



# Working Instruction, Electrical

Applicable for W760

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# 1 Read this first!

## **CAUTION**

***Before you start replacing any components, make sure you have read and fully understood the contents of section 2 and 3!***

***Use Electrostatic Discharge (ESD) equipment to avoid damaging the PBA.***

***Use gloves or finger cots to avoid contaminating the PBA with skin oil.***

## **EQUIPMENT**

***For equipment information, refer to the Electrical and Mechanical Equipment Lists.***

## **MECHANICAL INSTRUCTIONS**

***For phone disassembly and reassembly information, refer to the Mechanical Working Instruction.***

## 2 Lead-free soldering

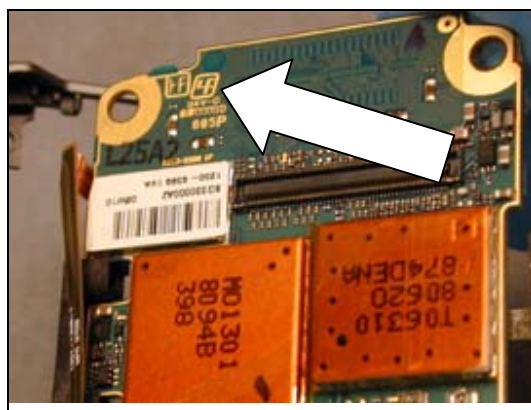
***THIS PRODUCT IS MANUFACTURED WITH LEAD-FREE SOLDER AND LEAD-FREE COMPONENTS!***

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 as shown.



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) characteristics:

- High melting point (typically 217°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), 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 section 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 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 Kapton tape can be used.

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

These values are strongly dependent on the BGA replacement equipment.

Select a nozzle size that is the same size or slightly larger than the part being replaced.

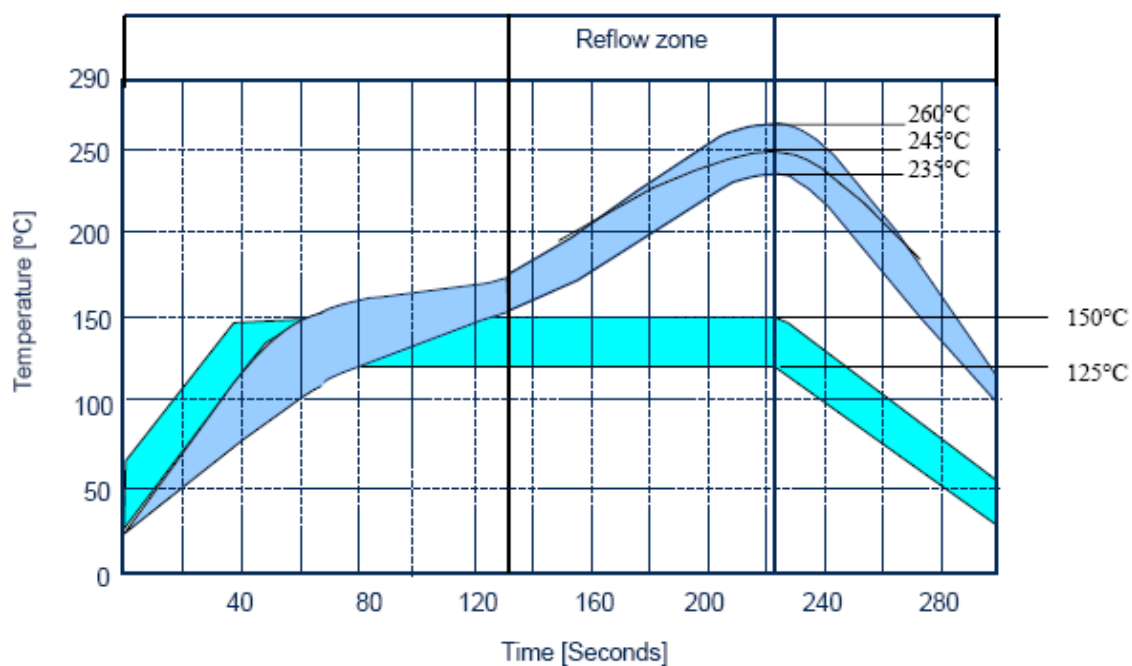
Make sure the nozzle does not affect any nearby placed components.

