

# Service Manual

## Digital Cellular Telephone

### GSM

### EB-VS3



	900 MHz	1800 MHz	1900 MHz
Tx Frequency Range:	880 - 915MHz	1710 -1785 MHz	1850 - 1910 MHz
Rx Frequency Range:	925 - 960 MHz	1805 -1880 MHz	1930 - 1990 MHz
Tx / Rx separation	10.4 MHz	20.4 MHz	20.4 MHz
RF Channel Bandwidth	200 kHz		
Number of RF channels	174	374	299
Speech coding	Full rate / Half rate / Enhanced Full rate		
Operating temperature	-10 °C to +55 °C		
Type	Class 4 Handheld	Class 1 Handheld	Class 1 Handheld
RF Output Power	2 W maximum	1 W maximum	1 W maximum
Modulation	GMSK (BT = 0.3)		
Connection	8 ch / TDMA		
Voice digitizing	13 kbps RPE-LTP / 13 kbps ACLEP / 5.6 kbps CELP / VSLEP		
Transmission speed	27		
Signal Reception	Direct conversion		
Antenna VSWR	< 2.5 : 1		
Dimensions	Height: 96 mm Width: 46 mm Depth: 17.85 mm (Depth excludes protrusions)		
Volume	79 cc		
Weight	102 g		
Main Display	TFT LCD; approximately 16 million colours		
Illumination	16 LEDs for Keypad Backlighting (14 Blue & 2 White) 4 LEDs for LCD Backlighting (White) 1 LEDs for Sub LCD (White)		
Keys	21-key Keypad, Navigation key, 1 memo key		
SIM	1.8 V & 3 V Plug-in type only		
External DC Supply Voltage	5.8 V		
Battery	3.7 V nominal, 830 mAh, Li-Ion 3.7 V nominal, 810 mAh, Li-Ion for China market		
Charging Time	150 minutes		
Standby Time	up to 240 hrs		
Talk Time	up to 5 hrss		

Talk and standby time will be dependent on network conditions, SIM card, backlight usage and network condition.

#### ⚠ 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.

# Panasonic

Revision : 03

© 2005 Panasonic Mobile Communications Co., Ltd.  
All rights reserved. Unauthorized copying and distribution is a violation of law.

# COMPANY LIABILITY

Every care has been taken to ensure that the contents of this manual give an accurate representation of the equipment. However, Panasonic Mobile Communications Co., Ltd. accepts no responsibility for inaccuracies which may occur and reserves the right to make changes to the specification or design without prior notice. The information contained in this manual and all rights in any design disclosed therein, are and remain the exclusive property of Panasonic Mobile Communications Co., Ltd.

Other patents applying to material contained in this publication:

CP8 PATENTS

Comments or correspondence concerning this manual should be addressed to:

Panasonic Mobile Communications Co., Ltd.

600, Saedo-cho, Tsuzuki-ku, Yokohama, 224-8539, Japan

# CONTENTS

## VOL.1

<b>1. INTRODUCTION</b> .....	1-1
1.1. Purpose of the Manual .....	1-1
1.2. Structure of the Manual .....	1-1
1.3. Servicing Responsibilities .....	1-1
<b>2. GENERAL DESCRIPTION</b> .....	2-1
2.1. General .....	2-1
2.2. Features .....	2-1
2.3. Handportable Main Kits .....	2-1
<b>3. OPERATING INSTRUCTIONS</b> .....	3-1
3.1. General .....	3-1
3.2. Phone Overview .....	3-1
3.3. Key Functions .....	3-2
3.4. Quick Keys .....	3-3
3.5. Display .....	3-4
3.6. Menu Structure .....	3-5
<b>4. TECHNICAL SPECIFICATIONS</b> .....	4-1
4.1. Tx Characteristics .....	4-1
4.2. Rx Characteristics .....	4-2

## VOL.2

<b>5. TECHNICAL DESCRIPTION</b> .....	5-1
<i>(Referring to a separate volume)</i>	
5.1. RF Description .....	5-1
5.2. Baseband Description .....	5-28

## VOL.3

<b>6. DISASSEMBLY / REASSEMBLY INSTRUCTIONS</b> .....	6-1
6.1. General .....	6-1
6.1.1. ESD Handling Precautions .....	6-1
6.2. Disassembly .....	6-2
6.3. Reassembly .....	6-8

<b>7. REPAIR PROCEDURES</b> .....	7-1
7.1. Introduction .....	7-1
7.2. Any-Layer Interstitial Via Hole (ALIVH) PCBs .....	7-1
7.2.1. General Information .....	7-1
7.2.2. Repair Procedures .....	7-1
7.3. Lead Free (PbF) solder .....	7-2
7.4. Jigs and Tools .....	7-3

## **VOL.4**

<b>8. SOFTWARE DOWNLOAD</b> .....	8-1
8.1. Flash Tool update and operation guide .....	8-1
8.1.1. Introduction .....	8-1
8.2. Installation of the Flash Download Tool .....	8-1
<b>9. CALIBRATION PROCEDURE</b> .....	9-1
9.1. Introduction .....	9-1
9.2. Carrier Power Calibration .....	9-1
9.3. Baseband Calibration .....	9-4
9.4. Data Overwrite Procedure .....	9-8
9.5. VCTCXO (Frequency) Calibration .....	9-10
9.6. Transmit Power Calibration .....	9-12
9.7. Rxlev Calibration .....	9-18

## **VOL.5**

<b>10. REPLACEMENT PARTS LIST</b> .....	10-1
10.1. Upper Unit .....	10-1
10.2. Lower Unit .....	10-2
10.3. Main PCB .....	10-3
10.4. Upper PCB .....	10-6
10.5. SIM PCB .....	10-8

## **VOL.6**

<b>11. BLOCK DIAGRAM</b> .....	11-1
10.1. Baseband .....	11-1
10.2. RF Band .....	11-2
<b>12. CIRCUIT DIAGRAM</b> .....	12-1
12.1. Main PCB (Baseband) .....	12-1
12.2. Main PCB (RF Band) .....	12-2
12.3. Upper PCB .....	12-3
12.4. FPC PCB .....	12-4
12.5. SIM PCB .....	12-5
<b>13. LAYOUT DIAGRAM</b> .....	13-1
13.1. Main PCB (Upper Side) .....	13-1
13.2. Main PCB (Bottom Side) .....	13-2
13.3. Upper PCB (Upper Side) .....	13-3
13.4. Upper PCB (Upper Side) .....	13-4
13.5. FPC PCB .....	13-5
13.6. SIM PCB .....	13-6

# Service Manual

Digital Cellular Telephone

GSM

EB-VS3

VOL. 1

<b>1. INTRODUCTION</b>	1-1
1.1. Purpose of the Manual	1-1
1.2. Structure of the Manual	1-1
1.3. Service Responsibilities	1-1
<b>2. GENERAL DESCRIPTION</b>	2-1
2.1. General	2-1
2.2. Features	2-1
2.3. Handportable Main Kit	2-1
<b>3. OPERATING INSTRUCTIONS</b>	3-1
3.1. General	3-1
3.2. Phone Overview	3-1
3.3. Key Functions	3-2
3.4. Quick Keys	3-3
3.5. Display	3-4
3.6. Features Menu Structure	3-5
<b>4. TECHNICAL SPECIFICATIONS</b>	4-1
4.1. Tx Characteristics	4-1
4.2. Rx Characteristics	4-2

## 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.

# Panasonic

© 2005 Panasonic Mobile Communications Co., Ltd.  
All rights reserved. Unauthorized copying and distribution is a violation of law.

# 1. INTRODUCTION

## **WARNING**

The equipment described in this manual contains polarised capacitors utilising liquid electrolyte. These devices are entirely safe provided that neither a short-circuit nor reverse polarity connection is made across the capacitor terminals. FAILURE TO OBSERVE THIS WARNING COULD RESULT IN DAMAGE TO THE EQUIPMENT OR, AT WORST, POSSIBLE INJURY TO PERSONNEL RESULTING FROM ELECTRIC SHOCK OR THE AFFECTED CAPACITOR EXPLODING. EXTREME CARE MUST BE EXERCISED AT ALL TIMES WHEN HANDLING THESE DEVICES.

## **Caution**

The equipment described in this manual contains electrostatic devices (ESDs). Damage can occur to these devices if the handling procedures are described in Section 6.

## **Caution**

This equipment may contain an internal battery in addition to the external battery packs. These batteries are recyclable and should be disposed of in accordance with local legislation. They must not be incinerated, or disposed of as ordinary rubbish.

## 1.1. Purpose of the Manual

This Service Manual contains the information and procedures required for installing, operating and servicing the Panasonic 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 the testing, disassembly, repair and reassembly of each major component part. 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 enables verification of the integrity of the equipment after any remedial action has been carried out.
4. Illustrated parts list - provided to enable the identification of all equipment components, for the ordering of spare / replacement parts.

## 1.3. Servicing Responsibilities

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

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

## 2. GENERAL DESCRIPTION

### 2.1. General

This section provides a general description and kit composition details for the GSM Handportable Telephone System and optional kits.

### 2.2. Features

The Panasonic Cellular Telephone Model EB-VS3 is a high performance, small, light, handset for business and domestic use. The following features are provided:

- Dual Codec, which includes Full Rate, Half Rate and Enhanced Full Rate (EFR) Speech Codec.
- Triple Band, E-GSM 900, DCS 1800 and PCS 1900 operation.
- Tegic T9 Text Entry.
- Voice Ringer.
- Desktop handsfree function comprising integral echo cancellation and noise suppression.
- Wireless Application Protocol (WAP) Browser.
- Backup Battery.
- Downloadable polyphonic melody ring tones.
- Clock, Calculator and Currency Converter.

### 2.3. Handportable Main Kit



Figure 2.1. : Handportable Main Unit Kit Contents

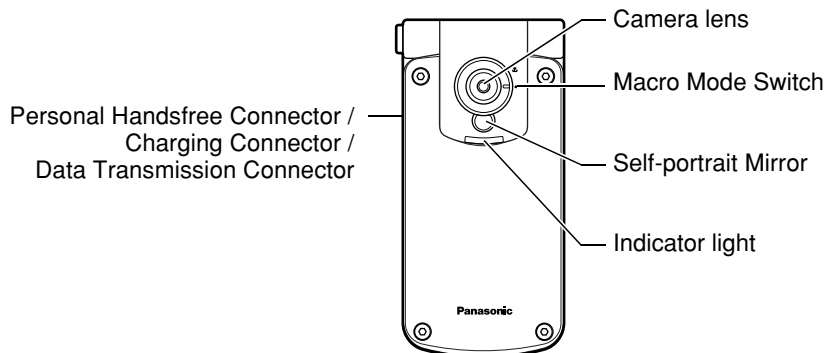
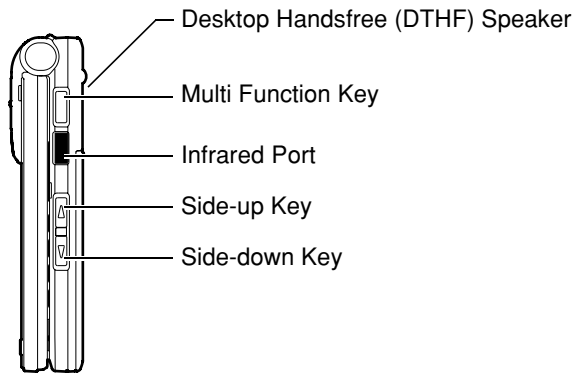
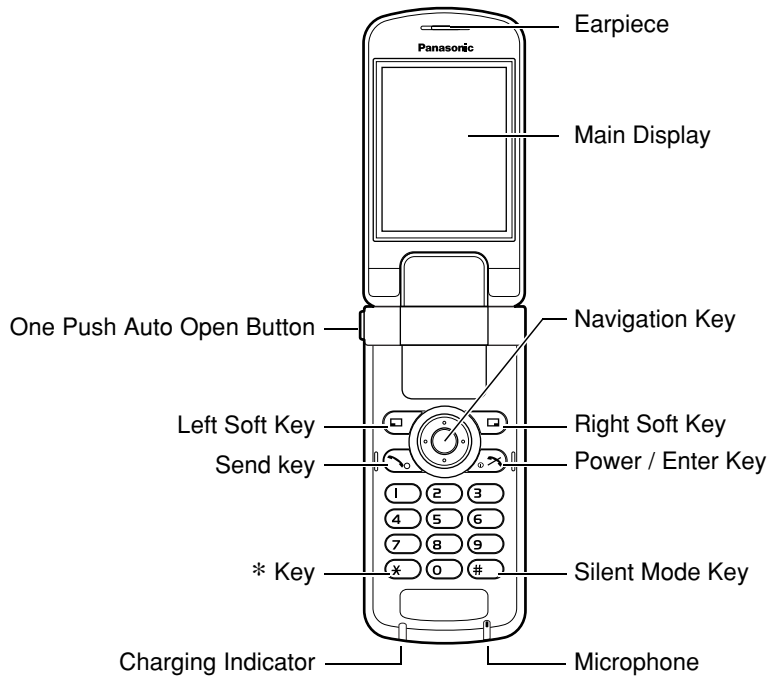
Item	Description	Model Number
1	Main Unit	EB-VS3
2	Battery, Standard	EB-BS001, EB-BS001CN
3	Travel Charger	EB-CD001, EB-CD001US

# 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 Instructions supplied with the telephone for full operational information.

## 3.2. Phone Overview



### 3.3. Key Functions

Key Name	Function	Key Icon *1
Navigation key	Press outside edges to scroll up [▲], down [▼], left [◀] or right [▶] to move through menus and text. Press centre [●] to select to select option, or take a picture or record a video clip in Camera mode.	[▲] [▼] [◀] [▶] [●]
Left Soft key	Perform the functions indicated by text shown in the lower left-hand corner of the display.	[☐]
Right Soft key	Perform the functions indicated by text shown in the lower right-hand corner of the display.	[☐]
Send key	Make or answer a call.	[↵]
Power/End key	Press and hold to switch the phone on/off. End or reject a call. Return to standby mode.	[⏻]
Numeric keys	Enter numbers and characters. Press and hold [2] - [9] for Speed dialling. Press and hold [0] to enter the international prefix (+).	[ 0 ] to [ 9 ]
Asterisk key	Enter " * ". In text entry mode, press to change the letter case, or press and hold to change the input method.	[ * ]
Silent Mode key	Enter " # ". Press and hold to switch the Silent mode on/off. While entering a phone number, press and hold to enter a pause (p).	[ # ]
Side-up key *2	Scroll page up. Increase volume or zoom level.	[▲]
Side-down key *2	Scroll page down. Decrease volume or zoom level.	[▼]
Multi Function key *2	Take a picture or record a video clip in Camera mode.	[📷]

\*1 The key icons given in the table represent the actual keys on the phone.

\*2 Located on the right side of the phone.

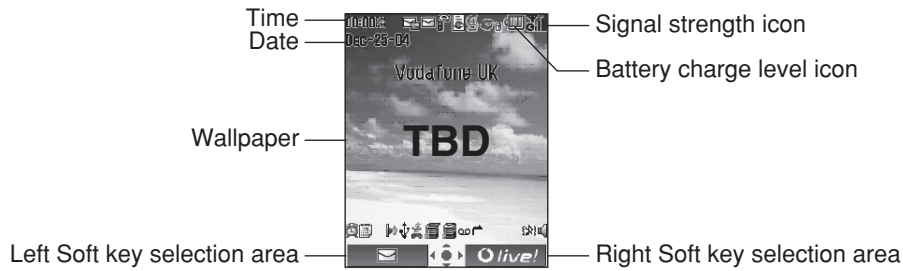


### 3.4. Quick Keys

	Key	Function
<b>In standby mode</b>		
<b>Short press</b>	[●]	Open Main menu / Alert mute / Keyguard off
	[☐]	Open Main menu
	[☐]	Open Browser
	[▲]/[▼]/[◀]/[▶]	Open shortcut menu
	[↶]	Open Call log
	[☐]/[☐]/[☐]	Alert mute
<b>Long press</b>	[●]	Keyguard on
	[1]	Dial your voice mailbox
	[2] to [9]	Speed dial
	[#]	Silent mode on / off
	[☐]	Switch to phone mode
<b>During a call</b>		
<b>Short press</b>	[▲]/[☐]	Increase the volume
	[▼]/[☐]	Decrease the volume
	[☐]	Start / stop sound recording
	[↶]	Switch between hold and unhold on one call or switch between one active and one held call
<b>In Menu list</b>		
<b>Short press</b>	[1] - [9]	Select Menu <b>1 - 9</b>
	[✖]	Select Menu <b>✖</b>
	[0]	Select Menu <b>0</b>
	[#]	Select Menu <b>#</b>

## 3.5. Display

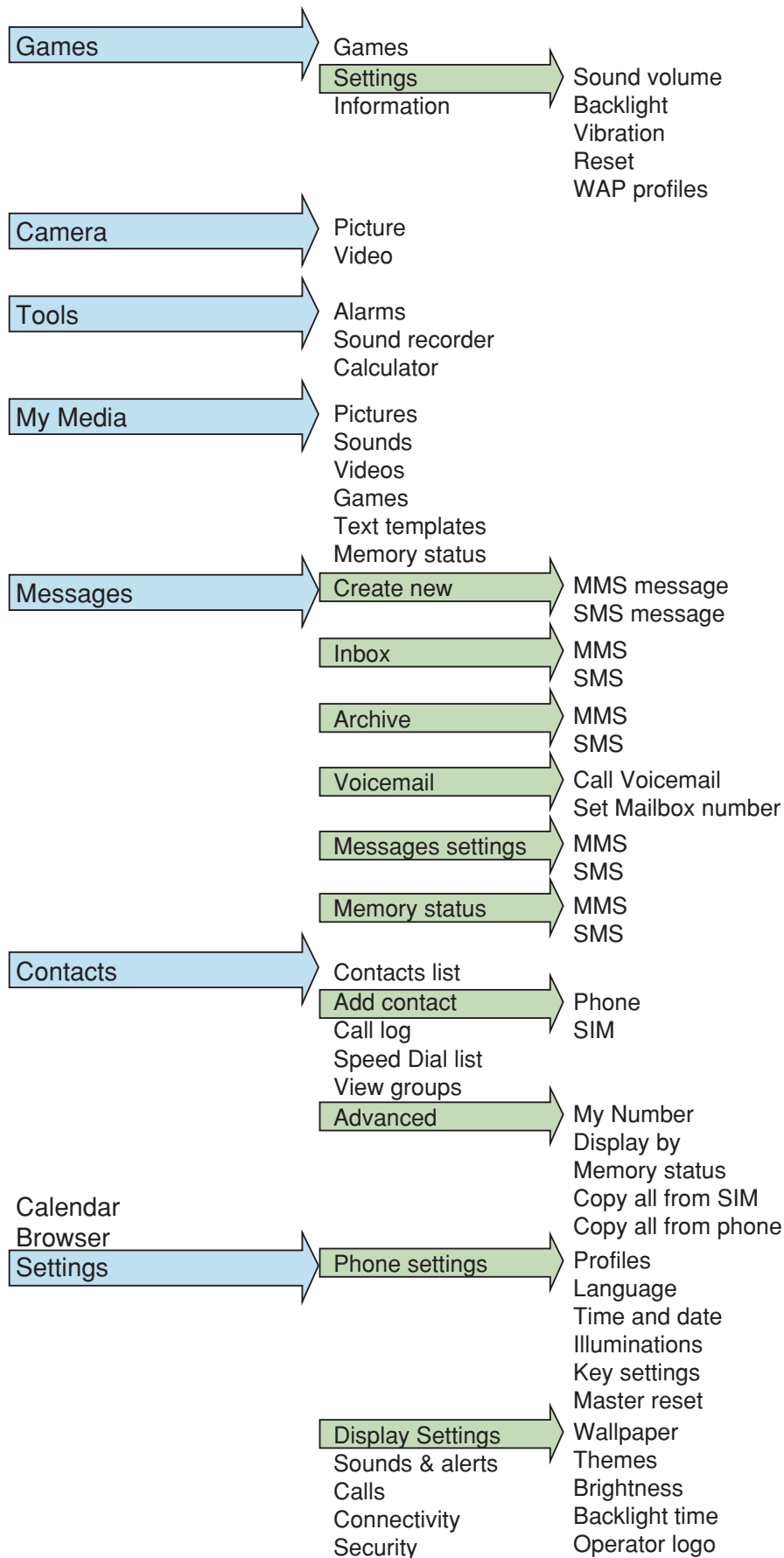
### ■ Standby display



### ■ Status Icons

Icon	Meaning
	Signal strength; the more bars visible, the stronger the signal.
	In roaming area
	Battery charge level
	Battery is charging
	GPRS is active
	Silent profile is active
	Meeting profile is active
	Outdoor profile is active
	Car profile is active
	SMS message storage area is full
	MMS message storage area is full
	Java <sup>TM</sup> is suspended
	Unread SMS message
	Unread MMS message
	Unread WAP Push message
	Call diverts is on
	Infrared is active
	USB connection is available
	New voicemail received
	All tones are off
	Vibration alert is on
	Alarm is set
	Keyguard is on

### 3.6. Features Menu Structure



## 4. TECHNICAL SPECIFICATIONS

### 4.1. Tx Characteristics

All data is applicable to E-GSM 900 and GSM 1800 except where stated.

#### ■ Frequency Error

±0.1 ppm max., relative to base station frequency.

#### ■ Modulation Phase Error

RMS: Equal to or less than 5 °

Peak: Equal to or less than 20 °

#### ■ Output RF Spectrum due to Modulation

Offset from Centre Frequency (kHz)	Maximum Level Relative to Carrier (dB)
±100	+0.5
±200	-30
±250	-33
±1200	-60
±600 to 1800	-60

#### ■ Output RF Spectrum due to Switching Transients

Offset from Centre Frequency (kHz)	Maximum Level (dBm)	
	E-GSM 900	GSM 1800
±400	-19	-22
±600	-21	-24
±1200	-21	-24
±1800	-24	-27

Measurement conditions for output RF spectrum measurements:

Frequency Span	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

## ■ Spurious Emissions at Antenna Connector

Frequency Range	Frequency offset	Filter Bandwidth	Approx Video B/W	Limits (dBm)	
				E-GSM 900	GSM1800
100 kHz to 50 MHz	–	10 kHz	30 kHz	–36	–36
50 MHz to 500 MHz	–	100 kHz	300 kHz	–36	–36
500 MHz to 1 GHz	0 to 1MHz	100 kHz	300KHz	–36	–36
1 GHz to 12.75 GHz	0 to 10 MHz	100 kHz	300 kHz	–30	–30 (1.0 GHz - 1.710 GHz)
Excl. relevant TX band	> 10 MHz	300 kHz	1 MHz	–30	
E-GSM : 880 MHz to 915 MHz	> 30 MHz	3 MHz	3 MHz	–30	–36 (1.710 GHz - 1.785GHz)
DCS : 1710 MHz to 1785 MHz	(offset from edge of relevant Tx band)				–30 (1.785 GHz - 12.75GHz)
-and the Rx bands					
925 MHz - 960 MHz					
1805 MHz - 1880 MHz					
Relevant TX band:	1.8 MHz to 6.0 MHz	30 kHz	100 kHz	–36	–36
E-GSM : 880 MHz to 915 MHz	> 6.0 MHz	100 kHz	300 kHz	–36	–36
DCS :1710 MHz to 1785 MHz					

## ■ Residual Peak Power

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

## 4.2. Rx Characteristics

### ■ 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 TU high		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	$6.742^* \alpha$	8,900					$0.122^* \alpha$	164,000
Class Ib (RBER)	$0.42/\alpha$	1,000,000	7.5	24,000	9.333	60,000	$0.41/\alpha$	20,000,000
Class II (RBER)	8.33	120,000					2.439	8,200

The reference sensitivity level is < –102 dBm.

**NOTE:**  $1 < \alpha < 1.6$ . The value of  $\alpha$  can be different for each channel condition but must remain the same for FER and class 1b RBER measurements for the same channel condition.

❑ **GSM 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 TU high		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	4.478* $\alpha$	13400					0.122* $\alpha$	164,000
Class 1b (RBER)	0.32/ $\alpha$	1,500,000					0.41/ $\alpha$	20,000,000
Class II (RBER)	8.333	60,000	7.5	24,000	9.333	30,000	2.439	8,200

The reference sensitivity level is < -102 dBm.

**NOTE:**  $1 < \alpha < 1.6$ . The value of  $\alpha$  can be different for each channel condition but must remain the same for FER and class 1b RBER measurements for the same channel condition.

**❑ Blocking:**

Frequency	Small MS level in dB $\mu$ Vemf( )	
	E-GSM 900	GSM 1800
FR $\pm$ 600 kHz to FR $\pm$ 800 kHz	70	70
FR $\pm$ 800 kHz to FR $\pm$ 1.6 MHz	70	70
FR $\pm$ 1.6 MHz to FR $\pm$ 3 MHz	80	80
915 MHz to FR - 3 MHz	90	–
FR $\pm$ 3 MHz to FR 980 MHz	90	–
FR $\pm$ 600 KHz to FR $\pm$ 800 KHz	–	87
1785 MHz to FR - 3 MHz	–	87
835 MHz to < 915 MHz	113	–
> 980 MHz to 1000 MHz	113	–
100 kHz to < 835 MHz	90	–
> 1000 MHz to 12.75 GHz	90	–
100 kHz to 1705 MHz	–	113
> 1705 MHz to < 1785 MHz	–	101
> 1920 MHz to 1980 MHz	–	101
> 1980 MHz to 12.75 GHz	–	90

Measurement Conditions:

Wanted carrier is 3 dB above reference sensitivity.

Interferer is CW.

Spurious response exceptions:

Six exceptions are permitted IN band 915 MHz - 980 MHz.

24 exceptions are permitted OUTSIDE band 915 MHz - 980 MHz.

**❑ Intermodulation Characteristics**

Interferer Level ( f1 & f2) dBm	Interferer Frequencies ( f1 & f2 )
–49	Wanted frequency= 2f1 - f2, and [ f1 - f2] = 800 kHz

# Service Manual

Digital Cellular Telephone

GSM

EB-VS3

VOL. 2

<b>5. TECHNICAL DESCRIPTION</b> .....	5-1
5.1. RF Description .....	5-1
5.2. Baseband Description .....	5-3

*(Referring to a separate volume)*

## **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.

# Panasonic

©2005 Panasonic Mobile Communications Co., Ltd.  
All rights reserved. Unauthorized copying and distribution is a violation of law.



# Service Manual

Digital Cellular Telephone

**GSM**

**EB-VS3**

**VOL. 3**

<b>6. DISASSEMBLY / REASSEMBLY INSTRUCTIONS</b> .....	6-1
6.1. General .....	6-1
6.2. Disassembly .....	6-2
6.3. Reassembly .....	6-8
<b>7. REPAIR PROCEDURE</b> .....	7-1
7.1. Introduction .....	7-1
7.2. Any-Layer Interstitial Via Hole (ALIVH) PCBs .....	7-1
7.3. Lead Free (Pbf) solder .....	7-2
7.4. Jigs and Tools .....	7-3

## **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.

**Panasonic**

© 2005 Panasonic Mobile Communications Co., Ltd.  
All rights reserved. Unauthorized copying and distribution is a violation of law.

## 6. DISASSEMBLY / REASSEMBLY INSTRUCTIONS

### 6.1. General

This section provides disassembly and reassembly procedures for the main components of the telephone. These assemblies MUST be performed by qualified service personnel at an authorised service centre. The following Warnings and Cautions MUST be observed during all disassembly / reassembly operations:

#### WARNING

The equipment described in this manual contains polarised capacitors utilising liquid electrolyte. These devices are entirely safe provided that neither a short-circuit nor a reverse polarity connection is made across the capacitor terminals. FAILURE TO OBSERVE THIS WARNING COULD RESULT IN DAMAGE TO THE EQUIPMENT OR, AT WORST, POSSIBLE INJURY TO PERSONNEL RESULTING FROM ELECTRIC SHOCK OR THE AFFECTED CAPACITOR EXPLODING. EXTREME CARE MUST BE EXERCISED AT ALL TIMES WHEN HANDLING THESE DEVICES.

