Working Instructions - electrical

Applicable for K750i / K750c

Contents

1 Lead-free soldering

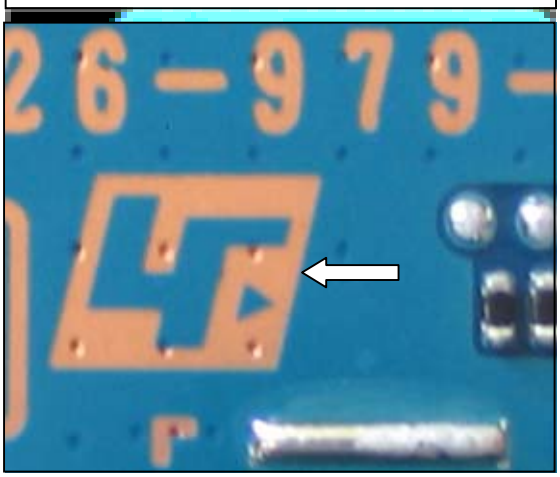
Caution

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.

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

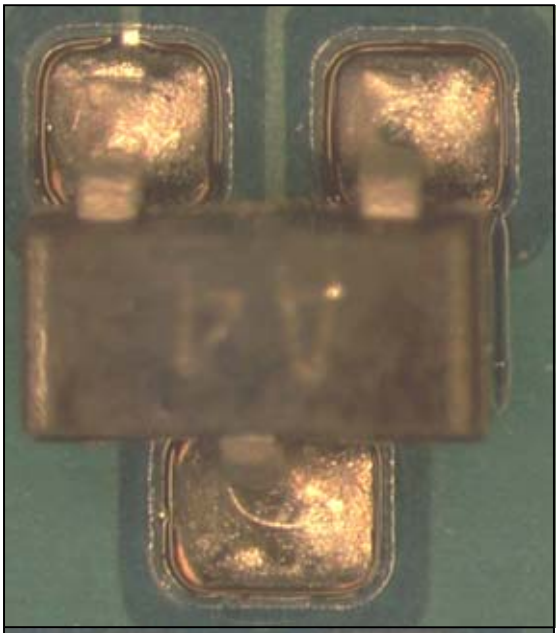
When servicing PBA's that have been manufactured with LFS (lead-free solder paste), LFS must be used.

If not, there is a high risk for unreliable soldering joints.

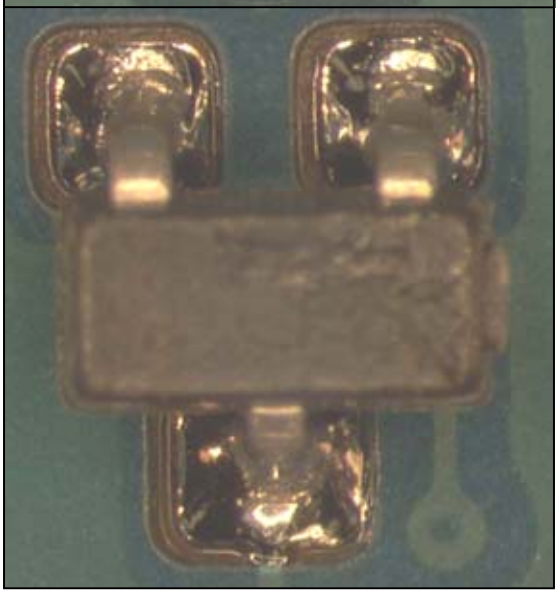
Lead-free solder joints are more difficult to inspect because they do not have shiny surfaces like leaded solder joints.

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

Example of lead-free solder joints.

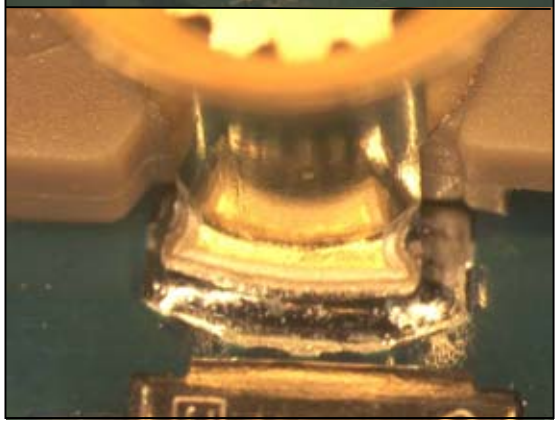


Example of solder joints with lead.



Example of lead-free solder joints.

Example of solder joints with lead.



