



# Working Instruction, Electrical

Applicable for W380, Z555

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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 Lists described 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

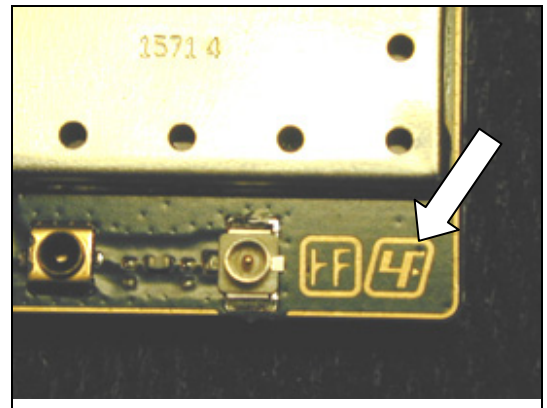
**THIS PRODUCT IS MANUFACTURED WITH LEAD-FREE SOLDER  
AND LEAD-FREE COMPONENTS!**

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 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.





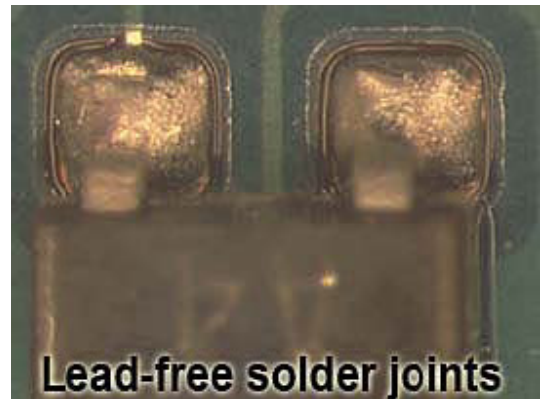
## Lead-free soldering *continued*

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 depending on the BGA replacement equipment.

A nozzle type will be chosen based on the outer size of the actual component.

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

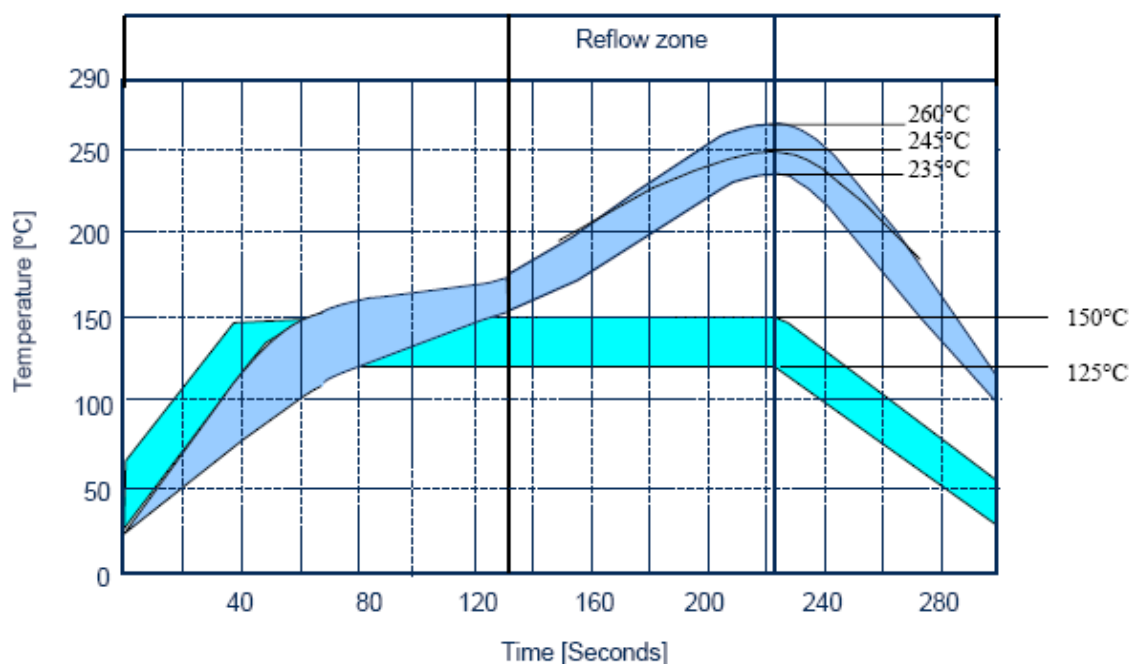
***THESE VALUES ARE RECOMMENDATIONS AND MAY HAVE TO BE CHANGED DEPENDANT ON THE TYPE OF EQUIPMENT!***

