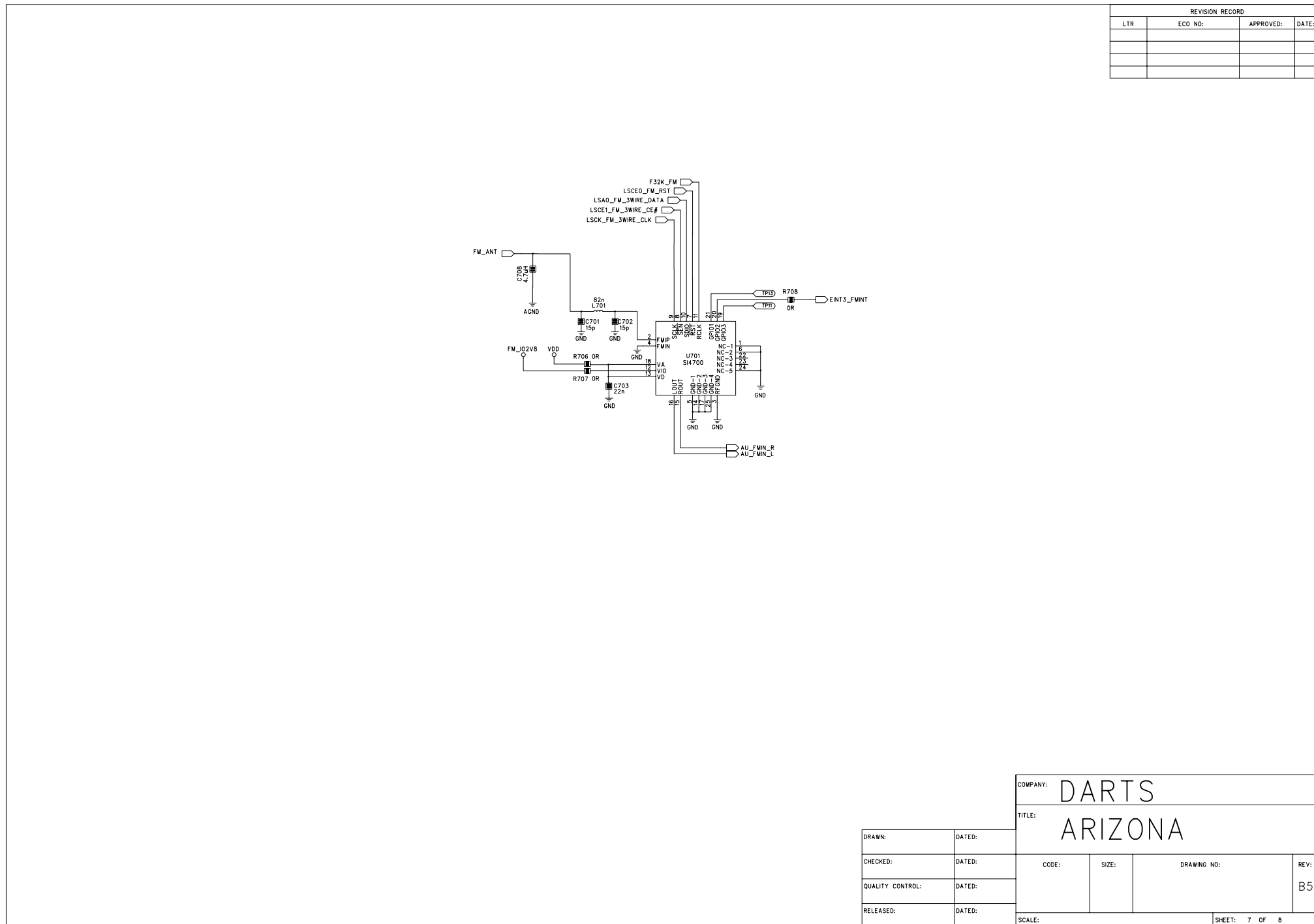
## PMIC & LED







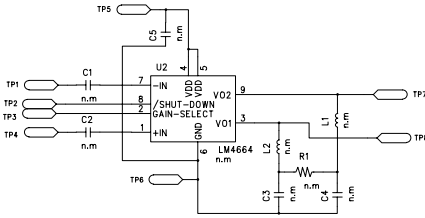
# 9. Circuit Diagram



COMPANY: DARTS			
TITLE: ARIZONA			
DRAWN:	DATED:	CODE:	SIZE:
CHECKED:	DATED:	DRAWING NO:	
QUALITY CONTROL:	DATED:	REV: B5	
RELEASED:	DATED:	SCALE:	SHEET: 7 OF 8



