



# Working Instruction, Electrical

Applicable for W710, Z710

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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!***
- ***Use Electrostatic Discharge (ESD) equipment to avoid damaging the PBA.***
- ***Use gloves or finger cots to avoid contaminating the PBA with skin oil.***



## 2 Lead-free soldering

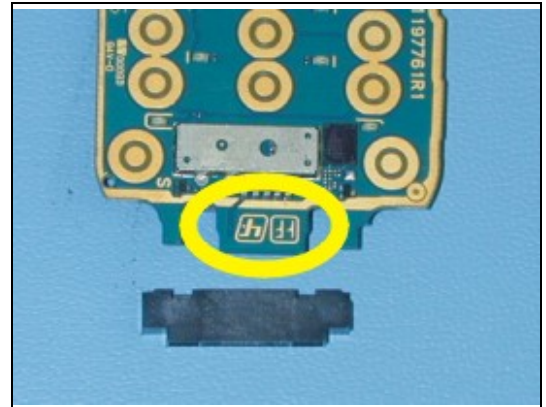
**THIS PRODUCT IS MANUFACTURED WITH LEAD-FREE SOLDER AND LEAD-FREE COMPONENTS!**

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

This symbol indicates that the product is lead-free.



The lead-free symbol is located on the PCB under the system connector.



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 wetting
- 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.

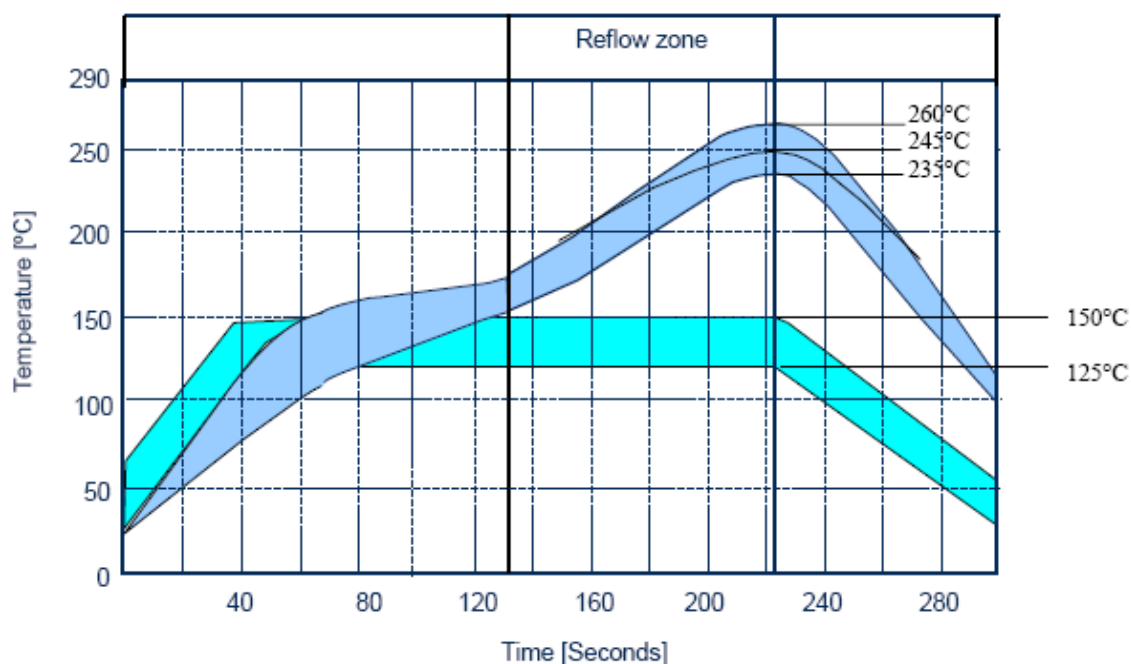
***THESE VALUES ARE RECOMMENDATIONS AND MAY HAVE TO BE CHANGED DEPENDING ON THE TYPE OF EQUIPMENT!***

***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 $\Delta T$ )
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!***