***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

### CAUTION

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

### EQUIPMENT

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

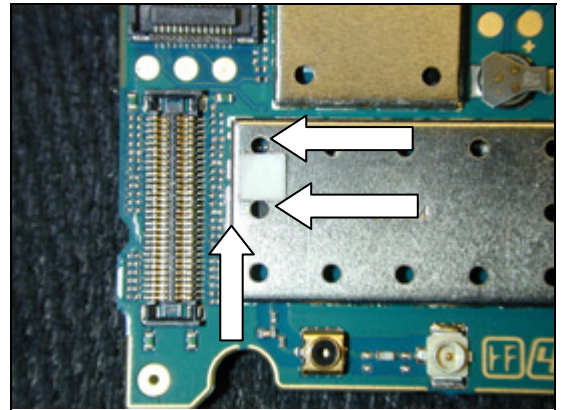
### MECHANICAL INSTRUCTIONS

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



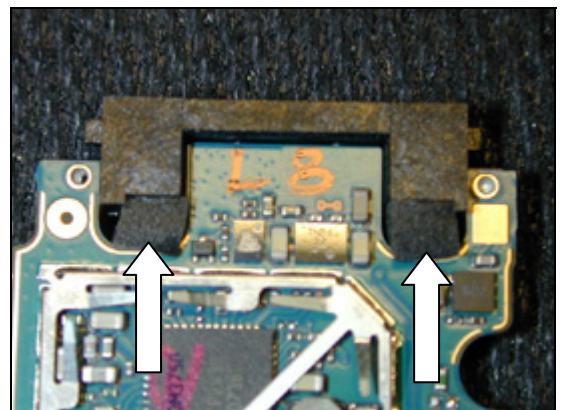
## 4.1 Liquid Intrusion Indicator:

If the liquid Intrusion indicator is damaged or missing, or if the shield lid on E1004 is replaced, then place a new liquid intrusion indicator on the shield lid in the position shown. The indicator should be at the left edge of the lid and centered between the top and middle holes.

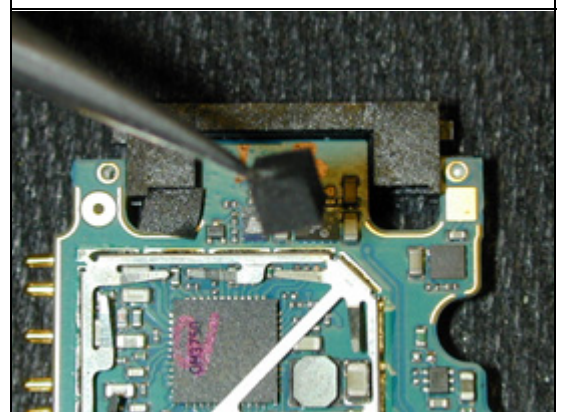


## 4.2 System Connector Gaskets:

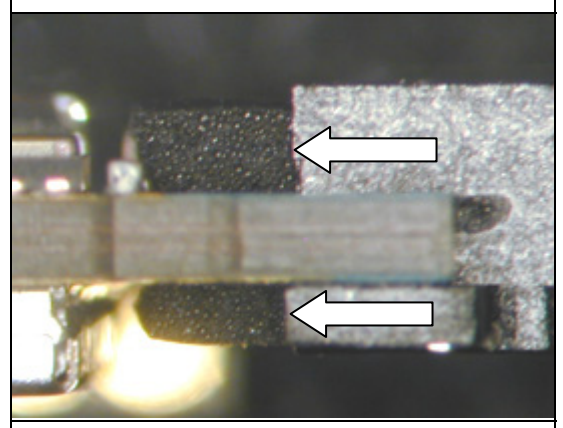
Before repairing parts near the system connector, remove the system connector gaskets.



