



# Working Instruction, Electrical

Applicable for Z610i

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# 1 Read this first!

## CAUTION

***Keep all contact surfaces clean, no dirt or hand grease!***

***Protect the phone from ESD damages whenever it has been opened by using:***

- ***ESD-wristband***
- ***ESD-gloves***



## 2 Lead-free soldering

**KEEP ALL CONTACT SURFACES CLEAN OF DIRT AND HAND GREASE!**

**THIS PRODUCT IS MANUFACTURED WITH LEAD-FREE SOLDER AND LEAD-FREE COMPONENTS!**

During electrical repair, it is critical to make sure that no lead is introduced.

This symbol indicates that the product is lead-free.



All lead-free PBA's will be marked with this symbol.



A lead-free work area must be set up completely separated from work areas that are used to make lead repairs.

The lead-free work area must also be clearly labeled with the lead free symbol as shown in the adjacent picture.

The items on this desk must remain lead-free.

They must be adequately labeled to make their lead-free status clearly and easily recognized.





## Lead-free soldering *continued*

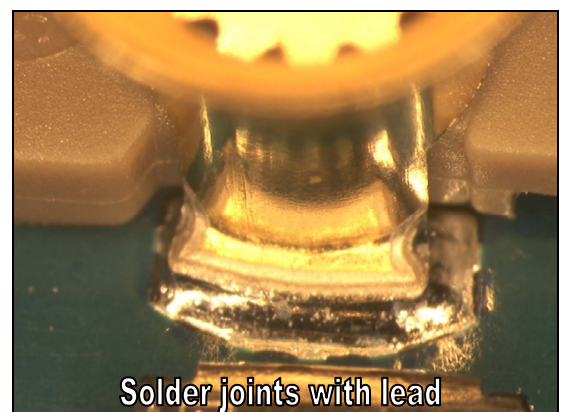
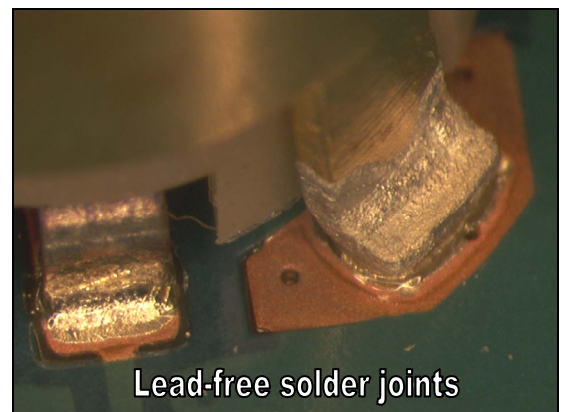
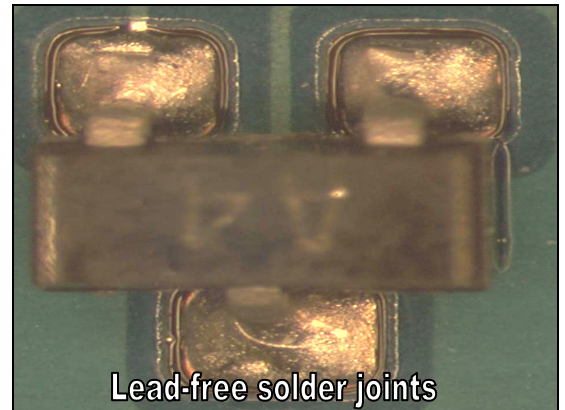
LFS (lead-free solder paste) characteristics:

- High melting point (typically 220°C)
- Low wettability
- High surface tension
- Difficult to spread
- Recommended tip temperature = 370°C

**WHEN SERVICING PBA'S THAT HAVE BEEN MANUFACTURED WITH LFS (LEAD-FREE SOLDER PASTE), LFS MUST BE USED. IF NOT, THERE IS A HIGH RISK FOR UNRELIABLE SOLDERING JOINTS.**

Lead-free solder joints are more difficult to inspect because they do not have shiny surfaces like leaded solder joints.

Also, lead-free solder does not flow as well as leaded solder, so some of the solder pad areas may remain exposed.





## 3 BGA equipment reflow profiles

### 3.1 General

This document contains reflow profile recommendations for mobile phones and similar products.

They are just general recommendations and considerations have to be taken for every single product.

The solder paste is secondary but could also affect the parameters.

In this document one alloy is specified:

SnAgCu (Lead free) melting point 217°C

### 3.2 Temperature measurement

At least four probes should be used.

They should be placed on components with the highest and lowest thermal mass.

The probes shall be located in the beginning, in the middle and at the end of the board/panel.

It is recommended that the probes are soldered on the board, but glue and capton tape could also be used, if necessary.

At least one probe shall be placed in the air or on top of a component.

These values are strongly depending on the BGA replacement equipment.

Nozzle type will be chosen after the outer size of the actual component.

Make sure the nozzle does not affect any nearby placed components.