# 9. CIRCUIT DIAGRAM



REVISION RECORD			
LTR	ECO NO:	APPROVED:	DATE:

COMPANY:				DARTS	
TITLE:				ARIZONA	
DRAWN:	DATED:	CODE:	SIZE:	DRAWING NO:	REV:
CHECKED:	DATED:				B5
QUALITY CONTROL:	DATED:				
RELEASED:	DATED:	SCALE:		SHEET: 8 OF 8	

## 10. REPLACEMENT PART LIST

### 10. REPLACEMENT PART LIST

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

ITEM	Darts P/No.	Description	Min. Q'ty	Location	SVC	LG part number
	Chip Set					
1	2255-6217-3080	RISC PROCESSOR,TFBGA,282P	100	U201	OK	EUSY0298601
2	225K-T700-1080	BACKEND IC,TFBGA,96P,AIT700G/CN1-G	100	U500	OK	EUSY0296501
3	2257-6305-2080	DS,IC,POWER MANAGEMENT,QFN48,48PS	100	U403	OK	EUSY0296001
4	2259-RF31-2000	POWER AMPLIFIER RF3146 LFM 48P	100	U602	OK	SMPY0006401
5	2256-6120-1080	DS,IC,RF TRANSCEIVER,QFN,56P	100	U604	OK	EUSY0296801
	Memory					
5	2651-00FS-0080	FLASH+SRAM,128+32,S71PL127JB0BFW9U0	200	U102	OK	EUSY0296301
6	2252-9F12-5080	NAND FLASH,TSOP1,48P,64*8,K9F1208U0M-PCB0	200	U104	OK	EUSY0296401
	RF					
7	0942-5026-1082	X'TAL,26MHz,2.8V,0.5%,7P26000132,TXC	500	U601	OK	EXXY0022901
8	225W-ASM5-2080	SWITCH,ASM4518806T-2510A	500	U603	OK	SFAY0008001
9	0945-9425-0183	RF FILTER,942.5MHZ ,5P,F5EB-942M50-B28E,	500	Z601	OK	SFSY0024501
10	0945-1960-0183	RF FILTER,1960MHZ,5P,F6EB-1G9600-B2BE	500	Z602	OK	SFSY0028601
11	0945-1842-5183	RF FILTER,1842.5MHZ,5P,F6EB-1G8425-B2BG	500	Z603	OK	SFSY0028701
	BB					
12	220S-1020-0081	SWITCH,SIDE KEY,20MA/12V,6P,SOH-213HST	500	S320,S321,S333	OK	ESCY0004301
13	0942-6001-1000	TUNING FORK CRYSTAL,32.768KHZ,20ppm,12.5pF	500	X201	OK	EXXY0021301
14	225R-5323-5080	REGULATOR,SOT-23-6,6P,R5323N001B-TR-F	500	U501	OK	EUSY0297801
15	2258-2005-2080	AUDIO AMPLIFIER,ZQY,15P,TPA2005D1ZQYR	500	U101	OK	EUSY0160001
16	225F-4700-2080	FM MODULE,QFN,24P,SI4700-A09-GMR,SILICON	500	U701	OK	SMZY0012901
17	2263-6303-0684	MOSFET,SC70-6,6P,FDG6303N-NL,FAIRCHILD	500	U405,U406	OK	EQFN0003102
18	225W-9411-1080	SWITCH,SC70-6,6p,DG9411DL-T1-E3	500	U407,U408,U409	OK	EUSY0296101
19	2262-EMD6-0681	DOUBLE TRANSISTORS EMD6 PNP+NPN	500	U402	OK	EQBA0004001
20	225C-9362-2080	DC-DCCONVERTER,QFN-16L,3X3,16P	500	U302	OK	EUSY0296701
21	2263-3443-0685	MOSFET SI3443DV-T1-E3 SOT-6 LF	500	U404	OK	EQFP0006501
22	225R-9198-1080	REGULATOR,SC-70-5,5P,3.3V,RT9198-33PU5	500	U401	OK	EUSY0297701
23	221C-SK20-0186	DS,ME,CONN.,SOCKET,20PIN,CLE9020-0102F	500	U502	OK	ENSY0017301
24	2257-MLVS-1000	VCE MLVS0402M07 +-20% 7V 0402	500	T105,T106,T108, T109,T115,T116, T301,T302,T303, T304,T401,T402, T403,T404,T420, T421,T422	OK	SEVY0008201
25	2257-MLVS-2000	VCE MLVS0603K14 +-10% 14V 0603	500	T100,T103,T104	OK	SEVY0008202
26	2265-3010-0582	LED R G B HT-372FCH-DT	500	D401	OK	EDLS0001001
27		2265-B040-0286 LED,L=B,AOT-0603P-B110-HS	500	LED402-D407	OK	EDLH0012401
28	228S-T180-0000	PRE-SUB ASS'Y OSP,OTHER,BASE BAND SHIELDING ASS'Y	500			MTAC0035101