2 BGA equipment reflow profiles

2.1 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

2.2 Temperature measurement

At least 4 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.

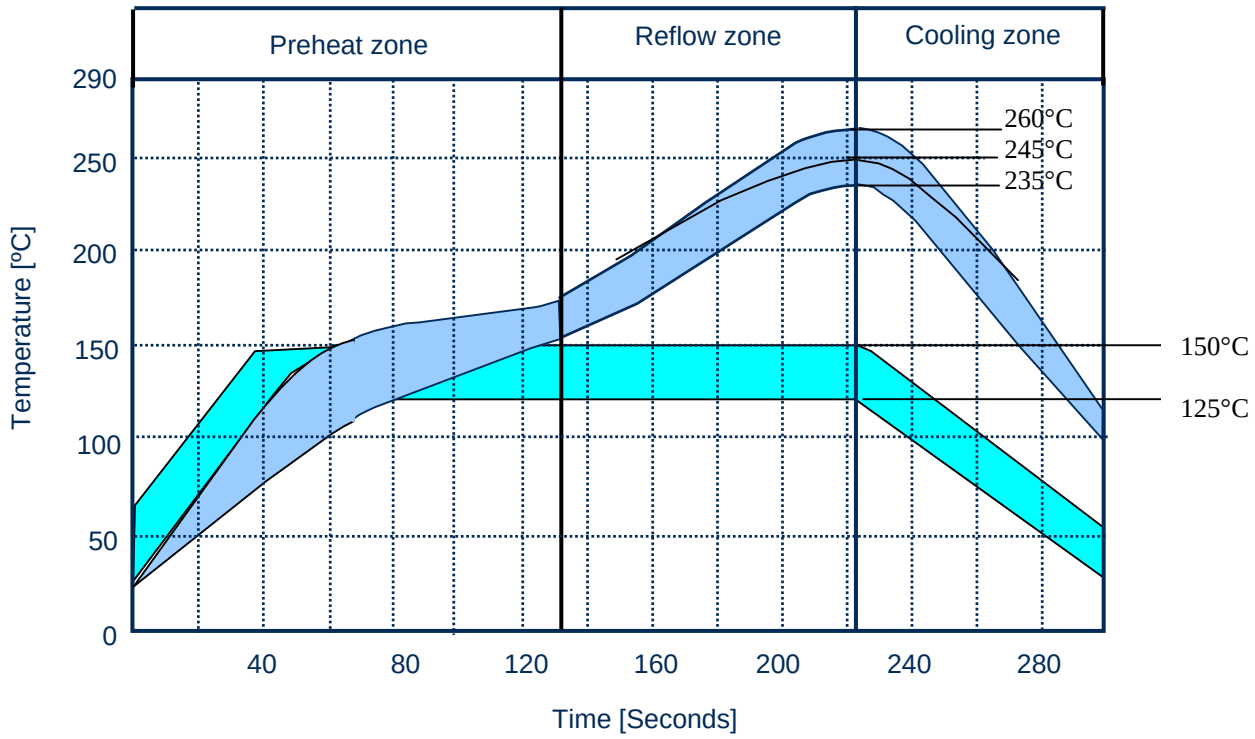
Nozzle type will be chosen after the outer size of the actual component.
Make sure the nozzle does not affect any nearby placed components.

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.

2.3 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	Appr. 4-7 min

* The higher temperature in case the board has extremely high ΔT.

3 Replacement of parts

Equipment

- Dentist hook
- ESD-gloves (cotton gloves)
- ESD-wristband
- Soldering tool
- Hot air soldering station
- BGA replacement equipment
- Pair of tweezers
- Solder cleaning wiper (tin wick)
- Solder paste lead-free (SN 96% Ag 3.5% Cu 0.5%)
  Use the soldering tip only for lead-free solder paste!
- Flux, RMA no-clean flux
- Cutting pliers
- Shield fence pliers NTZ 112 537

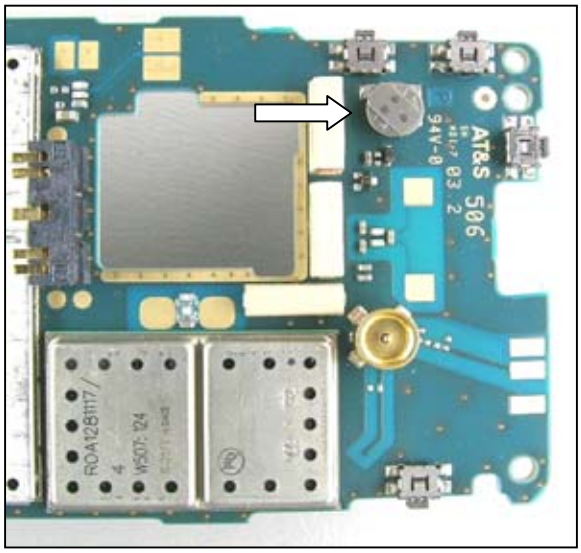
Caution

Keep all contact surfaces clean of dirt and hand-grease

Instruction

For all the following part replacements, disassemble and assemble the phone as described in *Working Instructions 3/200021-1/FEA 209 544/94*.