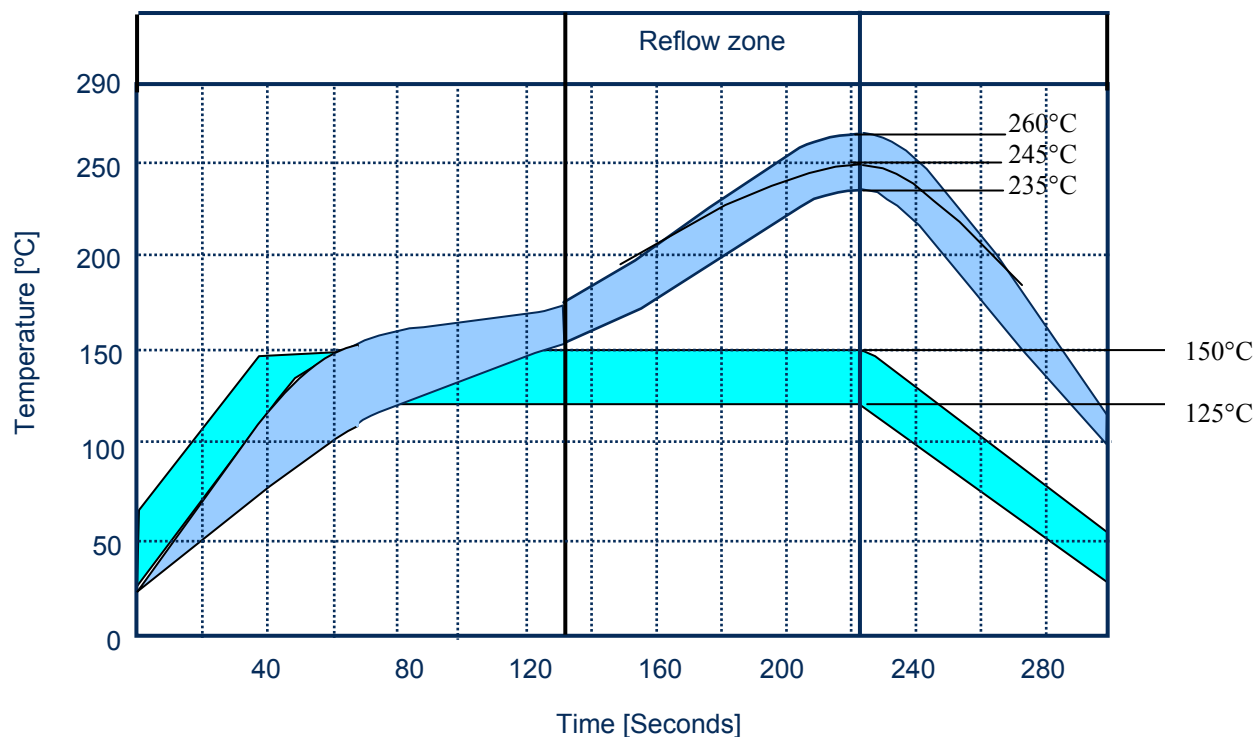
***These values are recommendations and may have to be changed depending on the type of equipment.***

***The maximum temperature for any component must not exceed 250°C.***



### 3.3 Reflow profiles

#### Sn/Ag/Cu (lead-free)



|                         |                            |
|-------------------------|----------------------------|
| Ramp rate               | < 4°C/sec                  |
| Ramp rate cooling zone  | < 6°C/sec                  |
| Time above liquidus     | 60-150 sec                 |
| Minimum temperature     | 235°C                      |
| Maximum temperature     | 245°C or 260°C* for 10 sec |
| Bottom heat temperature | 125°C-150°C                |
| Total time              | Approx. 4-7 min            |

\* The higher temperature in case the board has extremely high  $\Delta T$ .





## 4 Shield fence instruction

This instruction shows how to cut and bend the shield can fence to be able to replace components under the fence.  
Use a sharp-edged pliers to cut the fence.  
Use Shield fence pliers NTZ 112 537 to bend the fence.



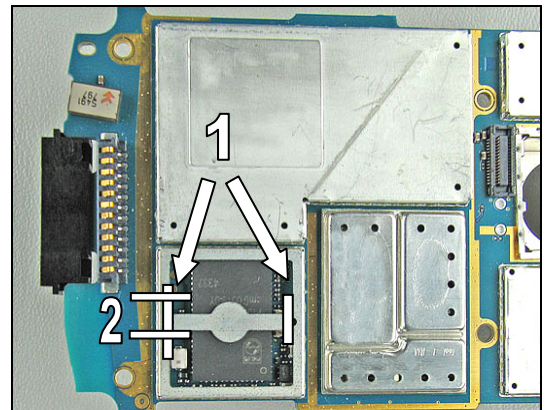
**MAKE SURE THAT CUTTING PLIERS IS SHARP-EDGED TO PREVENT DAMAGING THE SHIELD CAN FENCE.**

Remove the shield can lid, use a dentist hook.