#### Caution

The equipment described in this manual contains electrostatic devices (ESDs). Damage can occur to these devices if the handling procedures described are not adhered to.

#### 6.1.1. ESD Handling Precautions

A working area where ESDs may be handled safely without undue risk of damage from electrostatic discharge must be available. The area must be equipped as follows.

#### Working Surfaces

All working surfaces must have a dissipative bench mat, safe for use with live equipment, connected via 1.2 M $\Omega$  resistor (usually built into the lead) to a common ground point.

#### Wrist Strap

A QUICK RELEASE SKIN CONTACT DEVICE WITH A FLEXIBLE CORD, WHICH HAS AN INTEGRAL SAFETY RESISTOR OF BETWEEN 5.2 k $\Omega$  AND 1.2 M $\Omega$ , SHALL BE USED.

#### Containers

All containers and storage must be of the conductive type.

## 6.2. Disassembly

### ■ Lower Case Assembly and Main PCB removal

1. Place thumbs at outer edges of battery cover, press down, then slide the battery cover toward direction of the arrow.



2. Lift and remove battery.



3. Using tweezers, remove the two screw caps. Discard these items.

Two screw caps.



4. Use the Trident screwdriver to remove the four case screws. Retain the screws for re-use.



5. Separate the two halves of the lower case assembly using a plastic strip (of Guitar pick thickness) as shown.



6. Remove the SIM/Speaker board by finger.



7. Using tweezers, remove the hinge holder.

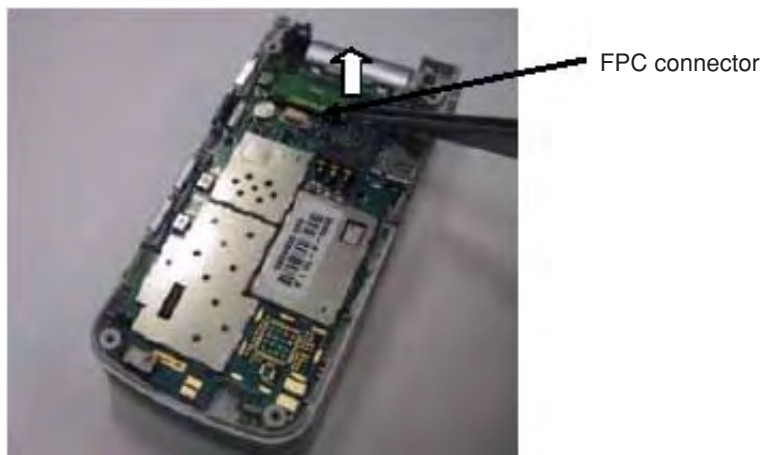


8. Carefully insert tweezers into the gap between FPC and Main PCB.

9. Gently lift up the tweezers direction of the arrow and then remove the FPC connector.

10. Remove Main PCB from the lower front cover.

**Note:** Take care not to damage the FPC connector when disconnecting the FPC from the Main PCB.



## ■ Upper Case Assembly and Display Modle removal

1. Set the phone into the "open" position.

2. Using tweezers or a pin gently lift up and remove the three panels.

**Note:** The three panels must be replaced with new parts for reassembly.



3. Use the trident screwdriver to remove the four screws. Retain the screws for re-assembly

Four screws



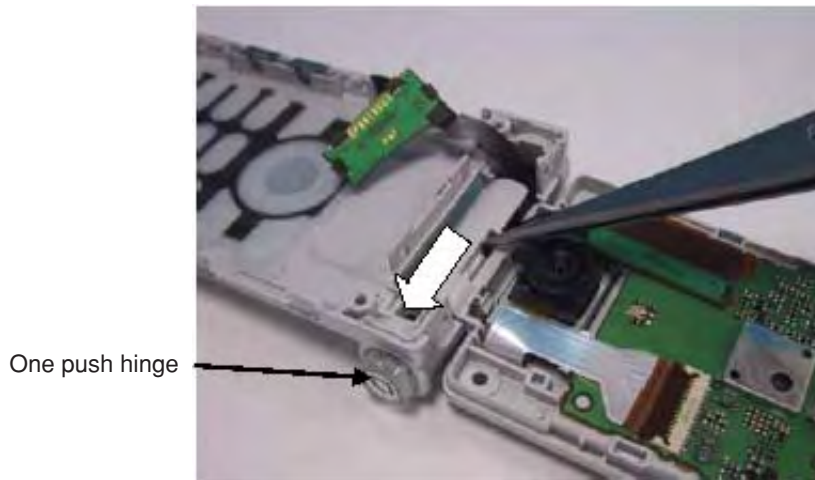
4. Set the phone into the "Close" position.
5. Use a strip of plastic (of guitar pick thickness) to separate the case halves.



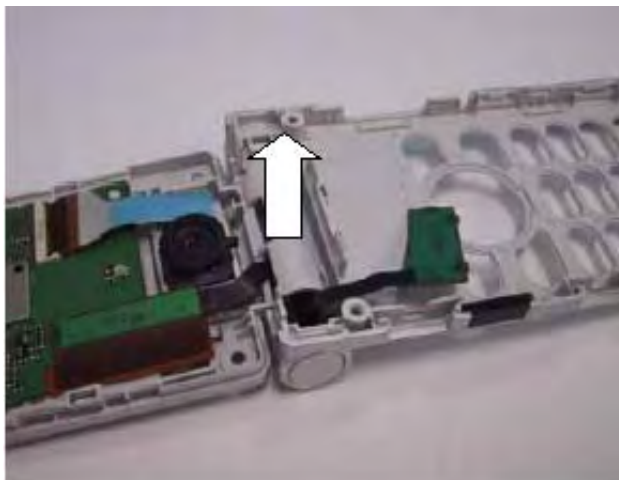
6. Remove upper case assembly.



7. Set the phone to the "Open" position.
8. Using a small screw driver or tweezers, apply pressure to the one push hinge direction while pulling the hinge away from the case.



9. Lift and remove the case assembly.

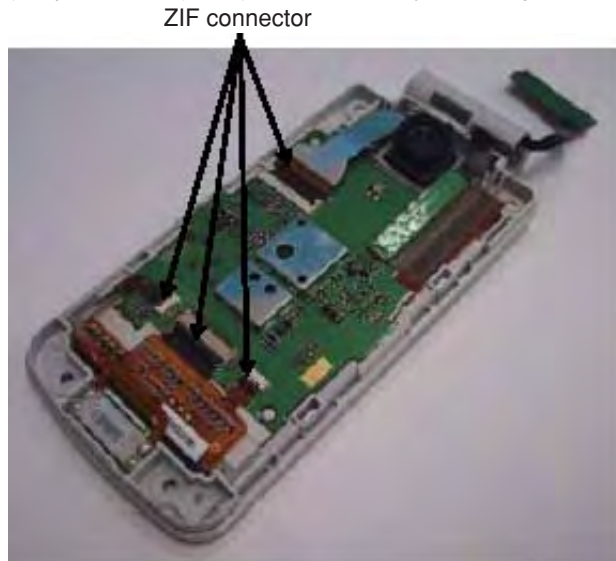




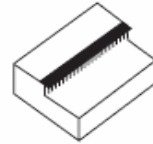
## ■ LCD Removal

1. Using tweezers, carefully open the ZIF connector.
2. Remove four FPC from upper PCB.

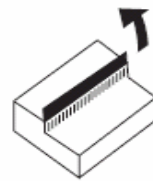
**Caution:** Lift up(open) or push down (close) flex lock carefully, If damaged, a new connector must be placed on PCB.



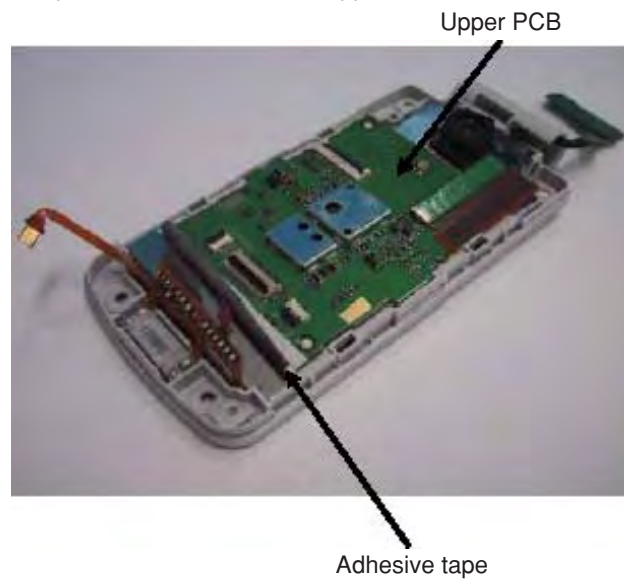
Flex Lock Closed



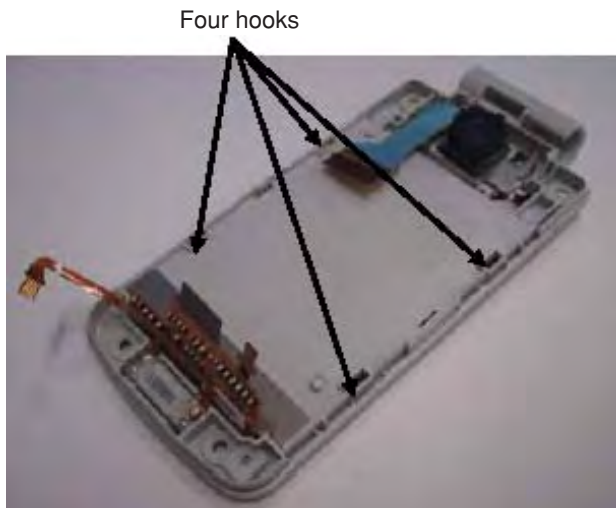
Flex Lock Open



3. Peel the the adhesive tape and them remove the Upper PCB.



4. Release the four hooks and then remove LCD module.





## 6.3. Reassembly

### CAUTION

IF ANY RF, BLUETOOTH OR BASEBAND SHIELDS ARE REMOVED FROM THE PCB AT ANY TIME, THEY MUST BE REPLACED WITH NEW ITEMS. ONCE REMOVED, THE SHIELDS MUST NOT BE REUSED.

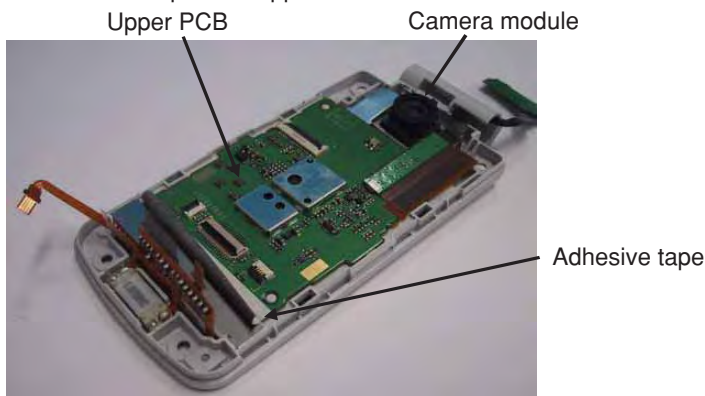
**Notes:** *If the case assemblies have been disassembled and reassembled more than three times, they should be replaced with new items.*  
*Examine all case and cover parts before assembly. If any scratches or defects are found in their finish, they should be replaced with new items.*

### ■ Upper Case reassembly

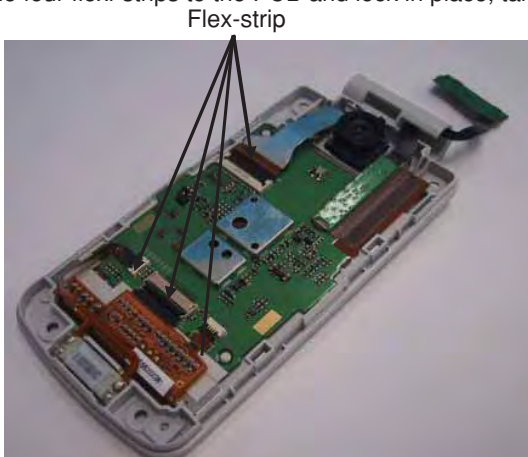
1. Fit the LCD module onto the upper cover.



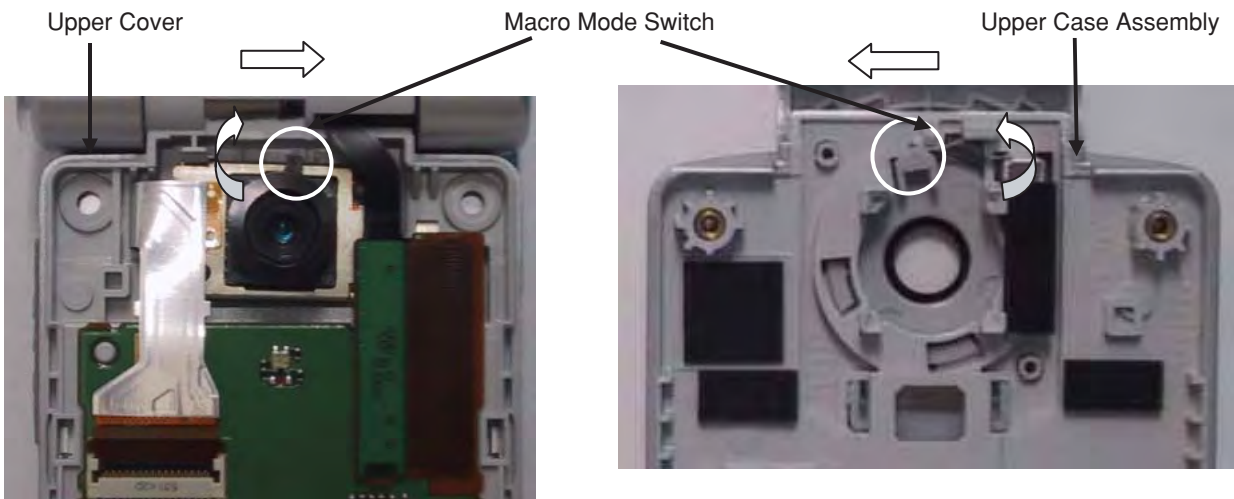
2. Fit the Upper PCB on the Upper cover.
3. Press and hold the adhesive tape with Upper PCB.



4. Reconnect the four flexi-strips to the PCB and lock in place, taking care not to damage the receiver connector flexi-strip.



5. Position the camera macro switch and the case-mounted actuator so that they engage when the case halves are mated.



6. Place the Upper Case Assembly on the upper cover. Assemble the Upper Cover with the Upper Case Assembly. Close the four snaps making sure that both assemblies are connected.
7. Fit the four screws saved during disassembly, and tighten to 1.3 kgf.



8. Fit two new screw covers and Main LCD panel on the Upper Cover.



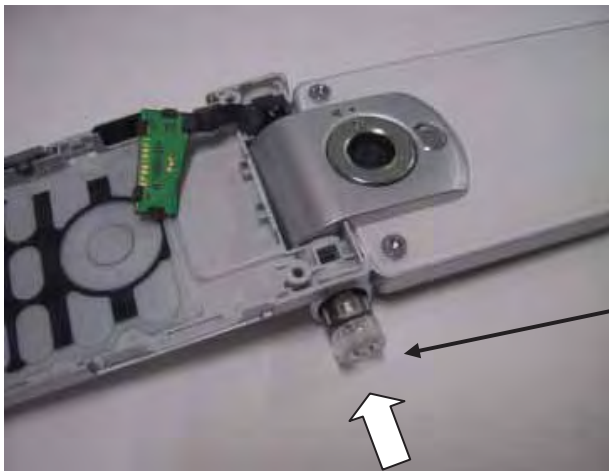
9. Rotate and align the hinge pivot with the open area facing upward and carefully insert the main area of the lower front cover, taking care to tilt the upper cover assembly without causing damage to the flex circuit during reassembly.
10. Push down until the upper cover assembly is full engaged into the lower front cover.

**Caution:** Damage to the flex circuit portion of the upper flex PCB is not repairable. The flex circuit may be easily damaged during this operation, causing a small tear which can grow with use and render the circuit unusable.

Open area of pivot



11. Set the phone into the "Open" position.
12. Insert the one push hinge into the lower front cover.



13. Set the phone into the "Close" position.
14. Place the hinge holder in the slot on the lower front cover and then push the hinge until locked in the position.

Hinge holder



15. Place the Main PCB on the lower front cover.
16. Connect the FPC connector on the Main PCB.



17. Connect the SIM PCB on the Main PCB.



18. Place the lower back case on the lower front cover. Fit the lower front cover to the lower back case. Close the four snaps making sure that both halves are connected.
19. Refit the four screws saved during disassembly.
20. Tighten the upper two screws to 2.9 kgf/cm and the lower two screws to 3.2 kgf/cm.



# 7. REPAIR PROCEDURES

## 7.1. Introduction

This section describes the equipment and software required to test and calibrate the phone.

Calibration Procedures are described in Section 8.

The handset can be connected to a compatible personal computer for electronic adjustment and fault diagnosis. This section provides a description of the equipment required to perform those tasks.

Prior to testing and adjustment, the unit should first be disassembled, as detailed in Section 6, and then the PCB connected to the PCB Repair Jig. Fault tracing can be performed on the PCB using suitable test equipment, such as spectrum analysers and oscilloscopes.

The unit must be tested and calibrated for all frequency bands (900 MHz, 1800 MHz and 1900 MHz).

## 7.2. Any-Layer Interstitial Via Hole (ALIVH) PCBs

### CAUTION

The telephone handset uses an ALIVH PCB assembly, the substrate of which is hydrophilic. To avoid damaging the ALIVH PCB, the specialist equipment and procedures described below must be employed when replacing suspect or faulty components.

### 7.2.1. General Information

To reduce overall size and provide enhanced speech and data performance, an Any-Layer Interstitial Via Hole (ALIVH) PCB is used in this telephone. ALIVH PCBs are multi-layer boards which have an IVH structure in all inter-layers and can provide an inter-layer connection immediately under the land of a component. In addition, the PCB has no through holes and any number of layers can be interconnected.

As the specification and performance characteristics of ALIVH PCBs differ from that of conventional multi-layered boards, special attention is required when handling and repairing these assemblies.

#### **Moisture Absorbency**

The ALIVH PCB is more absorbent than a conventional PCB because of the nature of its material. Its aramid substrate is hydrophilic, i.e. it absorbs moisture from the air. If, after having absorbed moisture, the ALIVH PCB is submitted to re-flow or repair process, moisture in the board can suddenly evaporate and cause vapour explosion.

Copper Foil Peel Strength (Land Detachment Resistance)

The ALIVH PCB is slightly less resistant to copper detachment force than conventional boards. Therefore, it is necessary to ensure that solder is melted sufficiently before a component is removed from the board.

#### **Warping Property**

The ALIVH PCB has a smaller Young's Modulus and is therefore more pliant than conventional boards. It is important that the ALIVH PCB is not bent when component placement is performed.

### 7.2.2. Repair Procedures

To prevent problems caused by moisture absorption, it will be necessary to perform dehydration of ALIVH PCBs in a suitable oven or similar heating device prior to repair. The boards should be heated at 85 °C for a duration of at least ten hours.

The repair should also be performed under the following conditions:

#### **Soldering Iron**

The temperature of the tip of the soldering iron should be 350 °C ± 10 °C for an application time of five seconds or less.

Removal and re-mounting of components should be performed only once at any component position.

**Note: To avoid land detachment, do NOT apply excessive force on the soldering iron when heating the board. Ensure that the solder has melted sufficiently to allow component removal without damaging the board.**

#### **Hot-Air Blower**

The blower air temperature should be at:

295 °C ± 5 °C for an application time of 120 seconds or less,

or:

395 °C ± 5 °C for an application time of 30 seconds or less.

Removal and re-mounting of components should be performed only once at any component position.

### **Re-flowing / Re-touching**

1. Re-touching by soldering iron:

HAKKO 928 soldering iron is recommended.

900S-T-B tip for thicker solder joints and 900M-T-LB tip for thinner solder joints are recommended.

2. Tip temperature/time

Normal pad:  $325 \pm 10$  °C, less than five seconds

Large Pad:  $400 \pm 10$  °C, less than five seconds

3. Pressure at solder tip

- Weight of soldering iron, (50gm) + 100gm to 150gm
- Do not exert pressure in the horizontal direction

4. Retouching small components

Pinch the component using two soldering irons and retouch within four seconds.

**Note:** To avoid land detachment, do NOT apply excessive force on the soldering iron when heating the board. Ensure that the solder has melted sufficiently to allow component removal without damaging the board.

## **7.3. Lead Free (PbF) solder**

### **CAUTION**

The Printed Circuit Board (PCB) used in this telephone has been manufactured using Lead Free solder.

Lead Free solder has a higher melting point than Lead solder - typically 30 - 40 °C higher. Always use a high temperature soldering iron. When using a soldering iron with temperature control, it should be set to  $370 \pm 10$  °C ( $700 \pm 20$  °F).

When using lead solder, all PbF solder must be removed from the solder area. Where this is not possible, heat the PbF solder until it melts before applying lead solder.

Avoid overheating PbF solder as it has a tendency to splash at temperatures above 600 °C (1100 °F).



## 7.4. Jigs and Tools

### ■ Personal Computer (PC)

The PC (IBM compatible) is used as a Unit Under Test controller. This, in conjunction with the channel box software, allows all of the test facilities normally provided through the keypad of the Unit Under Test.

The Microsoft Windows® 98SE, 2000 or XP operating system must be installed on the PC.

A Universal Serial Bus (USB) port must be installed on the PC if automatic RF calibration is to be performed.

### ■ PCB Repair Jig (Part No. 3WZ001168AAA)

#### Caution

The power cable has a large capacitor across the positive and negative leads to reduce the loading effect on the power supply during RF calibration.

Therefore, it is important that the correct polarity of the cables is observed, otherwise serious damage will occur to the capacitor.

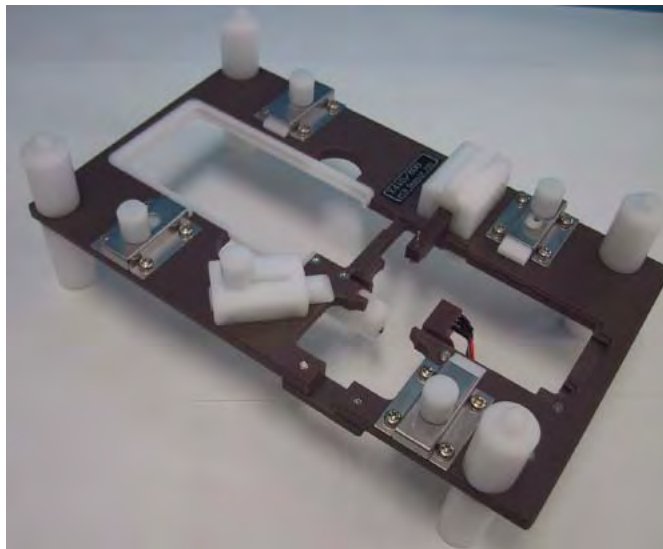


Figure 5.1. : PCB Repair Jig

The PCB Repair Jig provides the necessary connections between the PCB Assembly and external test equipment. It is required for RF calibration. The following spares item is available for the PCB Repair Jig:

- **RF Probe (Part No. : MS-147-HRMJ-1)**

A cable with SMA female connector is provided to make the RF connection. An SMA to N-Type male adaptor will be required to connect the Repair Jig to the service equipment. Cable losses for the RF connection are as follows:

Band	Offset
GSM 850 & 900	0.6 dB
GSM 1800	0.8 dB
GSM 1900	0.9 dB

A replacement RF Probe for the Repair Jig is available as a spares item.

■ **Dummy Battery with RF Test Jig (Part No. 3WZ001169AAA)**



Figure 5.2. : Dummy Battery with RF Test Jig

■ **Power Cable (Part No. 3WZ001130AAA)**

The power cable provides the necessary connections between the PCB repair jig / dummy battery and external power supply.



Figure 5.3. : Power Cable

■ **USB Cable (Part No. EB-USX800)**

The USB cable is used for software download only.



Figure 5.4. : USB Cable

■ **Jig Data Cable (Part No. 3WZ001166AAA)**

The Jig Data Cable is used for software download and calibration.



Figure 5.5. : Jig Data Cable



### ■ **Calibrated Torque Screwdriver**

This screwdriver is required to secure the case screws on the phone. It must have settings for 1.3 kgf and 2.5 kgf.

### ■ **Power Supply**

Two power supplies is required to provide power to the PCB via the PCB Repair Jig while a second unit is required to provide power baseband calibration and unit testing.

### ■ **GSM Test Set**

This unit acts as a base station providing all the necessary GSM signalling requirements and also provides GSM signal measuring facilities.

# Service Manual

Digital Cellular Telephone

GSM

EB-VS3

VOL. 4

<b>8. SOFTWARE DOWNLOAD</b> .....	8-1
8.1. Flash Tool update and operation guide .....	8-1
8.2. Installation of the Flash Download Tool .....	8-1
<b>9. CALIBRATION PROCEDURE</b> .....	9-1
9.1. Introduction .....	9-1
9.2. Carrier Power Calibration .....	9-1
9.3. Baseband Calibration .....	9-4
9.4. Data Overwrite Procedure .....	9-8
9.5. VCTCXO (Frequency) Calibration .....	9-10
9.6. Transmit Power Calibration .....	9-12
9.7. Rxlev Calibration .....	9-19

## 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.

# Panasonic

© 2005 Panasonic Mobile Communications Co., Ltd.  
All rights reserved. Unauthorized copying and distribution is a violation of law.

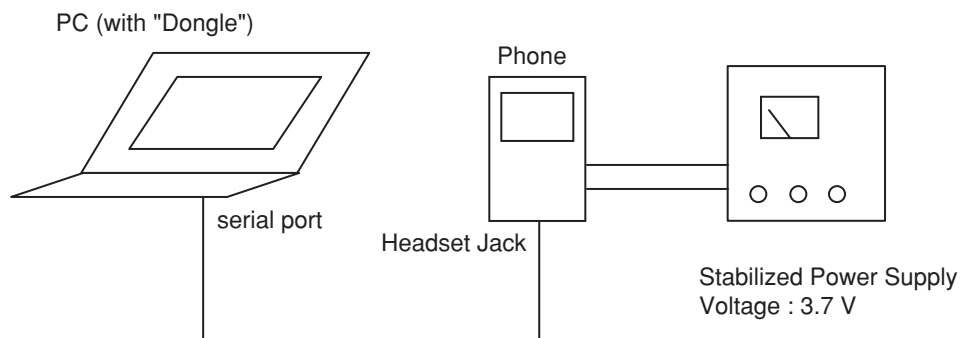
## 8. SOFTWARE DOWNLOAD

### 8.1. Flash Tool update and operation guide

#### 8.1.1. Introduction

The system has been tested on the following platforms: Windows ® 98, 2000, XP.