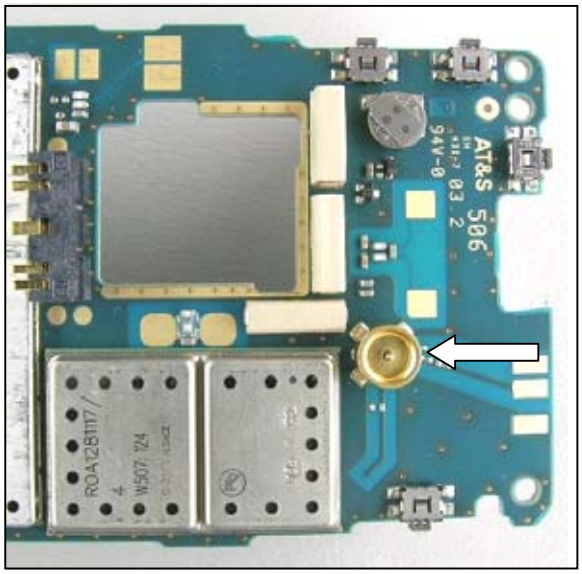
3.1 Backup capacitor



Do not use hot air soldering equipment since the nearby switch is heat sensitive!

Replace the *backup capacitor* using a soldering iron.

3.2 External antenna switch



Replace the *external antenna switch*.
Use hot air soldering equipment to remove the switch.

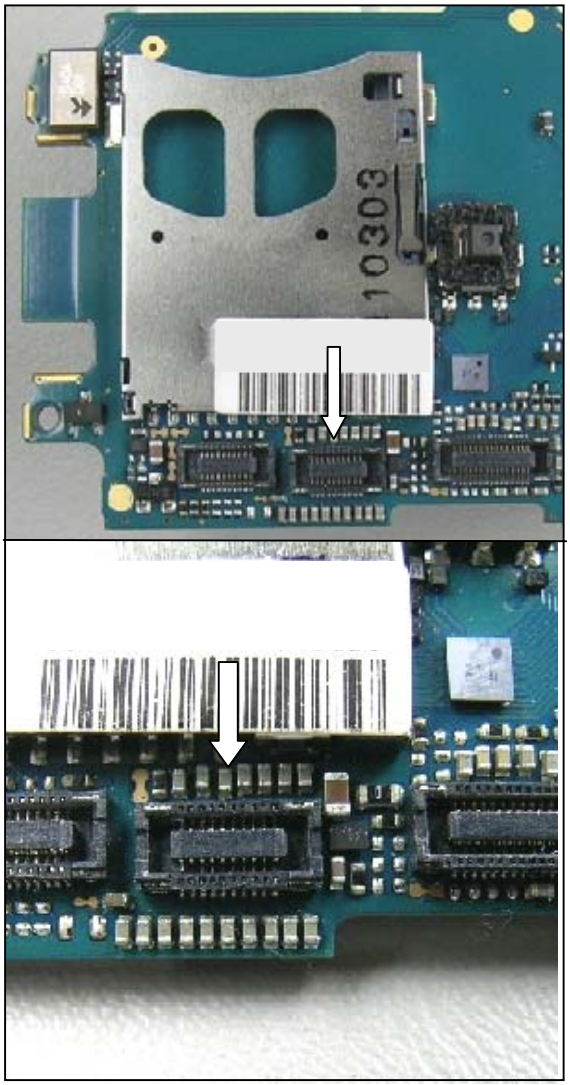
Use BGA repair equipment to resolder the new switch.

3.3 Camera connector BtB 30 pin

Replace the *camera connector*.
Use hot air equipment to remove the connector.
Use a soldering iron to mount the connector.