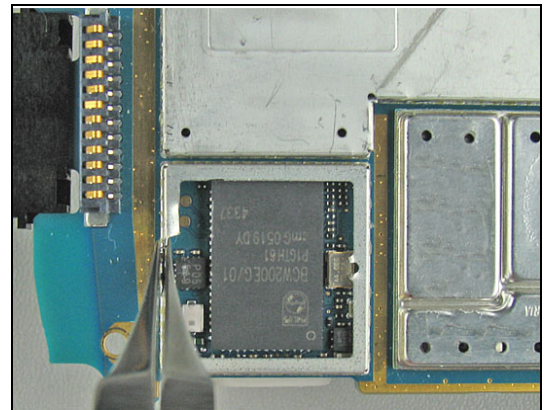
Remove the pick up area according to the white lines with a cutting plier. (1)

This pick up area is only used when machine mounting and there is no need to put it back again.

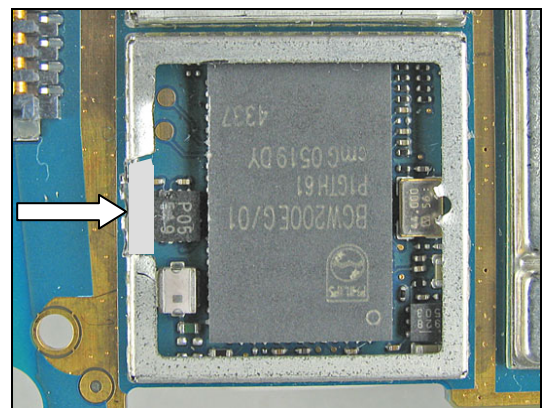
Cut the shield can fence according to the white lines with a cutting plier. (2)



Bend carefully the shield fence with a shield fence plier.  
Replace the components.



Replace the components.  
Bend carefully back the shield fence.  
Put back a **new** shield can lid.  
Press on all sides of the lid until you hear a "click" sound.



## 5 Replacement of components

### EQUIPMENT

- Dentist hook
- Shield fence pliers NTZ 112 537
- Hot air soldering equipment
- Soldering iron
- BGA repair equipment
- Pair of tweezers
- Soldering cleaning wiper (tin wick)
- Solder paste lead-free (SN 96% AG 3.5% Cu 0.5 %)
- Flux, RMA no-clean flux
- Cutting pliers

### CAUTION

***Keep all contact surfaces clean, no dirt or hand grease!***

***Protect the phone from ESD damages whenever it has been opened by using:***

- ***ESD-wristband***
- ***ESD-gloves***
- 

### MECHANICAL INSTRUCTIONS

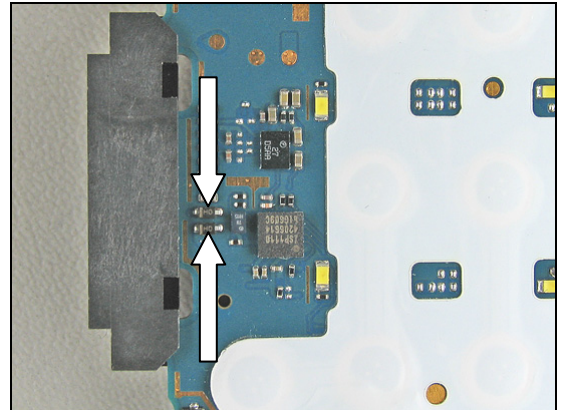
For all the following part replacements, disassemble and assemble the phone as described in *Working Instruction 3/00021-1/FEA 209 544/110*.



## 5.1 V2204 V2250

Replace the voltage regulator.  
Use soldering iron.

### Diode voltage regulator



## 5.2 V2200

### ***FOLLOW THE SHIELD FENCE INSTRUCTION. (4)***

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction

Replace the ESD protect diode.

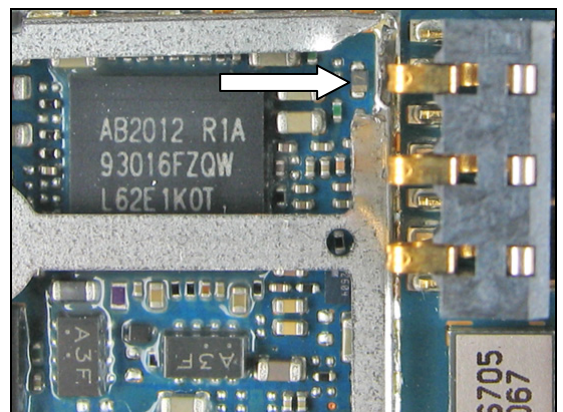
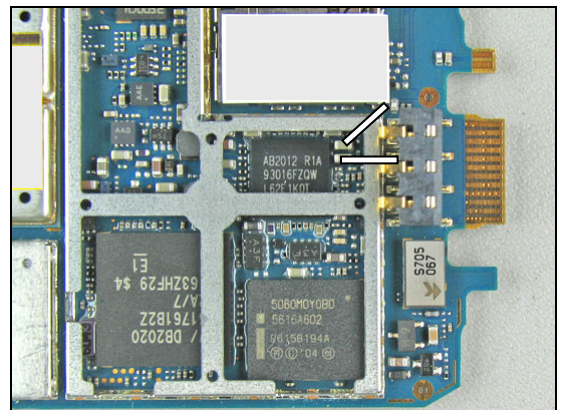
Use soldering iron.

