



Working Instruction, Electrical

Applicable for Z320

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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 wet ability
- 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

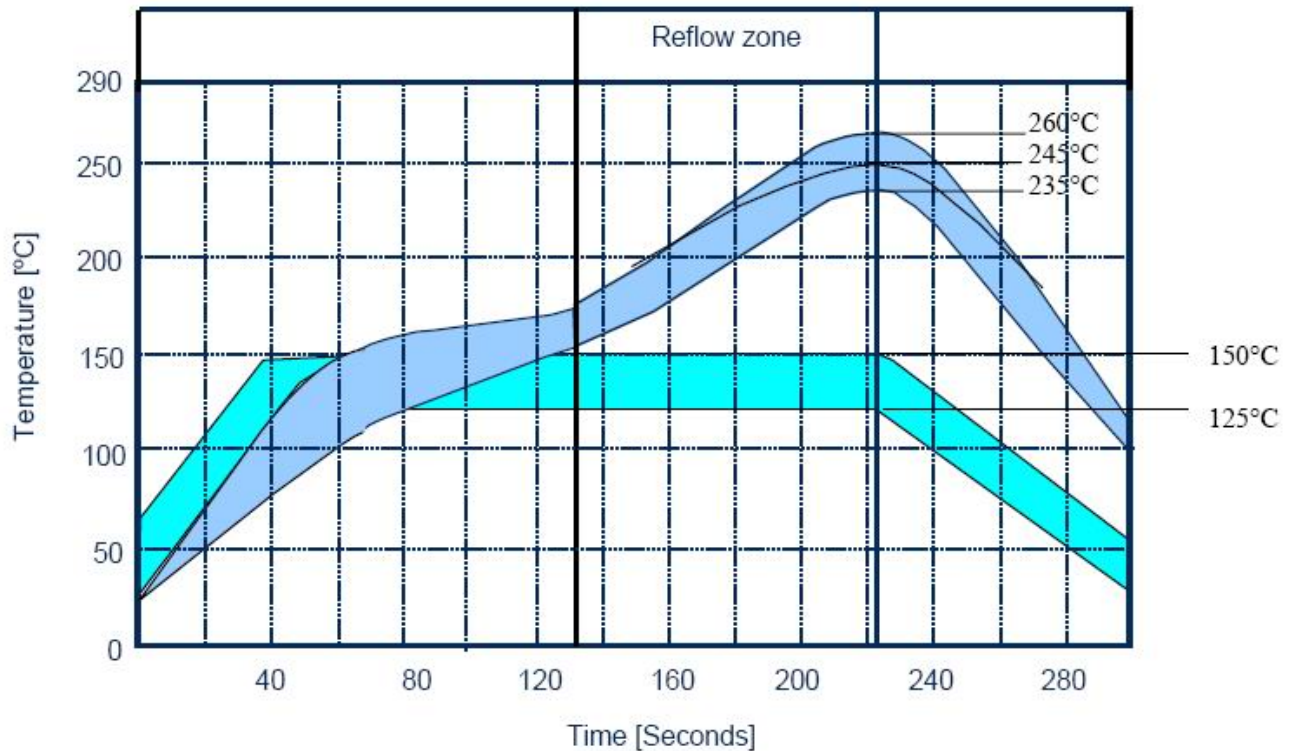
3.2 Temperature Measurements

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*.

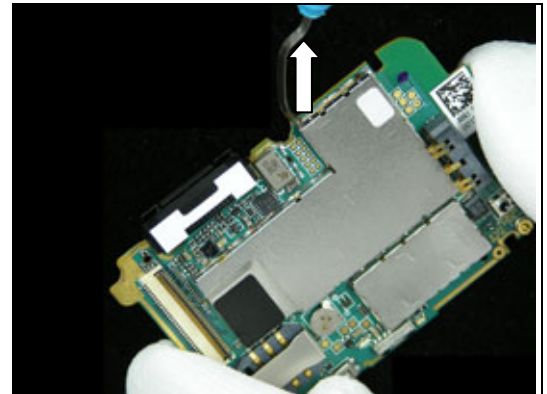


4.1 Shielding Cover BB

BE CAREFUL NOT TO DAMAGE ANY COMPONENTS SURROUNDING THE SHIELDING FRAME!