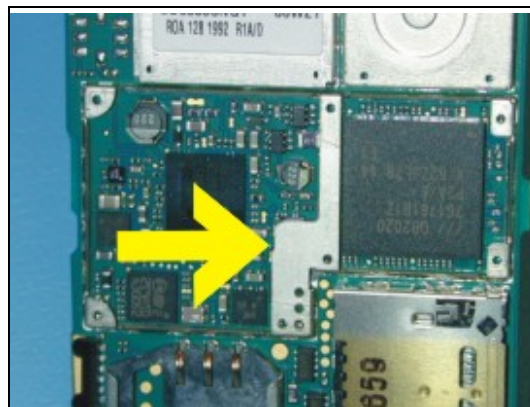
### MECHANICAL INSTRUCTIONS

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

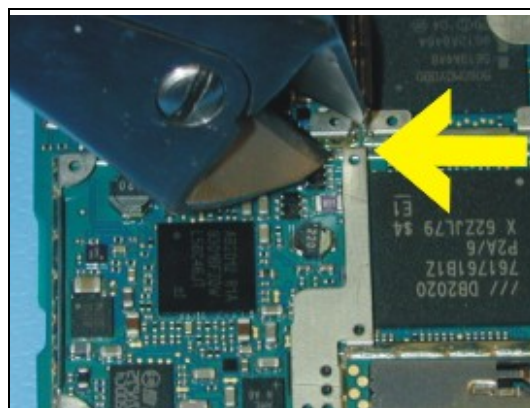


## 4.1 B300 and D601: Crystal 32768HZ and USB Transceiver

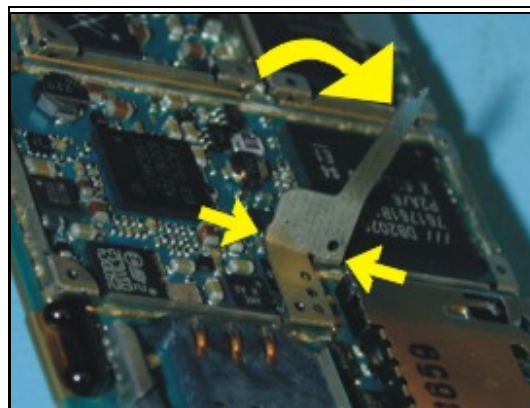
A shield fence overhang must be removed to access B300 and D601.



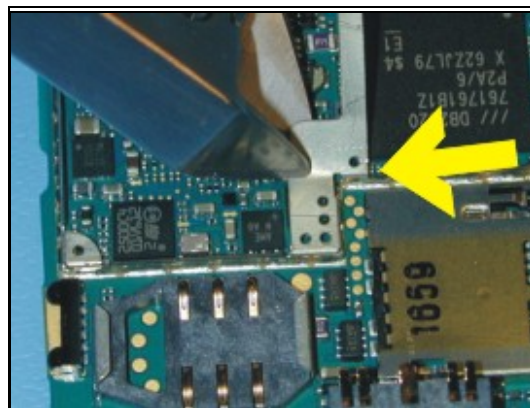
Cut the top end of the overhang first.



Bend the overhang up.



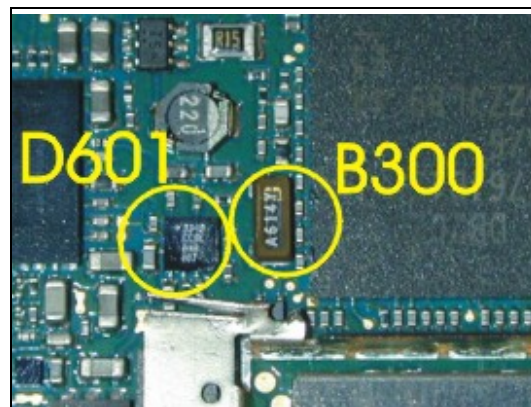
Cut the overhang at the bend





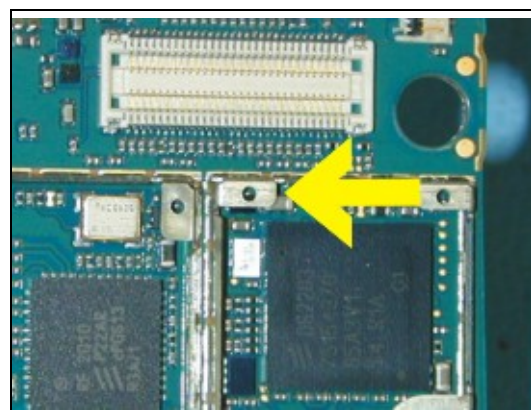
## B300 and D601: *continued*

The components are now accessible.