### ***BEND CAREFULLY BACK THE SHIELD FENCE.***

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

### Diode ESD protection



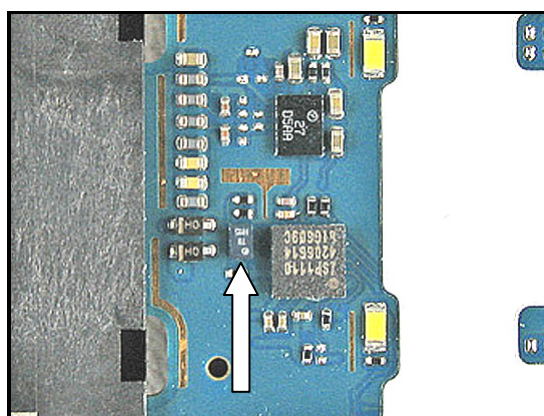
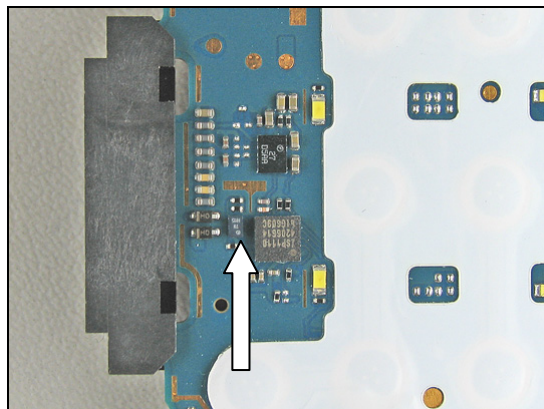
Close-up picture of V2200.

### 5.3 N2300

Replace the USB filter.  
Use soldering iron.

Close up picture of N2300.

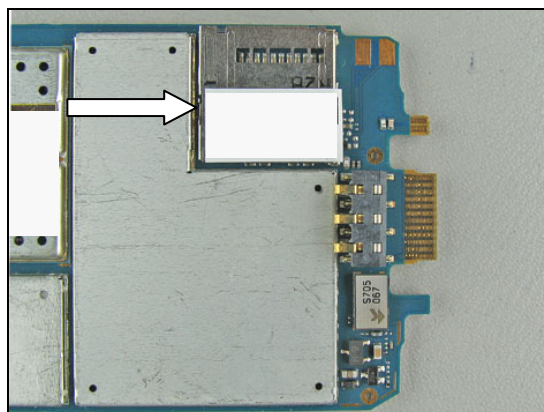
#### USB filter



### 5.4 X2301

Replace the Memory stick holder.  
Use BGA repair equipment.

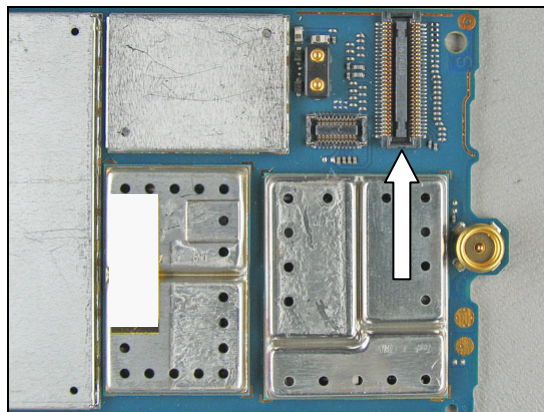
#### Holder MS



## 5.5 X2304

Replace the 60 pin connector.  
Use BGA repair equipment.

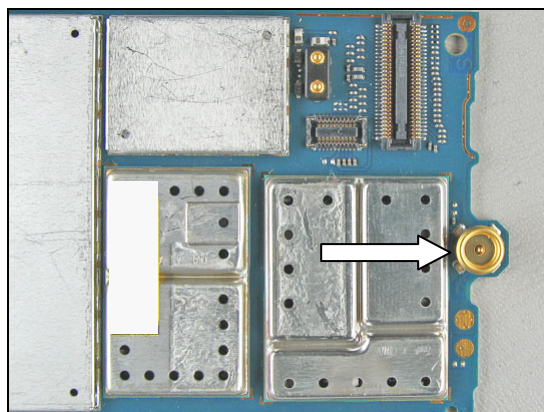
### Connector BtB 60 pin



## 5.6 X1000

Replace the RF external connector.  
Use BGA repair equipment.