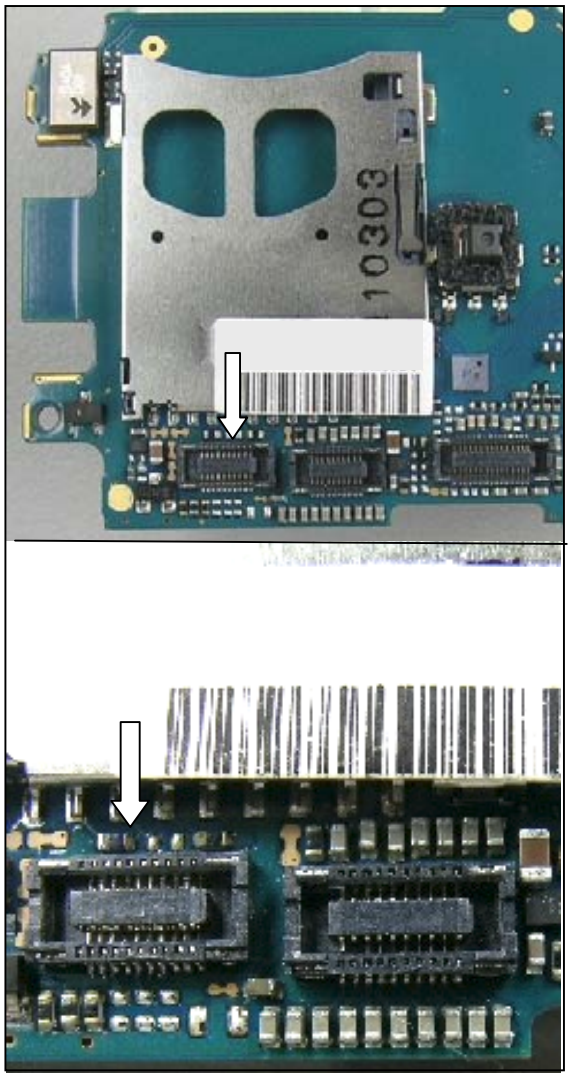
3.4 LCD connector BtB 20 pin

Replace the *LCD connector*.
Use hot air equipment to remove the connector.
Use a soldering iron to mount the connector.



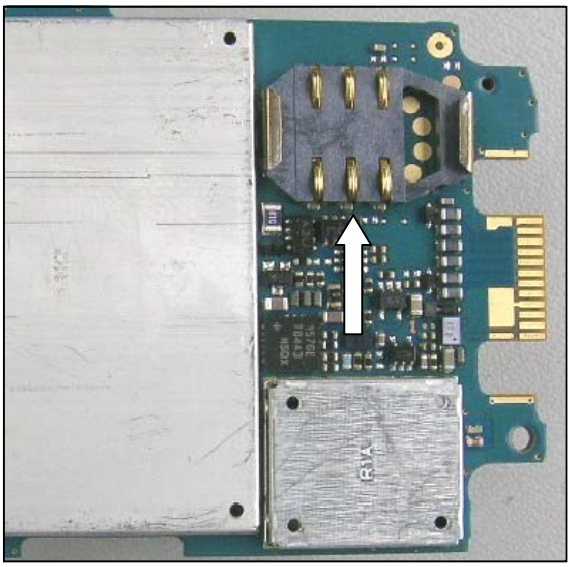
3.5 Keyboard connector BtB 20 pin

Replace the *keyboard connector*.
Use hot air equipment to remove the connector.
Use a soldering iron to mount the connector.



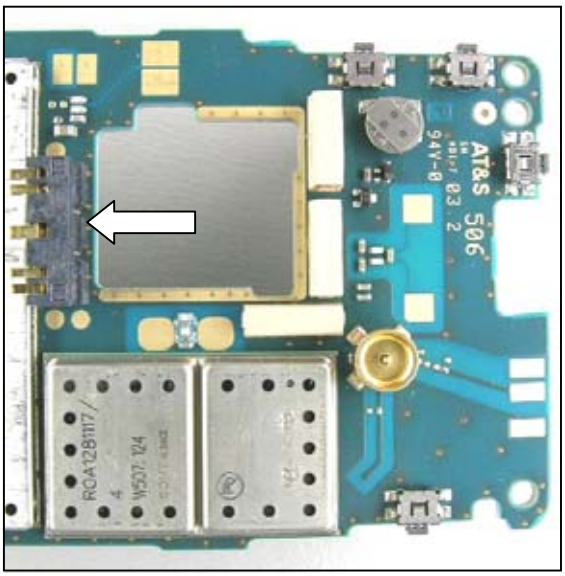
3.6 SIM reader

Use BGA repair equipment to remove and replace the *SIM reader*.



