



Working Instruction, Electrical

Applicable for J110 and J120

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1 Read this first!

- *Before you start replacing any components, make sure you have read and fully understood the contents of section 2 and 3!*
- *Also make sure you have access to the mechanical Working Instruction and the equipment listed on the first page of section 4!*



2 Lead-free soldering

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 PBAs 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 PBAS THAT HAVE BEEN MANUFACTURED WITH LFS (LEAD-FREE SOLDER PASTE), LFS MUST BE USED! IF NOT, THERE IS A HIGH RISK OF 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

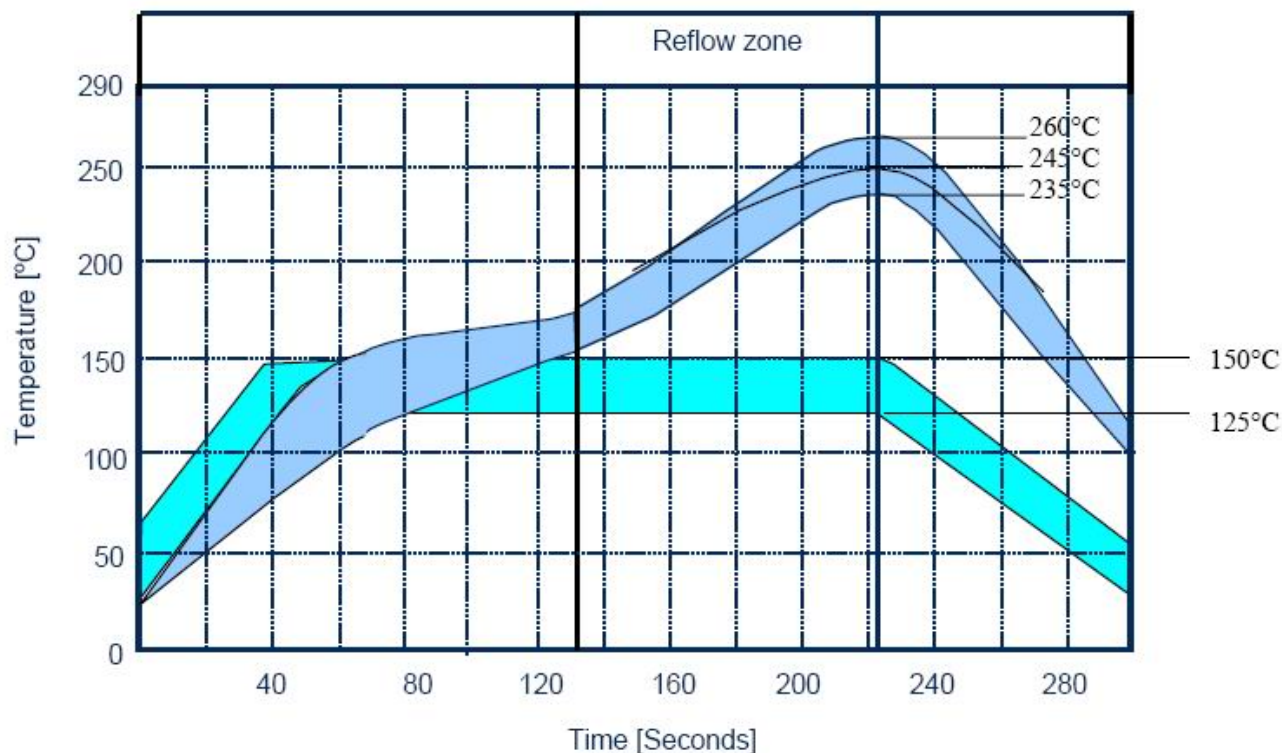
3.2 Temperature Measurements

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 can be used.
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. (the higher temperature in case the board has extremely high ΔT) |
| Bottom heat temperature | 125°C-150°C |
| Total time | Approx. 4-7 min |

4 Replacement of components

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%)
- Flux, RMA no-clean flux
- Cutting pliers
- Shield fence pliers NTZ 112 537