##### ■ System overview



**NOTE :**  
If using a battery pack to power the phone, ensure that it is fully charged.

### 8.2. Installation of the Flash Download Tool

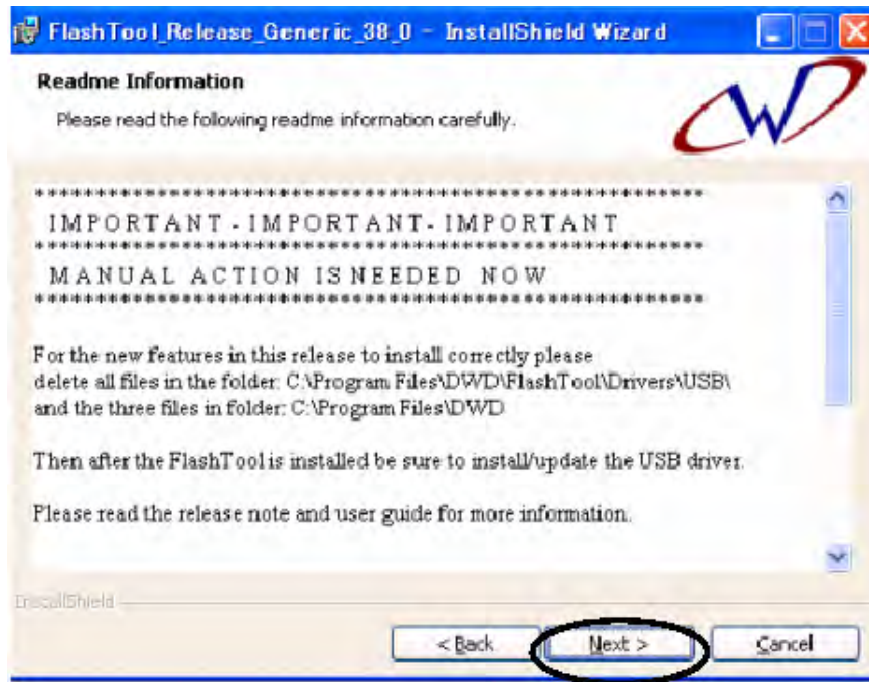
1. Unzip to "**FlashTool\_Release\_PMC\_VS3\_20030625.zip**" and "**progs.m.zip**" files to an appropriate directory on the hard disk of the PC, e.g. C:\sw\tools.

**NOTE:** The **progs.m.zip** archive contains the FLS, DEP and FFS files for the handset.

2. In the folder where **FlashTool\_Release\_PMC\_VS3\_20030625** was installed, double click "**SETUP.EXE**". The Setup Wizard will start.



3. A notice is displayed warning the user to close down all other Windows applications. Close any open programs and then click "Next".

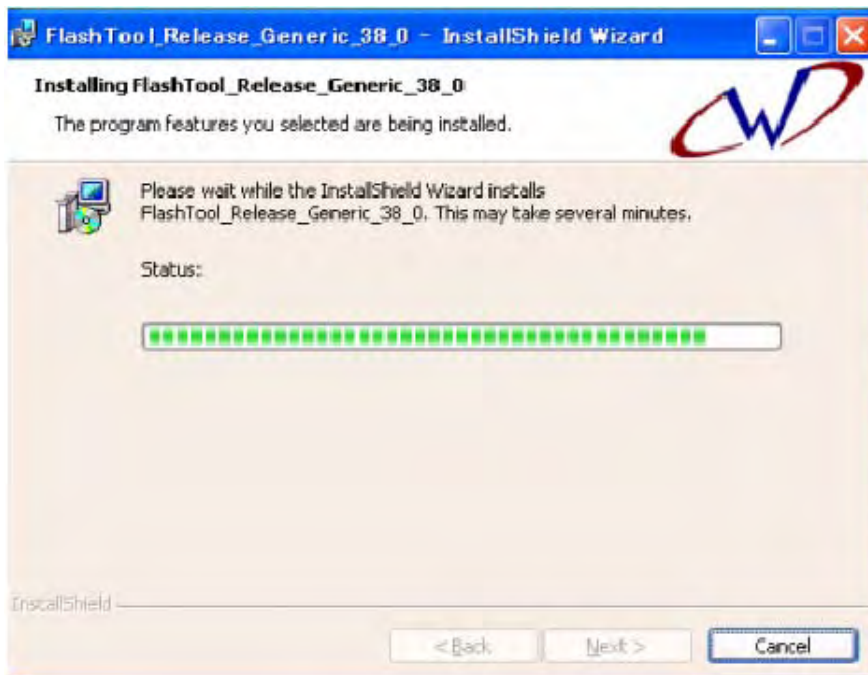
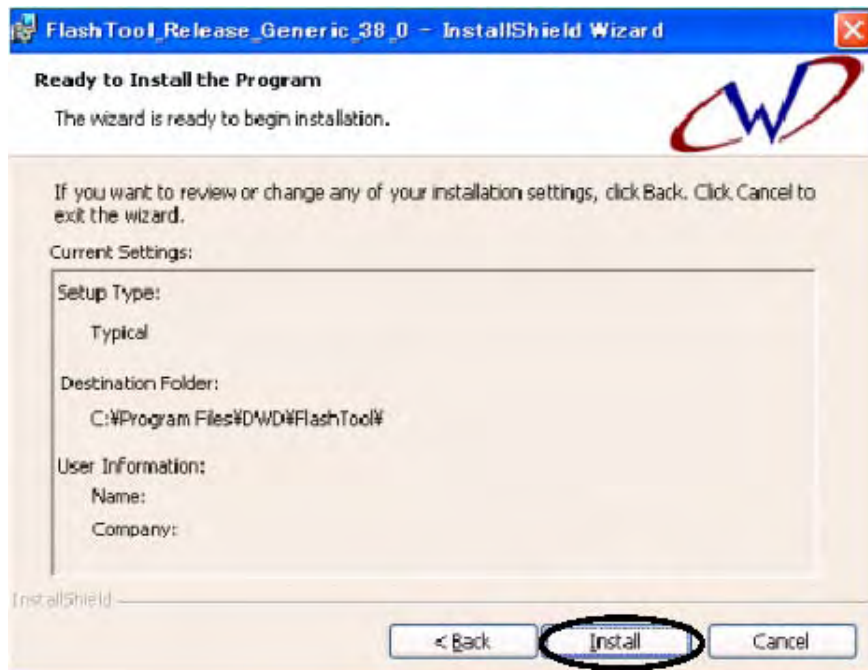


4. An information window is then displayed. When read, click "Next".



5. Flash Downloader will be installed under this folder by default.

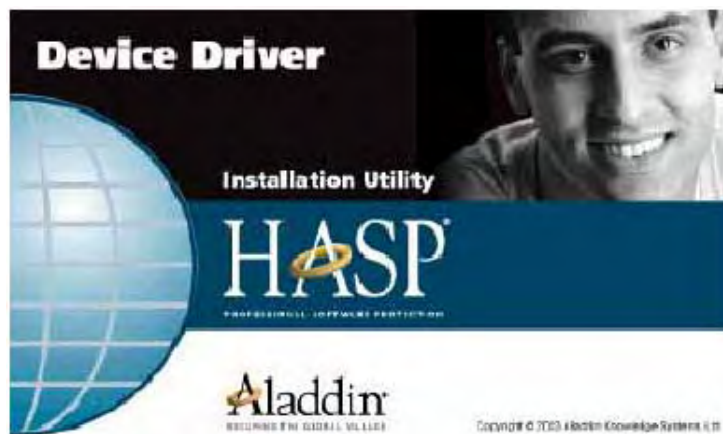
6. Click "install" button.



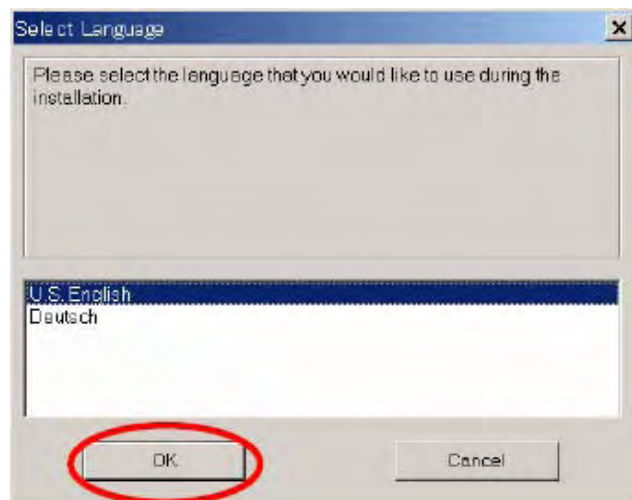
- 7. The following screen is displayed.
- 8. Click "**Install**" button.  
**Note:** This driver is for using USB cable.



- 9. Click "**Exit**" button.  
Then installation of the Dongle driver will start automatically.

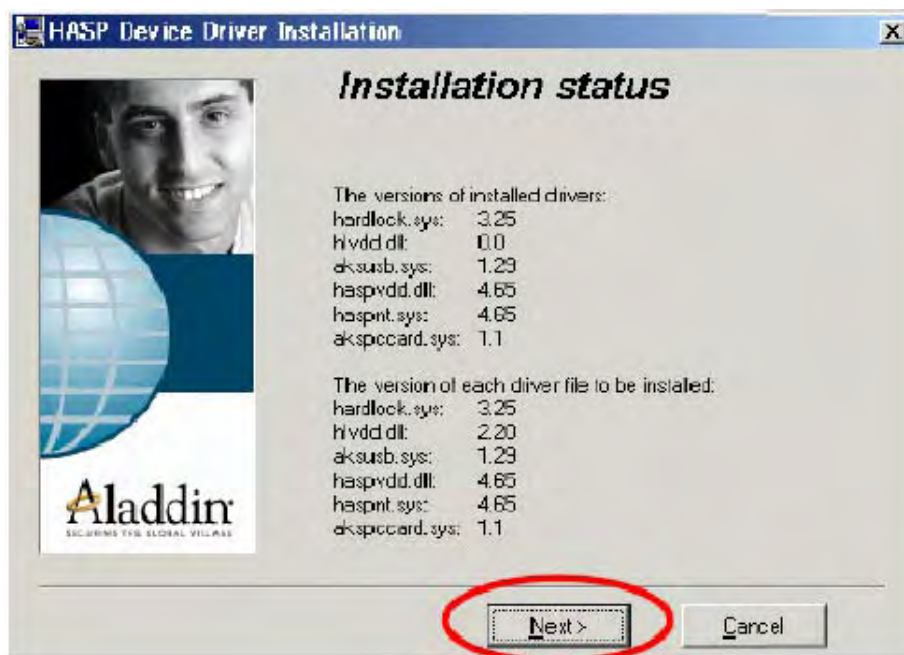
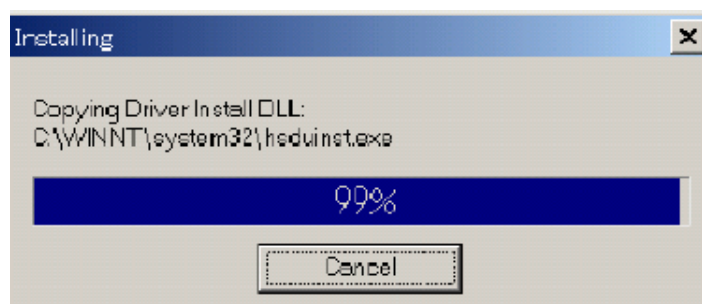
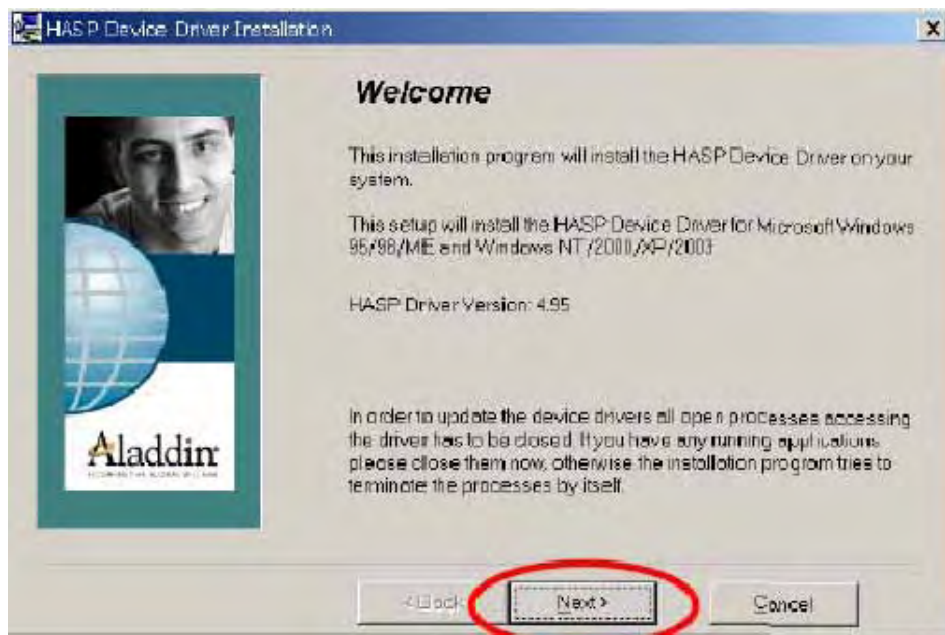


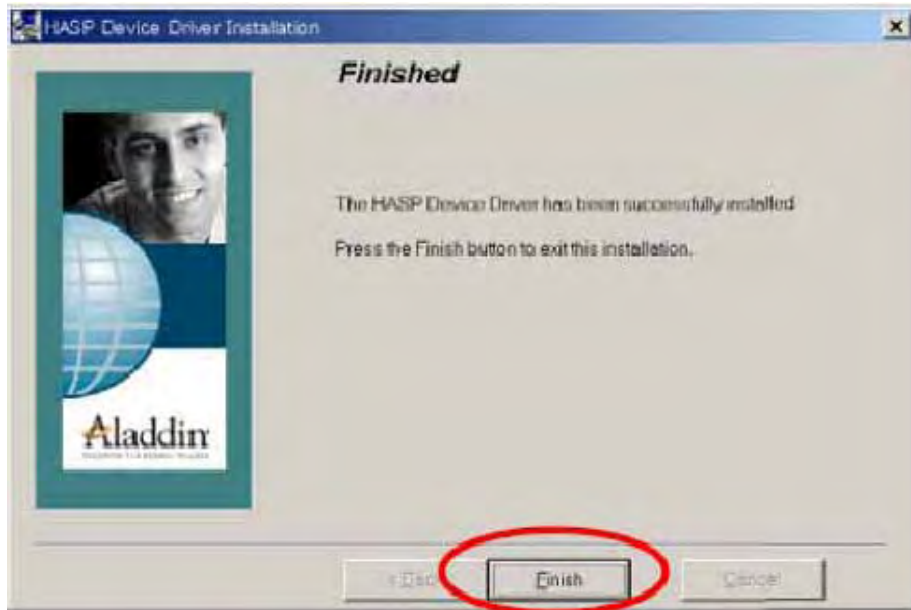
- 10. Select the language preference. Then click "**OK**" button.





11. Click "Next >" button. Then installation will start.





12. Click "Finish" button.

#### ■ Installation of the USB Cable Driver

1. Plug in the Dongle to the PC.
2. Connect the USB cable between the PC and handset.
3. Ensure that the handset is powerd OFF.
4. Short press the power key of handset.

**Note:** Do not press & hold the power key. If the handset powers on, please retry from step 3.

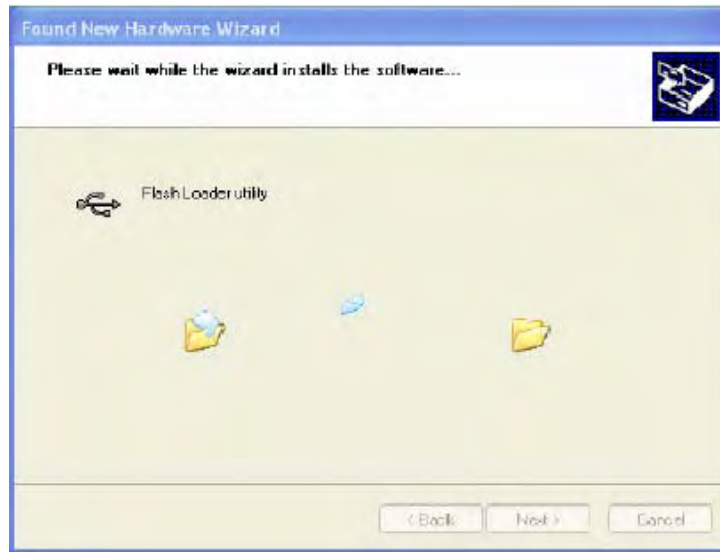
If PC has recognized the device as 'CDC', please CANCEL the installation, and disconnect the USB cable from the handset. Detach & attach the battery them re-try from step 3.



5. Click "Next" button.



6. Following screen will be appeared.



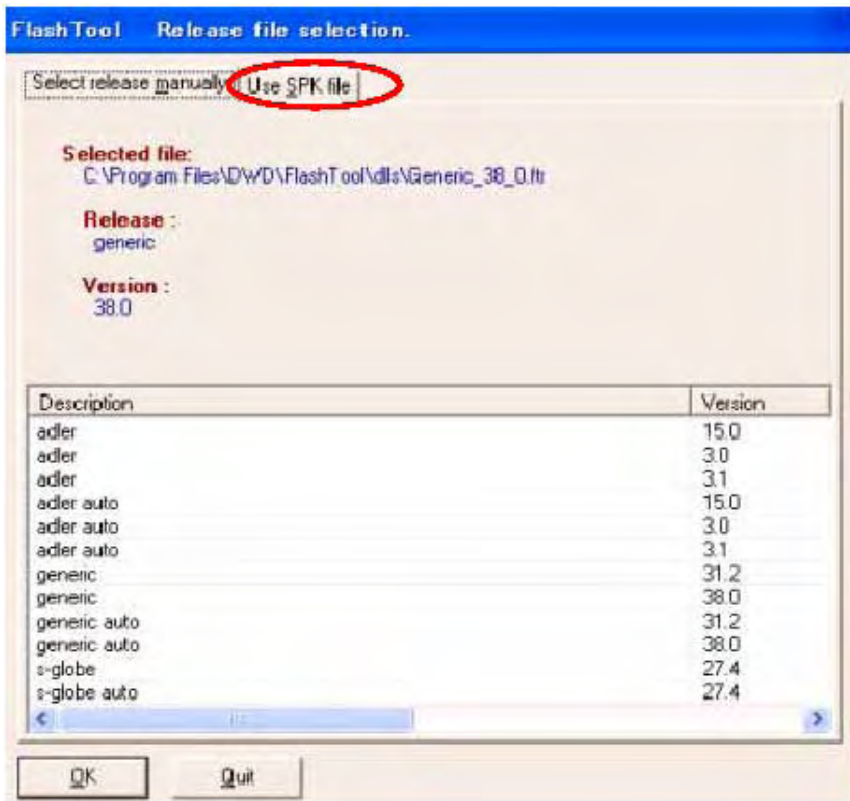
7. Click "Continue Anyway" button.



8. Click "Finish" button.

■ **Software Upgrade Procedure- FlashTool operation by using SPK file.**

Select [ Start ] - [ FlashTool ] - [ FlashTool\_6\_1 ] in PC menu. Then the following screen apperas. Click the tab of "Use SPK file".



■ **Select SPK file**

The following screen is displayed.

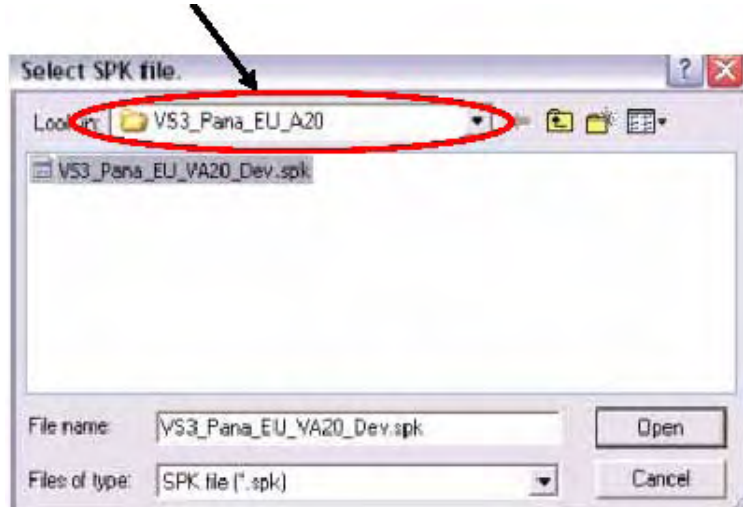
Click "None" ( If you have specifine spk file before, the file name is displayed ) to specify. Spk file as shown in the following procedure.

Click "None".



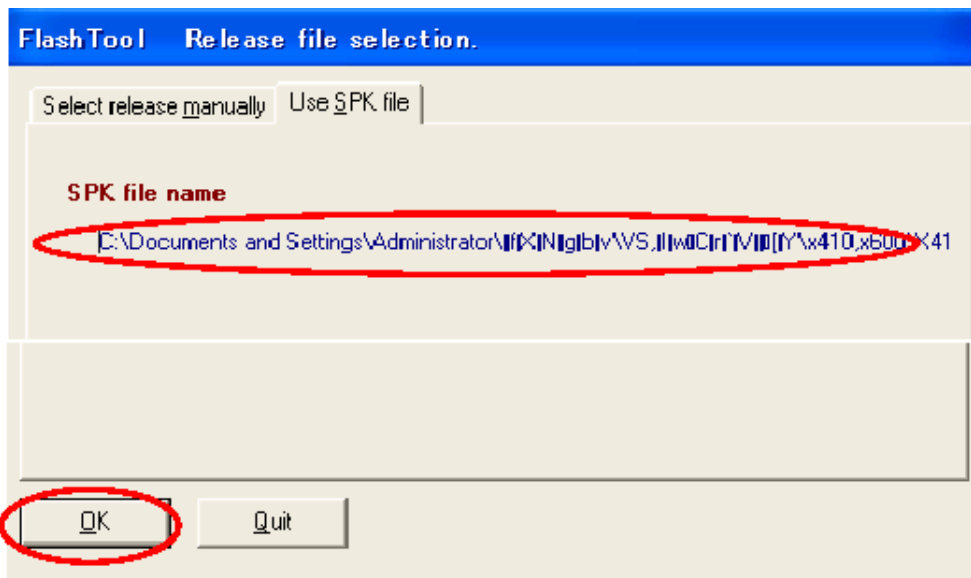
The following screen is displayed.

Move to the folder where diffs is located



Select spk file and press "Open" button.

Then the path and name of .spk file are displayed.



Then Click "OK".

Check that all required files are in the same folder.

### ■ COM port set-up

The following screen is displayed



Each item can be changed by clicking the blue part.

First COM port: Specify port number to connect the data cable.

Number of COM ports : Number of actual machines to write. Normally one machine at a time, so 1 will be OK.

Baud rate : When COM port is used on PC, enter 115200.

Click "OK". Then the download screen appears after completion of the tool initialisation.

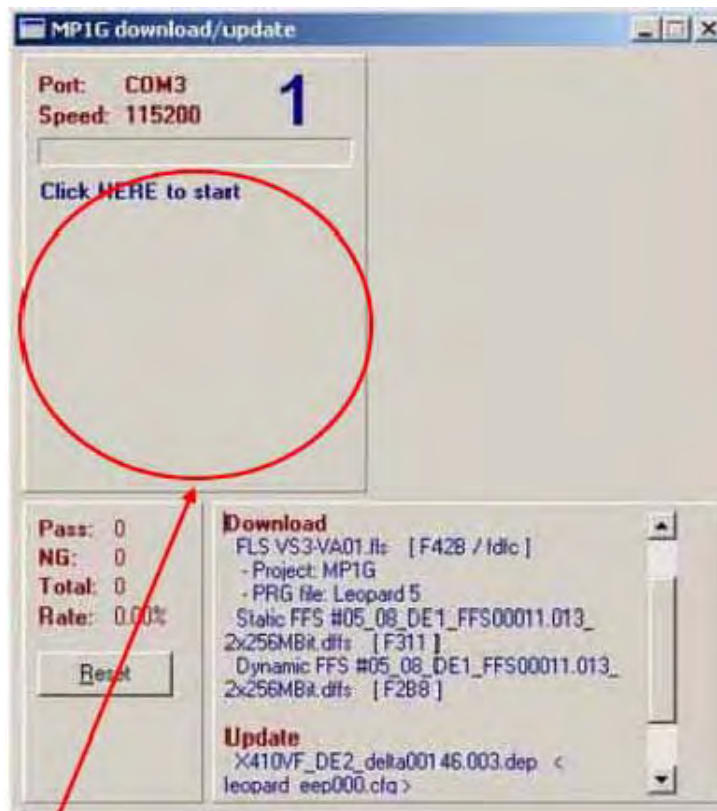
## ■ Start download

### CAUTION

Should the PC or Download application crash or lock-up during downloading, calibration data in the phone may be lost. To minimise the risk of data loss, it is strongly recommended that no other PC applications are running when downloading data, and that a fully-charged battery is attached to the phone.

The download procedure is as follows

1. Ensure that fully charged battery is connected to the phone.
2. Connect the handset to the PC via the date cable.

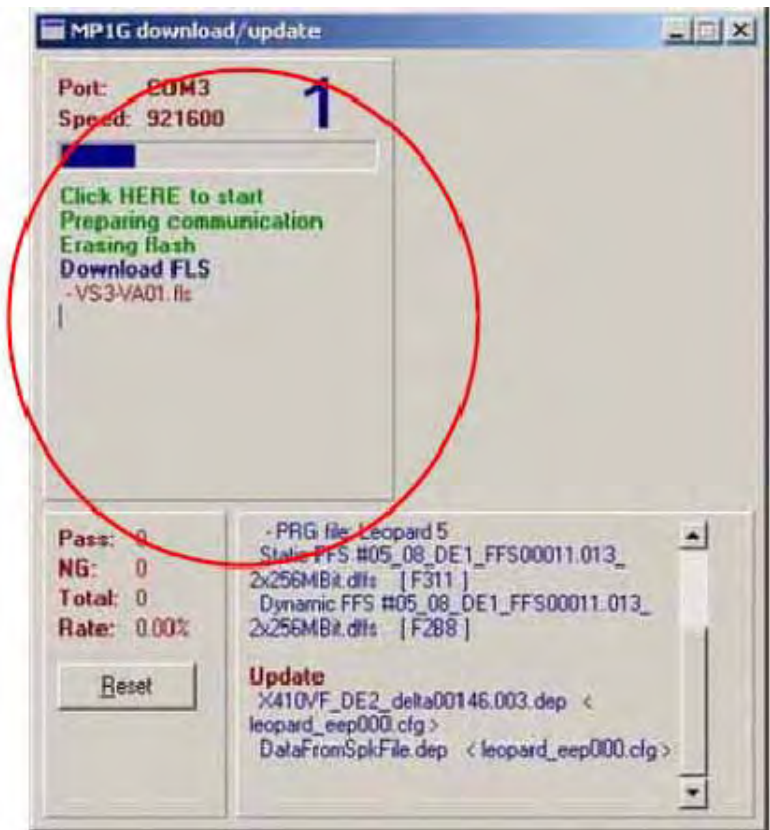


Click around "Click to start"

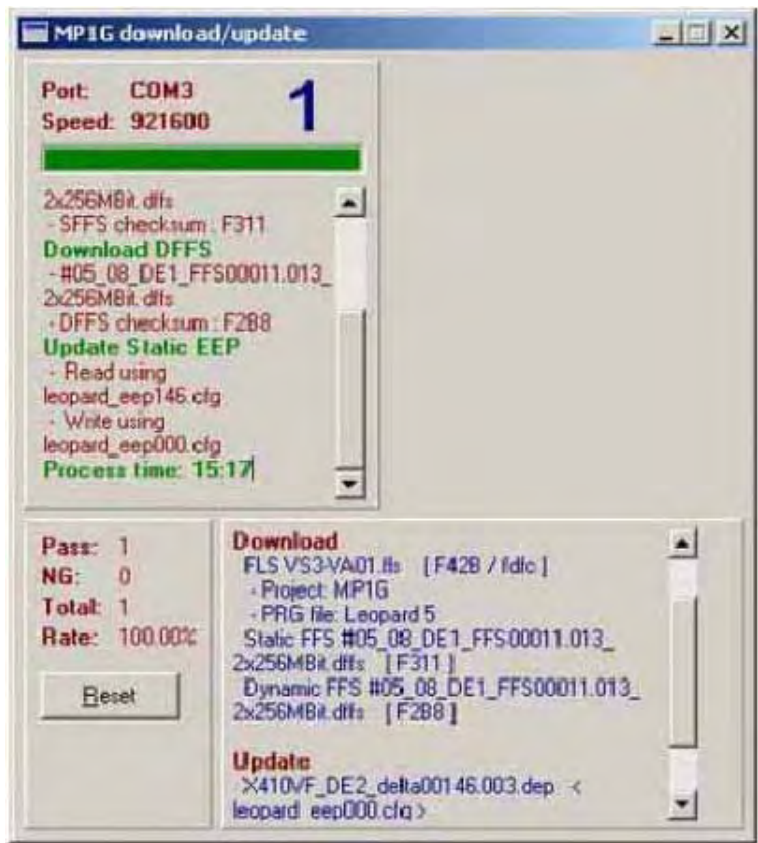
Press the power button on handset

After the above procedure, download starts.