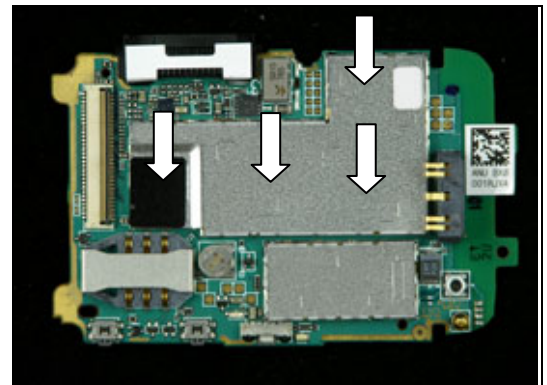
Use tweezers to raise the corner of shielding cover.

Continue with the same procedure on all other corners to remove the Shielding Cover



USE A NEW SHIELDING COVER!

Press the shielding cover down to snap all hooks onto shielding frame until you hear a 'Click' sound.

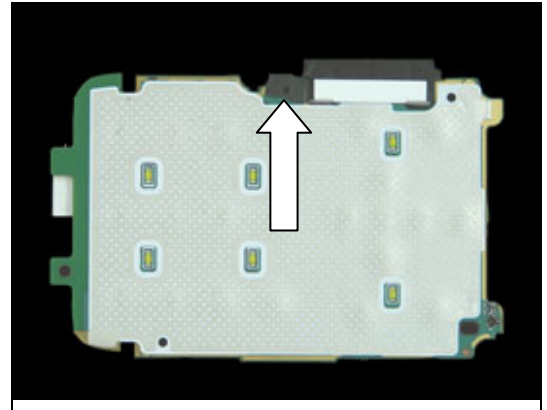




4.2 B1200 - Microphone

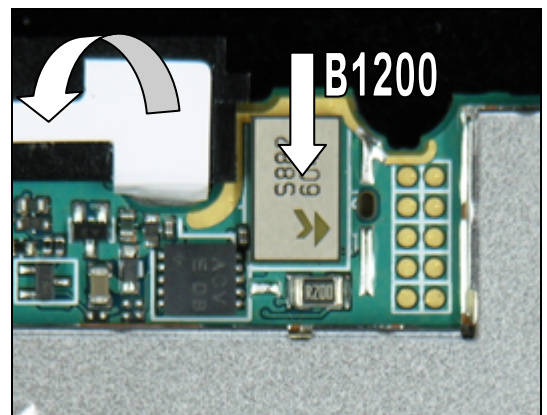
THE MICROPHONE SPONGE MUST BE REMOVED BEFORE SOLDERING!

Use a pair of tweezers to remove the Microphone Sponge



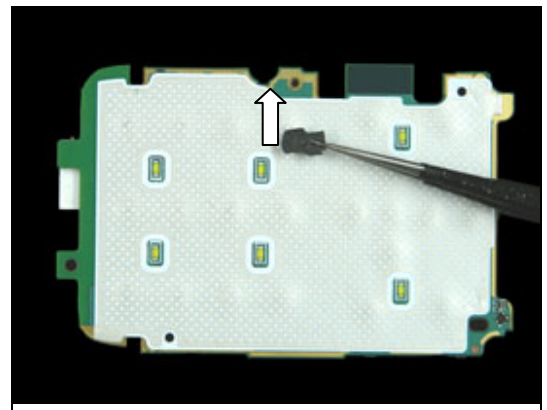
REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

- Use BGA Station to replace the B1200
- Use your fingers to replace the System Connector



USE A NEW MICROPHONE SPONGE!

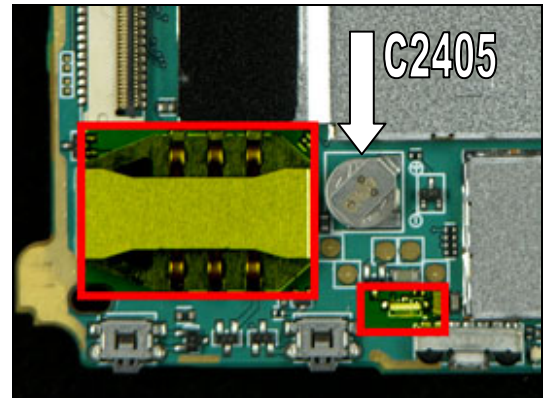
Use a pair of tweezers to align the Microphone Sponge.