CAUTION

- ***Keep all contact surfaces clean of dirt and hand-grease!***

MECHANICAL INSTRUCTIONS

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

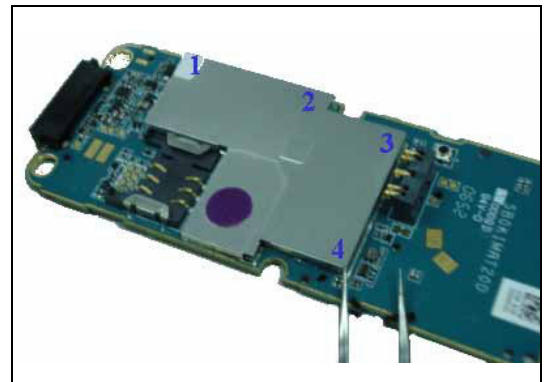


4.1 Shielding Cover

Use the tweezers to raise the corner of shielding cover.

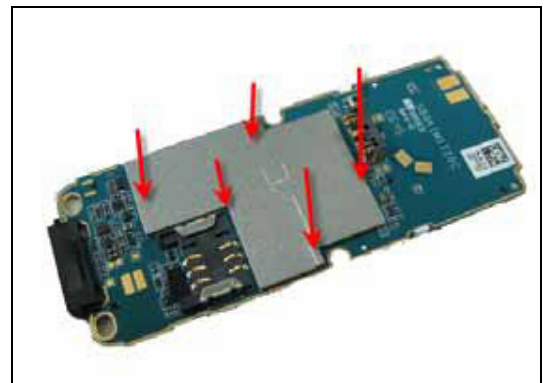


Follow the steps 1-4 to remove the shielding cover



USE A NEW SHIELDING COVER!

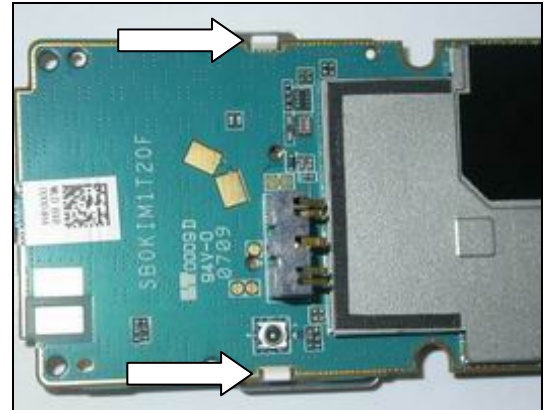
Press the shielding cover down to snap all hooks onto shielding frame.



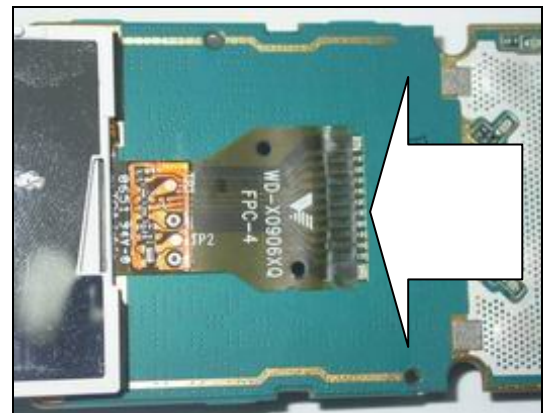


4.2 LCD Module

Take apart the LCD Module and the LCM Metal Frame shield can lid.