When download starts, progress bar is displayed.  
Do not disconnect the data cable while downloading.

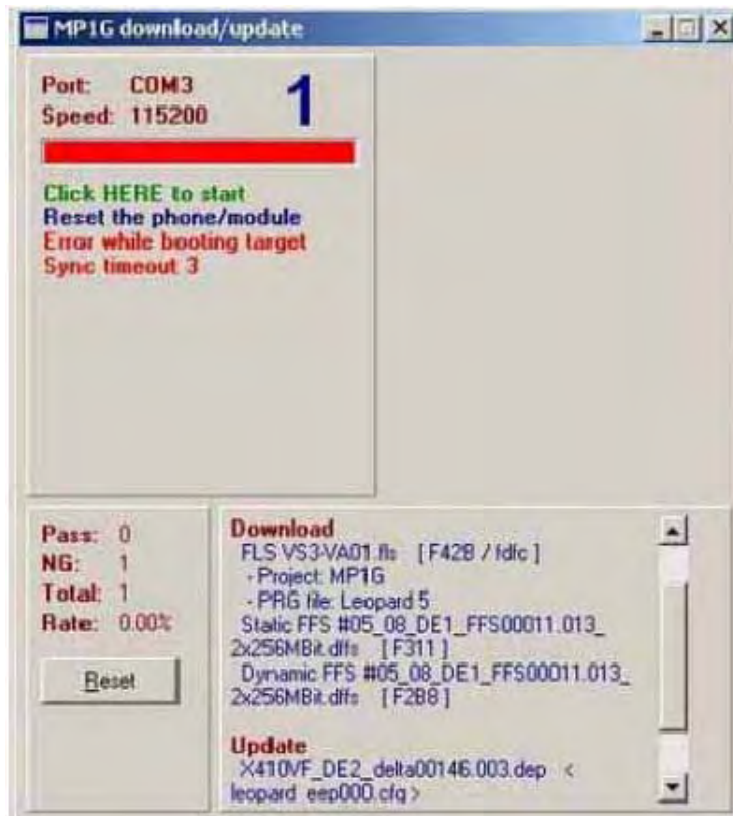


When download is successful, the following screen is displayed.





In case of an error, the following screen is displayed.



If a download fails, check all connections between the phone, data cable and PC.  
Before restarting the download procedure, remove and then re-attach the phone battery.

# 9. CALIBRATION PROCEDURE

## 9.1. Introduction

The following procedure MUST be performed after replacement or repair of the PCB. Failure to do so may result in incorrect operation of the telephone.

The following adjustment MUST be made to the complete unit using the appropriate Repair Jig.

The applied voltage should be a constant 3.7 V with a current limit of 2.5 A.

There are four distinct calibration procedures to adjust RF performance, These procedure are : Carrier Power calibration.

RSSI also

To ensure that the phone is within set SAR margina after Peak Power Calibration has been performed, a power mater that is accurate to 0.2 dB MUST be used . The output power of the phone can be influenced by the RF/Logic shield covers, therefore all power calibration procedures MUST be performed with the shield frames and covers fitted.

**IF ANY OF THE RF OR LOGIC SHIELDS ARE REMOVED FROM THE PCB AT ANY TIME, THEY MUST BE REPLACED WITH NEW ITEMS, ONCE REMOVED, THE SHIELDS MUST NOT REUSED.**

## 9.2. Carrier Power Calibration

### ■ General Information

Tx Calibration can be performed manually Manual Calibration is used to adjust or verify each calibration channel in turn.

To minimise the variation of Tx power with frequency due to component tolerance, each GSM band is split into sub-bands, which are calibrated separately. The calibration bands and channels used are as follows.

Band	Segment	Calibration Channel
EGSM 900	0	12
	1	38
	2	112
	3	975
GSM 1800	0	556
	1	698
	2	750
	3	842
PCS 1900	0	512
	1	624
	2	699
	3	773

## ■ Power Level Tables

The following tables show the measurement limits according to power level:

### □ EGSM 900

Power Level (PL)	Output Power (dBm)		
	Nominal	Target	
		Min	Max
5	32.00	32.25	32.50
6	29.20	29.45	30.70
7	27.90	28.15	28.40
8	26.75	27.00	27.25
9	24.50	25.00	25.50
10	22.50	23.00	23.50
11	20.50	21.00	21.50
12	18.50	19.00	19.50
13	16.50	17.00	17.50
14	14.50	15.00	15.50
15	12.50	13.00	13.50
16	10.50	11.00	11.50
17	8.50	9.00	9.50
18	6.50	7.00	7.50
19	4.50	5.00	5.50

### □ GSM 1800

Power Level (PL)	Output Power (dBm)		
	Nominal	Target	
		Min	Max
0	29.00	29.25	29.50
1	27.75	28.00	28.25
2	25.50	26.00	26.50
3	23.50	24.00	24.50
4	21.50	22.00	22.50
5	19.50	20.00	20.50
6	17.50	18.00	18.50
7	15.50	16.00	16.50
8	13.50	14.00	14.50
9	11.50	12.00	12.50
10	9.50	10.00	10.50
11	7.50	8.00	8.50
12	5.50	6.00	6.50
13	3.50	4.00	4.50
14	1.50	2.00	2.50
15	-0.50	0.00	0.50

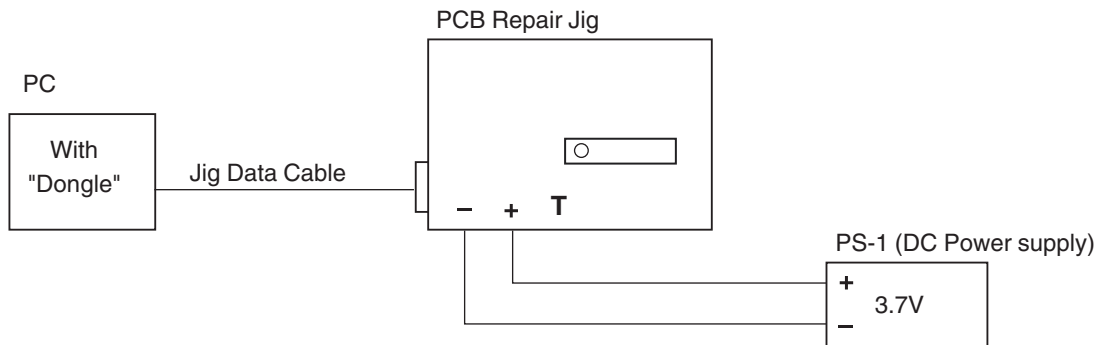


□ **GSM 1900**

Power Level (PL)	Output Power (dBm)		
	Nominal	Target	
		Min	Max
0	29.00	29.25	29.50
1	27.10	27.35	27.60
2	25.50	25.75	26.00
3	23.50	24.00	24.50
4	21.50	22.00	22.50
5	19.50	20.00	20.50
6	17.50	18.00	18.50
7	15.50	16.00	16.50
8	13.50	14.00	14.50
9	11.50	12.00	12.50
10	9.50	10.00	10.50
11	7.50	8.00	8.50
12	5.50	6.00	6.50
13	3.50	4.00	4.50
14	1.50	2.00	2.50
15	-0.50	0.00	0.50

## 9.3. Baseband Calibration

### ■ System Overview



### ■ P-test (Enter the P-Test Mode)

Press the \* key and # key at the same time and then turn on the power key of the mobile phone.



Start the PhoneTool program. The following screen is then displayed.

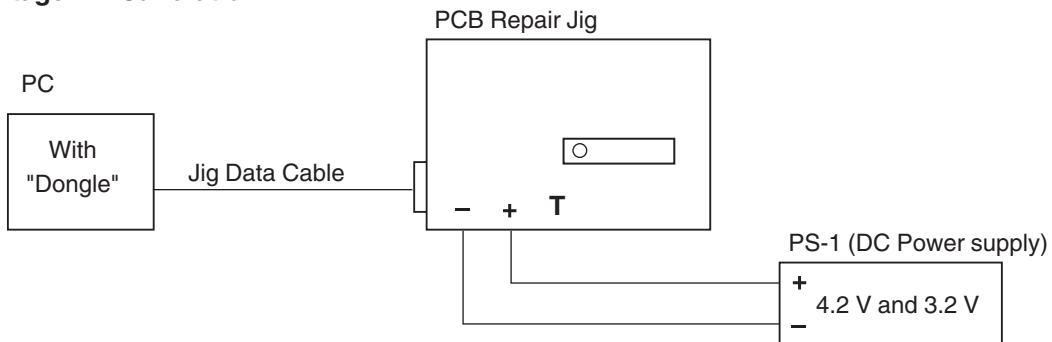


1. Click the "V24 AT# On" , and check the log window. >>> "AT# OK"
2. Click the "Update Info" button, and check the log window. >>> "OK"

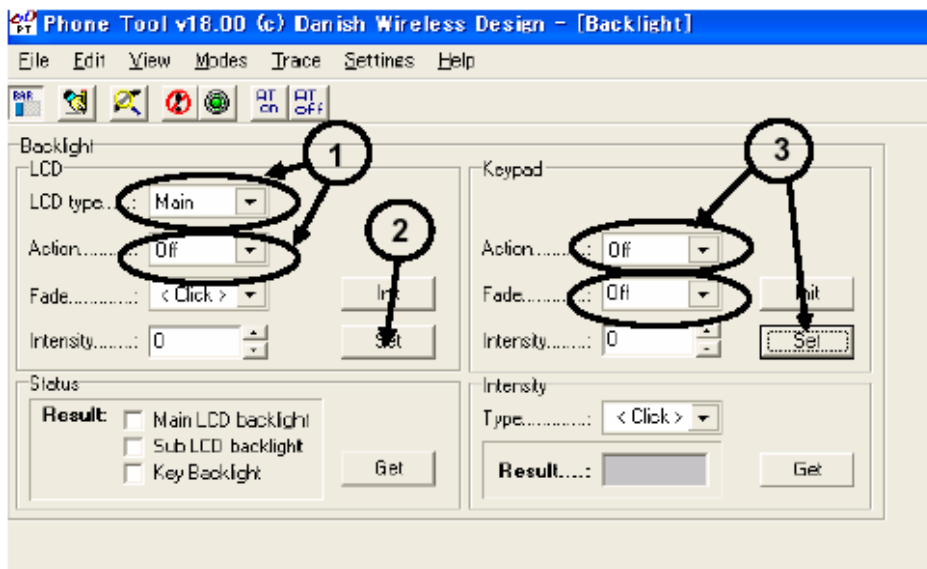
**Note:** If the message "ERROR" is displayed, check the cable connections, the power supply and that the phone is switched on. Repeat step1 and 2.



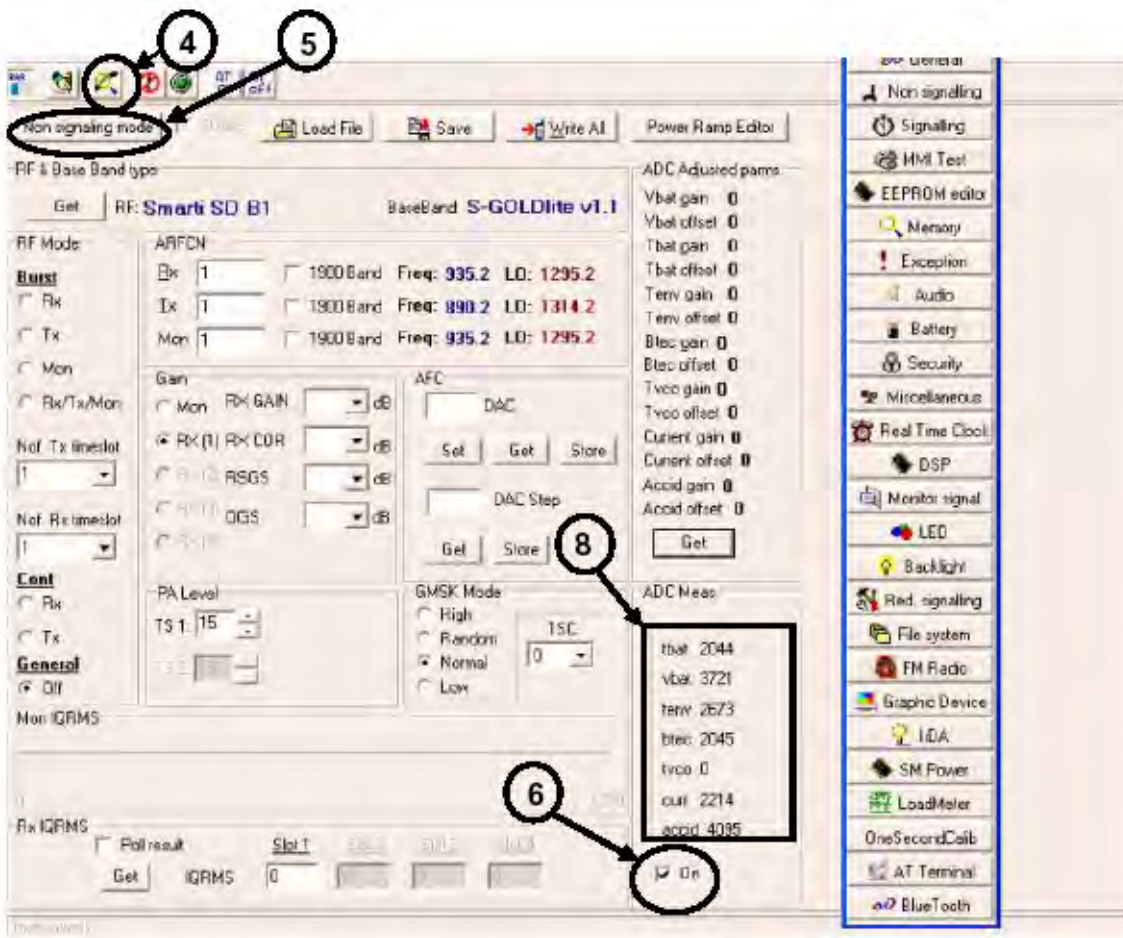
### ■ Battery Voltage AD Calibration



1. Set the LCD type to "Main".
2. Set Action to "Off" and then click to "Set".
3. Set Action and Fade to "Off" and then click "Set".

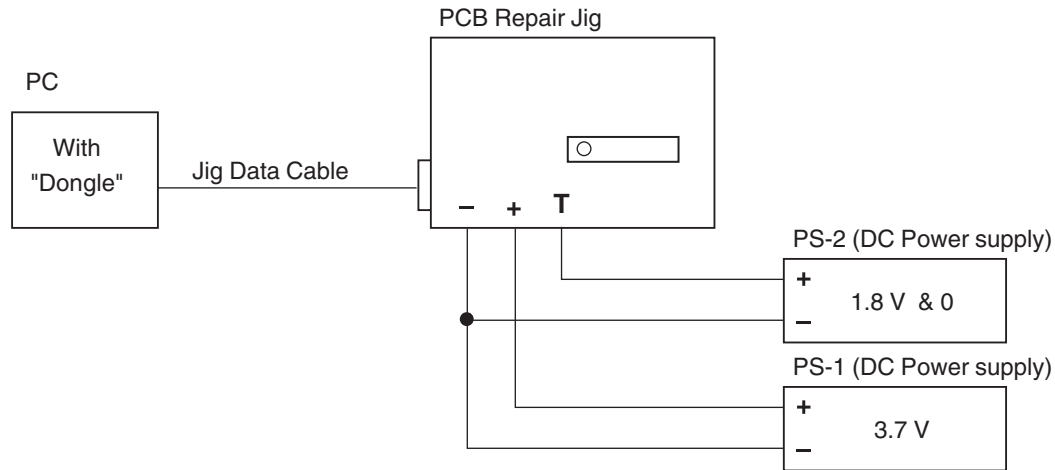


4. Click "Connection" button.
5. Click "Non signaling mode".
6. Check the "On" box located on the ADC measurement box.
7. Change the power supply voltage from 3.7 V to 4.2 V.
8. Monitor the vbat ADC value in the ADC Meas. Box.  
If this average value is outside the range of 3436 to 3927, then the unit has failed.
9. Enter the average vbat ADC into the "VS3\_ADC\_Cal" Excel sheet in the vbat = 4.2 V field.
10. Change the power supply voltage from 4.2 V to 3.2 V.  
If this average value is outside the range of 3138 to 3503, then the unit has failed.
11. Enter the average vbat ADC into the "VS3\_ADC\_Cal" Excel sheet in the vbat = 3.2 V field.
12. Change the power supply voltage from 3.2 V to 3.7 V.



for Calibration				for Confirmation	
VBAT = 4.2	VBAT = 3.2	Gain	Offset	adc value	cal. value
3718	3344	-641	-2147	3500	3617
OK	OK	OK	OK		

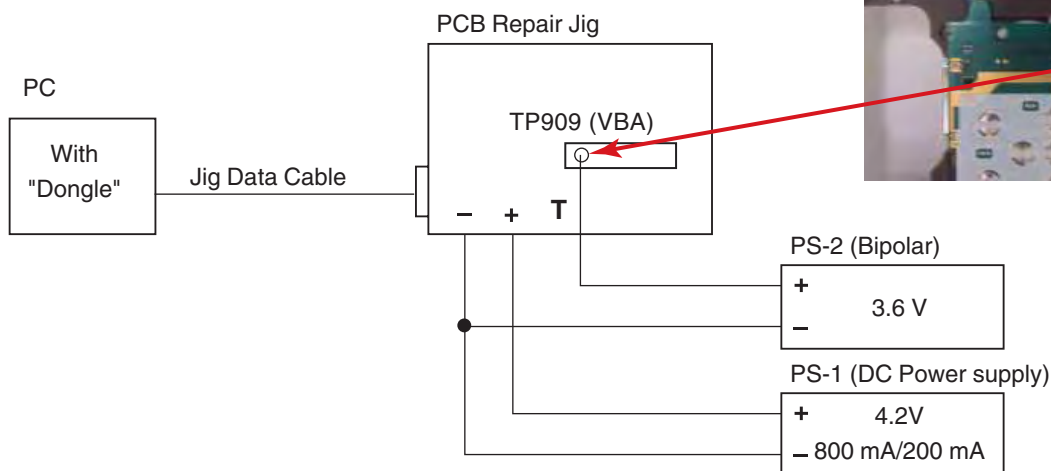
## ■ Battery Temperature AD Calibration



1. Connect the PS-2 so that 1.8 V is supplied to BATT-Temp.
2. Monitor the average value of the tbat ADC reading.  
If this average value is outside the range of 3798 to 3986, then the unit has failed.
3. Enter the average tbat ADC value into the TBAT ADJ Excel sheet in the tbat = 1.8V field.
4. Change the power supply PS-2 voltage from 1.8 V to 0 V.
5. Monitor the average value of the tbat ADC reading.  
If this average value is outside the range of 2028 to 2069, then the unit has failed.
6. Enter the average tbat ADC value into the TBAT ADJ Excel sheet in the tbat = 0 V field. The recorded VBAT/TBAT value will be used to automatically calculate the VBAT\_ GAIN /OFFSET and TBAT\_ GAIN/OFFSET. It will then be stored to the eep file of the BATT format Excel sheet.

for Calibration				for Confirmation	
TBAT = 1.8	TBAT = 0.0	Gain	Offset	adc value	cal. value
3951	2039	64	-2039		(1920)
OK	OK	OK	OK		

## ■ Current AD (LOAD) Calibration



**Note:** For this testing PS-2 must be able to sink current. PS-1 also need to have an extremely accurate current sourcing capability. Agilent HP66311B, HP66321A, Kikusui PLZ70UA and Bipolar power supplies or equivalent are recommended for this calibration.



1. Connect power supply PS-2 (Bipolar) so that it supplies 3.6 V to VBAT.
2. Change PS-1 so that it is set 4.2 V with a current limit of 800 mA.
3. Monitor the current . ADC value in the ADC Meas. Box.  
If this average value is outside the range of 3524 to 3970, then the unit has field.
4. Enter the average current. ADC value into the LOAD Excel sheet in the current = 800 mA field.
5. Change PS-1 so that it is current limited to 200 mA.
6. Monitor the current.LOAD ADC value in the ADC Meas. Box.  
If this average value is outside the range of 2413 to 2538, then the unit has failed.
7. Enter the average LOAD ADC value into the LOAD Excel sheet in the current =200 mA field.

for Calibration				for Confirmation	
I = 0.8 (A)	I = 0.2 (A)	Gain	Offset	adc value	cal. value
3795	2461	1253	-2016		(907)
OK	OK	OK	OK		

8. Convert the Excel sheet of EEP data to TXT (text) format.
9. File ---> Save As ---> Text (Tab delimited) ---> Save
10. Rename the epp file from the original filename and then save to PC.

037A	eep_static.chr_adjcomp.vbat_gain	-641	
037C	eep_static.chr_adjcomp.vbat_offset	-2147	
037E	eep_static.chr_adjcomp.tbata_gain	64	
0380	eep_static.chr_adjcomp.tbata_offset	-2039	
038E	eep_static.chr_adjcomp.current_gain	1253	
0390	eep_static.chr_adjcomp.current_offset	-2016	

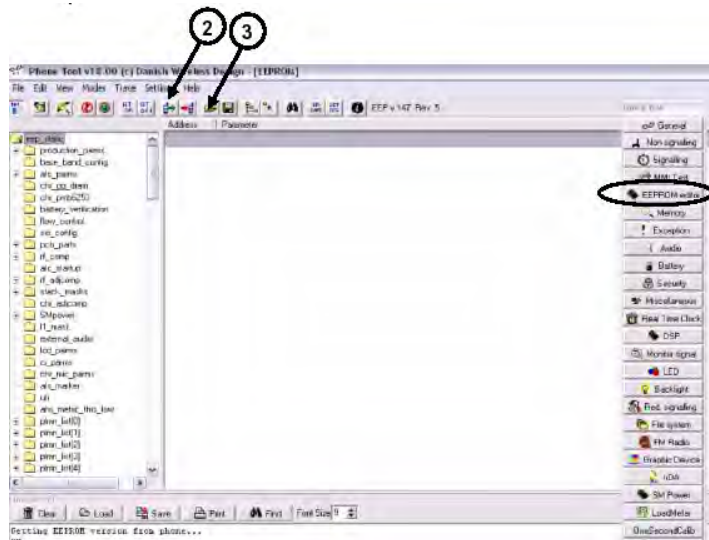
► | \ VBAT \ VS3\_ADC \ LOAD \ BB eep



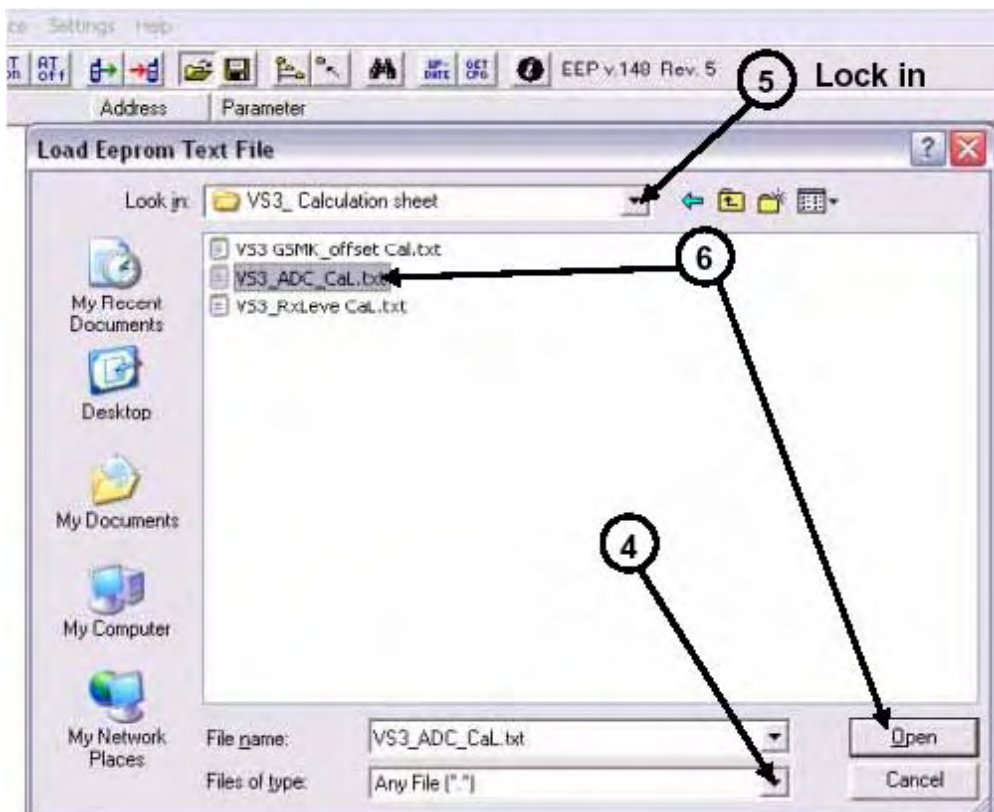
037A	eep_static.chr_adjcomp.vbat_gain	-641
037C	eep_static.chr_adjcomp.vbat_offset	-2147
037E	eep_static.chr_adjcomp.tbata_gain	64
0380	eep_static.chr_adjcomp.tbata_offset	-2039
038E	eep_static.chr_adjcomp.current_gain	1253
0390	eep_static.chr_adjcomp.current_offset	-2016

## 9.4. Data Overwrite Procedure

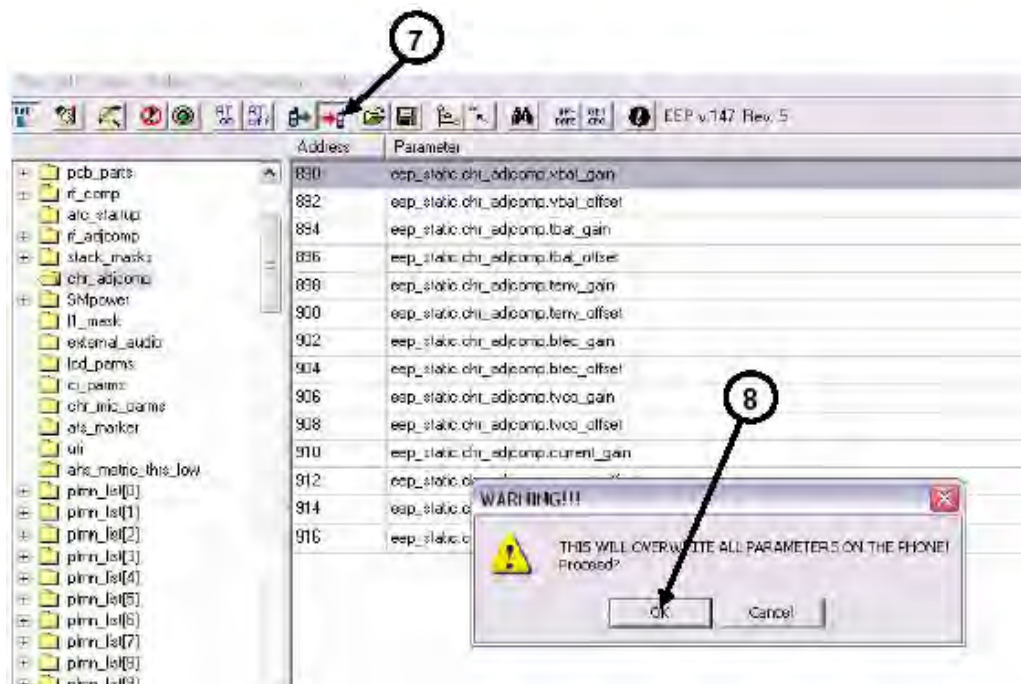
1. From the "Modes" pull-down menu, select "EEPROM".
2. Click "Read EEPROM" value from the phone. The "eep-static" folder is opened.
3. Click "Load Eeprom Text File".