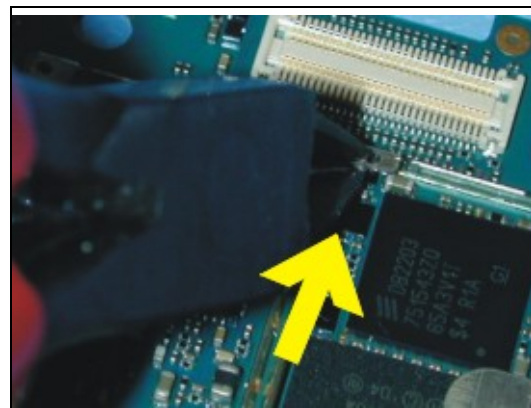


## 4.2 N810: LDO1.2 V, 200mA, low noise, CS-5r

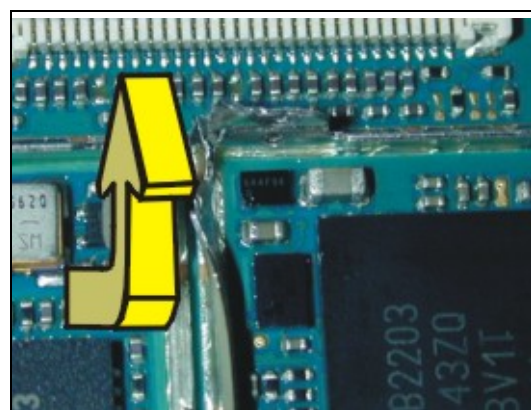
A shield fence corner must be removed to access N810.



Cut one side of the corner.



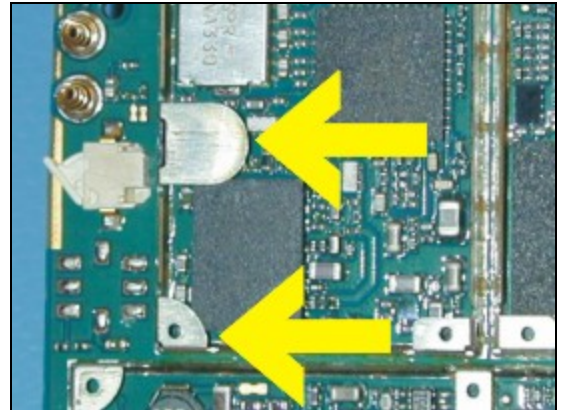
Bend the corner up.



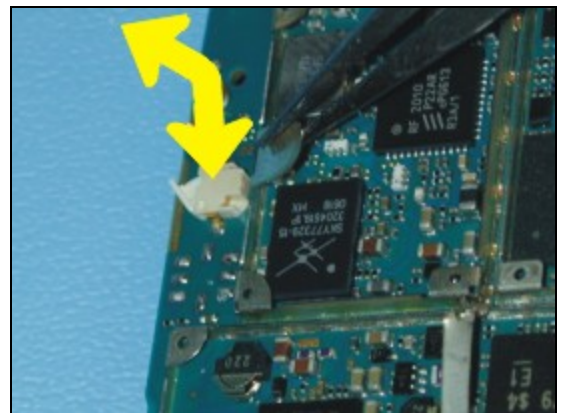


### 4.3 N1300: PA Module

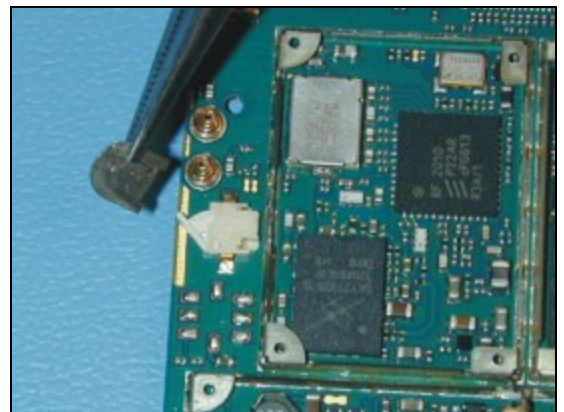
A shield fence corner and overhang must be removed to access *N1300*.