Use soldering iron equipment to replace LCD Module



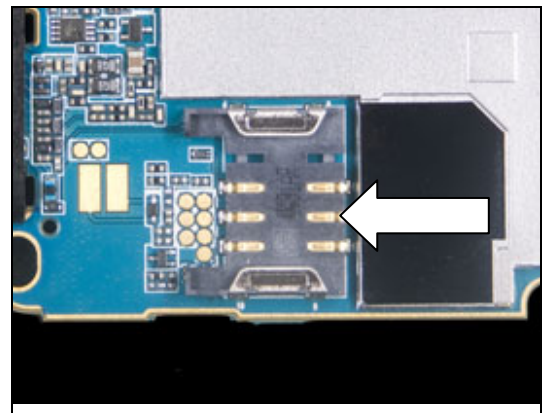
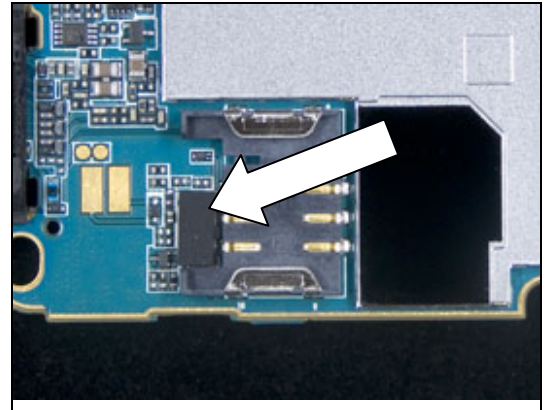


4.3 CON301: SIM Connector

BEFORE PROCEEDING: REMOVE THE RUBBER SIM!

Use BGA equipment to replace the SIM Connector

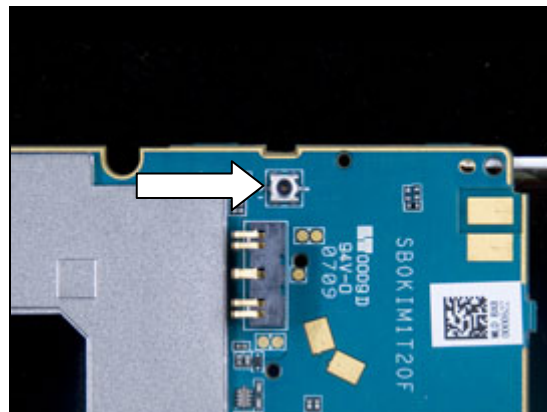
Clean the pads and attach a new Rubber SIM.



4.4 CON801: RF Connector

RELEASE THE LCD FROM THE PCB BEFORE PROCEEDING!

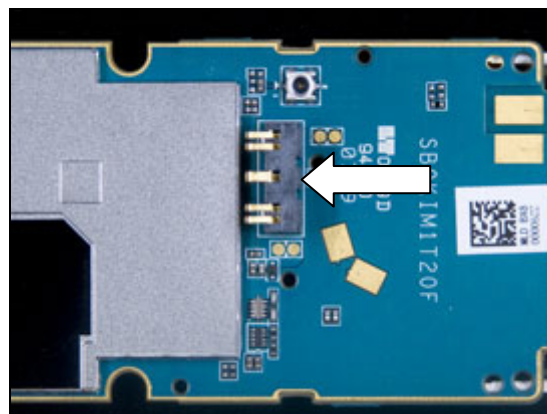
Use BGA repair equipment to replace CON801.



4.5 CON802: Battery Connector

RELEASE THE LCD FROM THE PCB BEFORE PROCEEDING!

Use BGA repair equipment to replace CON802.

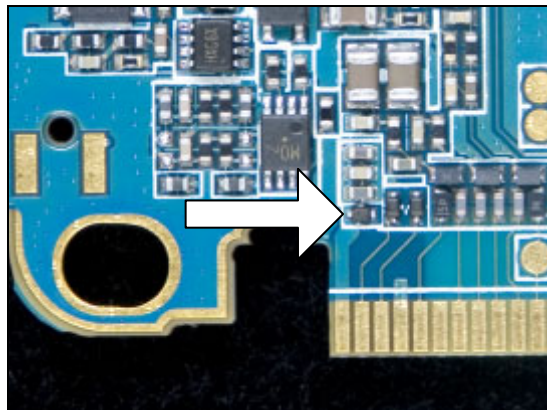


4.6 ESD606: Varistor

REMOVE THE SYSTEM CONNECTOR BEFORE PROCEEDING!