4. Select "Any File" of the Files of type.
5. Click "Lock in" and then select which is saved "VS3\_ADC\_Cal" text (Tab delimited) file from PC.
6. Select Text file and then click "Open".



7. Click "Download current Eeprom value to phone".
8. Click "OVERWRITE" button.  
The VS3\_ADC\_Calibration values in the phone will be overwritten by the new values from the PC.



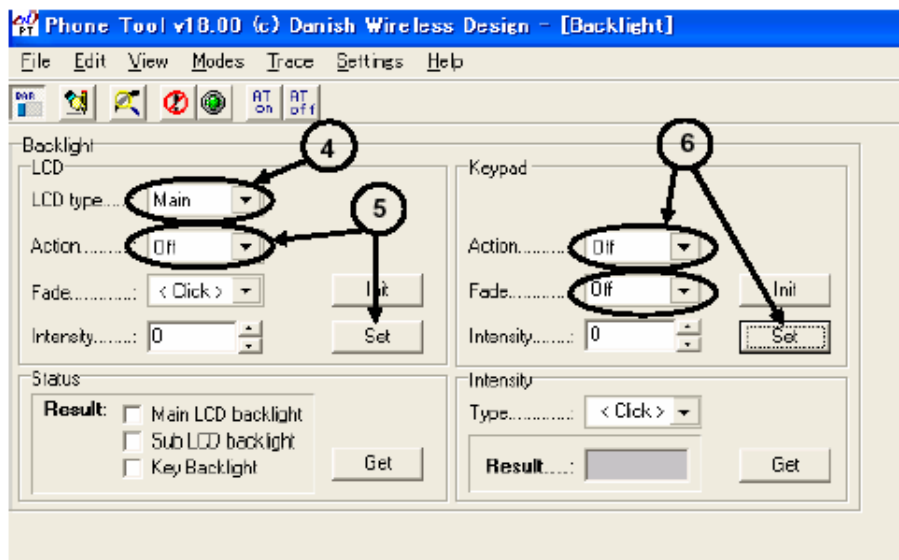


## 9.5. VCTCXO (Frequency) Calibration

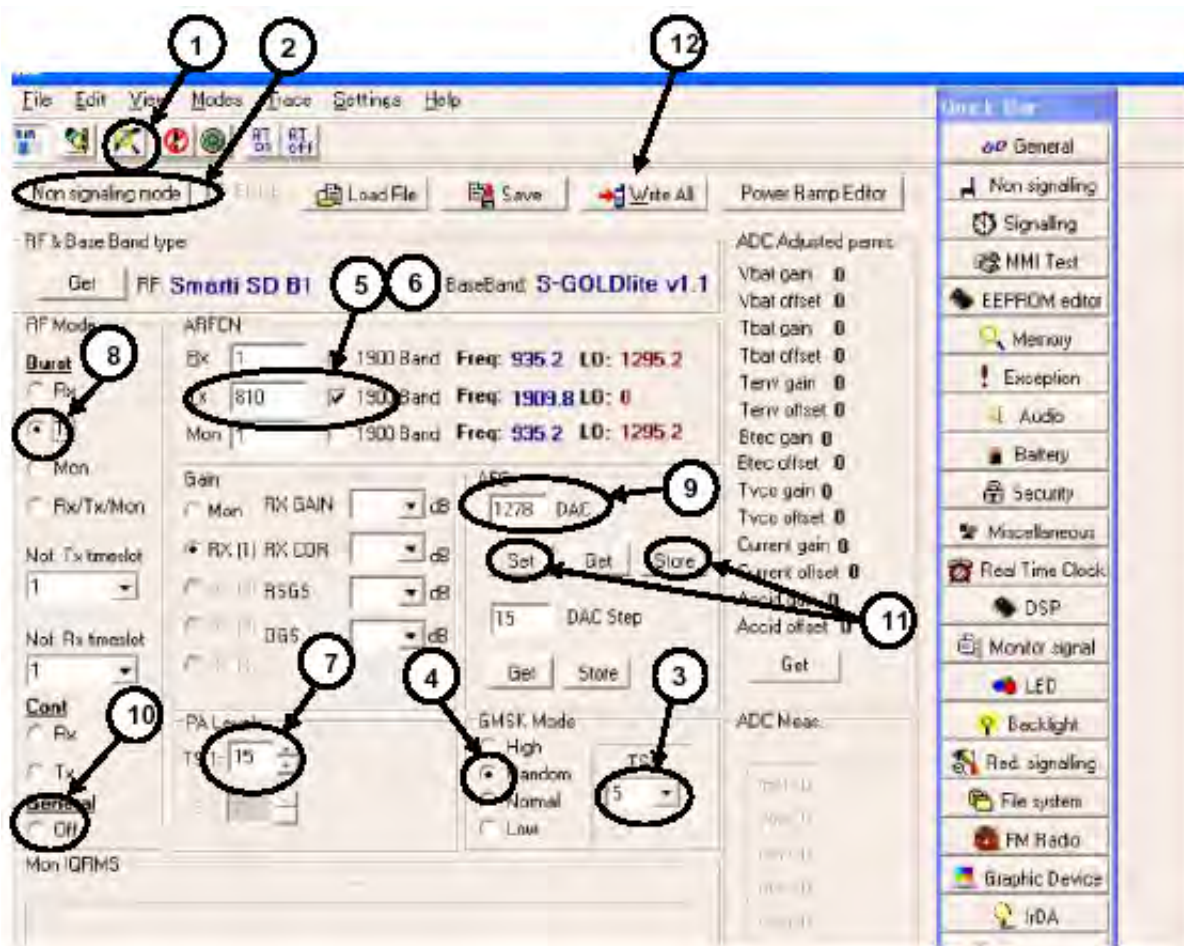
1. Click the "V24 AT# On", and check the log window. >>> "AT#OK".
2. Click the "Update Info" button, and check the log window. >>> "OK".
3. Click mode button and select "Backlight".



4. Set the LCD type to "Main".
5. Set Action to "Off" and then click to "Set".
6. Set Action and Fade to "Off" and then click "Set".



1. Click the "Check Connection" button.
2. Click the "Non-Signaling Mode" button
3. Select "TSC=5" (Make sure the call box has the same setting for TSC)
4. Check the Random of the GMSK Mode.
5. Check the "1900 Band" box to the right of the TX ARFCN box. (Very important Not checking this box will cause the phone to transmit in the DCS band instead of the required PCS band)
6. Type "810" in the TX ARFCN box and press ENTER (on the keyboard).
7. Select "15" in the PA Level box and press ENTER (on the keyboard)
8. Click the "Burst Tx" of the RF Mode. This enables the transmitter. Check that a Tx signal is seen on the GSM Test Unit. Measure the frequency error. A calibrated VCTCXO should provide a frequency error within  $\pm 800$  Hz at room temperature.
9. The frequency (and therefore the VCTCXO) is adjusted by changing the AFC DAC value in PhoneTool. Adjust the AFC DAC value until the frequency error measured on the GSM Test Set is within  $\pm 800$  Hz. Note the DAC value required.
10. Check the frequency error displayed GSM Tester and stop transmit by checking "General off".
- Note:** Transmit time should be within a few seconds. Because frequency error will change and this make the calibration error. This is caused by the temperature of transmit.
11. Click set and store.
12. Click Write All.

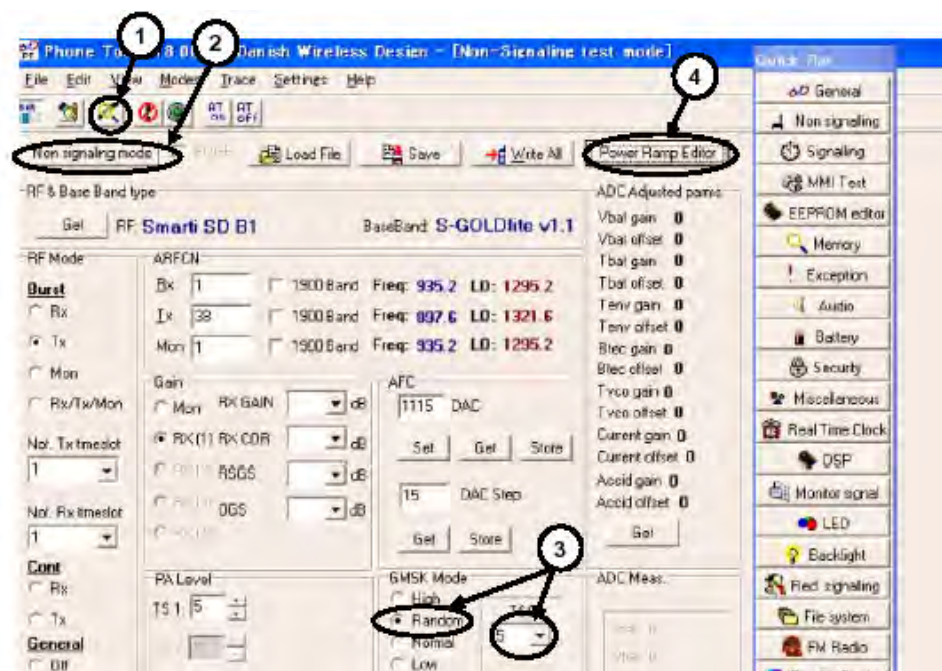


## 9.6. Transmit Power Calibration

To begin calibration of the transmitter, select **"Non signaling Test"** from the **"Modes"** pull-down menu in PhoneTool and complete the following steps.



1. Click the **"Connection"** button.
2. Click the **"Non signaling mode"** button.
3. Select **"TSC=5"** and check the **"Random"** of GMSK Mode.
4. Before starting Power Level Calibration, the Power Ramp Editor should be enabled.  
The Power Ramp Editor popup window is displayed.





To adjust the DAC to obtain the desired Tx power level.

1. Check **"Advanced options"**.
2. Select the required **"Band"**
3. Input the Tx ARFCN (See **"Tx Power Calibration Channels"** at the end of this section for the input channel). and press Enter Key.

**Note:** If the PCS band is being calibrated, the **"1900 Band"** box must first be checked.

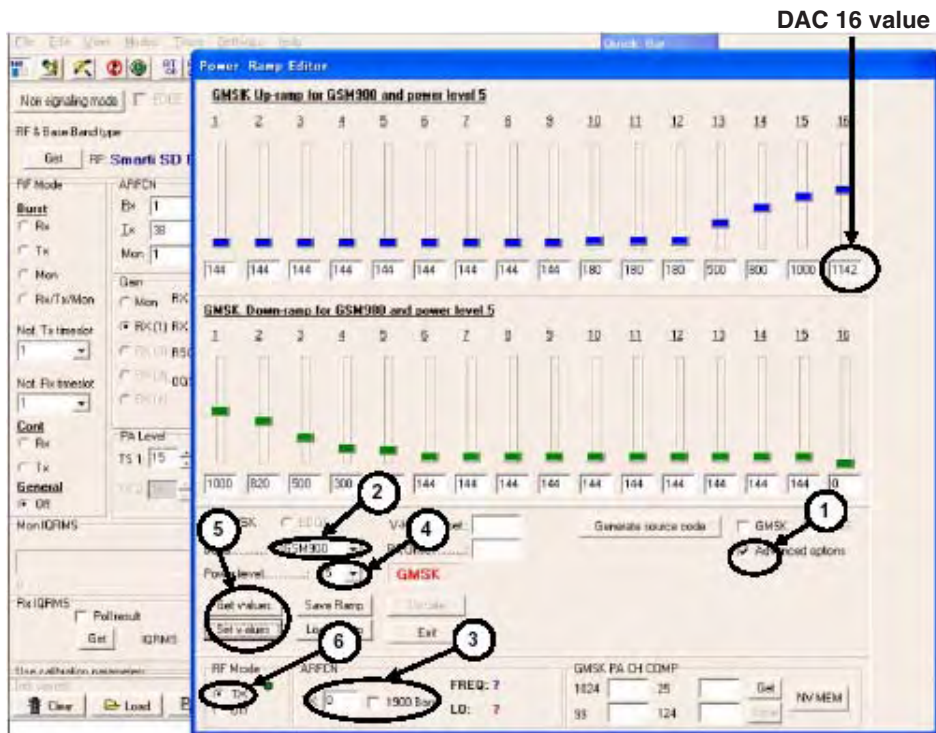
4. Select **"Power level"** (See **"Default dac value table"** at the end of this section for the dac value)
5. Click **"Get values"** and then click **"Set values"**.

The default ramping value for the selected band and Power level will displayed in the 16th section of Power Ramp Editor.

6. Under the **"RF Mode"** heading, check the **"TX"**. The handset will transmit, and the power meter will displayed the default Tx power output.

7. Input an appropriate value for **"DAC16"**, and Check that the power meter registers a change in power level.

**Note:** Before setting a new DAC16 value, turn off the transmitter by clicking RF Mode **"Off"**.



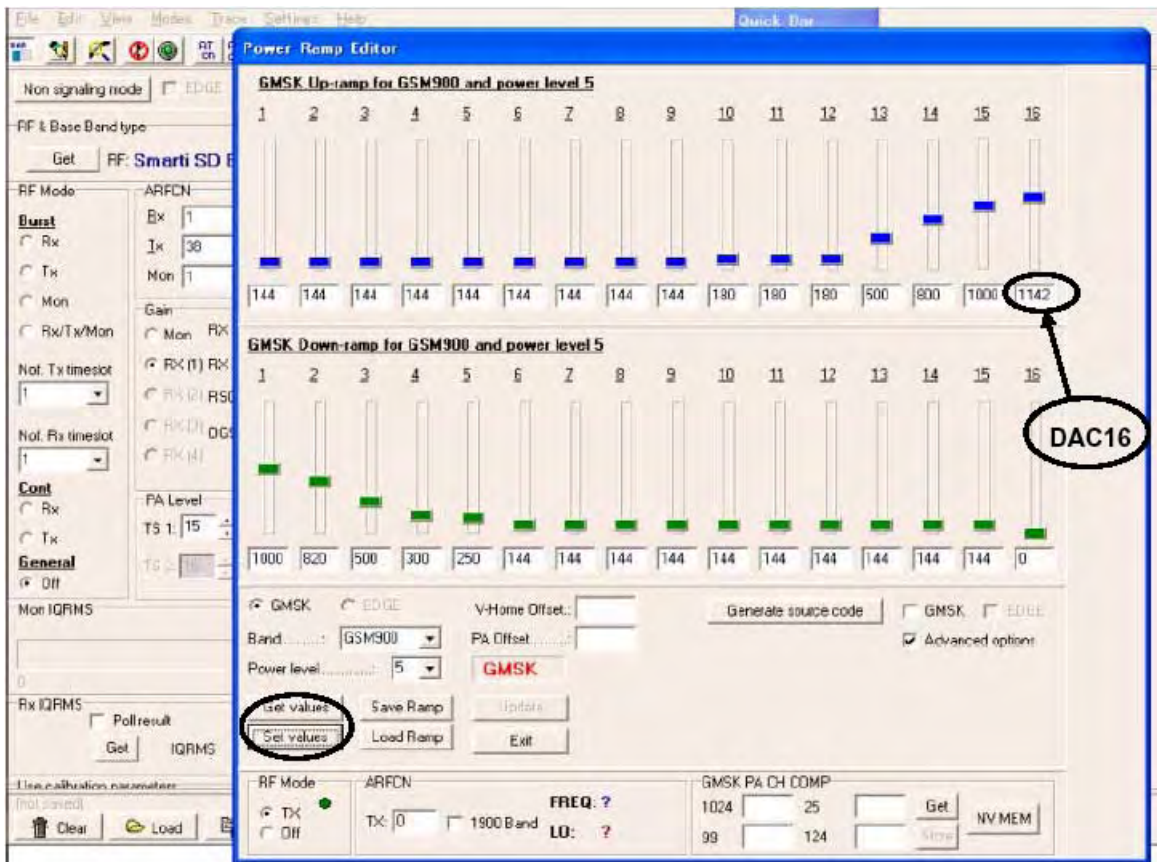
### Calibration Channels

The following table shows calibration channels. It is important to perform the calibration at these specific channels, as the software performs linear interpolation based upon these channels.

Tx Power Calibration Channels

Band	Segment	Calibrating Channel	Channel Range
E-GSM	1 - 0	12	1 - 25
	1 - 1	38	26 - 99
	1 - 2	112	100 - 124
	1 - 3	975	975 - 0
DCS	2 - 0	556	512 - 600
	2 - 1	698	601 - 700
	2 - 2	750	701 - 800
	2 - 3	842	801 - 885
PCS	3 - 0	512	512 - 586
	3 - 1	624	587 - 661
	3 - 2	699	662 - 735
	3 - 3	773	736 - 810

8. Repeat Step 4 to 6 (Input and set) the target power level is displayed on the power meter.  
(Refer to the Calibration Specification tables at the end of this section for target power levels.)
9. Enter the final DAC16 value from Step 6 into the TX Excel spreadsheet. The spreadsheet will automatically calculate the channel compensation value and it in the appropriate eep memory location on the eep worksheet within the same Excel file.



GSM		DCS		PCS	
PL	dac	PL	dac	PL	dac
5	1142	0	1140	0	1116
6	1009	1	977	1	944
7	956	2	920	2	887
8	851	3	813	3	779
9	759	4	719	4	687
10	676	5	639	5	607
11	604	6	568	6	538
12	541	7	505	7	478
13	486	8	450	8	424
14	437	9	401	9	378
15	394	10	357	10	338
16	355	11	319	11	302
17	322	12	286	12	271
18	294	13	257	13	244
19	269	14	232	14	221
		15	210	15	201

Input the Calibrated Ramping values

Channel 12

PL	Meas. Ramp	Default Ramp	Offset
5	1142	1142	0
6	1009	1009	0
7	956	956	0
8	851	851	0
9	759	759	0
10	676	676	0
11	604	604	0
12	541	541	0
13	486	486	0
14	437	437	0
15	394	394	0
16	355	355	0
17	322	322	0
18	294	294	0
19	269	269	0

Channel 668

PL	Meas. Ramp	Default Ramp	Offset
0	1140	1140	0
1	977	977	0
2	920	920	0
3	813	813	0
4	719	719	0
5	639	639	0
6	568	568	0
7	505	505	0
8	450	450	0
9	401	401	0
10	357	357	0
11	319	319	0
12	286	286	0
13	257	257	0
14	232	232	0
15	210	210	0

Channel 612

PL	Meas. Ramp	Default Ramp	Offset
0	1116	1116	0
1	944	944	0
2	887	887	0
3	779	779	0
4	687	687	0
5	607	607	0
6	538	538	0
7	478	478	0
8	424	424	0
9	378	378	0
10	338	338	0
11	302	302	0
12	271	271	0
13	244	244	0
14	221	221	0
15	201	201	0

Channel 88

PL	Meas. Ramp	Default Ramp	Offset
5	1142	1142	0
6	1009	1009	0
7	956	956	0
8	851	851	0
9	759	759	0
10	676	676	0
11	604	604	0
12	541	541	0
13	486	486	0
14	437	437	0
15	394	394	0
16	355	355	0
17	322	322	0
18	294	294	0
19	269	269	0

Channel 688

PL	Meas. Ramp	Default Ramp	Offset
0	1140	1140	0
1	977	977	0
2	920	920	0
3	813	813	0
4	719	719	0
5	639	639	0
6	568	568	0
7	505	505	0
8	450	450	0
9	401	401	0
10	357	357	0
11	319	319	0
12	286	286	0
13	257	257	0
14	232	232	0
15	210	210	0

Channel 824

PL	Meas. Ramp	Default Ramp	Offset
0	1116	1116	0
1	944	944	0
2	887	887	0
3	779	779	0
4	687	687	0
5	607	607	0
6	538	538	0
7	478	478	0
8	424	424	0
9	378	378	0
10	338	338	0
11	302	302	0
12	271	271	0
13	244	244	0
14	221	221	0
15	201	201	0

Channel 122

PL	Meas. Ramp	Default Ramp	Offset
5	1142	1142	0
6	1009	1009	0
7	956	956	0
8	851	851	0
9	759	759	0
10	676	676	0
11	604	604	0
12	541	541	0
13	486	486	0
14	437	437	0
15	394	394	0
16	355	355	0
17	322	322	0
18	294	294	0
19	269	269	0

Channel 760

PL	Meas. Ramp	Default Ramp	Offset
0	1140	1140	0
1	977	977	0
2	920	920	0
3	813	813	0
4	719	719	0
5	639	639	0
6	568	568	0
7	505	505	0
8	450	450	0
9	401	401	0
10	357	357	0
11	319	319	0
12	286	286	0
13	257	257	0
14	232	232	0
15	210	210	0

Channel 888

PL	Meas. Ramp	Default Ramp	Offset
0	1116	1116	0
1	944	944	0
2	887	887	0
3	779	779	0
4	687	687	0
5	607	607	0
6	538	538	0
7	478	478	0
8	424	424	0
9	378	378	0
10	338	338	0
11	302	302	0
12	271	271	0
13	244	244	0
14	221	221	0
15	201	201	0

Channel 876

PL	Meas. Ramp	Default Ramp	Offset
5	1142	1142	0
6	1009	1009	0
7	956	956	0
8	851	851	0
9	759	759	0
10	676	676	0
11	604	604	0
12	541	541	0
13	486	486	0
14	437	437	0
15	394	394	0
16	355	355	0
17	322	322	0
18	294	294	0

Channel 842

PL	Meas. Ramp	Default Ramp	Offset
0	1140	1140	0
1	977	977	0
2	920	920	0
3	813	813	0
4	719	719	0
5	639	639	0
6	568	568	0
7	505	505	0
8	450	450	0
9	401	401	0
10	357	357	0
11	319	319	0
12	286	286	0
13	257	257	0

Channel 778

PL	Meas. Ramp	Default Ramp	Offset
0	1116	1116	0
1	944	944	0
2	887	887	0
3	779	779	0
4	687	687	0
5	607	607	0
6	538	538	0
7	478	478	0
8	424	424	0
9	378	378	0
10	338	338	0
11	302	302	0
12	271	271	0
13	244	244	0

Meas Tx Tx\_eep VCTCXO

10. To calibrate other PA level or Bands, repeat steps 1 through 7.

11. When all channels, power levels, and bands are calibrated, save the Excel sheet of EEP data using File >>> Save As >>> Test (Tab delimited) >>> Save.

09B8	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][0]	0
09BA	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][1]	0
09BC	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][2]	0
09BE	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][3]	0
09C0	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][0]	0
09C2	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][1]	0
09C4	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][2]	0
09C6	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][3]	0
09C8	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][0]	0
09CA	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][1]	0
09CC	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][2]	0
09CE	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][3]	0
09D0	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][0]	0
09D2	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][1]	0
09D4	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][2]	0
09D6	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][3]	0
09D8	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][13][0]	0



09B8	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][0]	0
09BA	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][1]	0
09BC	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][2]	0
09BE	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][9][3]	0
09C0	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][0]	0
09C2	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][1]	0
09C4	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][2]	0
09C6	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][10][3]	0
09C8	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][0]	0
09CA	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][1]	0
09CC	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][2]	0
09CE	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][11][3]	0
09D0	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][0]	0
09D2	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][1]	0
09D4	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][2]	0
09D6	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][12][3]	0
09D8	eep_static.gmsk_rf_comp.gmsk_pa_ch_comp[1][13][0]	0

### ■ Calibration Limits

The following tables provide the target output power levels for calibration. For each power level, the target power is listed in the Nominal column. The calibrated power must always fall within the Target Min and Max ranges listed to the right of the Nominal target.

[E-GSM 800]

PL	Output Power Level (dBm)		
	Target		
	Min	Typ	Max
5	32.00	32.25	32.50
6	29.20	29.45	29.70
7	27.90	28.15	28.40
8	26.75	27.00	27.25
9	24.50	25.00	25.50
10	22.50	23.00	23.50
11	20.50	21.00	21.50
12	18.50	19.00	19.50
13	16.50	17.00	17.50
14	14.50	15.00	15.50
15	12.50	13.00	13.50
16	10.50	11.00	11.50
17	8.50	9.00	9.50
18	6.50	7.00	7.50
19	4.50	5.00	5.50

[DCS 1800]

PL	Output Power Level (dBm)		
	Target		
	Min	Typ	Max
0	29.00	29.25	29.50
1	27.20	28.00	28.25
2	25.50	26.00	26.50
3	23.50	24.00	24.50
4	21.50	22.00	22.50
5	19.50	20.00	20.50
6	17.50	18.00	18.50
7	15.50	16.00	16.50
8	13.50	14.00	14.50
9	11.50	12.00	12.50
10	9.50	10.00	10.50
11	7.50	8.00	8.50
12	5.50	6.00	6.50
13	3.50	4.00	4.50
14	1.50	2.00	2.50
15	-0.50	0.00	0.50

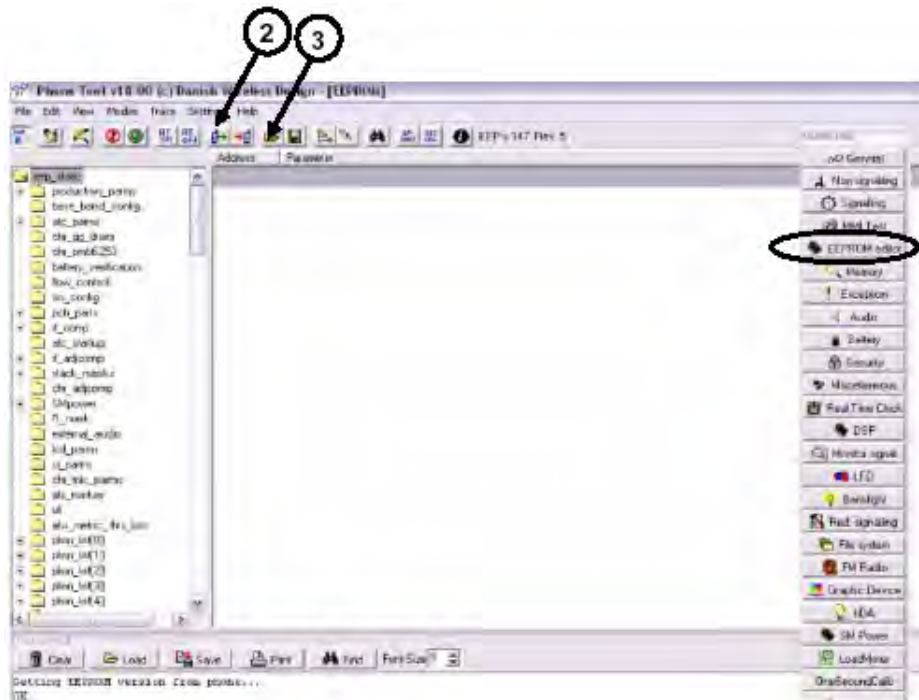
[PCS 1900]

PL	Output Power Level (dBm)		
	Target		
	Min	Typ	Max
0	29.00	29.25	29.50
1	27.10	27.35	27.60
2	25.50	25.75	26.00
3	23.50	24.00	24.50
4	21.50	22.00	22.50
5	19.50	20.00	20.50
6	17.50	18.00	18.50
7	15.50	16.00	16.50
8	13.50	14.00	14.50
9	11.50	12.00	12.50
10	9.50	10.00	10.50
11	7.50	8.00	8.50
12	5.50	6.00	6.50
13	3.50	4.00	4.50
14	1.50	2.00	2.50
15	-0.50	0.00	0.50

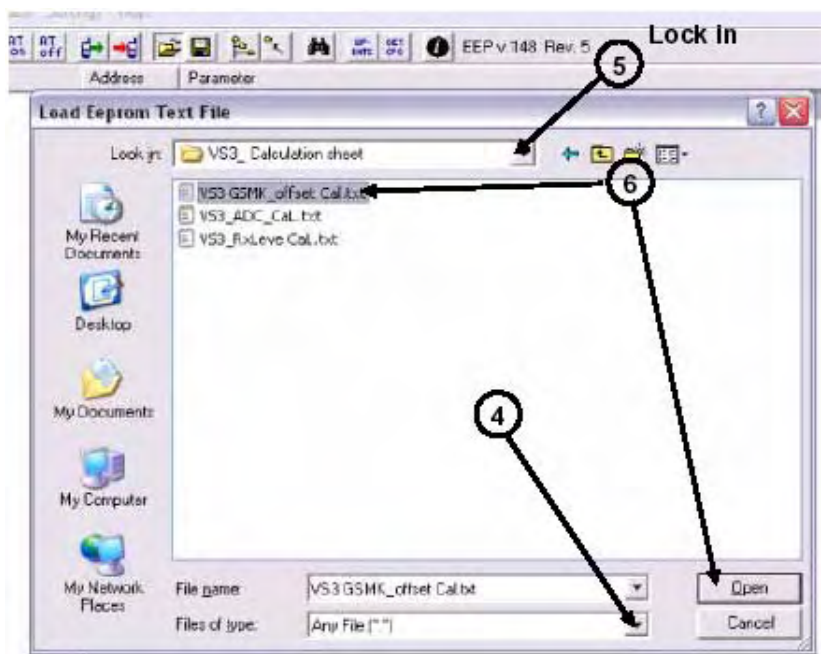


## ■ Data Overwrite Procedure

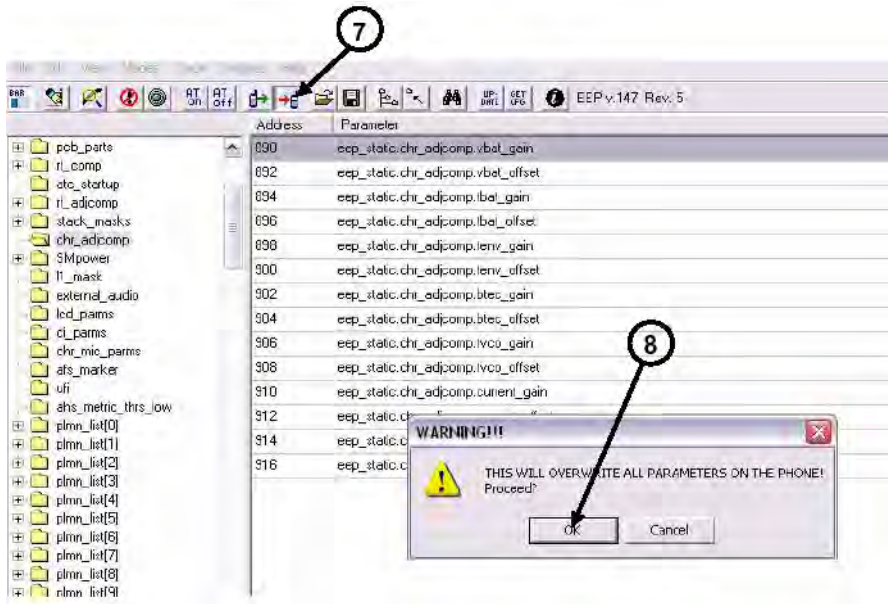
1. From the "Modes" pull-down menu, select "EEPROM".
2. Click "Read EEPROM" value from the phone. The "eep-static" folder is opened.
3. Click "Load Eeprom Text File".