### Connector RF external

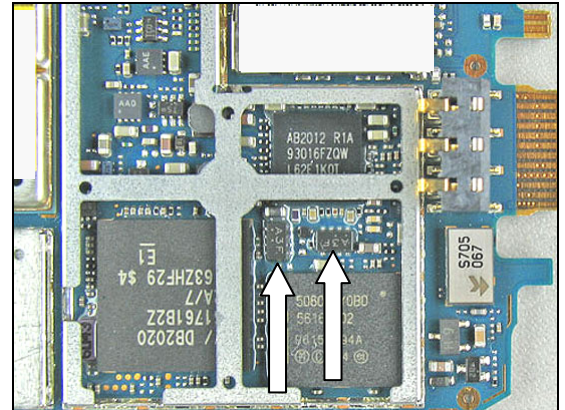




## 5.7 V2202 V2203

Remove the shield can lid.  
Use a dentist hook  
Replace the P-channel transistors.  
Use BGA repair equipment.  
Put back a **new** shield can lid.  
Press on all sides of the lid until you hear a “click” sound.

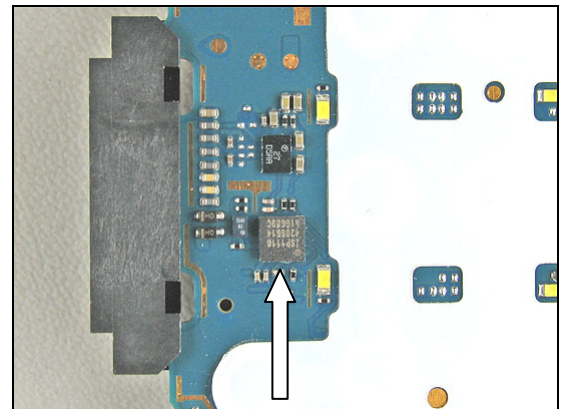
## Transistor/P-Channel



## 5.8 D2304

Replace the USB transceiver module.  
Use BGA repair equipment.

## USB/transceiver/Uart Mux







## 5.9 N2400

### ***FOLLOW THE SHIELD FENCE INSTRUCTION. (4)***

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction

Replace the Level shifter.

Use BGA repair equipment.

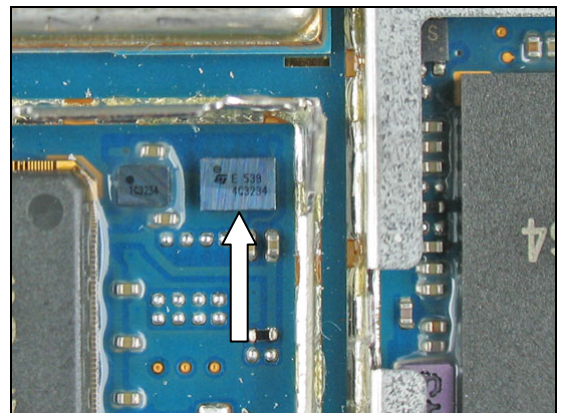
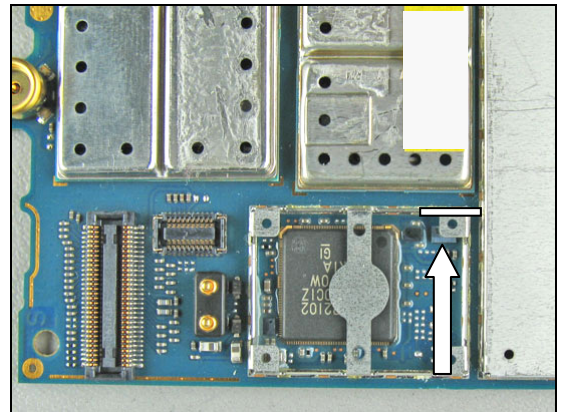
### ***BEND CAREFULLY BACK THE SHIELD FENCE.***

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a “click” sound.

Close-up picture of N2400.

## Level shifter

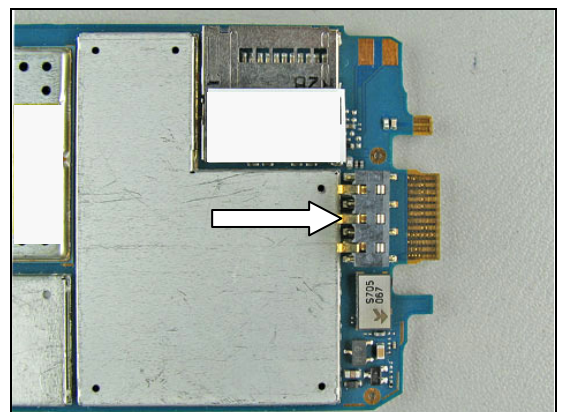


## 5.10 X2200

Replace the Battery connector.

Use BGA repair equipment.

## Battery connector



## 5.11 Z1400

### ***FOLLOW THE SHIELD FENCE INSTRUCTION. (4)***

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction.

Replace the Bluetooth filter.

Use BGA repair equipment.