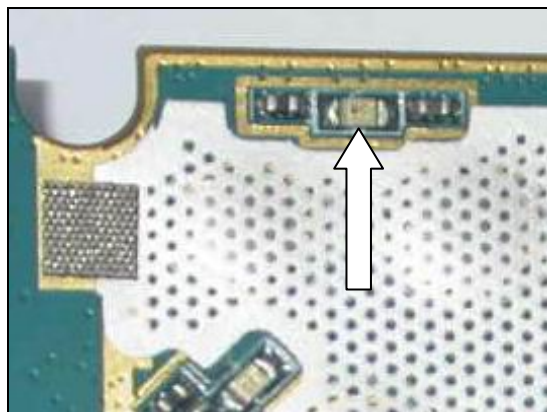
Use hot air soldering equipment to replace ESD606.

Replace the System Connector.



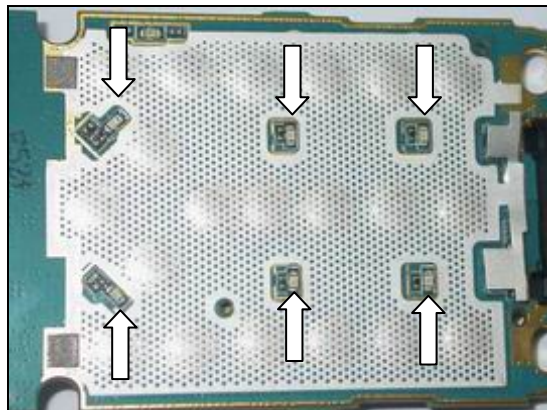
4.7 LED606: LED Red

Use hot air or soldering iron equipment to replace *LED601*



4.8 LED401-LED406: LED Blue

Use hot air or soldering iron equipment to replace the damaged LED.

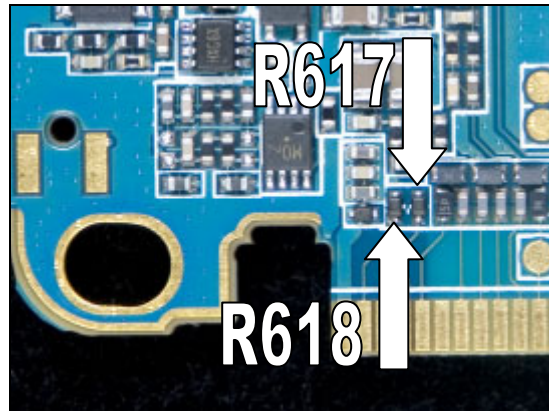


4.9 R617, R618: ESD Protection 9x3.3

REMOVE THE SYSTEM CONNECTOR BEFORE PROCEEDING!

Use hot air soldering equipment to replace R617 and/or R618.

Replace the System Connector.



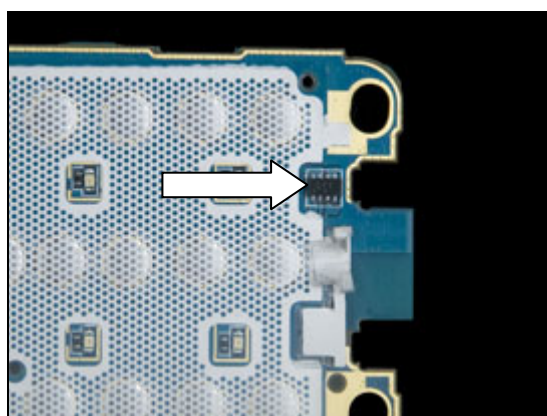
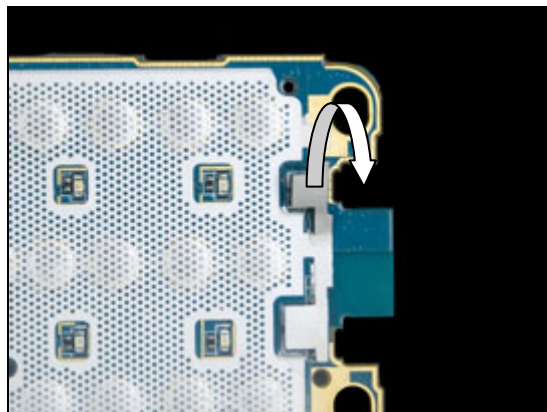
4.10 U604: MOSFET

REMOVE THE SYSTEM CONNECTOR BEFORE PROCEEDING!