4. Select "Any File" of the Files of type.
5. Click "Lock in" and then select which is saved "VS3\_GSMK\_Offset\_Cal" text (Tab delimited) file from PC.
6. Select Text file and then click "Open".



7. Click "Download current Eeprom value to phone".
8. Click "OVERWRITE" button. The "S3\_GSMK\_Offset\_Cal" values in the phone will be overwritten by the new values

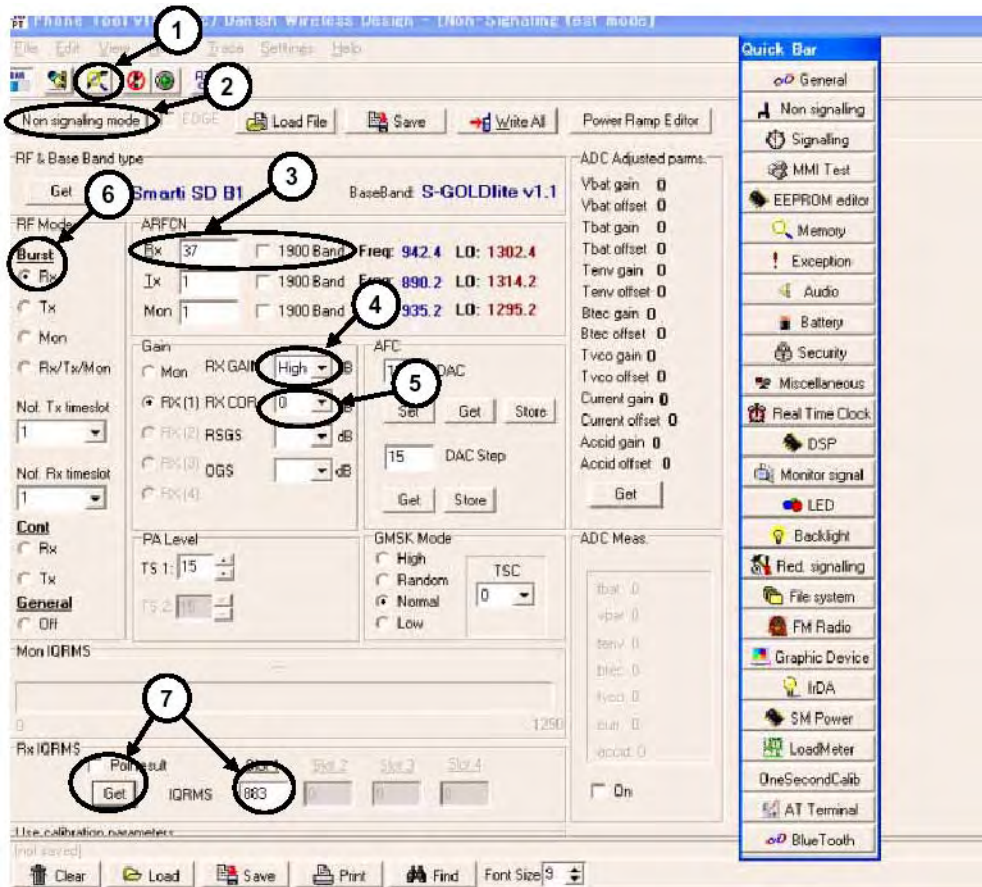


## 9.7. Rxlev Calibration

### ■ Rxlev Gain Calibration

For RX Level calibration, the mobile must be connected to a GSM Test Set, The power into the mobile should be **"-75.5 dBm/High"** or **"-48.5 dBm/Low"** Gain.

1. Click the **"Connection"** button.
2. Click the **"Non-Signaling Mode"** button.



3. Input the Rx ARFCN (EGSM=37ch, DCS=670 ch, PCS=650 ch) and press the Enter key.  
Note: If the PCS band is being calibrated, the "1900 Band" box must first be checked.
4. Set RX GAIN to "High" or "Low".
5. Use the pull-down menu to select the Gain "Rx(1) RX COR = 0 dB".
6. Check the "Burst Rx" of the RF Mode.
7. Click the "Get" Button of Rx IQRMS. The value displayed at "Slot1" will be the "IQRMS value".
8. Enter the IQRMS value into the RX Excel sheet (below). The IQRMS value will be used to calculate the gain and channel compensation values. It will then stored to the eep file of the RX Excel sheet.
9. Repeat steps 1 through 8 for all calibration channels.
10. When all channels and bands are calibrated, save the Excel sheet of eep data using File >>> Save As >>> Text (Tab delimited) >>> Save.

	High Gain / -75.5 dBm						Low Gain / -48.5 dBm		
GSM	12	37	63	88	113	1000			37
DAC	900	880	870	860	850	820			755
RX Lev	35	34	33	33	32	30			60
Gain off		1							2
Channel off	-1	0	1	1	2	4			
DCS	530	570	630	670	730	770	830	870	670
DAC	859	858	853	856	859	859	862	858	744
RX Lev	35	34	33	34	34	34	34	34	61
Gain off				1					1
Channel off	0	0	1	0	0	0	0	0	
PCS	530	570	610	650	690	730	770	800	650
DAC	847	851	854	853	853	851	841	841	739
RX Lev	33	33	33	33	33	33	33	33	60
Gain off				2					2
Channel off	0	0	0	0	0	0	0	0	

○ Please write Gain offset and Channel offset by using eep Rom editor.

027A	eep_static.rf_adjcomp.rxlev_gain_comp[1][0]	1
027B	eep_static.rf_adjcomp.rxlev_gain_comp[1][1]	1
027C	eep_static.rf_adjcomp.rxlev_gain_comp[1][2]	1
027D	eep_static.rf_adjcomp.rxlev_gain_comp[1][3]	1
027E	eep_static.rf_adjcomp.rxlev_gain_comp[1][4]	1
027F	eep_static.rf_adjcomp.rxlev_gain_comp[1][5]	1
0280	eep_static.rf_adjcomp.rxlev_gain_comp[1][6]	1
0281	eep_static.rf_adjcomp.rxlev_gain_comp[1][7]	1
0282	eep_static.rf_adjcomp.rxlev_gain_comp[1][8]	1
0283	eep_static.rf_adjcomp.rxlev_gain_comp[1][9]	1
0284	eep_static.rf_adjcomp.rxlev_gain_comp[1][10]	1
▶ RX_Level Calculation / RX_eep / EV Map		



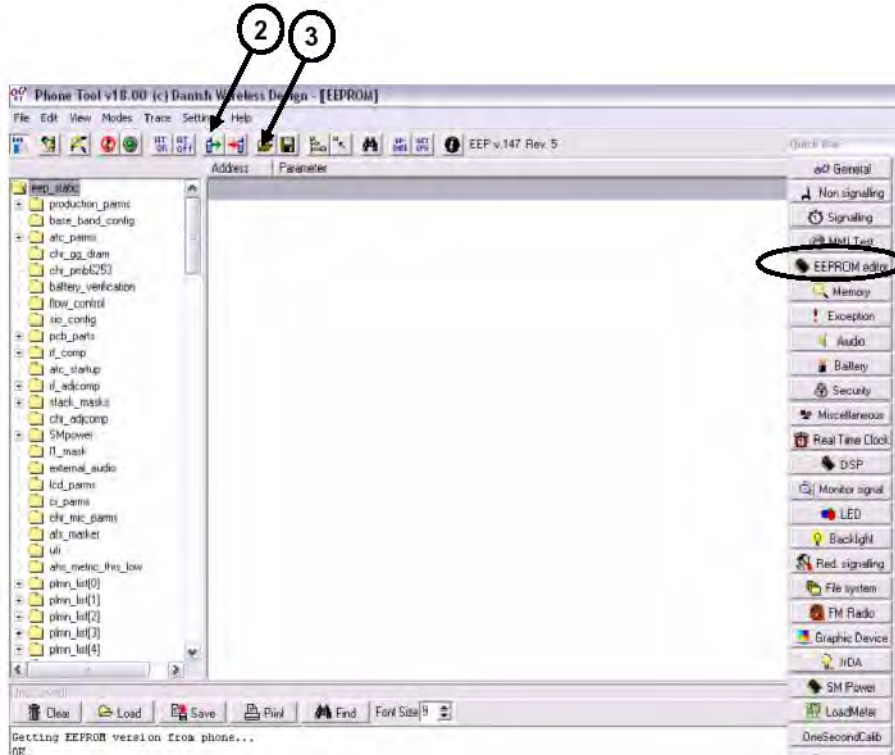
```

"027A eep_static.rf_adjcomp.rxlev_gain_comp[1][0]" 1
"027B eep_static.rf_adjcomp.rxlev_gain_comp[1][1]" 1
"027C eep_static.rf_adjcomp.rxlev_gain_comp[1][2]" 1
"027D eep_static.rf_adjcomp.rxlev_gain_comp[1][3]" 1
"027E eep_static.rf_adjcomp.rxlev_gain_comp[1][4]" 1
"027F eep_static.rf_adjcomp.rxlev_gain_comp[1][5]" 1
"0280 eep_static.rf_adjcomp.rxlev_gain_comp[1][6]" 1
"0281 eep_static.rf_adjcomp.rxlev_gain_comp[1][7]" 1
"0282 eep_static.rf_adjcomp.rxlev_gain_comp[1][8]" 1
"0283 eep_static.rf_adjcomp.rxlev_gain_comp[1][9]" 1
"0284 eep_static.rf_adjcomp.rxlev_gain_comp[1][10]" 1
"0285 eep_static.rf_adjcomp.rxlev_gain_comp[1][11]" 1
"0286 eep_static.rf_adjcomp.rxlev_gain_comp[1][12]" 1
"0287 eep_static.rf_adjcomp.rxlev_gain_comp[1][13]" 1

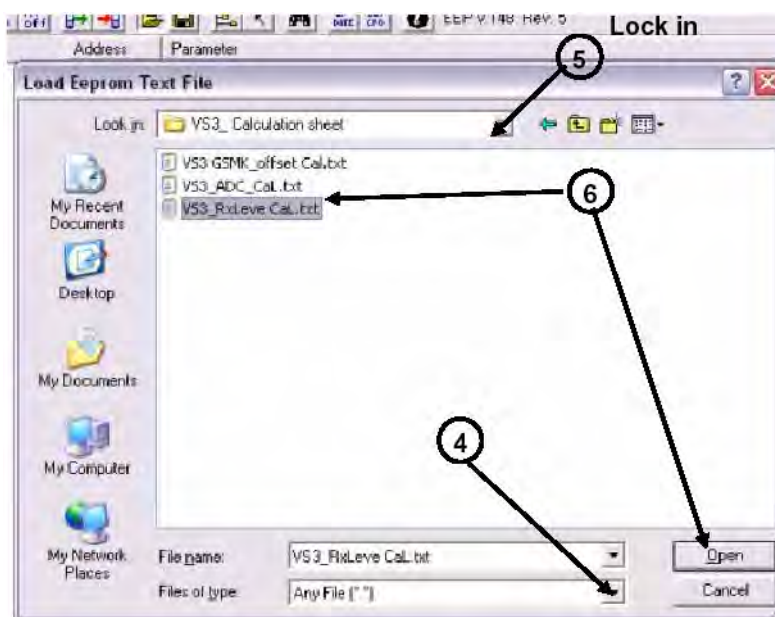
```

## ■ Data Overwrite Procedure

1. From the "Modes" pull-down menu, select "EEPROM".
2. Click "Read EEPROM" value from the phone. The "eep-static" folder is opened.
3. Click "Load Eeprom Text File".



4. Select "Any File" of the Files of type.
5. Click "Lock in" and then select which is saved "VS3\_Rxlevel\_Cal" text (Tab delimited) file from PC.
6. Select Text file and then click "Open".

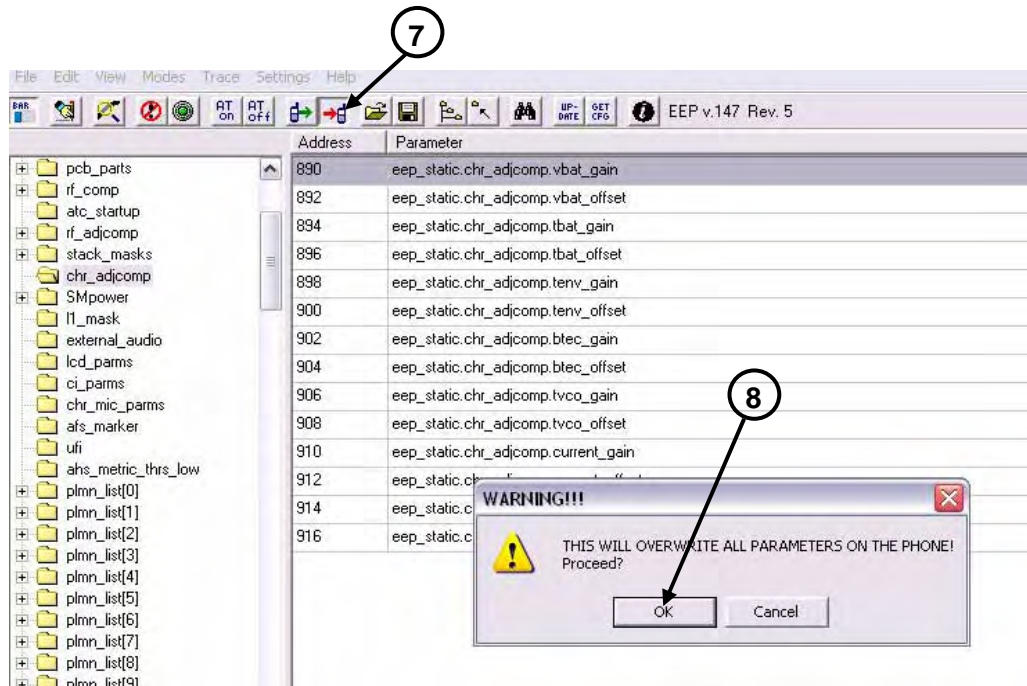




7. Click " **Download current Eeprom value to phone** " .

8. Click "**OVERWRITE** " button.

The " VS3\_RxLeve\_Cal" values in the phone will be overwritten by the new values from the PC.



# Service Manual

Digital Cellular Telephone

GSM

EB-VS3

VOL. 5

<b>10. REPLACEMENT PARTS LIST</b> .....	10-1
10.1. Upper Unit .....	10-1
10.2. Lower Unit .....	10-2
10.3. Main PCB Assembly .....	10-3
10.4. Upper PCB Assembly .....	10-6
10.5. SIM PCB Assembly .....	10-7

## **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.

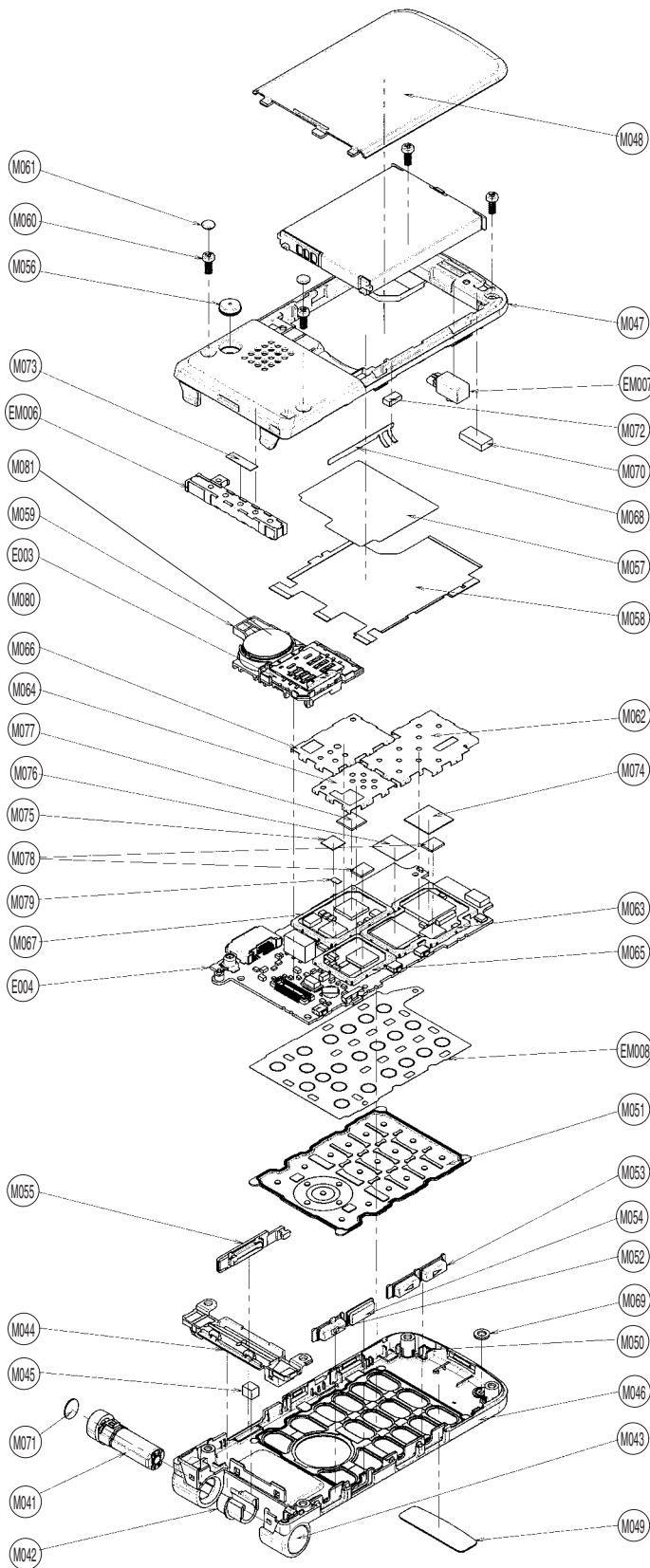
# Panasonic

© 2005 Panasonic Mobile Communications Co., Ltd.  
All rights reserved. Unauthorized copying and distribution is a violation of law.





## 10.2. Lower Unit



REF. NO.	PART NO.	DESCRIPTION
M041	3VA001994BAA	ONE-PUSH HINGE
M042	3CT001183AAA	HINGE GUIDE
M043	3MB001193AAC	DUMMY BUTTON (SILVER)
	3MB001193AAD	DUMMY BUTTON (BLACK)
M044	3CH001353CAC	HOLDER, STACKER
M045	3CV001780AAA	WATER PROOF CUSHION
M046	3DA002237AAB	LOWER COVER (SILVER)
	3DA002237AAD	LOWER COVER (BLACK)
M047	3CE001829AAB	LOWER CASE (SILVER)
	3CE001829AAD	LOWER CASE (BLACK)
M048	3CE001830BAB	BATTERY COVER (SILVER)
	3CE001830BAD	BATTERY COVER (BLACK)
M049	3CF002720BAM	LOGO PANEL
M050	3HP001109AAA	LOWER INDICATOR
M051	3MB001194AAC	KEY SHEET STANDARD (SILVER)
	3MB001194AAH	KEY SHEET STROKE SILVER
	3MB001194AAJ	KEY SHEET BOPOMOFO (SILVER)
	3MB001194AAK	KEY SHEET THAI (SILVER)
	3MB001194AAL	KEY SHEET RUSSIA (SILVER)
	3MB001194AAM	KEY SHEET STANDARD (BLACK)
	3MB001194AAN	KEY SHEET STROKE (BLACK)
	3MB001194AAP	KEY SHEET BOPOMOFO (BLACK)
	3MB001194AAQ	KEY SHEET THAI (BLACK)
	3MB001194AAR	KEY SHEET RUSSIA (BLACK)
M052	3MB001195DAA	MEMO KEY
M053	3MB001196AAA	SIDE KEY UP DOWN
	3MB001196AAC	SIDE KEY DOWN
M054	3HP001110AAA	IRDA LENS
M055	3DB001112AAA	I/O CAP (GRAY)
	3DB001112AAB	I/O CAP (BLACK)
M056	6RA507AAGA	RF CAP (SILVER)
	6RA507AAA	RF CAP (BLACK)
M057	3PA003097AAA	MAIN NAME PLATE
M058	3CJ001292AAA	NAME PLATE SHEET
M059	3CH001354AAA	SIM PCB HOLDER
M060	3AB001154AAA	LOWER SCREW
M061	3DB001114AAB	SCREW CAP (GRAY)
	3DB001114AAC	SCREW CAP (BLACK)
M062	3DH001602AAA	SHIELD LOGIC L COVER
M063	3DH001603AAA	SHIELD LOGIC L FRAME
M064	3DH001604AAA	SHIELD LOGIC S COVER
M065	3DH001605AAA	SHIELD LOGIC S FRAME
M066	3DH001606AAA	SHIELD RF COVER
M067	3DH001607AAA	SHIELD RF FRAME
M068	3DJ001263AAA	SAR PLATE
M069	3CV001781AAA	MICROPHONE MESH CUSHION
M070	3CV001583AAA	MICROPHONE CUSHION BLACK
M071	3PE001048AAA	HINGE BUTTON SHEET
M072	3CV001890AAA	SAR PLATE CUSHION
M073	3CJ001337AAA	UFC PLATE
M074	3AK001233AAA	ADHESIVE TAPE
M075	3CJ001342AAA	SGOLD SPACER
M076	3CJ001343AAA	PA SPACER
M077	3CJ001344AAA	MEMORY SPACER
M078	3CJ001345AAA	SMARTI SPACER
M079	3CJ001346AAA	IC SPACER
M080	3DG001364AAA	INSULATING PARTS
M081	3CJ001352AAA	SPACER
	LOAZ01B0001	SPEAKER ASSEMBLY
EM006	AN80051A	ANTENNA
EM007	DB80001A	VIBRATOR UNIT
EM008	3DJ001264AA	PANEL SWITCH
E003	EBVS3-E11	SIM PCB ASSEMBLY
E004	VS3AS01	MAIN PCB ASSEMBLY

## 10.3. Main PCB Assembly

Ref. No.	Part No.	Part Name & Description	Grid
BT900	N4EZA14A0001	BATTERY	
C101	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C102	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C103	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C104	F1G1H5R0A564	CERAMIC CAPACITOR 5 pF 50V	
C105	ECJZEC1E030C	CERAMIC CAPACITOR 3 pF 25V	
C106	ECJZEC1E080D	CERAMIC CAPACITOR 8 pF 25V	
C107	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C108	F1G1H2R0A561	CERAMIC CAPACITOR 2 pF 50V	
C109	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C111	F1G1C1030008	CERAMIC CAPACITOR 0.01 uF 16V	
C112	F1G1C1030008	CERAMIC CAPACITOR 0.01 uF 16V	
C114	ECJZEB1E102K	CERAMIC CAPACITOR 0.001 uF 25V	
C115	F1J1A106A034	CERAMIC CAPACITOR 10 uF 10V	
C117	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C118	ECJZEB1E102K	CERAMIC CAPACITOR 0.001 uF 25V	
C119	ECJZEB1E102K	CERAMIC CAPACITOR 0.001 uF 25V	
C122	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C123	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C124	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C125	ECJZEC1E120J	CERAMIC CAPACITOR 12 pF 25V	
C135	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C138	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C204	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C205	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C206	ECJZEC1E120J	CERAMIC CAPACITOR 12 pF 25V	
C207	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C208	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C210	F1G1H561A541	CERAMIC CAPACITOR 560 pF 50V	
C211	F1G1H561A541	CERAMIC CAPACITOR 560 pF 50V	
C215	F1L1ER75A075	CERAMIC CAPACITOR 0.75 pF 25V	
C216	ECJZEC1E0R5C	CERAMIC CAPACITOR 0.5 pF 25V	
C221	ECJZEC1C470J	CERAMIC CAPACITOR 47 pF 16V	
C302	F1G1A1040002	CERAMIC CAPACITOR 0.1 uF 10V	
C303	F1G1H4R0A564	CERAMIC CAPACITOR 4 pF 50V	
C304	F1G1H271A541	CERAMIC CAPACITOR 270 pF 50V	
C305	F1G1H221A541	CERAMIC CAPACITOR 220 pF 50V	
C306	F1G1H221A541	CERAMIC CAPACITOR 220 pF 50V	
C307	F1G1H561A541	CERAMIC CAPACITOR 560 pF 50V	
C310	F1G1C1030008	CERAMIC CAPACITOR 0.01 uF 16V	
C311	F1G1A1040002	CERAMIC CAPACITOR 0.1 uF 10V	
C313	F1G1A1040002	CERAMIC CAPACITOR 0.1 uF 10V	
C401	F1G1C1030008	CERAMIC CAPACITOR 0.01 uF 16V	
C402	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C407	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C408	F1G1C1030008	CERAMIC CAPACITOR 0.01 uF 16V	
C409	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 pF 6.3 V	
C410	F1G1C1030008	CERAMIC CAPACITOR 0.01 uF 16V	
C411	F1G1H270A565	CERAMIC CAPACITOR 27 pF 50V	
C501	ECJZEC1C470J	CERAMIC CAPACITOR 47 pF 16V	
C504	F1G0J334A001	CERAMIC CAPACITOR 0.33 uF 6.3 V	
C505	F3H0G226A057	TANTALUM CAPACITOR 22 uF 4V	
C506	F3H0G226A057	TANTALUM CAPACITOR 22 uF 4V	
C507	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C508	ECJZEC1C101J	CERAMIC CAPACITOR 100 pF 16V	
C510	ECJ0EC1H180J	CERAMIC CAPACITOR 18 pF 50V	
C511	ECJ0EC1H180J	CERAMIC CAPACITOR 18 pF 50V	
C523	ECJZEB1E331K	CERAMIC CAPACITOR 330 pF 25V	
C524	F1L0J333A019	CERAMIC CAPACITOR 0.033 uF 6.3V	
C525	F1J1C1050031	CERAMIC CAPACITOR 1 uF 16V	