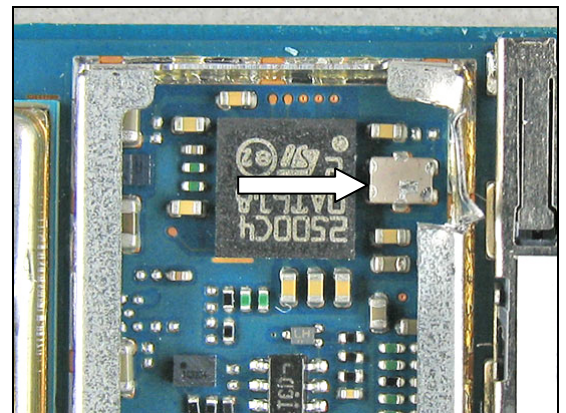
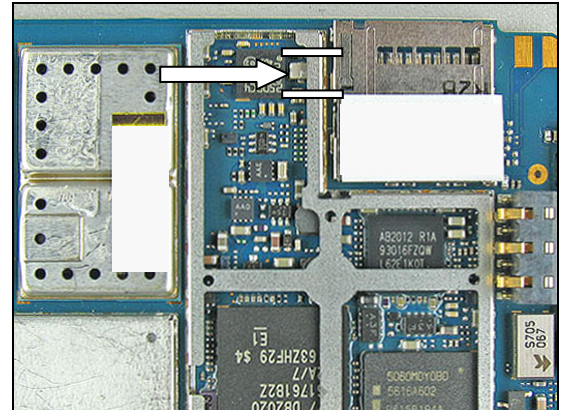
### ***BEND CAREFULLY BACK THE SHIELD FENCE.***

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

Close-up picture of Z1400.

## Bluetooth filter UMTS



## 5.12 D1400

Remove the shield can lid.

Use a dentist hook.

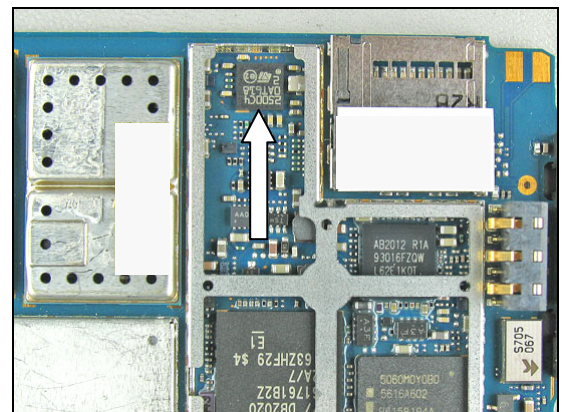
Replace the Bluetooth module.

Use BGA repair equipment.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

## Bluetooth STLC2500C

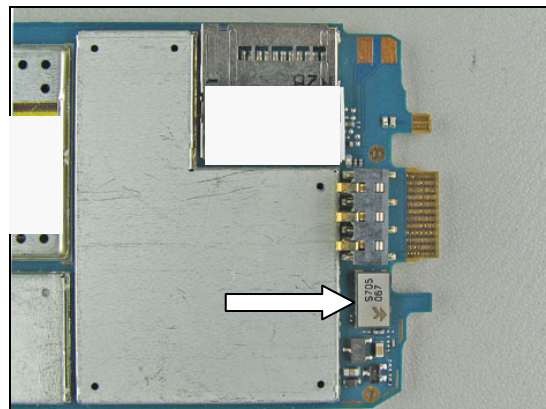




## 5.13 B4100

Replace the microphone.  
Use BGA repair equipment.

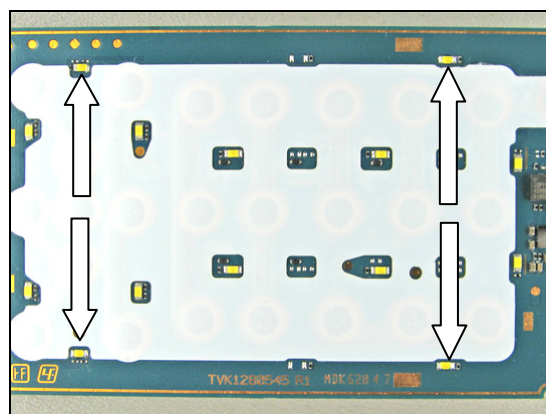
## Microphone



## 5.14 V2521 V2522 V2523 V2524

Replace the Leds.  
Use soldering iron.

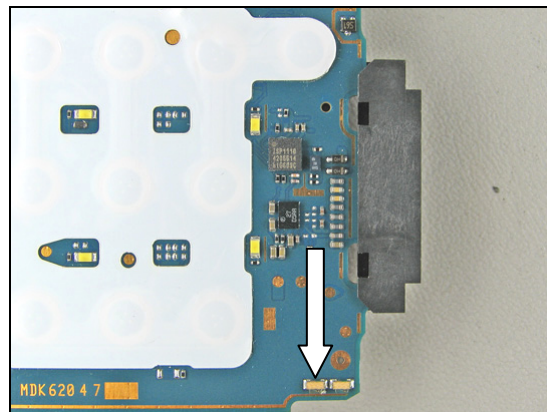
## Led white



## 5.15 V3111

Replace the Led.  
Use soldering iron.