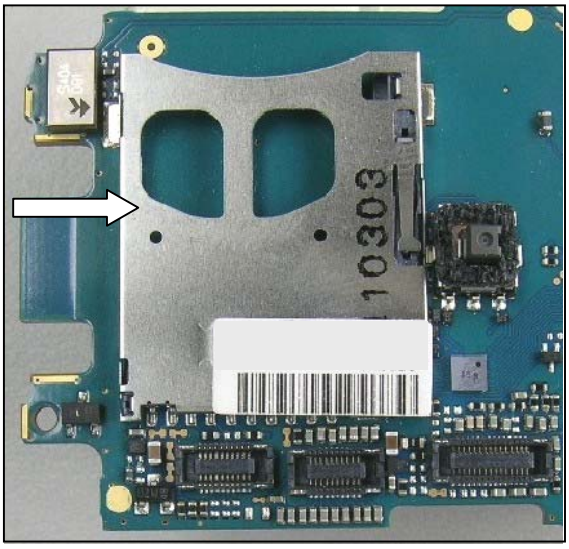
3.7 Battery connector

Use BGA repair equipment to remove and replace the *battery connector*.



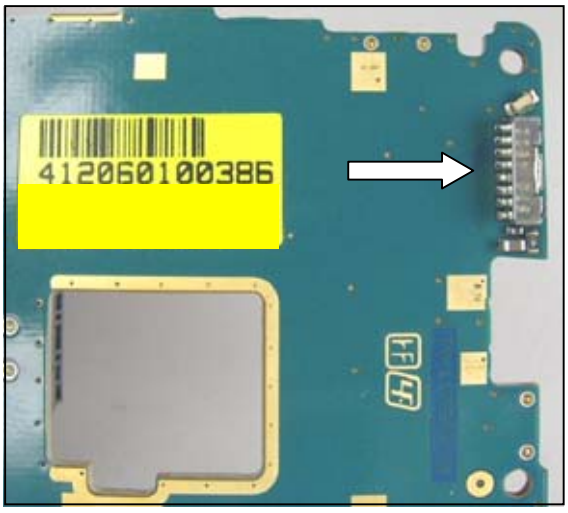
3.8 Memory stick Duo reader

Remove and replace the *memory stick reader*.
Use a soldering iron.



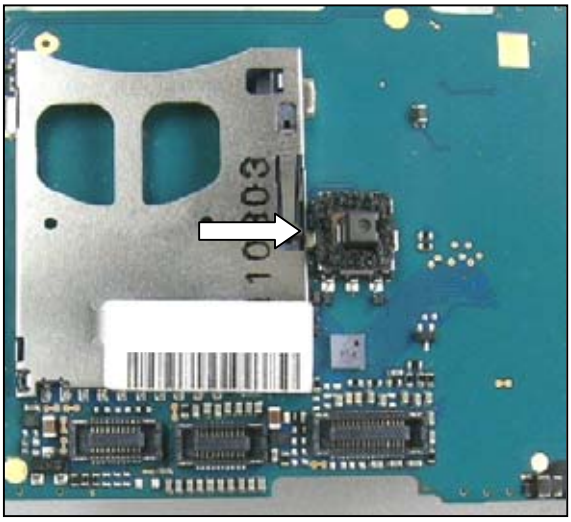
3.9 IrDA

Remove and replace the *IrDA* component.
Use a soldering iron or hot air soldering equipment.



3.10 Joystick switch

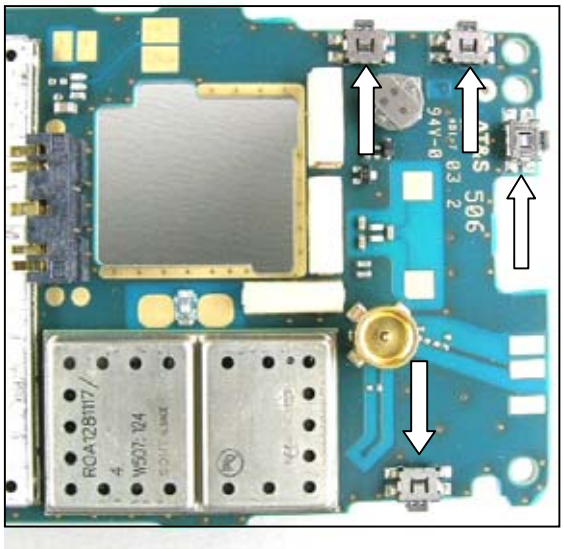
Use BGA repair equipment to remove and replace the *joystick switch*.