4.3 C2405 - Lithium Backup Battery

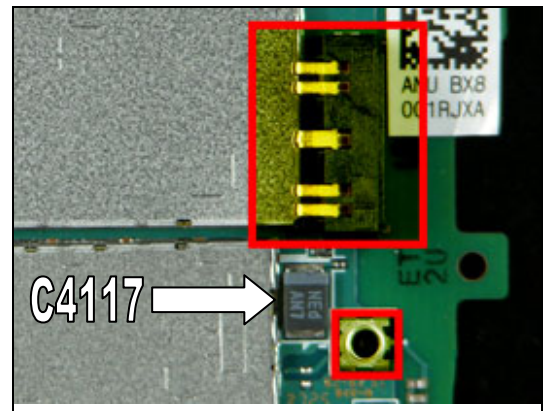
DO NOT USE HOT AIR TO REPLACE THE BACKUP BATTERY!

- Cover the SIM Connector and the LED with Heat Resisting tape
- Use BGA equipment **or two soldering-irons** to replace the backup battery



4.4 C4117 - Polymer Capacitor 33uF

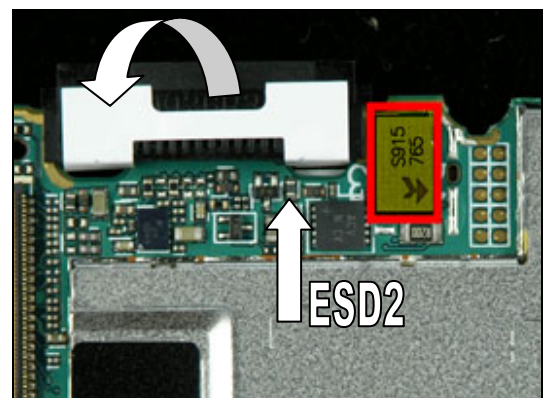
- Cover the Battery Connector and the External Antenna Connector with Heat Resistant Tape
- Use hot-air to remove the component
- Use two soldering-irons to solder the new component.



4.5 ESD2 - ESD Varistor 3pF 18V

REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

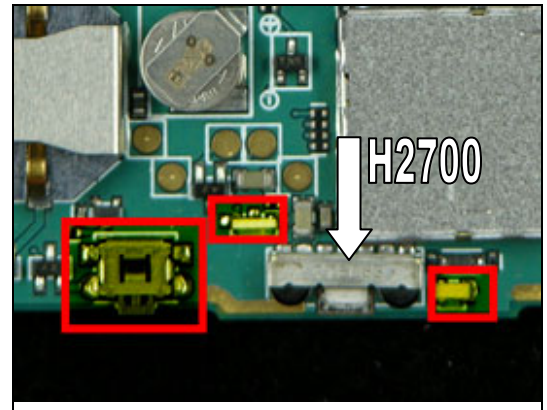
- Cover the Microphone with Heat Resistant Tape
- Use hot air soldering equipment to replace ESD2.
- Use your fingers to replace the System Connector





4.6 H2700 - IrDA Module

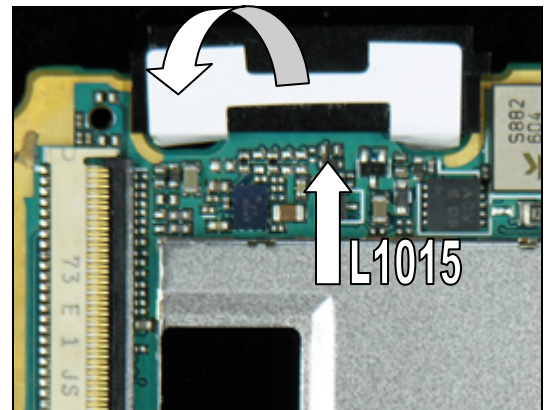
- Cover the Volume Micro Switch and the two LED's with Heat Resisting Tape
- Use hot air soldering equipment to replace H2700