## 10. REPLACEMENT PART LIST

ITEM	Darts P/No.	Description	Min. Q'ty	Location	SVC	LG part number
	EME -SMT					
29	220B-0010-0000	BACKUP BATT D4.8xH1.4mm 0.06F XC414-II06E	200	N401	OK	SBCL0001003
30	221J-EP06-0988	EARPHONE JACK KM03011ABGS1 6P	200	J101	OK	ENJE0005101
31	220S-2010-0081	SWITCH,RF TEST SWITCH,6000MHz 2W	200	J601	OK	ENWY0004101
32	221C-SC06-0182	CONN.,SIM CARD CONN.,6PIN,217+010+606,ACT	200	J401	OK	ENSY0017201
33	221C-IN05-0185	CONN.,I/O CONN.,5PIN,US25R05-SBS	200	J402	OK	ENRY0006201
34	221C-SP02-0186	SPEK CONN P=3mm 2P CBE-2809-2258H	200	LS101	OK	ENZY0018401
35	221C-PG01-0181	POGO PIN 1P CDR-5815-2961	200	E2	OK	ENZY0018501
36	2212-BC18-0000	BASE BAND COVER	200		OK	MCBA0011201
37	2212-BF18-0000	BASE BAND FRAME	200		OK	MCBA0011202
38	2212-RC18-0000	RF COVER	200		OK	MCBA0011301
39	2212-RF18-0000	RF FRAME	200		OK	MCBA0011302
	Antenna Ass'y					
40	2285-3187-0000	ASS'Y,ANTENNA	100		OK	SNGF0013601
	Top case Ass'y					
41	2206-1110-0001	RECEIVER RECTANGLE,L1.5xW0.6xH3.8	100		OK	SURY0009301
42	2218-1800-6280	KEYPAD,ARI,RU,SILVER,MM-OB613S-40CHA	100		OK	ABGA0006901
42a	2218-1800-6500	KEYPAD,ARI,RU,COOL GRAY	100		OK	ABGA0006902
42b	2218-1800-A100	KEYPAD,ARI,EN,SILVER	100		OK	ABGA0006903
42c	2218-1800-A500	KEYPAD,ARI,EN,GRAY	100		OK	ABGA0006904
42d	2218-1800-4200	KEYPAD,ARI,SC,SILVER	100		OK	ABGA0006905
42e	2218-1800-4500	KEYPAD,ARI,SC,GRAY	100		OK	ABGA0006906
42f	2218-1800-5200	KEYPAD,ARI,ARABIC,SILVER	100		OK	ABGA0006907
42g	2218-1800-5500	KEYPAD,ARI,ARABIC,GRAY	100		OK	ABGA0006908
43	2211-SE18-1100	SIDE KEY CASE,ARI,SILVER,FOR 2 WAY	100		OK	MBJN0008401
44	2211-SE18-0100	SIDE KEY CASE,ARI,SILVER,FOR 1 WAY	100		OK	MBJL0032901
45	2211-DP18-1100	DECORATE PLATE,ARI,D-BLUE,FOR SIDE-L	100		OK	MDAC0017601
45a	2211-DP18-0500	PLASTIC,DECORATE PLATE,ARI,COOL GRAY,FOR SIDE-L	100		OK	MDAC0017602
46	2211-DP18-2100	DECORATE PLATE,ARI,D-BLUE,FOR SIDE-R	100		OK	MDAC0017701
46a	2211-DP18-1500	PLASTIC,DECORATE PLATE,ARI,COOL GRAY,FOR SIDE-R	100		OK	MDAC0017702
47	228S-1187-0000	PRE-SUB ASS'Y OSP,PRE-SUB TOP CASE ASS'Y,ARI,LOG, SILVER	100		OK	ACGK0073101
47a	228S-1187-0100	PRE-SUB ASS'Y OSP,PRE-SUB TOP CASE ASS'Y,ARI,LOG, BLUE	100		OK	ACGK0073102
48	2211-ML18-0100	PLASTIC,MAIN LENS,ARI,D-BLUE	100		OK	AWAB0021501
48a	2211-ML18-7500	PLASTIC,MAIN LENS,ARI,LG,COOL GRAY	100		OK	AWAB0021502
	Bottom case Ass'y					
49	221C-BA03-0102	BATT CONN PITCH=2.50mm 3P PA08303	100		OK	ENZY0018701
50	2206-5030-0083	MIC,OBG-15S42-C1033	100		OK	SUMY0005604
51	2207-0030-0003	VIBRATOR,3V,13x6x5.3mm,S408J-810255-1	100		OK	SJMY0007009