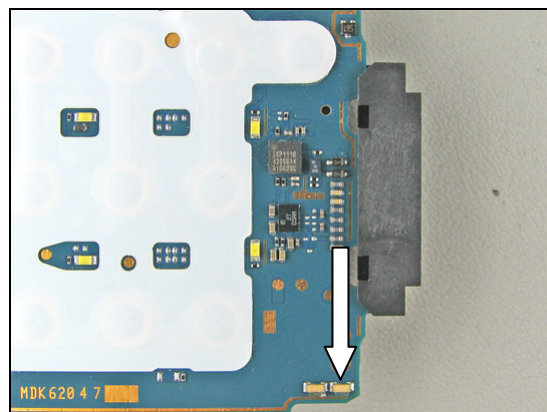
## Led yellow green



## 5.16 V3110

Replace the Led.  
Use soldering iron.

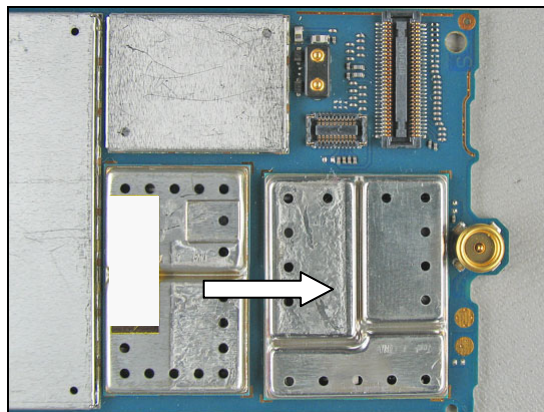
## Led red side fire



## 5.17 A1200

Replace the Ray module.  
Use BGA repair equipment.

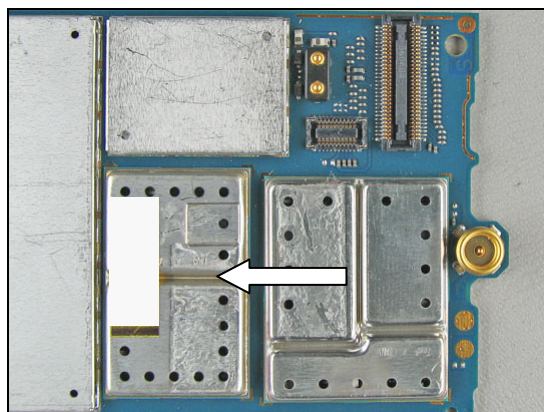
## Ray UMTS module



## 5.18 A1300

Replace the Marlin module.  
Use BGA repair equipment.

## Marlin GSM RF module





## 5.19 B2100

### ***FOLLOW THE SHIELD FENCE INSTRUCTION. (4)***

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction.

Replace the Crystal.

Use BGA repair equipment.

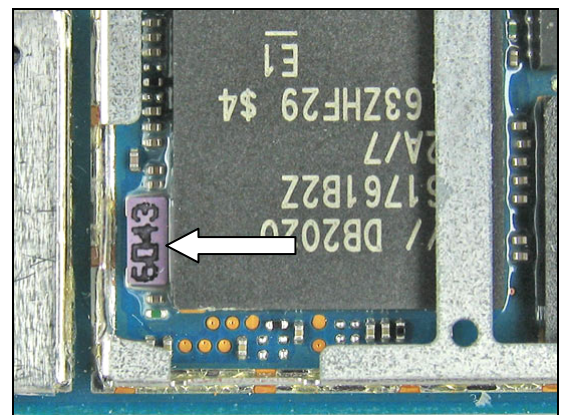
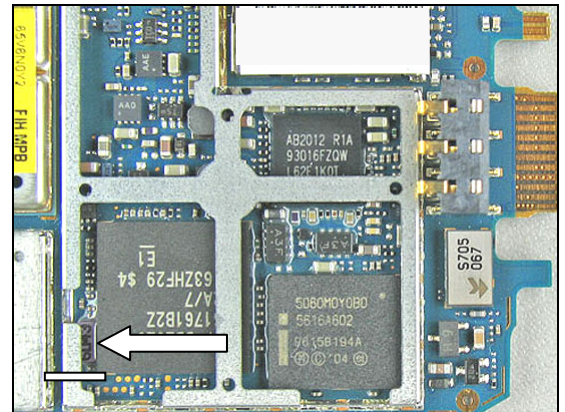
### ***BEND CAREFULLY BACK THE SHIELD FENCE.***

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

Close up picture of B2100.

## Crystal 32768HZ

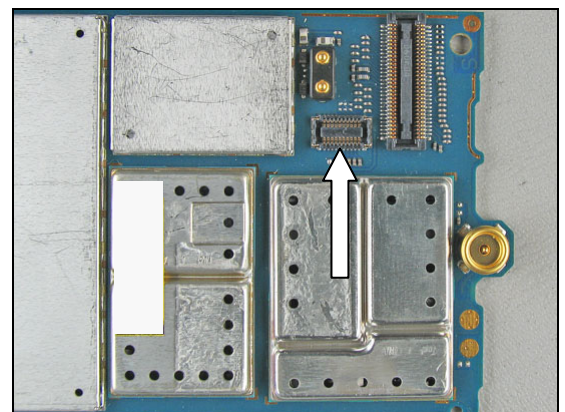


## 5.20 X2303

Replace the Sim connector.