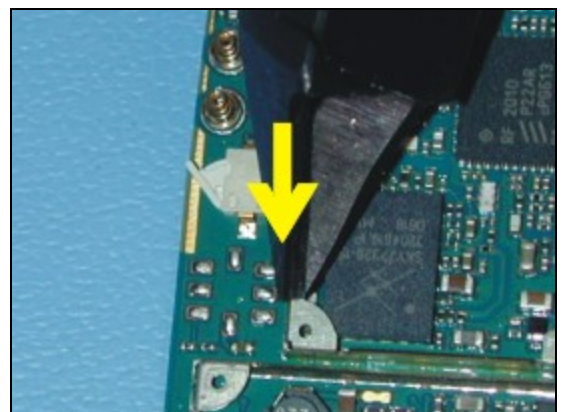
Bend the overhang up and down a few times until it breaks off.



Remove the overhang.

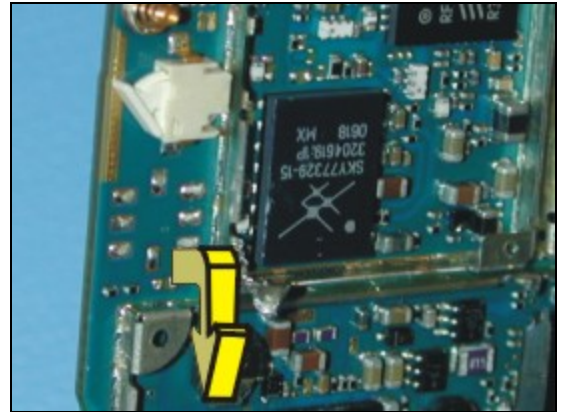


Cut one side of the corner.

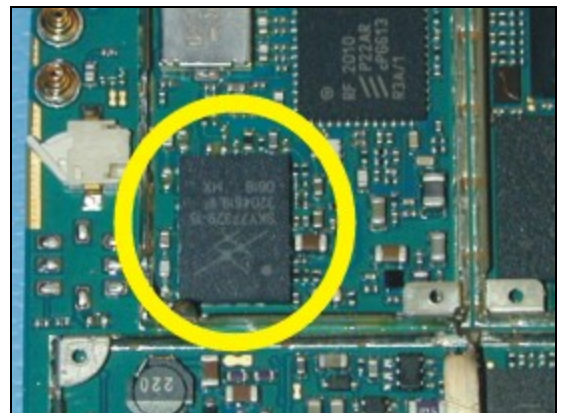


## N1300: PA Module *continued*

Bend the corner up.



The component is now accessible.

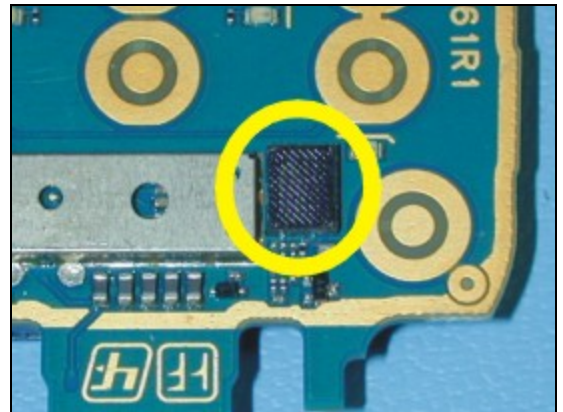




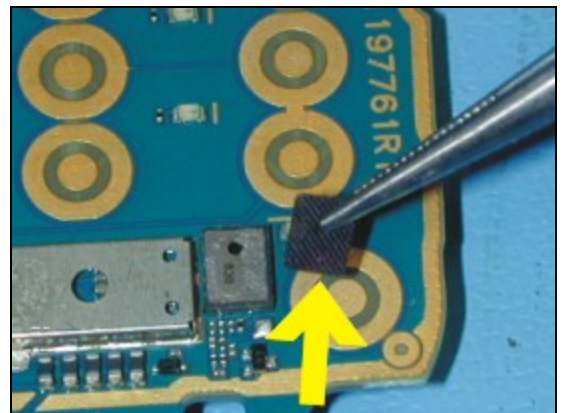


## 4.4 X702: Microphone

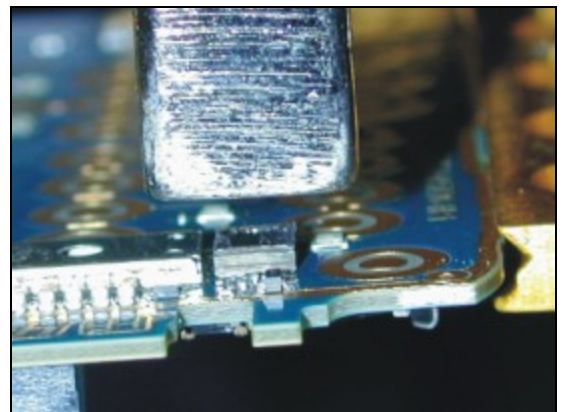
The microphone has a dust cloth adhered to its top.