## 10. REPLACEMENT PART LIST

ITEM	Darts P/No.	Description	Min. Q'ty	Location	SVC	LG part number
52	228S-2187-0010	PRE-SUB ASS'Y OSP,PRE-SUB BOTTOM CASE ASS'Y,ARI, LOG,SILVER	100		OK	ACGM0071701
52a	228S-2187-0110	PRE-SUB ASS'Y OSP,PRE-SUB BOTTOM CASE ASS'Y,ARI, LOG,BLUE	100		OK	ACGM0071702
	ME Ass'y					
53	2206-6020-0088	SPEAKER,DMS1508C-11-PC-F3-G	100		OK	SUSY0020801
54	2214-MF13-3Z80	SCREW,D2.4XM1.6X3.8,ZN,WHITE	100		OK	GMZZ0020401
55	2213-TR18-0100	OTHER,TPR,ARI,SILVER,FOR RF CAP	100		OK	MCCF0035601
55a	2213-RB18-4700	OTHER,RUBBER,ARI,BLUE,FOR RF CAP	100		OK	MCCF0035602
56	2213-TR18-2100	OTHER,TPR,ARI,SILVER,FOR USB CAP	100		OK	MCCE0029101
56a	2213-RB18-5700	OTHER,RUBBER,ARI,BLUE,FOR USB CAP	100		OK	MCCE0029102
57	2213-TR18-1100	OTHER,TPR,ARI,SILVER,FOR PHONE JACK CAP	100		OK	MCCC0036001
57a	2213-RB18-6700	OTHER,RUBBER,ARI,BLUE,FOR PHONE JACK CAP	100		OK	MCCC0036002
58	2212-DM18-0000	DS,ME,METAL,DOME,ARI	100		OK	ADCA0051201
59	2221-1341-0082	LCM,STN,128*128dot,26P,LKC34TML8Y2	100		OK	SVLY0027001
60	2211-BA18-0100	BAT.COVER	100		OK	MCJA0032301
60a	2211-BA18-0700	PLASTIC,BAT.COVER,ARI,BLUE	100		OK	MCJA0032302
	Accessory					
61	220A-1800-7080	BATT PACK	50		OK	SBPL0076310
62	2237-22T0-1003	TRV.CHARGER	50		OK	SSAD0007869
63	2236-6620-4001	CABLE MINI CABLE	50		OK	SGDY0005603
64	223A-0020-2080	HANDSFREE,150Bÿ,CHM201STM02027_LI,LF	50		OK	SGEY0003207
	Service					
65		SW D/L CABLE	50		OK	SGDY0011001
66	2281-18B5-0080	PCBA	50		OK	SAFY0159101

## Note

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