Fold down the Metal Dome.

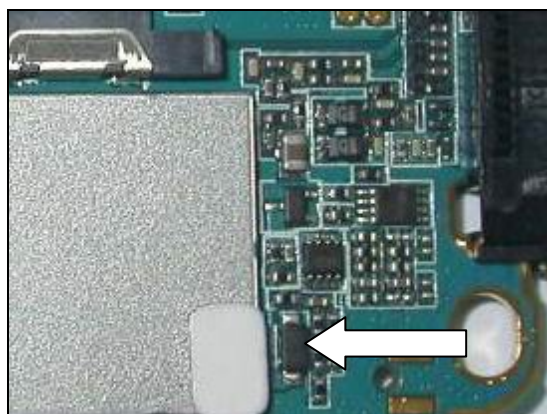
Use BGA repair equipment to replace *U604*.

Replace the Metal Dome and the System Connector.



4.11 U603: Shottky Diode

Use hot air soldering equipment to replace *U603*.

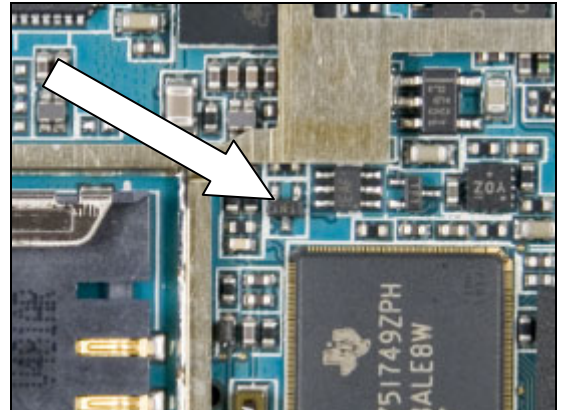


4.12 U601: MOSFET

REMOVE THE SHIELD CAN COVER ACCORDING TO SECTION 4.1

Use hot air soldering equipment to replace U601.

Use a **new** shield can and replace it according to Section 4.1



4.13 U808: Linear regulator output IC

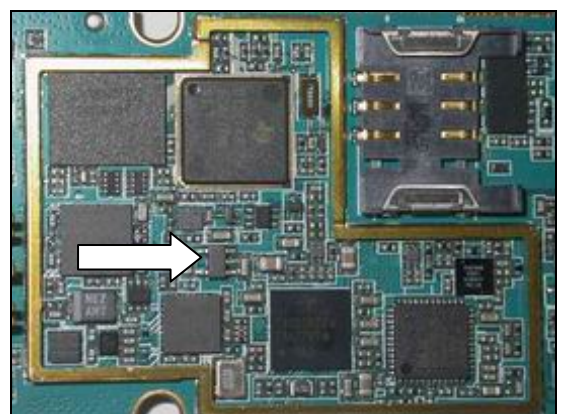
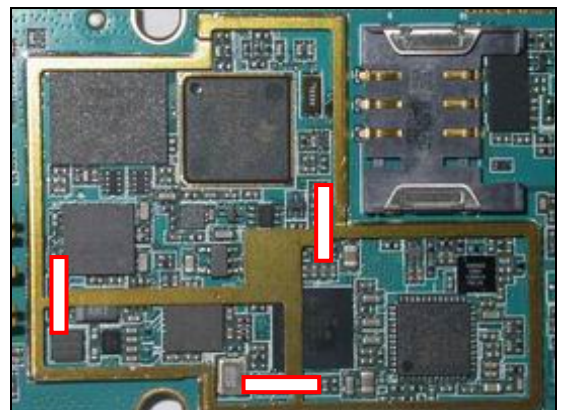
REMOVE THE SHIELD CAN COVER ACCORDING TO SECTION 4.1

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

USE SHARP-EDGED CUTTING PLIERS TO PREVENT DAMAGES TO THE SHIELD CAN FENCE!