Ref. No.	Part No.	Part Name & Description	Grid
C526	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C527	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C528	ECJZEB1E102K	CERAMIC CAPACITOR 0.001 uF 25V	
C529	F1G0J1050007	CERAMIC CAPACITOR 1 uF 6.3 V	
C531	F1G0J1050007	CERAMIC CAPACITOR 1 uF 6.3 V	
C550	ECJ0EC1H470J	CERAMIC CAPACITOR 47 pF 50V	
C554	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C555	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C556	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C559	ECJZEB0J682K	CERAMIC CAPACITOR 6800 pF 6.3 V	
C560	ECJZEC1E100D	CERAMIC CAPACITOR 10 pF 25V	
C562	ECJZEC1E100D	CERAMIC CAPACITOR 10 pF 25V	
C563	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C564	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C565	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C567	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C568	ECJ0EC1H101J	CERAMIC CAPACITOR 100 pF 50V	
C571	ECJZEC1C101J	CERAMIC CAPACITOR 100 pF 16V	
C572	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C573	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C574	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C575	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C576	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C577	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C578	F1J0J1060009	CERAMIC CAPACITOR 10 uF 6.3 V	
C579	ECJ0EC1H270J	CERAMIC CAPACITOR 27 pF 50V	
C585	ECJZEC1E100D	CERAMIC CAPACITOR 10 pF 25V	
C586	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C587	ECJZEB0J104K	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C588	F1J0J1060009	CERAMIC CAPACITOR 10 uF 6.3 V	
C589	ECJZEC1E270J	CERAMIC CAPACITOR 27 pF 25V	
C591	ECJ0EC1H101J	CERAMIC CAPACITOR 100 pF 50V	
C592	F1G1H561A541	CERAMIC CAPACITOR 560 pF 50V	
C594	F1G1H561A541	CERAMIC CAPACITOR 560 pF 50V	
C596	F1L1C102A027	CERAMIC CAPACITOR 0.001 uF 16V	
C597	ECJZEC1C101J	CERAMIC CAPACITOR 100 pF 16V	
C598	F1L1C102A027	CERAMIC CAPACITOR 0.001 uF 16V	
C599	ECJZEC1E100D	CERAMIC CAPACITOR 10 pF 25V	
C600	F1G0J2240003	CERAMIC CAPACITOR 0.22 uF 6.3 V	
C601	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C603	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C604	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C605	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C606	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C607	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C608	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C609	F1G0J2240003	CERAMIC CAPACITOR 0.22 uF 6.3 V	
C610	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C612	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C614	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C615	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C616	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C618	ECJ0EC1H180J	CERAMIC CAPACITOR 18 pF 50V	
C619	ECJ0EC1H180J	CERAMIC CAPACITOR 18 pF 50V	
C620	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C622	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C623	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C624	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C625	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C626	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	

Ref. No.	Part No.	Part Name & Description	Grid
C627	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C628	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C629	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C630	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C632	ECJ0EB1C103K	CERAMIC CAPACITOR 0.01 uF 16V	
C635	ECJZEB1C152K	CERAMIC CAPACITOR 1500 uF 16V	
C652	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C657	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C658	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C659	F1LQJ104A021	CERAMIC CAPACITOR 0.1 uF 6.3 V	
C902	F1G1A473A012	CERAMIC CAPACITOR 0.047 uF 10V	
C911	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C912	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C913	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C914	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C915	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10V	
C916	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C917	F1K1C225A069	CERAMIC CAPACITOR 2.2 uF 16V	
C918	F1K1C225A069	CERAMIC CAPACITOR 2.2 uF 16V	
C919	F1J0J2260005	CERAMIC CAPACITOR 20 uF 6.3 V	
C920	F1H1A225A025	CERAMIC CAPACITOR 2.2 uF 10V	
C921	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C922	F1H1A225A025	CERAMIC CAPACITOR 2.2 uF 10V	
C923	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C924	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C925	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C926	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C927	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C928	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C929	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C931	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C932	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C933	F1H0J2250006	CERAMIC CAPACITOR 2.2 uF 6.3 V	
C936	F1H1C105A095	CERAMIC CAPACITOR 1 uF 16V	
C937	ECJ1VF1A105Z	CERAMIC CAPACITOR 1 uF 10V	
C938	F1G0J1050007	CERAMIC CAPACITOR 1 uF 6.3 V	
C1019	ECJ0EC1H030C	CERAMIC CAPACITOR 3 pF 50V	
CN101	K1QYB1AD0001	ANTENNA CONNECTOR	
CN102	K1ZZ00001249	CONNECTOR	
CN502	K1FB124E0001	CONNECTOR	
CN503	K1KB14A00068	14PIN CONNECTOR	
CN504	K1KB50A00116	50PIN SOCKET	
CN505	K1MZ05A00003	5PIN BATTERY CONNECTOR	
D101	B0BC7R4A0015	DIODE	
D501	B0BD6R800011	DIODE	
D505	B0BC7R4A0015	DIODE	
D506	MAZW068H0L	DIODE	
D507	MA2S72800L	DIODE	
D612	MAZW068H0L	DIODE	
D613	MAZW068H0L	DIODE	
D614	MAZW068H0L	DIODE	
D615	MAZW068H0L	DIODE	
D616	MAZW068H0L	DIODE	
D617	MAZW068H0L	DIODE	
D618	B0BC7R4A0015	DIODE	
D901	B0JCMD000023	DIODE	
D902	B0JCPB000001	DIODE	
D903	B0JCPB000001	DIODE	
D906	MAZS0750ML	DIODE	
D907	MAZW068H0L	DIODE	

Ref. No.	Part No.	Part Name & Description	Grid
D908	B0BD6R800011	DIODE	
D909	B0BD6R800011	DIODE	
D910	MAZS0750ML	DIODE	
D912	MAZS0750ML	DIODE	
D913	MAZS0750ML	DIODE	
D1001	MAZS0750ML	DIODE	
D1002	MAZW068H0L	DIODE	
DS1001	LNJ326W830MC	LED GREEN	
DS1002	LNJ326W830MC	LED GREEN	
DS1003	LNJ326W830MC	LED GREEN	
DS1004	LNJ326W830MC	LED GREEN	
DS1005	LNJ326W830MC	LED GREEN	
DS1006	LNJ326W830MC	LED GREEN	
DS1007	LNJ326W830MC	LED GREEN	
DS1008	LNJ326W830MC	LED GREEN	
DS1009	LNJ326W830MC	LED GREEN	
DS1010	LNJ326W830MC	LED GREEN	
DS1011	LNJ326W830MC	LED GREEN	
DS1012	LNJ326W830MC	LED GREEN	
DS1013	LNJ326W830MC	LED GREEN	
DS1014	LNJ326W830MC	LED GREEN	
DS1015	CND0204A	IrDA	
DS1016	B3AAB0000090	LED RED	
E1004	B4BC000007	HALL IC	
F501	ERBSD1R00U	FUSE	24 V 1 A
FL201	EFCH942MTC A3	FILTER	
FL202	EFCH1842TCA3	FILTER	
FL203	EFCH1960TCA3	FILTER	
FL300	JOJHC0000078	FILTER	
FL301	JOJAC0000011	FILTER	
FL501	EXC24CP221U	FILTER	
FL601	J0HAAA000021	FILTER	
FL602	J0HAAA000021	FILTER	
L101	G1C27NJ00010	COIL	27NH
L102	G1C8N2J00004	COIL	8.2NH
L103	ELJRF4N7JFB	COIL	4.7NH
L105	ELJRF18NJFB	COIL	18NH
L106	ELJRF6N8JFB	COIL	6.8NH
L107	ELJRF22NJFB	COIL	22NH
L108	ELJRF10NJFB	COIL	10NH
L206	G1C18NZA0102	COIL	18NH
L207	G1C18NZA0102	COIL	18NH
L208	G1C5N1ZA0102	COIL	5.1NH
L209	G1C5N1ZA0102	COIL	5.1NH
L210	G1C6N2ZA0102	COIL	6.2NH
L211	G1C6N2ZA0102	COIL	6.2NH
L213	G1C1N0ZA0101	COIL	1NH
L214	G1C2N2ZA0101	COIL	2.2NH
L215	G1C15NZA0102	COIL	15NH
L401	G1C1R0K00005	COIL	1.0UH
L901	G1A100FA0015	COIL	10UH
MK501	L0CZAB000007	MICROPHONE	
Q500	B1CHHC000008	TRANSISTOR	
Q501	XP0440100L	TRANSISTOR	
Q502	XP0438J00L	TRANSISTOR	
Q902	B1DHCC000036	TRANSISTOR	
Q1001	UNR9210J0L	FIXED RESISTOR	47K Ohm 1/8W
R109	EXB24AT1AR3X	SPECIAL FIXED RESISTOR	
R110	EXB24AT1AR3X	SPECIAL FIXED RESISTOR	
R119	ERJ1GEJ201C	FIXED RESISTOR	200 Ohm 1/20W

Ref. No.	Part No.	Part Name & Description	Grid
R120	ERJ1GEJ181C	FIXED RESISTOR 180 Ohm 1/20W	
R124	ERJ1GE0R00C	FIXED RESISTOR 0 Ohm 1/20W	
R125	ERJ1GEJ102C	FIXED RESISTOR 1K Ohm 1/20W	
R126	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R127	ERJ1GE0R00C	FIXED RESISTOR 0 Ohm 1/20W	
R128	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R301	ERJ1GEF332C	FIXED RESISTOR 3.3K Ohm 1/20W	
R302	ERJ1GEJ821C	FIXED RESISTOR 820 Ohm 1/20W	
R304	ERJ2RKF123X	FIXED RESISTOR 12K Ohm 1/16W	
R305	ERJ2RKF471X	FIXED RESISTOR 470 Ohm 1/16W	
R306	ERJ1GEJ102C	FIXED RESISTOR 1K Ohm 1/20W	
R401	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R403	ERJ2GEJ103X	FIXED RESISTOR 10K Ohm 1/16W	
R404	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R405	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R407	ERJ1GEJ120C	FIXED RESISTOR 12 Ohm 1/20W	
R500	ERJ1GEJ472C	FIXED RESISTOR 4.7K Ohm 1/20W	
R504	ERJ2GEJ394X	FIXED RESISTOR 390K Ohm 1/16W	
R505	ERJ2GEJ104X	FIXED RESISTOR 100K 1/16W	
R508	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R509	ERJ3GEYJ220V	FIXED RESISTOR 22 Ohm 1/16W	
R510	ERJ3GEYJ220V	FIXED RESISTOR 22 Ohm 1/16W	
R511	ERJ2GEJ183X	FIXED RESISTOR 18K Ohm 1/16W	
R532	ERJ1GEJ273C	FIXED RESISTOR 27K Ohm 1/20W	
R533	ERJ1GEJ273C	FIXED RESISTOR 27K Ohm 1/20W	
R534	ERJ1GEJ154C	FIXED RESISTOR 150K Ohm 1/20W	
R535	ERJ1GEJ332C	FIXED RESISTOR 3.3K Ohm 1/20W	
R536	ERJ1GE0R00C	FIXED RESISTOR 0 Ohm 1/20W	
R544	ERJ2GEJ561X	FIXED RESISTOR 560 Ohm 1/16W	
R545	ERJ2GEJ561X	FIXED RESISTOR 560 Ohm 1/16W	
R559	ERJ1GEJ563C	FIXED RESISTOR 56 Kohm 1/20W	
R560	ERJ2GEJ330X	FIXED RESISTOR 33 Ohm 1/16W	
R561	ERJ2GEJ330X	FIXED RESISTOR 33 Ohm 1/16W	
R564	ERJ1GEJ221C	FIXED RESISTOR 220 Ohm 1/20W	
R565	ERJ2GEJ271X	FIXED RESISTOR 270 Ohm 1/16W	
R568	ERJ2GEJ102X	FIXED RESISTOR 1K Ohm 1/16W	
R571	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R573	ERJ2GEJ102X	FIXED RESISTOR 1K Ohm 1/16W	
R576	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R577	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R578	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R579	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R580	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R581	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R582	ERJ1GEJ122C	FIXED RESISTOR 1.2K Ohm 1/20W	
R583	ERJ1GEJ104C	FIXED RESISTOR 100K Ohm 1/20W	
R584	ERJ1GEJ104C	FIXED RESISTOR 100K Ohm 1/20W	
R586	ERJ2GEJ104X	FIXED RESISTOR 100K 1/16W	
R587	ERJ1GE0R00C	FIXED RESISTOR 0 Ohm 1/20W	
R591	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R594	ERJ1GEJ103C	FIXED RESISTOR 10K Ohm 1/20W	
R600	ERJ2GEJ4R7X	FIXED RESISTOR 4.7 Ohm 1/16W	
R601	ERJ2GEJ332X	FIXED RESISTOR 3.3K Ohm 1/16W	
R602	ERJ2GEJ220X	FIXED RESISTOR 22 Ohm 1/16W	
R604	ERJ2RKF3002X	FIXED RESISTOR 30K Ohm 1/16W	
R605	ERJ2GEJ220X	FIXED RESISTOR 22 Ohm 1/16W	
R606	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R607	ERJ1GE0R00C	FIXED RESISTOR 0 Ohm 1/20W	
R609	ERJ2GEJ220X	FIXED RESISTOR 22 Ohm 1/16W	
R610	ERJ2GEJ220X	FIXED RESISTOR 22 Ohm 1/16W	

Ref. No.	Part No.	Part Name & Description	Grid
R659	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R660	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R661	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R662	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R909	ERJ6RSFR15V	FIXED RESISTOR 0.15 Ohm 1/20W	
R910	ERJ2GEJ472X	FIXED RESISTOR 4.7K Ohm 1/16W	
R911	ERJ2GEJ472X	FIXED RESISTOR 4.7K Ohm 1/16W	
R913	ERJ2GEJ224X	FIXED RESISTOR 220K Ohm 1/16W	
R916	ERJ2RKF8202X	FIXED RESISTOR 82K Ohm 1/16W	
R919	ERJ2GEJ152X	FIXED RESISTOR 1.5K Ohm 1/16W	
R921	ERJ2GEJ223X	FIXED RESISTOR 22K Ohm 1/16W	
R922	ERJ2GEJ102X	FIXED RESISTOR 1K Ohm 1/16W	
R925	ERJL08KF47MV	FIXED RESISTOR 47M Ohm	
R926	ERJ2GEJ222X	FIXED RESISTOR 2.2K Ohm 1/16W	
R929	ERJ2GEJ472X	FIXED RESISTOR 4.7K Ohm 1/16W	
R936	ERJ2GEJ474X	FIXED RESISTOR 470K Ohm 1/16W	
R938	ERJ2GEJ100X	FIXED RESISTOR 10 Ohm 1/16W	
R939	ERJ2GEJ104X	FIXED RESISTOR 100K Ohm 1/16W	
R940	ERJ2GEJ104X	FIXED RESISTOR 100K Ohm 1/16W	
R1045	EXB24V101JX	FIXED RESISTOR 100 Ohm 1/16W	
R1046	EXB24V101JX	FIXED RESISTOR 100 Ohm 1/16W	
R1047	EXB24V101JX	FIXED RESISTOR 100 Ohm 1/16W	
R1048	EXB24V101JX	FIXED RESISTOR 100 Ohm 1/16W	
R1049	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R1050	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R1051	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R1057	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R1058	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R1059	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R1060	ERJ2GEJ470X	FIXED RESISTOR 47 Ohm 1/16W	
RT101	D4CC14720006	THERMISTOR	
RV501	D4ED12700002	VARISTOR	
RV502	D4ED12700002	VARISTOR	
RV503	D4ED12700002	VARISTOR	
RV504	D4ED12700002	VARISTOR	
RV507	D4ED12700002	VARISTOR	
RV508	D4ED12700002	VARISTOR	
RV509	D4ED11200006	VARISTOR 12 V	
RV901	D4ED12700002	VARISTOR	
RV1001	D4ED12700002	VARISTOR	
S1001	EVQP7D01K	SWITCH	
S1002	EVQP7D01K	SWITCH	
S1003	EVQP7D01K	SWITCH	
U101	C1CB00002010	IC	
U102	C1CB00001987	IC	
U103	J2FZ00000007	IC	
U105	J2GE00000012	IC	
U106	J2ZZ00000060	IC	
U401	H1D2605B0005	IC	
U501	C1BB00001078	IC	
U502	C1BB00000885	IC	
U602	C0JBAZ002561	IC	
U900	C1CB00002068	IC	
U901	C0EBE0000552	IC	
U903	C0CBCBC00204	IC	
Y600	H0J327200134	CRYSTAL OSCILLATOR 32.768 kHz	



## 10.4. Upper PCB Assembly

Ref. No.	Part No.	Part Name & Description	Grid
C3004	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3005	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3008	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3009	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3010	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3011	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3012	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3015	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3018	F1H1A105A025	CERAMIC CAPACITOR 1 uF 10 V	
C3019	F1H0J1050013	CERAMIC CAPACITOR 1 uF 6.3 V	
C3020	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3021	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3022	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3049	F1H1A225A050	CERAMIC CAPACITOR 2.2 uF 10 V	
C3050	F1J1H104A803	CERAMIC CAPACITOR 0.1 uF 10 V	
C3053	F1H1A105A025	CERAMIC CAPACITOR 1 uF 50 V	
C3055	F1H0J1050013	CERAMIC CAPACITOR 1 uF 6.3 V	
C3056	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3057	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3058	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3059	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3065	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3066	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3067	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3069	F1G1A104A012	CERAMIC CAPACITOR 0.1 uF 10 V	
C3085	F1H1A105A025	CERAMIC CAPACITOR 1 uF 10 V	
C3086	F1H1A105A025	CERAMIC CAPACITOR 1 uF 10 V	
C3095	F1G1A104A01	CERAMIC CAPACITOR 0.1 uF 10 V	
C3096	F1G1H470A422	CERAMIC CAPACITOR 47 pF 50 V	
CN3001	K1MN31B00022	31PIN FPC	
CN3002	K1MN04B00061	CONNECTOR	
CN3003	K1MN04B00061	CONNECTOR	
CN3004	K1MN33B00034	33PIN FPC	
D3001	B0JCDD000001	Diode 30 V 200MA	
DS3002	B3AZB0000028	LED	
FL3001	J0JCC0000249	FILTER	
FL3002	EXC24CP221U	FILTER	
FL3003	J0HAAA000024	FILTER	
FL3004	J0HAAA000024	FILTER	
FL3006	J0HAAA000016	FILTER	
FL3007	J0HAAA000016	FILTER	
FL3008	J0HAAA000016	FILTER	
FL3009	J0HAAA000016	FILTER	
FL3010	J0HAAA000016	FILTER	
FL3011	J0HAAA000021	FILTER	
L3001	G1A220CA0007	COIL 22UH	
L3002	G1A4R7EA0012	COIL 4.7UH	
Q3006	UNR921MJ0L	TRANSISTOR	
Q3007	B1GFCFEN0005	TRANSISTOR	
Q3008	B1GBCFNN0001	TRANSISTOR	
R3006	ERJ2GEJ152X	FIXED RESISTOR 1.5K Ohm 1/16W	
R3007	ERJ2GEJ152X	FIXED RESISTOR 1.5K Ohm 1/16W	
R3008	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R3009	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R3010	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R3020	ERJ2RCF6R20X	FIXED RESISTOR 6.2 Ohm 1/16W	
R3027	ERJ2GEJ121X	FIXED RESISTOR 120 Ohm 1/16W	
R3028	ERJ2GEJ820X	FIXED RESISTOR 82 Ohm 1/16W	
R3029	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R3048	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R3049	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R3052	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	

Ref. No.	Part No.	Part Name & Description	Grid
R3063	ERJ2GEJ102X	FIXED RESISTOR 1K Ohm 1/16W	
R3064	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
R3065	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R3066	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R3067	ERJ2GEJ101X	FIXED RESISTOR 100 Ohm 1/16W	
R3068	ERJ2GEJ220X	FIXED RESISTOR 22 Ohm 1/16W	
R3076	ERJ2GEJ470X	FIXED RESISTOR 47 Ohm 1/16W	
R3077	ERJ2GEJ474X	FIXED RESISTOR 470K Ohm 1/16W	
R3078	ERJ2GEJ104X	FIXED RESISTOR 100K Ohm 1/16W	
R3089	ERJ2GEJ102X	FIXED RESISTOR 1K Ohm 1/16W	
R3090	ERJ2RKF1002X	FIXED RESISTOR 10K Ohm 1/16W	
R3091	ERJ2RKF1203X	FIXED RESISTOR 120K Ohm 1/16W	
R3092	ERJ2RKF4701X	FIXED RESISTOR 4.7K Ohm 1/16W	
R3095	ERJ2GE0R00X	FIXED RESISTOR 0 Ohm 1/16W	
RV3003	D4ED18R00002	VARISTOR	
RV3004	D4ED18R00002	VARISTOR	
RV3005	D4ED18R00002	VARISTOR	
U3001	C1AB00002337	IC	
U3002	C0DBZLD00001	IC	
U3004	C0CBCAC00291	IC	
U3005	C0CBCAD00096	IC	
U3009	C0CBCAC00316	IC	





# Service Manual

Digital Cellular Telephone

GSM

EB-VS3

VOL. 6

<b>11. BLOCK DIAGRAMS</b> .....	11-1
11.1. Baseband .....	11-1
11.2. Power Source .....	11-2
<b>12. CIRCUIT DIAGRAMS</b> .....	12-1
12.1. Main PCB (Logic) .....	12-1
12.2. Main PCB (RF Band) .....	12-2
12.3. Upper PCB .....	12-3
12.4. FPC PCB .....	12-4
12.5. SIM PCB .....	12-5
<b>13. LAYOUT DIAGRAMS</b> .....	13-1
13.1. Main PCB (Upper Side) .....	13-1
13.2. Main PCB (Bottom Side) .....	13-2
13.3. Upper PCB (Upper Side) .....	13-3
13.3. Upper PCB (Bottom Side) .....	13-4
13.5. FPC PCB .....	13-5
13.6. SIM PCB .....	13-6

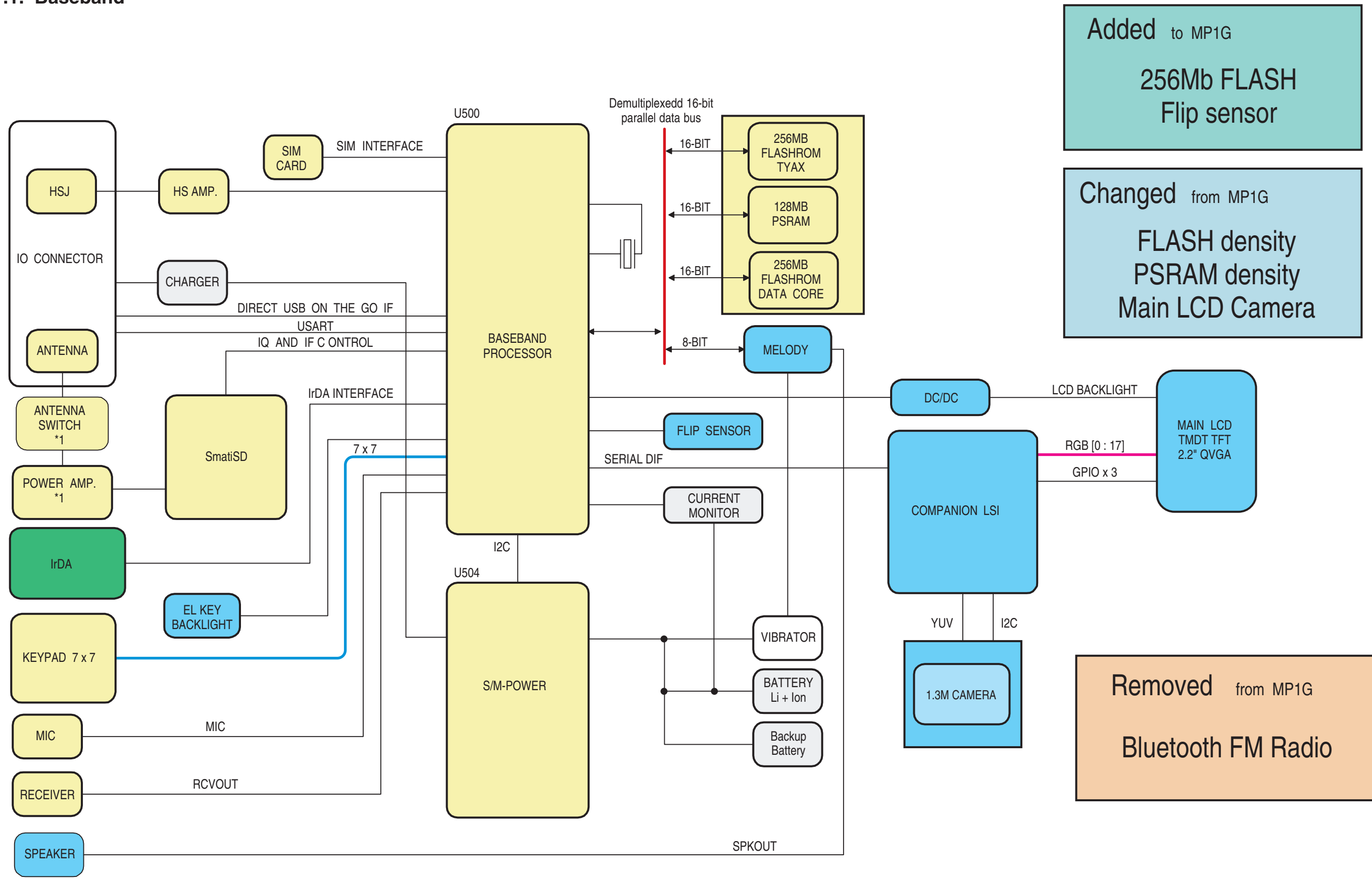
## WARNING

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.