***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 260°C!***

### 3.3 Reflow Profiles

Sn/Ag/Cu (lead-free)



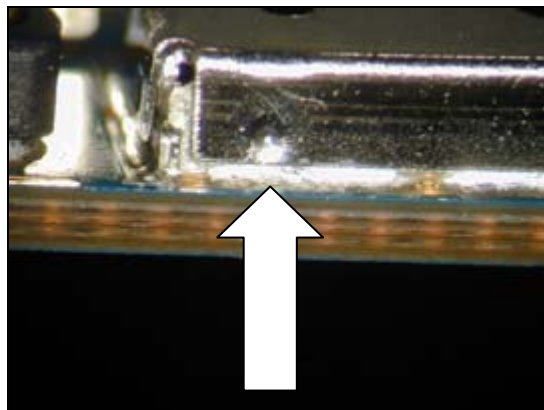
Ramp rate	< 4°C/sec
Ramp rate cooling zone	< 6°C/sec
Time above liquidus	60-150 sec
Minimum temperature	235°C
Maximum temperature	245°C or 260°C for 10 sec. (the higher temperature in case the board has extremely high $\Delta T$ )
Bottom heat temperature	125°C-150°C
Total time	Approx. 4-7 min



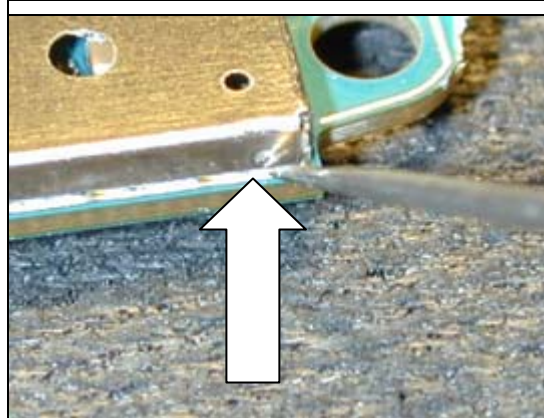
## 4 Replacement of components

### 4.1 D2404: IC IF 3.5X3.5X0.8

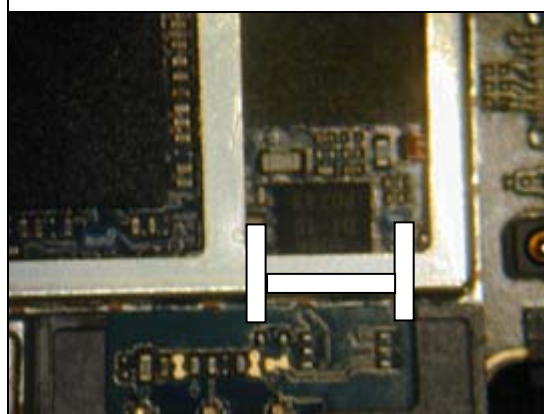
Locate the small, round, tabs around the perimeter of shield E1000.



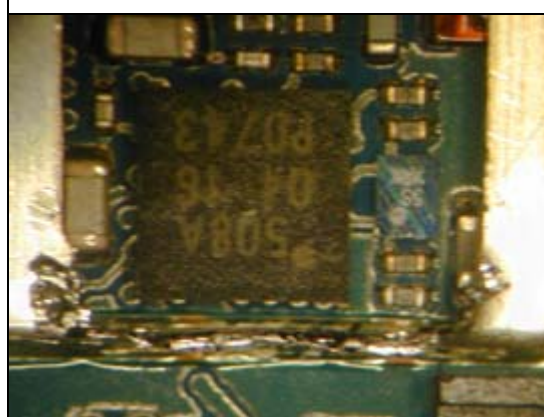
Use a dental pick to pry the lid up at each of the tabs. Be careful to not damage the lid.



Use clippers to trim the overhang as shown.

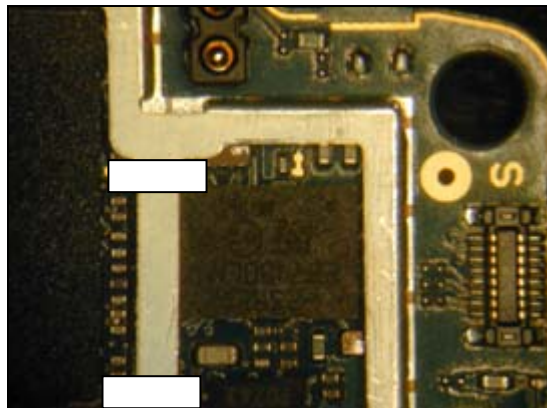


Make sure the remaining fence metal does not touch parts on the board, and make sure the metal does not prevent the lid from assembling properly.