4.7 L1015 - ESD Varistor 40pF 5.5V

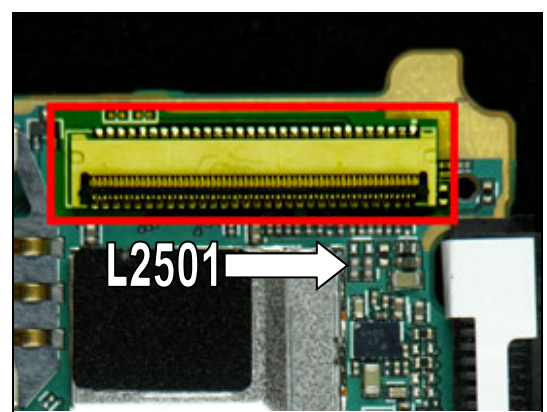
REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

- Use hot air soldering equipment to replace L1015
- Use your fingers to replace the System Connector



4.8 L2501 - Inductor BEAD

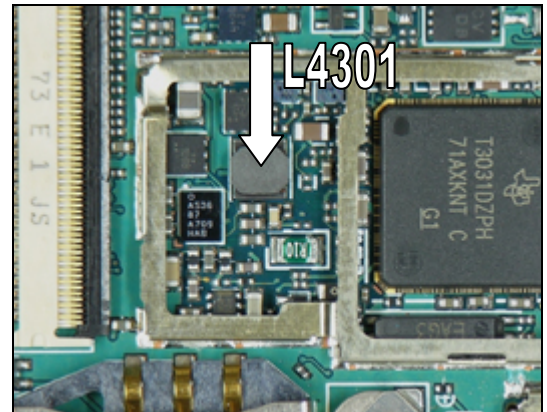
- Cover the ZIF Connector with Heat Resistant Tape
- Use hot air soldering equipment to replace L2501





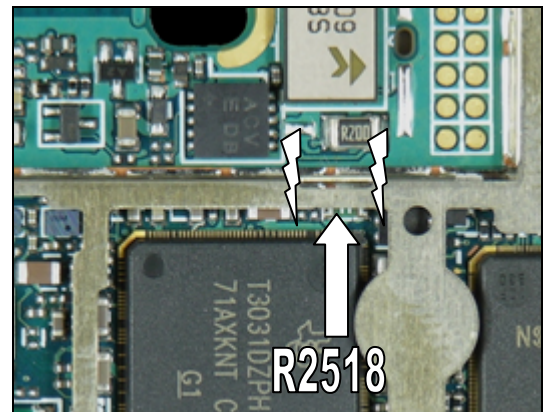
4.9 L4301 - Inductor 10uH

- Remove the shield can lid according to Chapter 4.1
- Use hot air soldering equipment to replace *L4301*
- Put back a new shield can lid according to 4.1



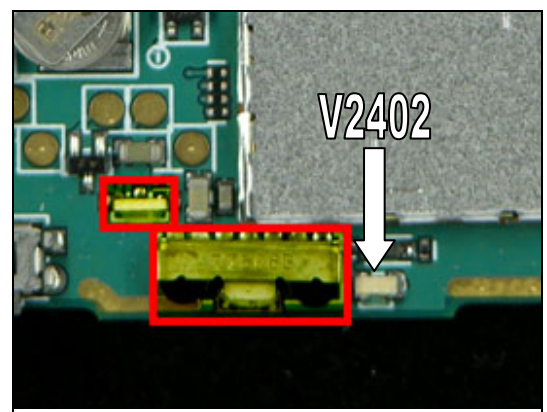
4.10 R2518 - Fuse Thin-Film 1.5A 32V

- Remove the shield can lid according to Chapter 4.1
- Use hot air soldering equipment to replace *L4301*
- Put back a new shield can lid according to Chapter 4.1



4.11 V2402 – LED Red

- Cover the LED and IrDA Module with Heat Resisting Tape
- Use hot air soldering equipment to replace R2518