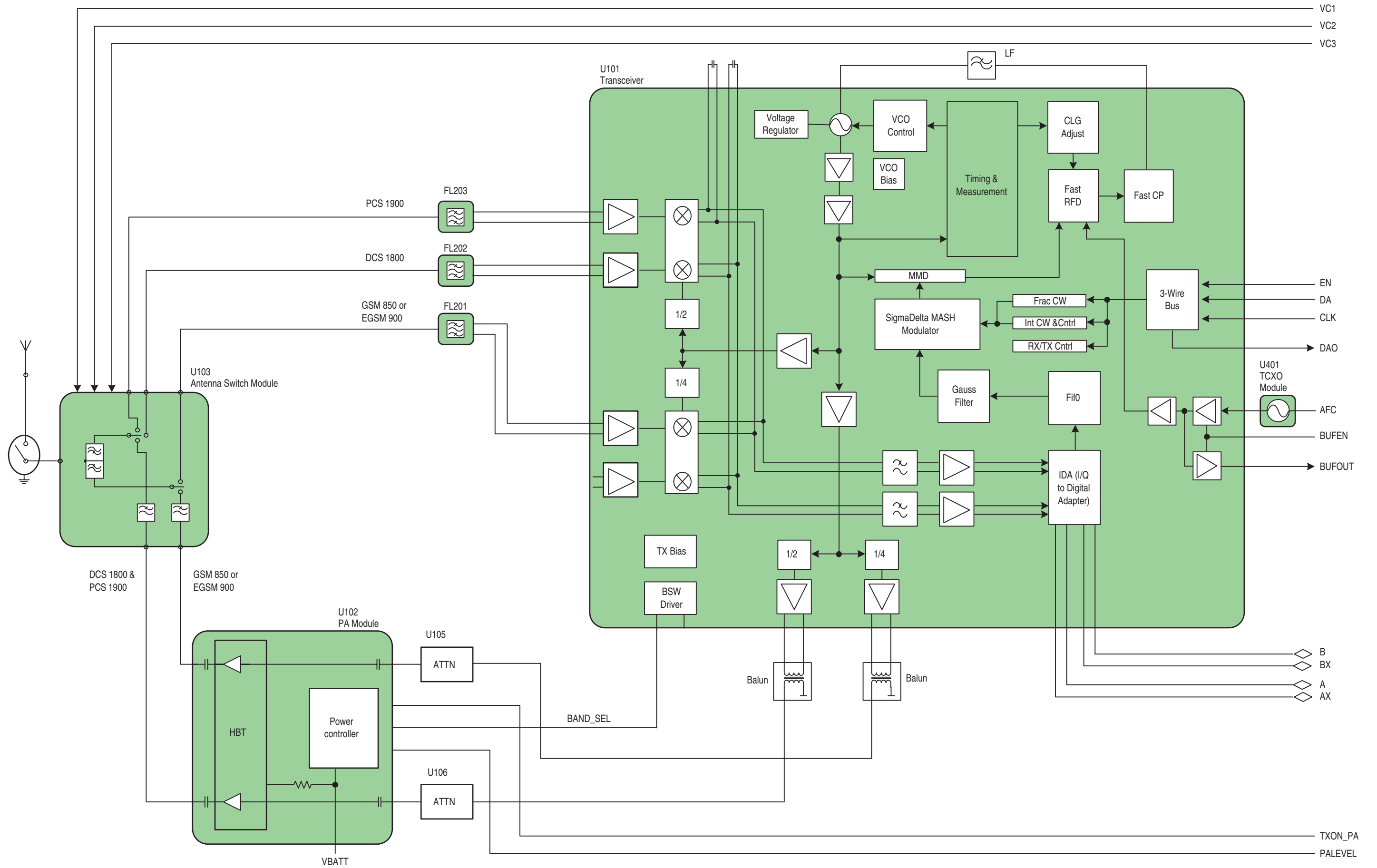
# 11. BLOCK DIAGRAMS

## 11.1. Baseband



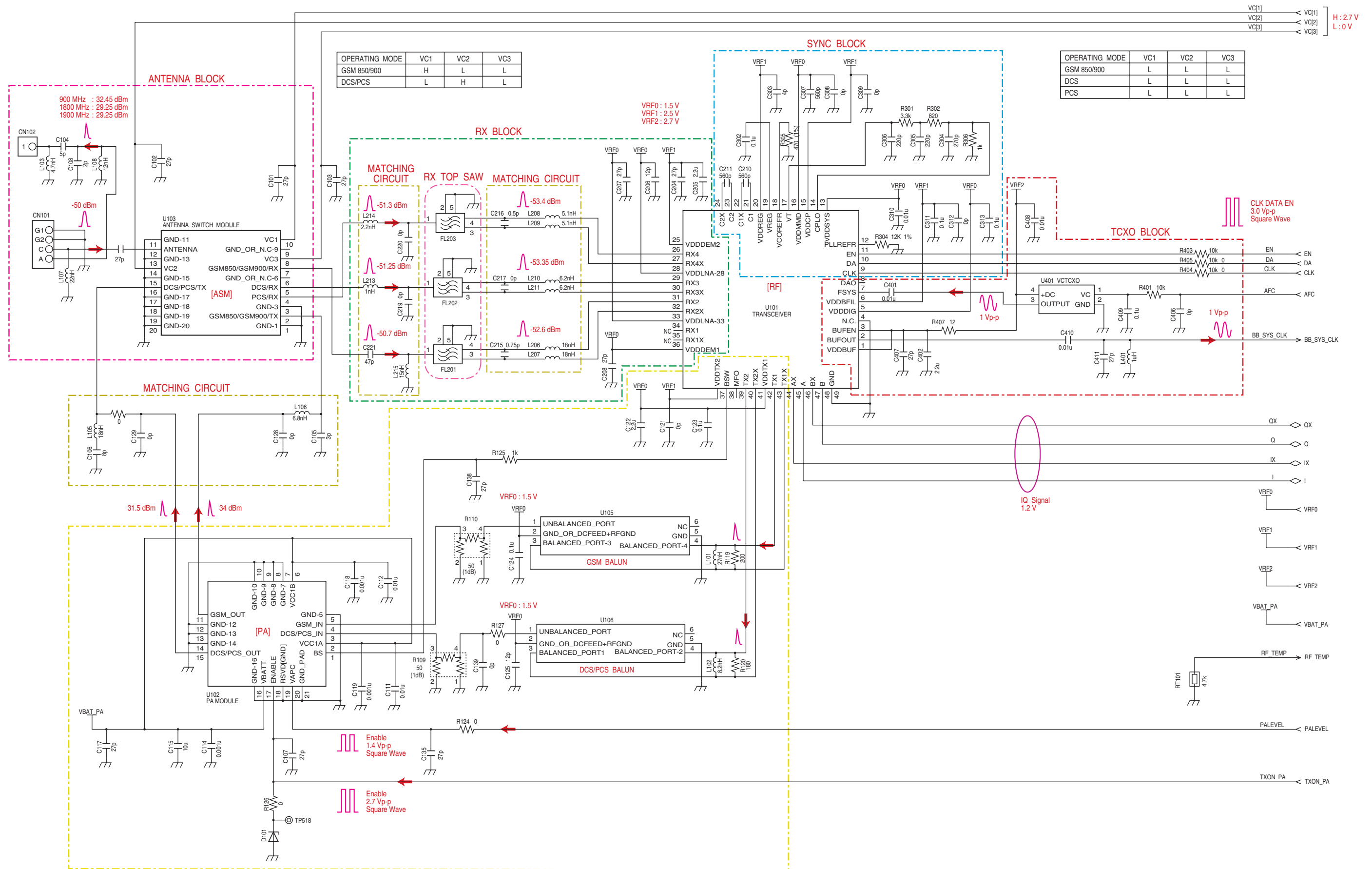
\*1 Please refer to Difference table.

# 11.2. RF Band





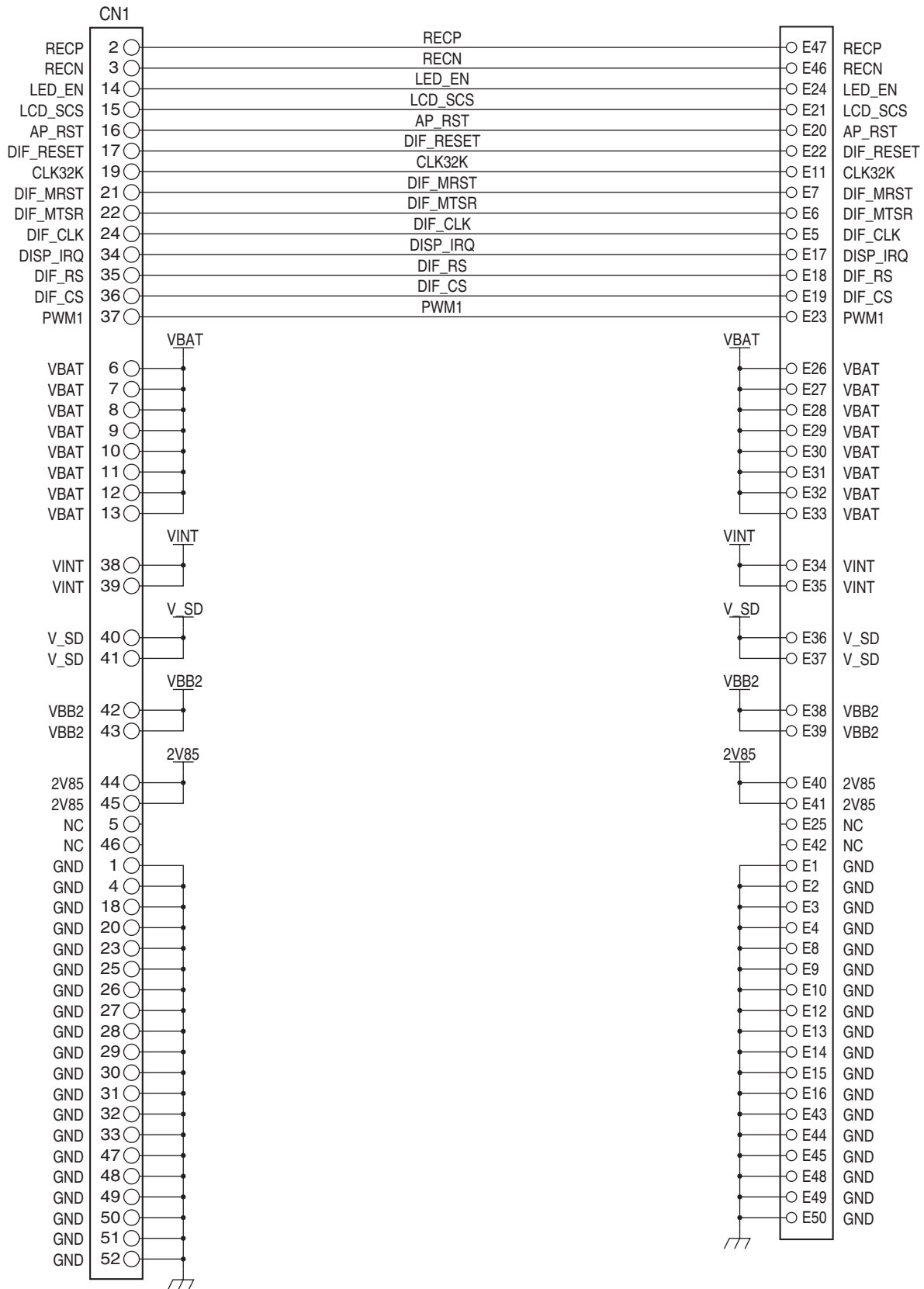
## 12.2. Main PCB (RF Band)



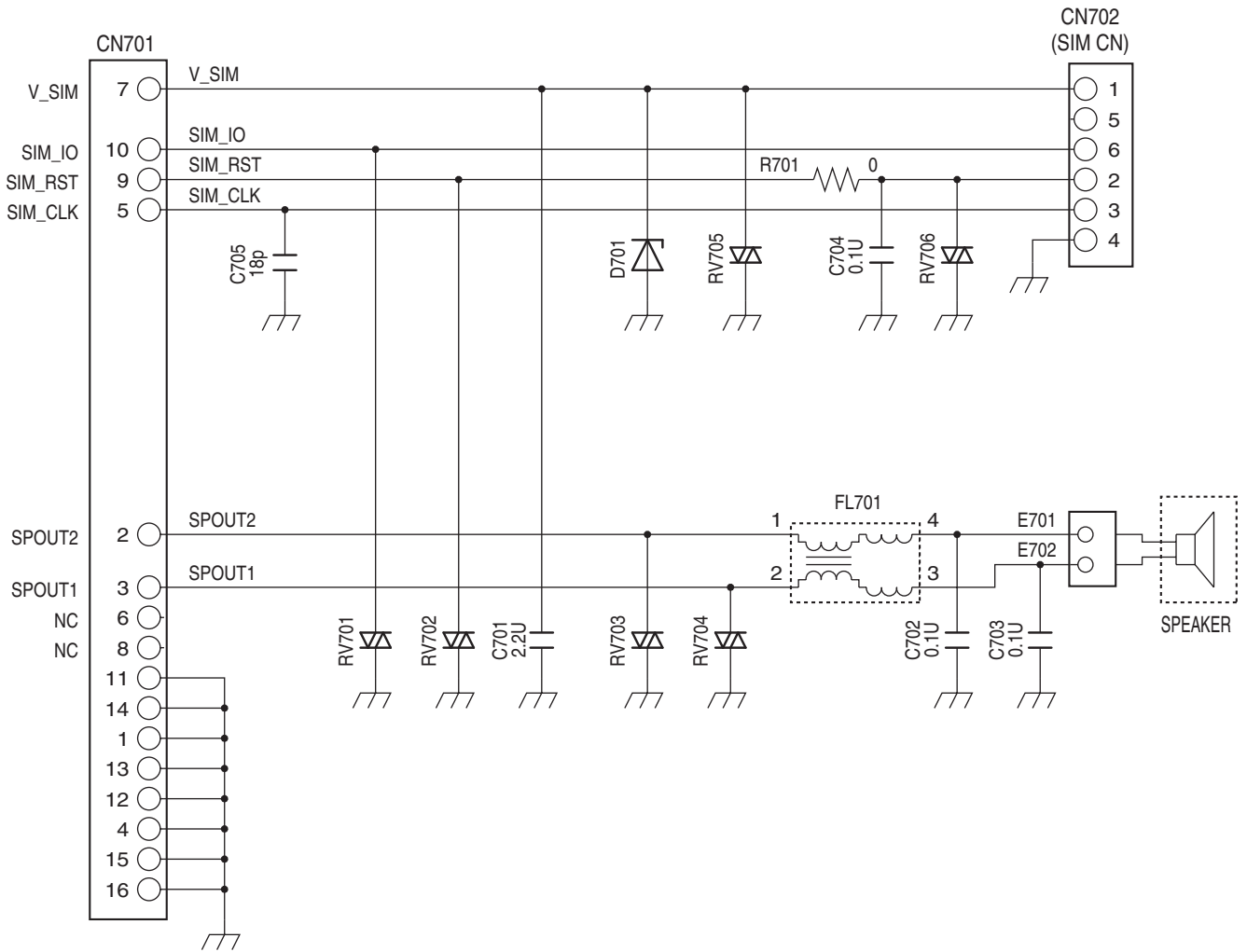




## 12.4. FPC PCB



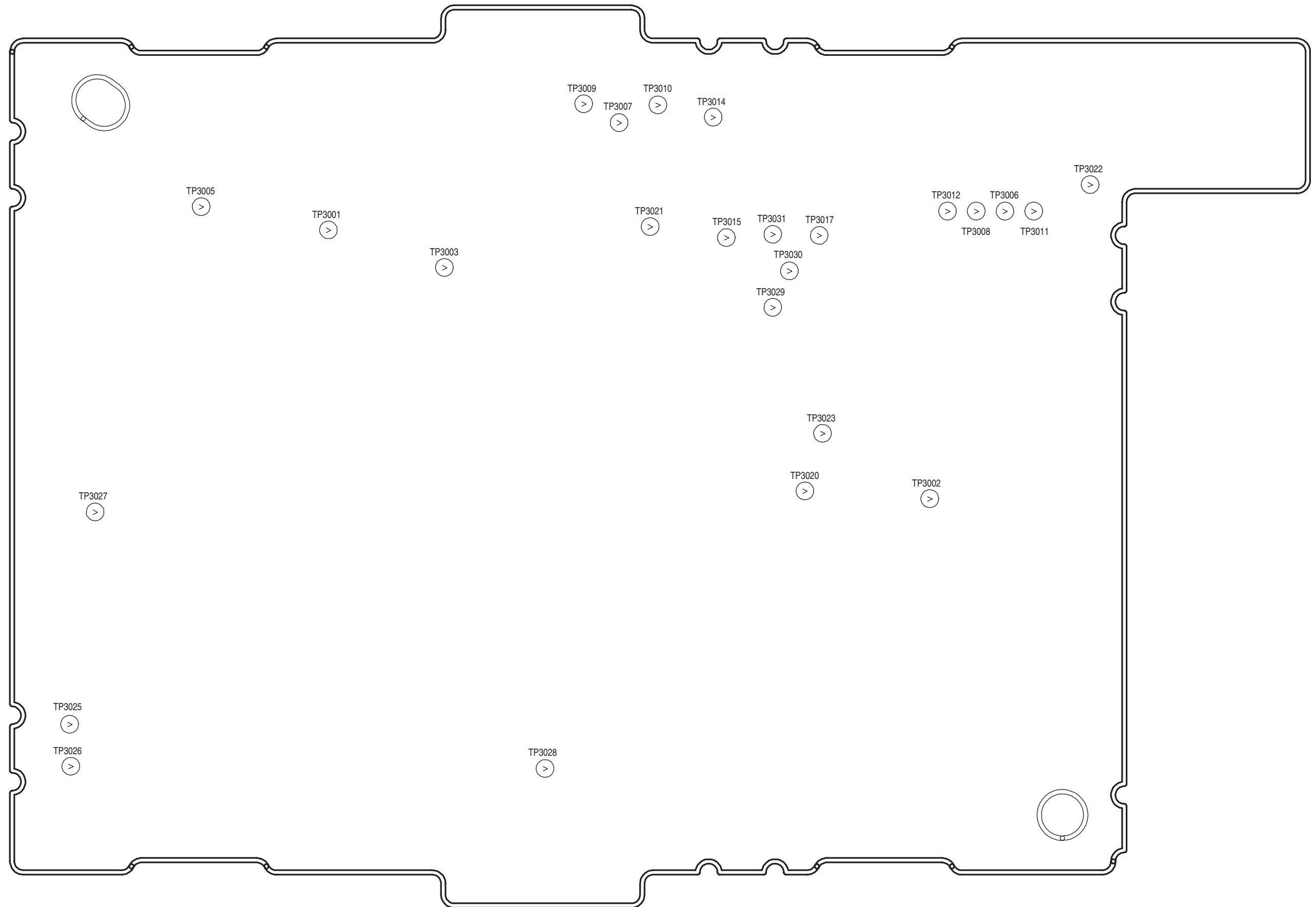
## 12.5. SIM PCB





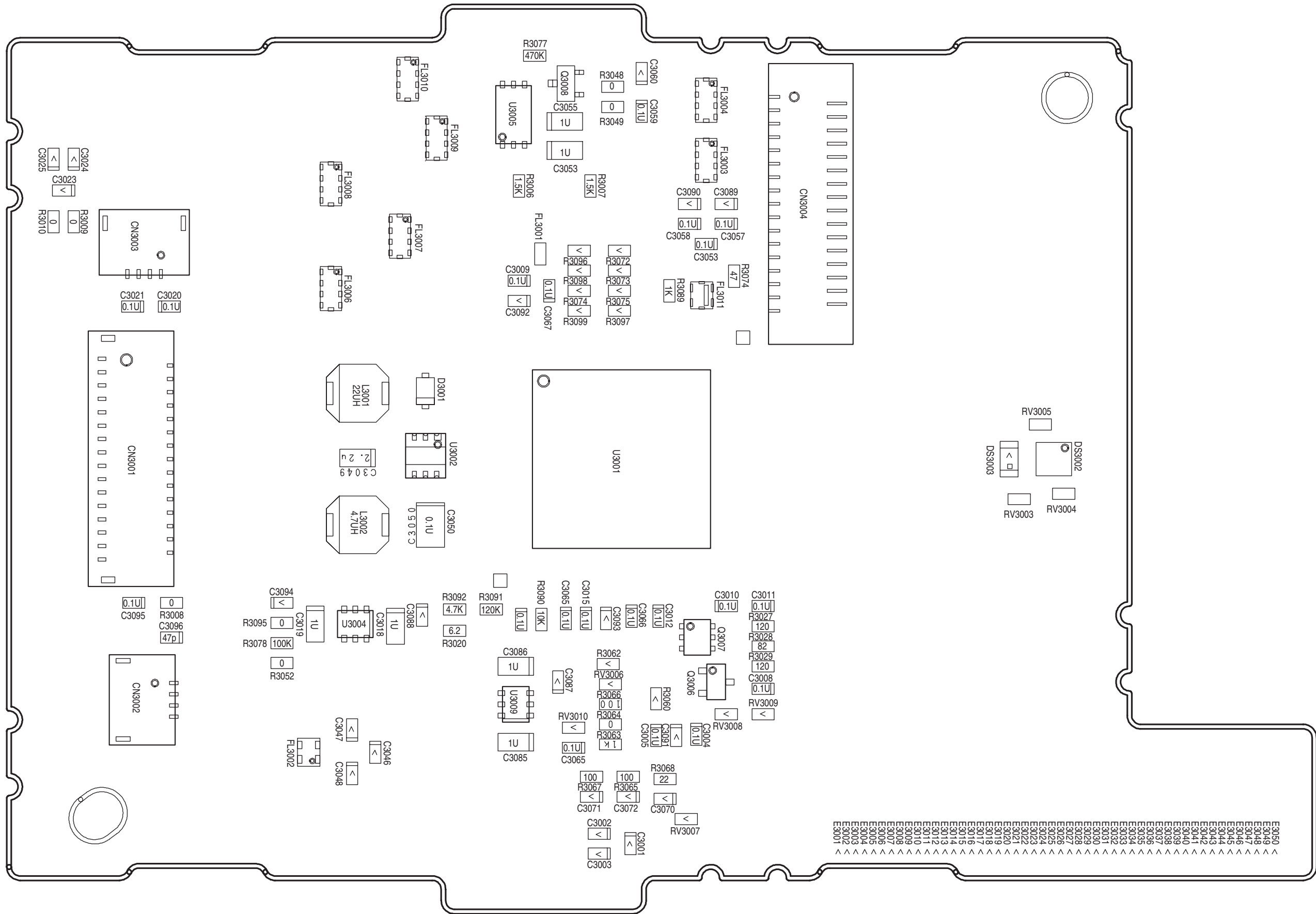


### 13.3. Upper PCB (Upper Side)

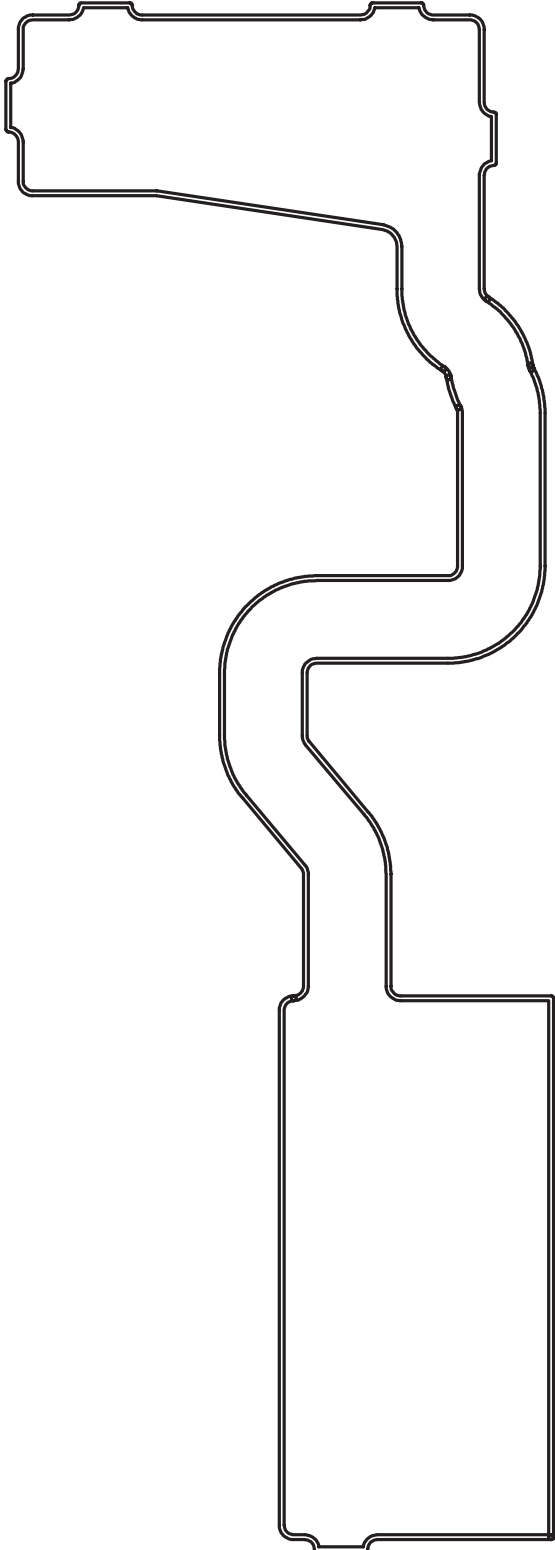
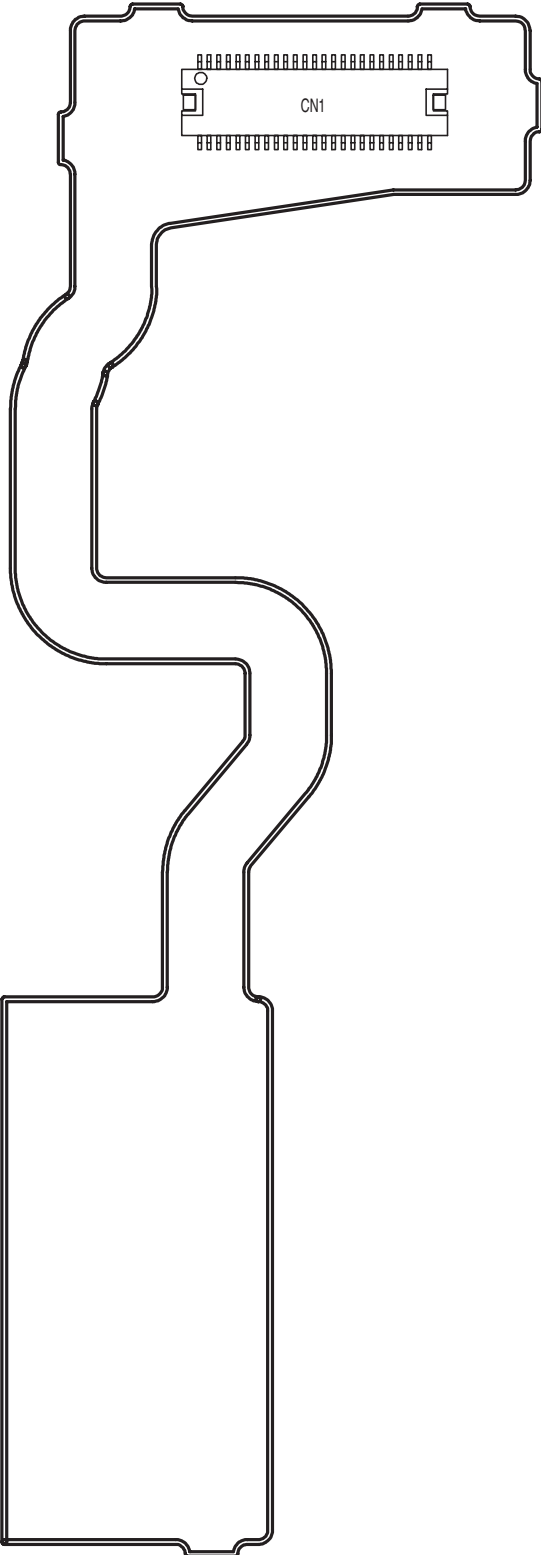




### 13.4. Upper PCB (Bottom Side)



13.5. FPC PCB



### 13.6. SIM PCB