3.11 Side key switch

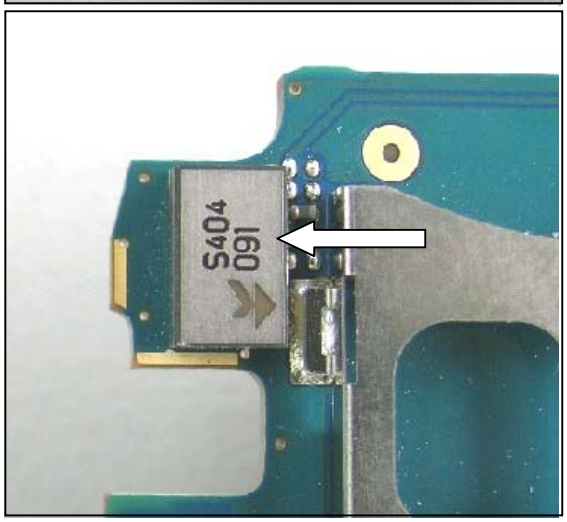
Remove the *side key switch*.
Use hot air soldering equipment.

Assemble a new *side key switch*.
Use a soldering iron.



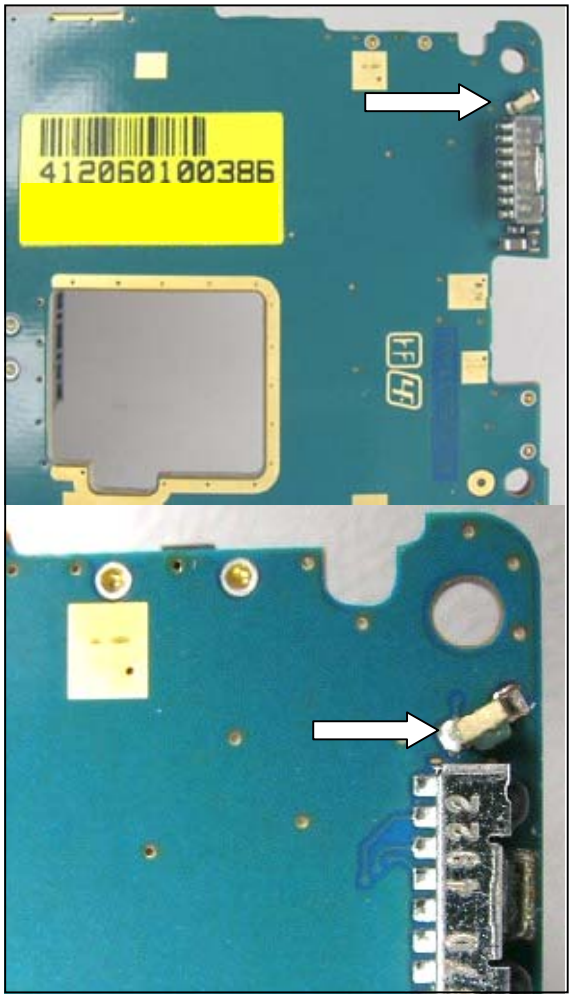
3.12 Microphone

Remove and replace the *microphone*.
Use BGA repair equipment.



3.13 Red LED

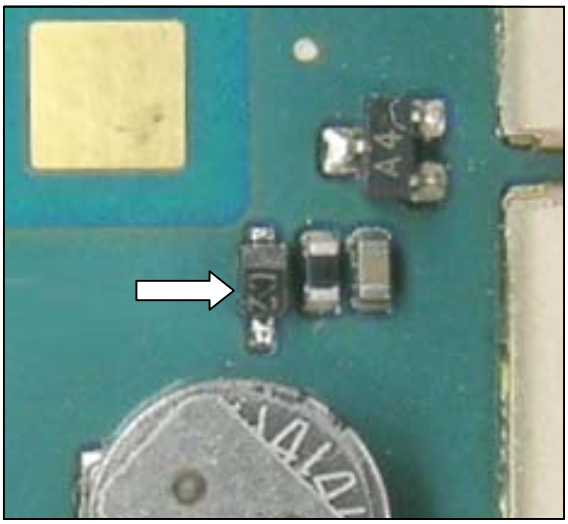
Remove and replace the *red LED*.
Use soldering iron equipment.