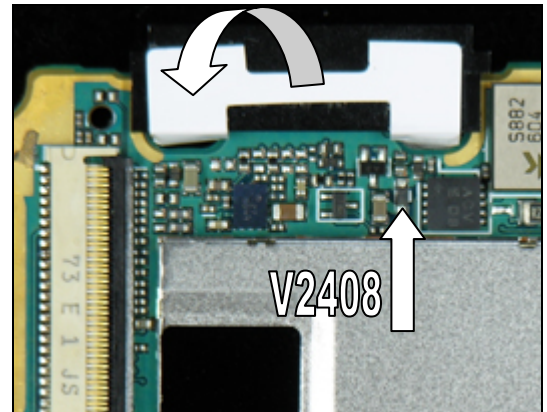




4.12 V2408 - Schottky Barrier Diode

REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

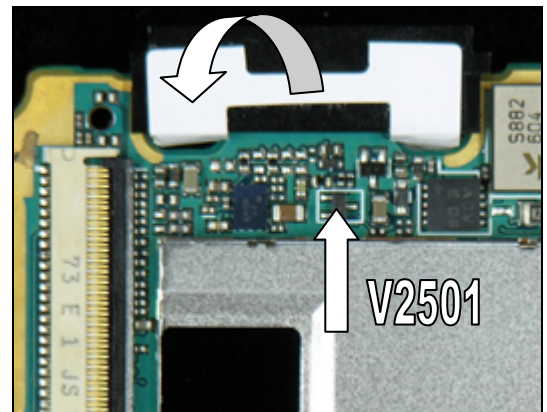
- Use hot air soldering equipment to replace V2501
- Use your fingers to replace the System Connector



4.13 V2501 - Transistor Small Signal MOSFET

REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

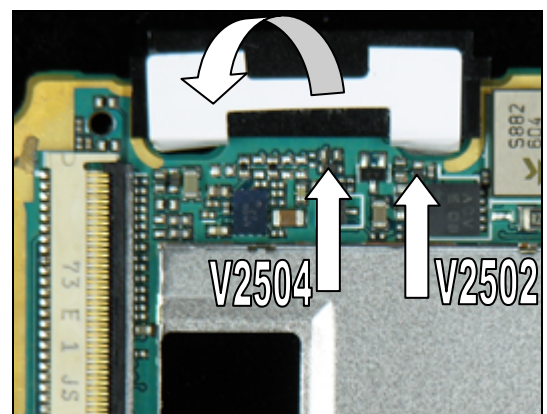
- Use hot air soldering equipment to replace V2501
- Use your fingers to replace the System Connector



4.14 V2502, V2504 – Zener Diode

REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

- Use hot air soldering equipment to replace V2502 or V2504
- Use your fingers to replace the System Connector



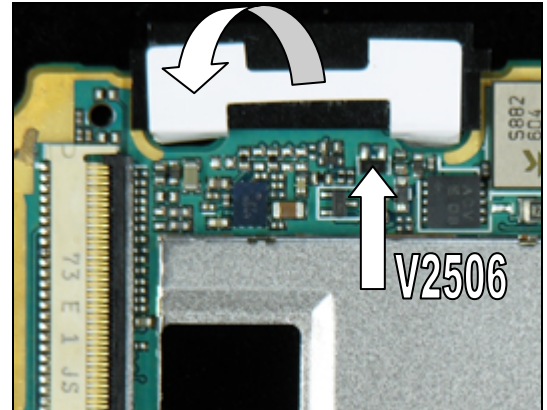


4.15 ESD Diode

V2506

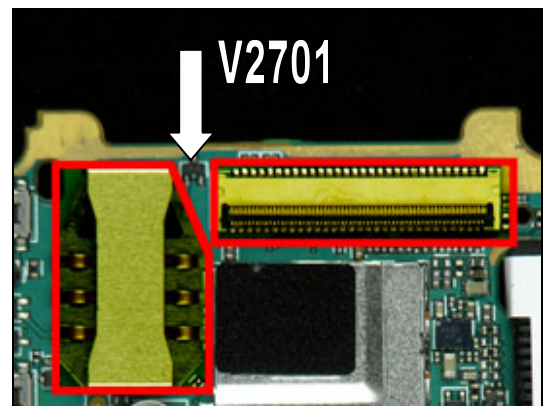
REMOVE THE SYSTEM CONNECTOR BEFORE REPAIR PROCEDURE!