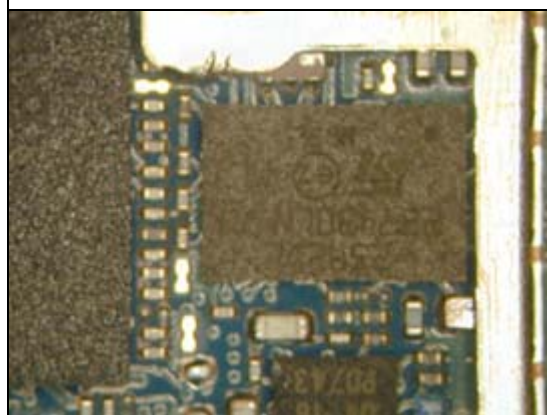


## 4.2 N1400: Module Bluetooth + FM STLC2592

After removing the lid of shield E1000 as shown in the D2404 section, cut the crossbar as shown.



Remove the cut section and discard it.





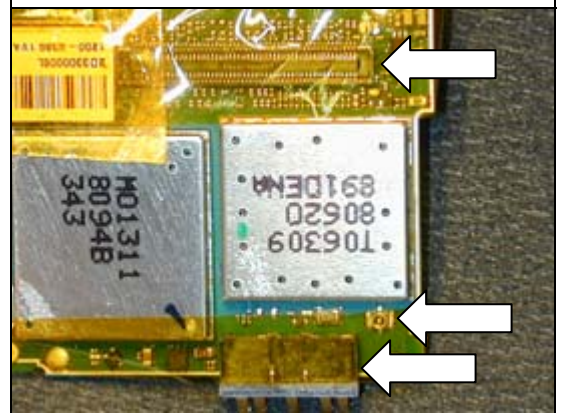


## 4.3 N1200: RF-Module Thor Pre-bumped

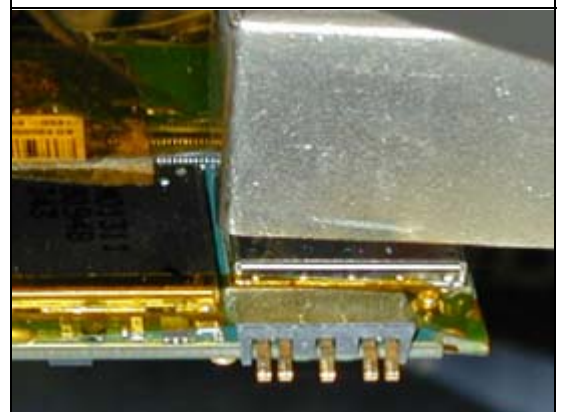
Remove yellow tape from N1200 and N1210.



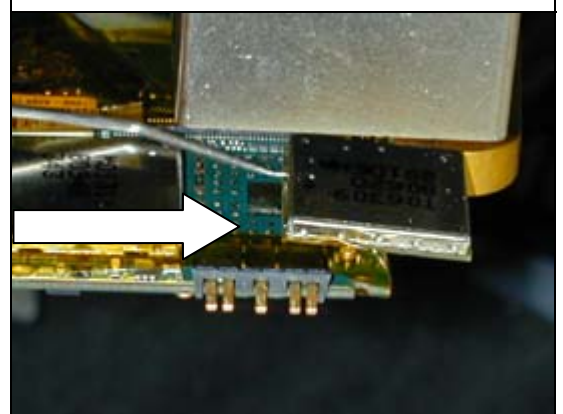
Apply heat-resistant tape to X4200, X1501, and X2200.



Use a Large Hot Air Device to melt the solder.



Slide the part off the board while the solder is hot.



#### 4.4 N1200: RF-Module Thor Pre-bumped *Continued*

After installing the new part, apply a new piece of tape to N1200 and N1210.