Use BGA repair equipment.

## Sim B2B connector

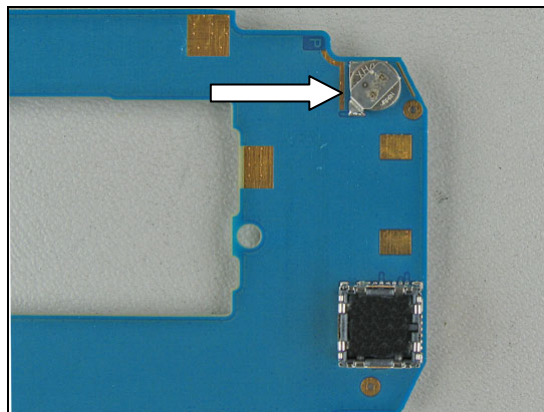




## 5.21 C0131

Replace the Back up capacitor.  
Use soldering iron.

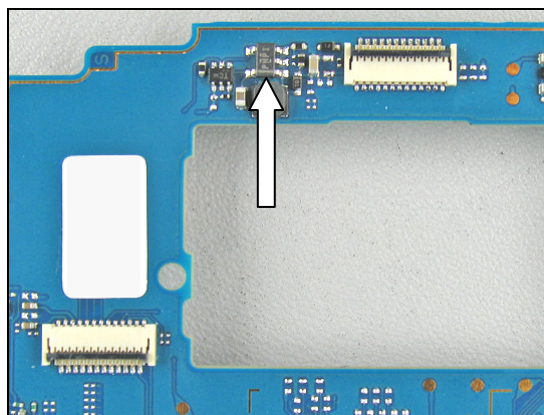
## Back up capacitor



## 5.22 N0001

Replace the Led driver.  
Use soldering iron.

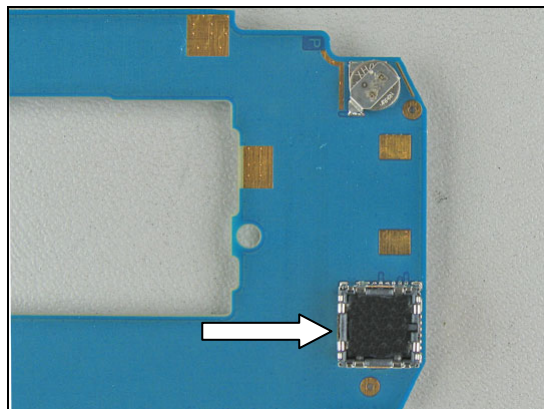
## LED driver



## 5.23 X0101

Replace the camera socket.  
Use BGA repair equipment.

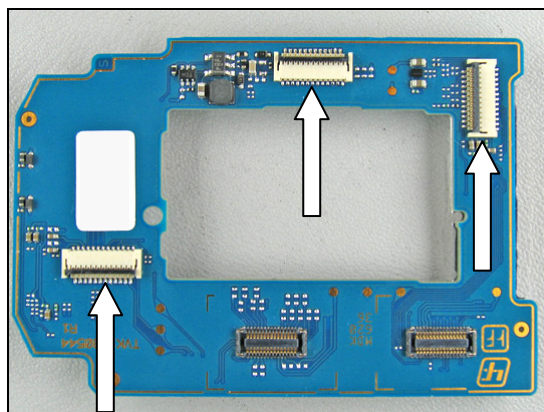
## VGA camera socket



## 5.24 X0001 X0002 X0102

Replace the 25 pin connectors.  
Use BGA repair equipment.

## Fpc connector 25pin

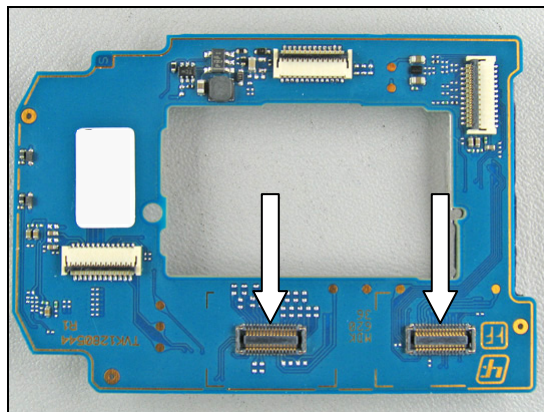




## 5.25 X0003 X0103

Replace the 30 pin connectors.  
Use BGA repair equipment.

## Connector BtB 30 pin



## 6 Revision history

| Rev. | Date       | Changes / Comments |
|------|------------|--------------------|
| A    | 2006-09-05 | Released Document  |