- Use hot air soldering equipment to replace V2506
- Use your fingers to replace the System Connector



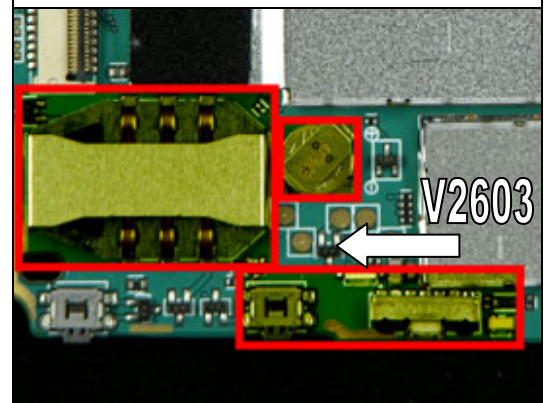
V2701

- Cover the ZIF Connector and the SIM Connector with Heat Resisting Tape
- Use hot air soldering equipment to replace V2701



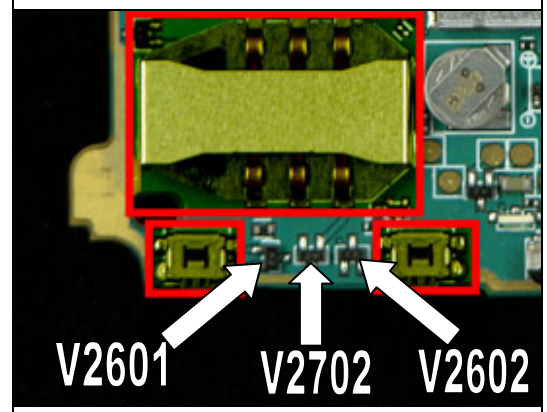
V2603

- Cover the SIM Connector, the Backup Battery, the Volume Micro switch, the IrDA Module and the two LED's with Heat Resisting Tape
- Use hot air soldering equipment to replace V2603



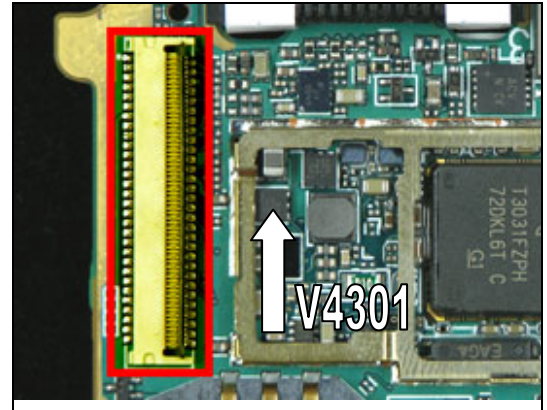
V2601, V2602, V2702

- Cover the SIM Connector and the two Volume Micro switches with Heat Resisting Tape
- Use hot air soldering equipment to replace V2601, V2602 or V2702



4.16 V4301 - MOSFET & Schottky Diode

- Remove the shield can lid according to Chapter 4.1
- Use hot air soldering equipment to replace V4301
- Put back a new shield can lid according to Chapter 4.1

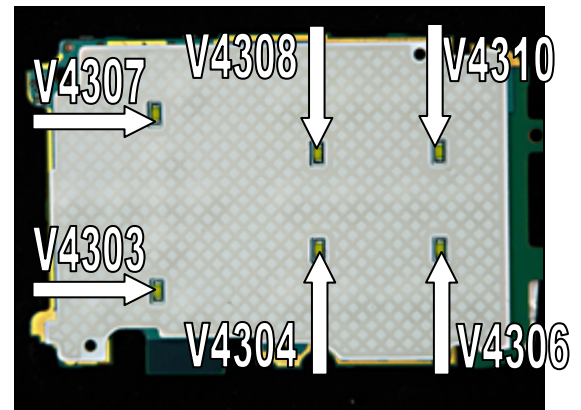


4.17 V4303, V4304, V4306, V4307, V4308, V4310 - LED White

REMOVE THE DOME SHEET ACCORDING TO MECHANICAL WORKING INSTRUCTIONS

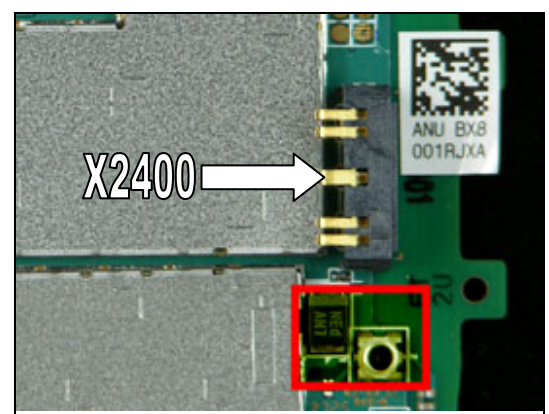
Use hot air soldering equipment to replace V4303, V4304, V4306, V4307, V4308 or V4310