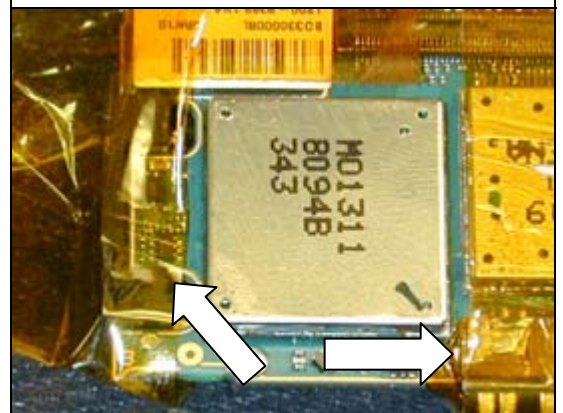


## 4.5 N1210: RF-Module Mammoth Pre-bumped

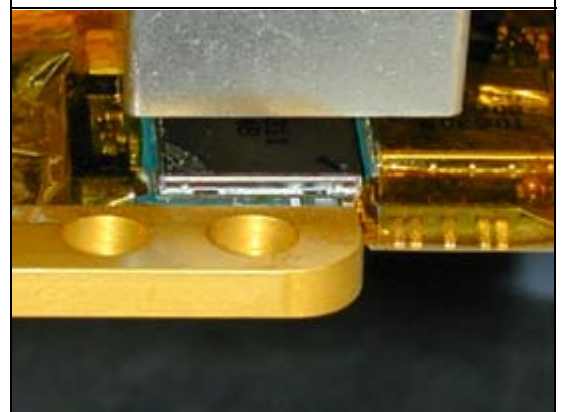
Remove yellow tape from N1200 and N1210.



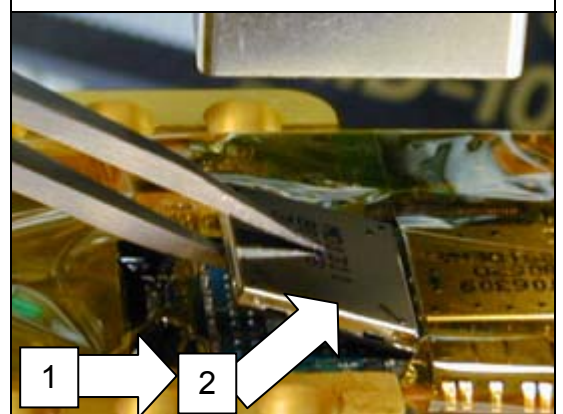
Apply heat-resistant tape to X2200 and X2400.



Use a Large Hot Air Device to melt the solder.



Insert tweezers from the left side of the part. Slide the part toward N1200 and lift it off the board.



## 4.6 N1210: RF-Module Mammoth Pre-bumped *Continued*

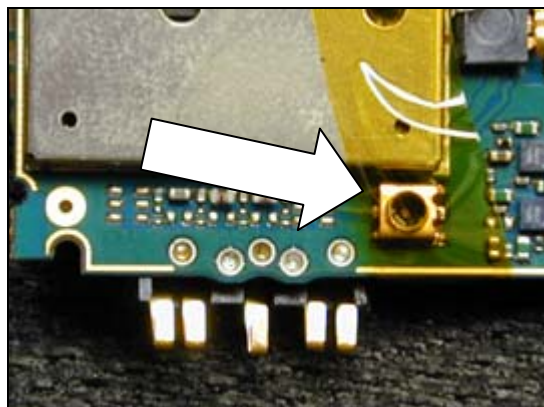
After installing the new part, apply a new piece of tape to N1200 and N1210.



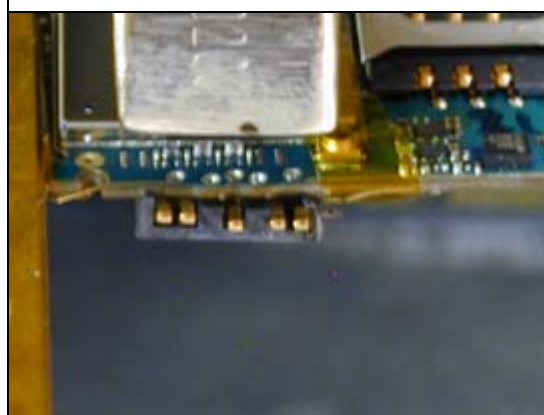


## 4.7 X2200: Battery Connector

Use heat-resistant tape to protect X1200.



Use a Large Hot Air Device to melt the solder.



Remove the excess solder from the holes.



Insert a new part and solder the pins in the holes.



## 4.8 X2400: System Connector

Apply heat-resistant tape to X2410, X1503, and X4100 (not shown).