Use tweezers to pull the gaskets out of the holes.



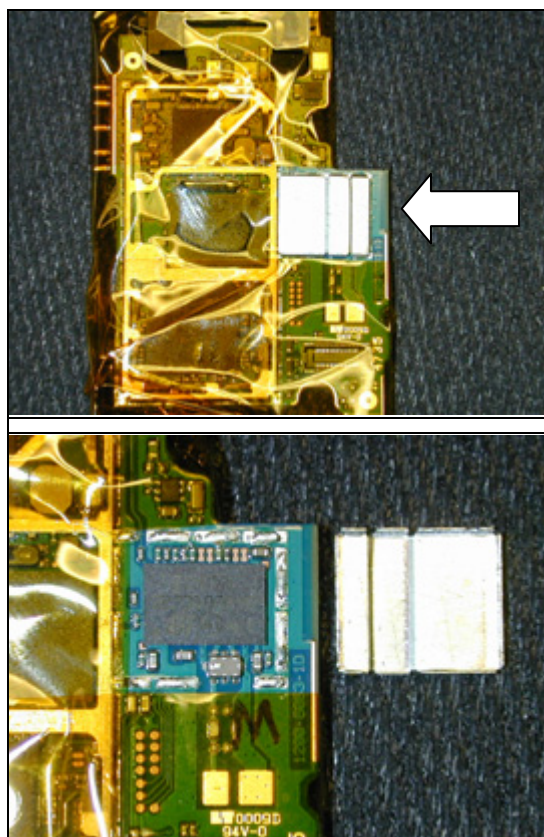
After the PCB cools, replace the gaskets as shown. Position the gaskets such that the amount extending on each side of the PCB is approximately equal.



### 4.3 E1002 Bluetooth Shield Can:

The Bluetooth module is located under a one-piece shield can. Apply heat-resistant tape to the adjacent components.

Use a large hot air device to remove the shield.



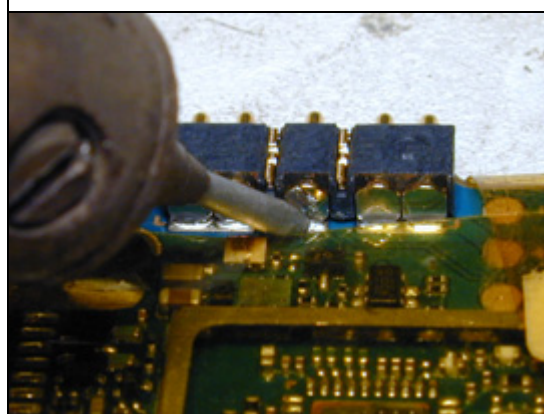
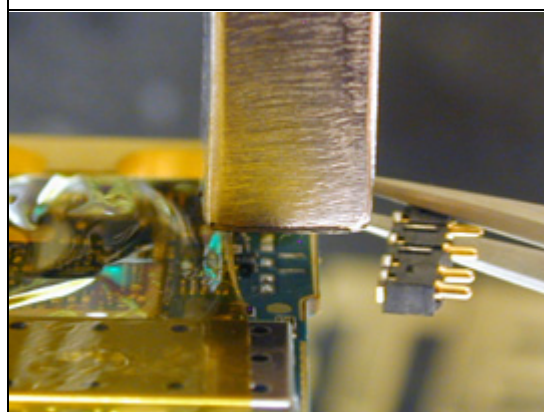
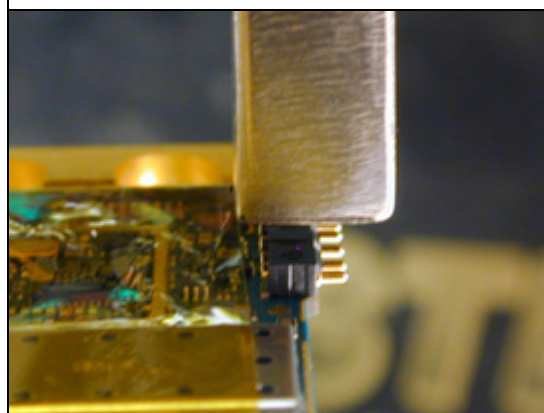
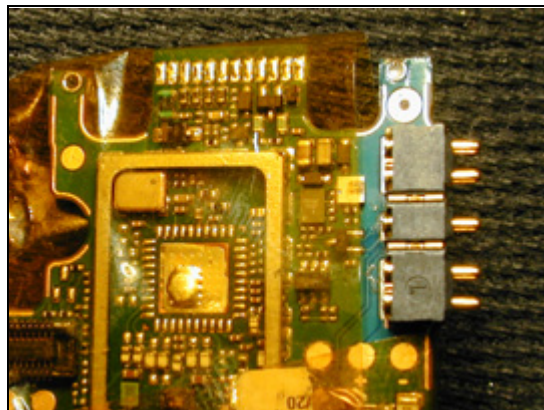
## 4.4 X0616: Battery Connector