INSTALL A NEW DOME SHEET ACCORDING TO MECHANICAL WORKING INSTRUCTIONS



4.18 X2400 – Battery Connector

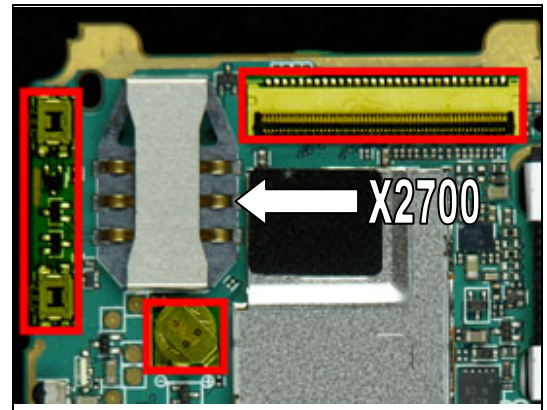
- Cover the External Antenna Connector with Heat Resisting Tape
- Use hot-air to remove the Battery Connector
- Use soldering-iron and under-heater to solder the new component.





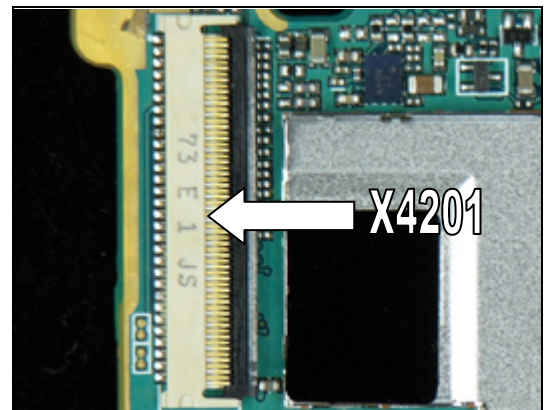
4.19 X2700 – SIM Connector

- Cover the ZIF Connector, the Backup Battery and the two Volume Micro switches with Heat Resisting Tape
- Use BGA Station to replace the SIM Connector



4.20 X4201 - ZIF Connector

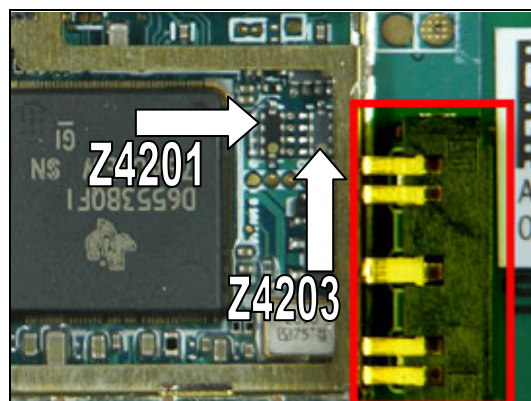
- Use hot-air to remove the ZIF Connector
- Use soldering-iron and under-heater to solder the new component.



4.21 EMI Filter and ESD

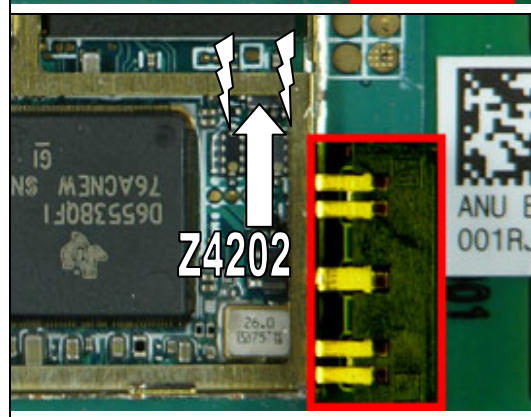
Z4201, Z4203

- Remove the shield can lid according to Chapter 4.1
- Cover the Battery Connector with Heat Resistant Tape
- Use hot air soldering equipment to replace Z4201 or Z4203
- Put back a new shield can lid according to Chapter 4.1



Z4202

- Remove the shield can lid according to Chapter 4.1
- Cut the fence over the component with Cutting pliers
- Cover the Battery Connector with Heat Resistant Tape
- Use hot air soldering equipment to replace Z4202
- Put back a new shield can lid according to Chapter 4.1



5 Revision history

Rev.	Date	Changes / Comments
A	2007-10-09	1 st version