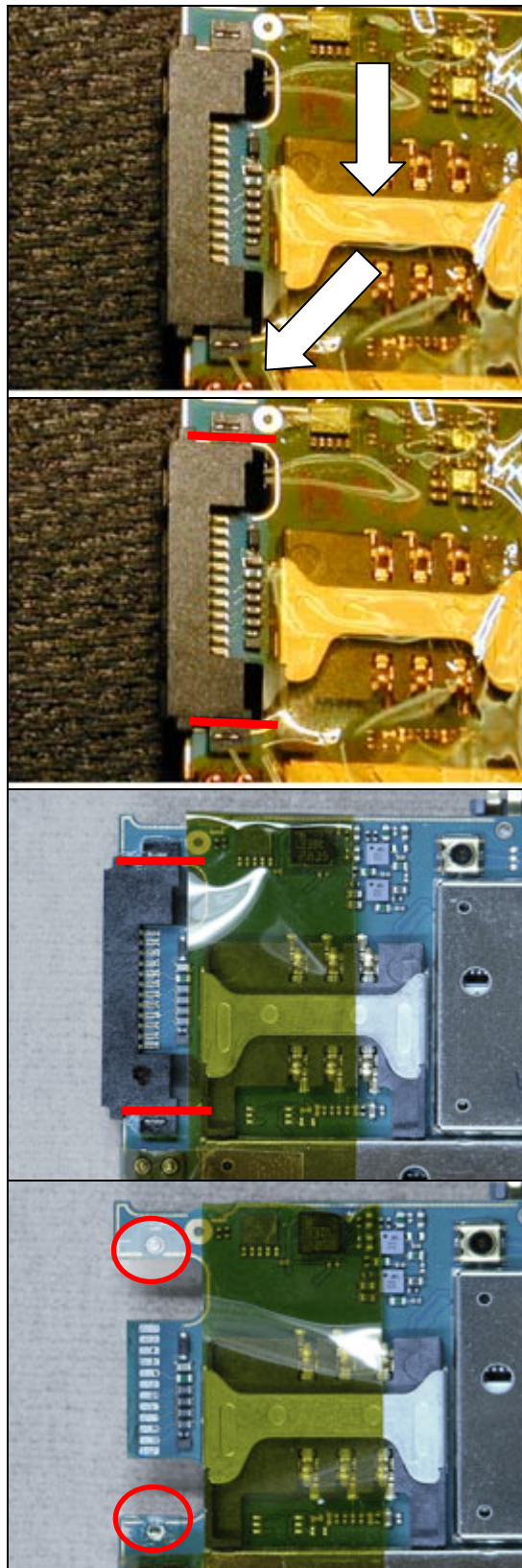
**CAREFUL NOT TO DAMAGE THE PCB WHEN CUTTING THE SYSTEM CONNECTOR**

Cut the system connector with a cutting pliers as shown by red line in picture

Use hot air to remove the connector

**NOTE: UNDERFILL IS ADDED ON PHONES PRODUCED AFTER W838**

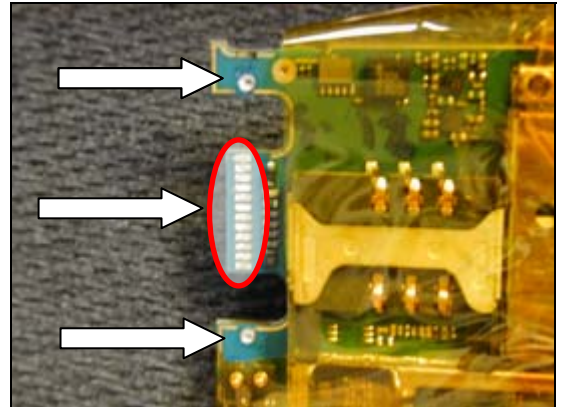
Use hot air and a dentist hook to remove the underfill located as shown in pictures.



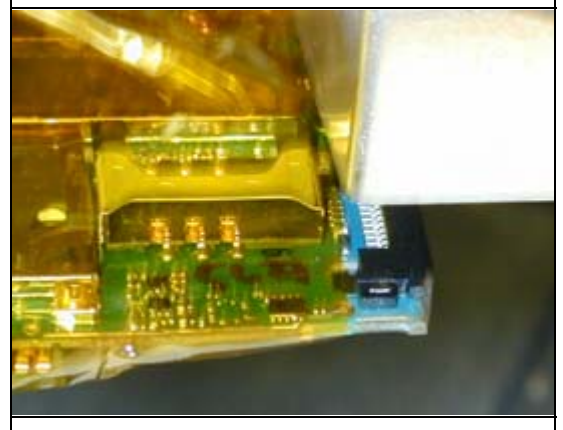


## X2400: System Connector *Continued*

Remove excess solder from holes and pads.



Use BGA equipment and soldering paste to mount the new connector.



## 5 Revision History

Rev.	Date	Changes / Comments
1	2008-May-26	Initial Release
2	2008-12-09	X2400 System Connector: Method changed