Use BGA repair equipment to replace U808.

Use a **new** shield can and replace it according to Section 4.1

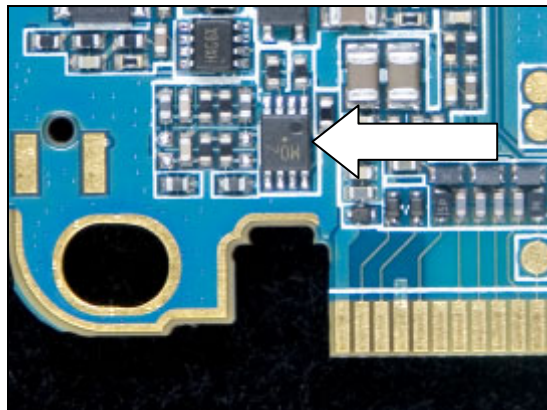


4.14 U811: Buffer Amplifier

REMOVE THE SYSTEM CONNECTOR BEFORE PROCEEDING!

Use hot air soldering equipment to replace U811.

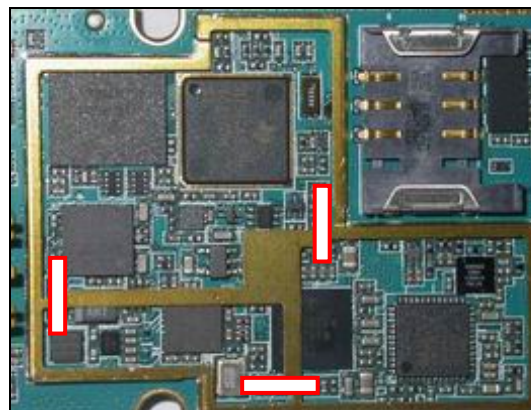
Replace the System Connector.



4.15 U813: LED backlight driver

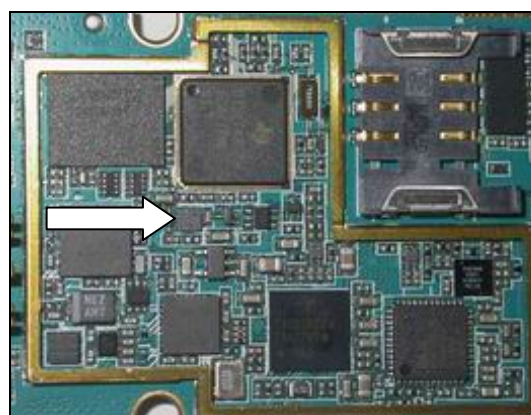
REMOVE THE SHIELD CAN COVER ACCORDING TO SECTION 4.1

Cut the fence according to the white lines in the picture.
USE SHARP-EDGED CUTTING PLIERS TO PREVENT DAMAGES TO THE SHIELD CAN FENCE!



Use BGA repair equipment to replace U813.

Use a **new** shield can and replace it according to Section 4.1

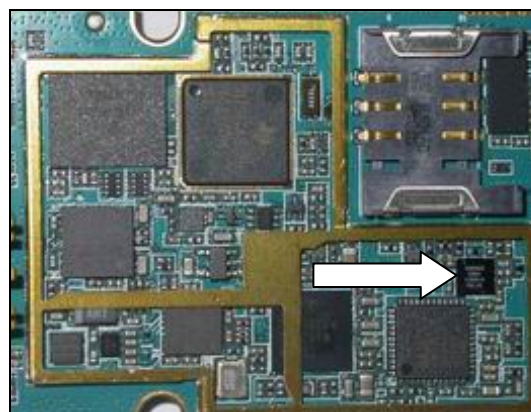


4.16 U814: IC FM Radio (Only applicable for J120)

REMOVE THE SHIELD CAN COVER ACCORDING TO SECTION 4.1

Use hot air soldering equipment to replace U814.

Use a **new** shield can and replace it according to Section 4.1



5 Revision history

| Rev. | Date | Changes / Comments |
|------|------------|-------------------------|
| A | 2007-06-13 | 1 st version |