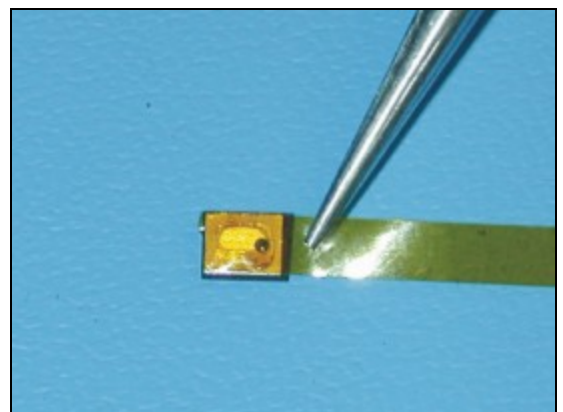
Remove the dust cloth.



Use hot air to remove the microphone.



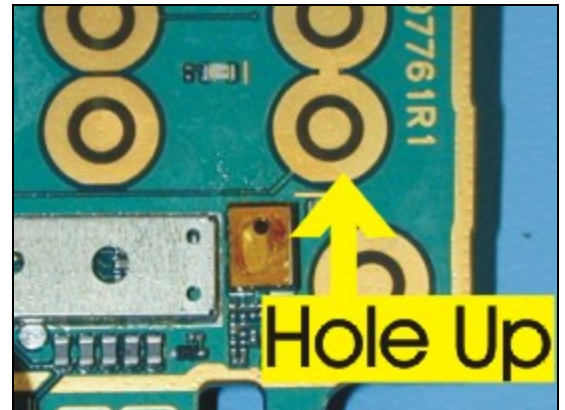
Apply a small piece of heat-resistant tape to the top of the new microphone.



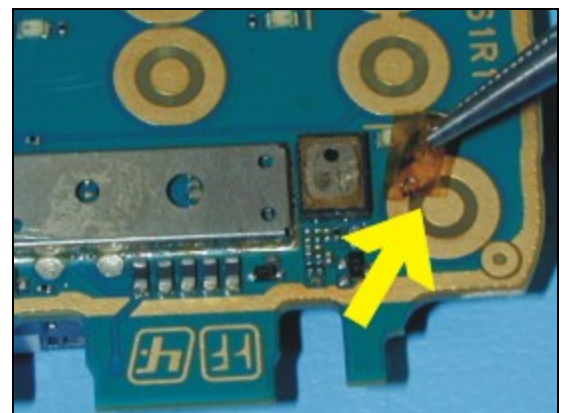


## X702: Microphone *continued*

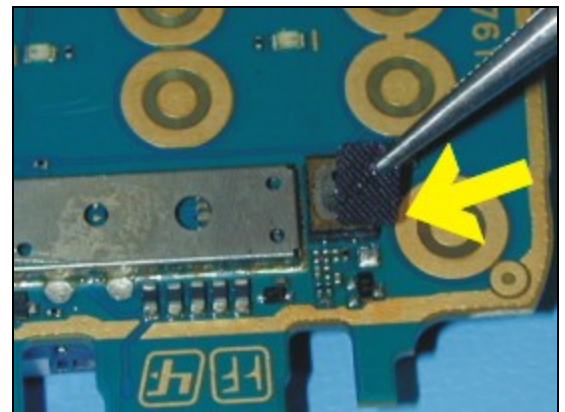
Place the microphone on the board in the orientation shown (hole away from system connector).



After using hot air to place the new microphone, remove the heat-resistant tape.



Apply a new dust cloth.



## 4.5 X900: SHIELDCAN/BB UPPER

Reassemble X900 with the orientation shown (smaller circle toward connectors).



## 5 Revision history

Rev.	Date	Changes / Comments
A	2006-Aug-29	Initial Release
B	2006-Nov-27	Removed N811 and X903 from FM radio section. These parts are not reparable. Attempting to remove the shield can causes solder ball shorts under the FM radio ASIC.