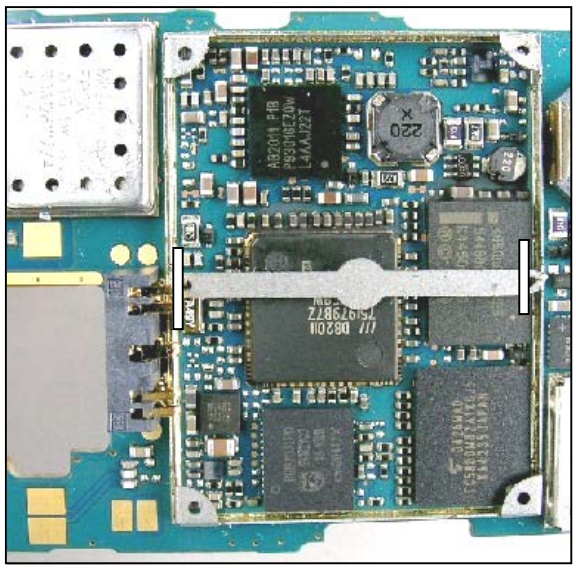
3.14 Diode/ESD protector

Remove and replace the *diode/ESD protector* component.

Use BGA repair equipment.



3.15 Quartz crystal unit

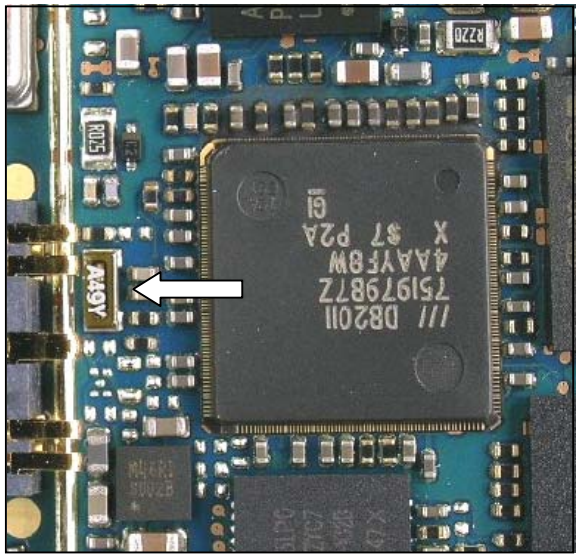


Remove the shield can lid.

If needed, it is allowed to remove the pick-up area with cutting pliers.
This pick-up area is only used when the can is machine mounted and there is no need to put it back.

Cut the fence according to the white lines in the picture.

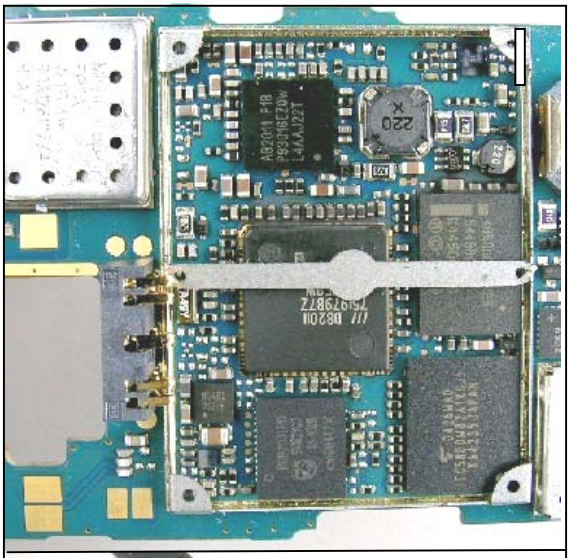
Make sure that the cutting pliers are sharp-edged to prevent damages to the shield can fence!



Replace the *quartz crystal* component.
Use a soldering iron.

Put back a *new* shield can lid.
Press on all sides of the lid until you hear a “click” sound.

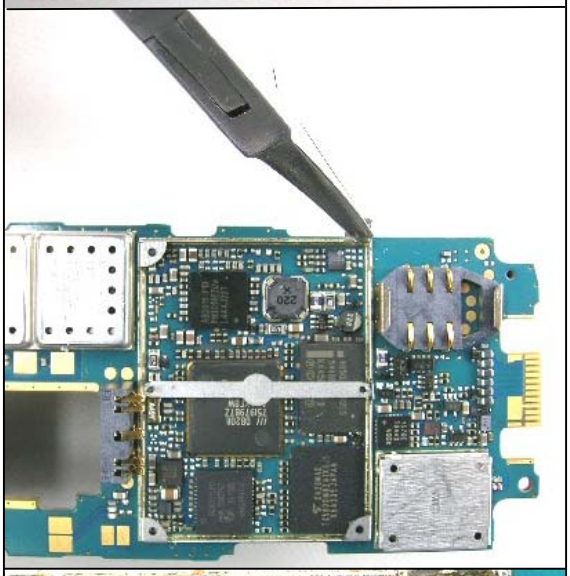
3.16 Prod adapt circuit/ASIC Tjatte 2



Remove the shield can lid.

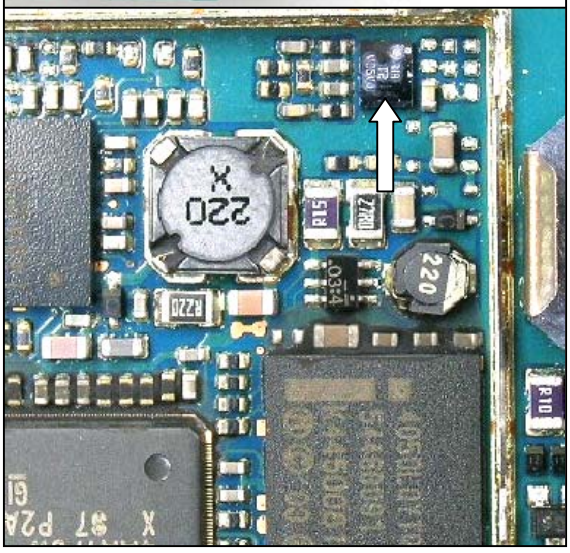
Cut the fence according to the white line in the picture.

Make sure that the cutting pliers are sharp-edged to prevent damages to the shield can fence!



Form the frame carefully without bending the shield can fence wall.

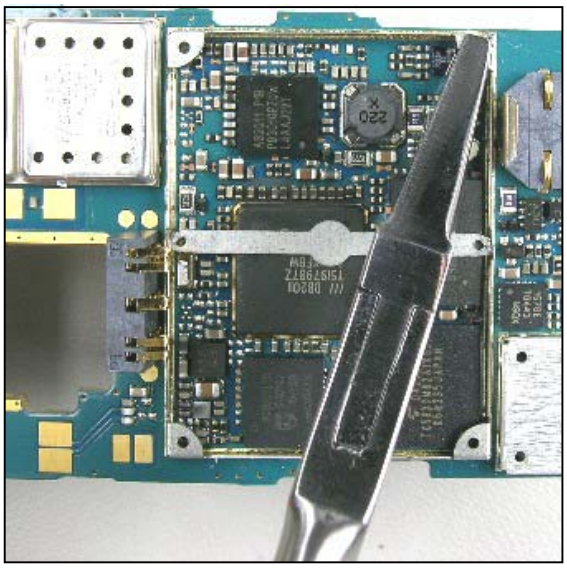
Use the shield fence pliers.



Remove the the *ASIC Tjatte 2* component.
Use BGA repair equipment.

Replace the *ASIC Tjatte 2* component and gently fold back the fence.

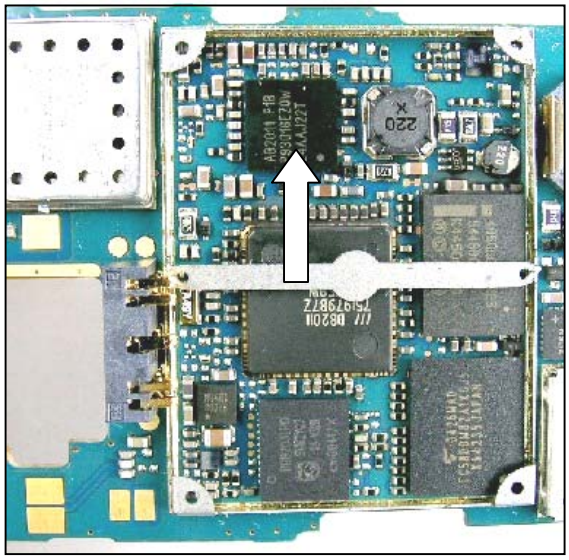
Be very cautious with the shield can fence wall.



Gently fold back the fence.
Be very cautious with the shield can fence wall.

Put back a *new* shield can lid.
Press on all sides of the lid until you hear a “click” sound.

3.17 Prod adapt circuit/ASIC Vincenne



Remove the shield can lid.

Remove the *ASIC Vincenne* component.
Use BGA repair equipment.

Replace the *ASIC Vincenne* component.
Use BGA repair equipment.

3.18 Mini T-top

To be added later

4 Revision History

Rev.	Date	Changes / Comments
A	2005-05-13	Initial release
B	2005-05-19	Due to system problem
C	2005-05-19	Due to system problem