Apply heat-resistant tape to protect the adjacent components.

Use a large hot air device to reflow the solder.

Use tweezers to remove the component.

After placing the new part in position, use a soldering iron to solder the leads.



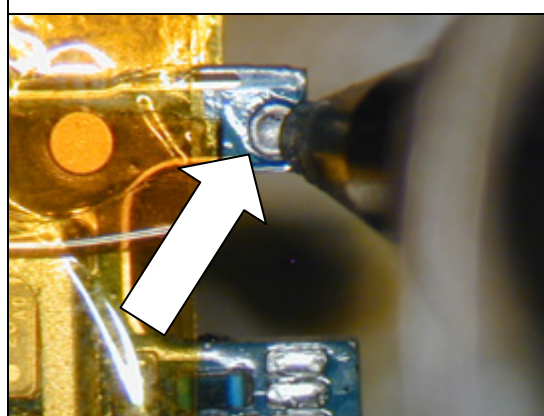
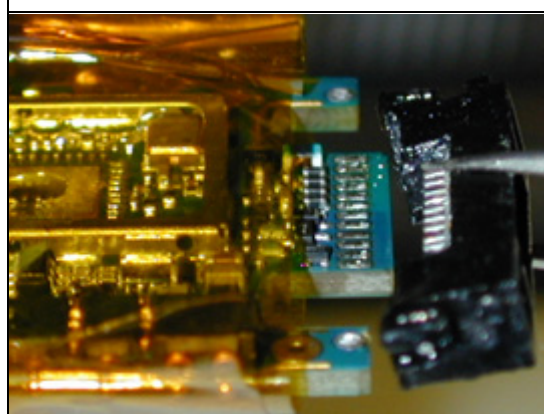
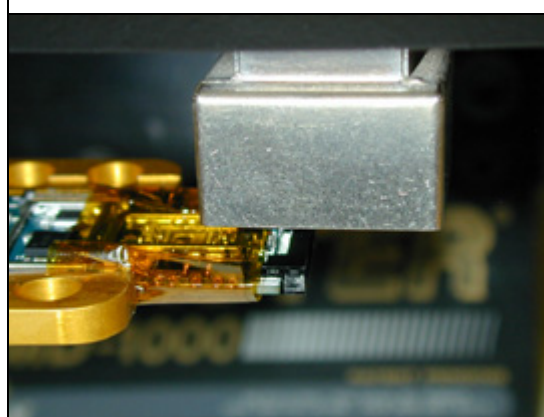
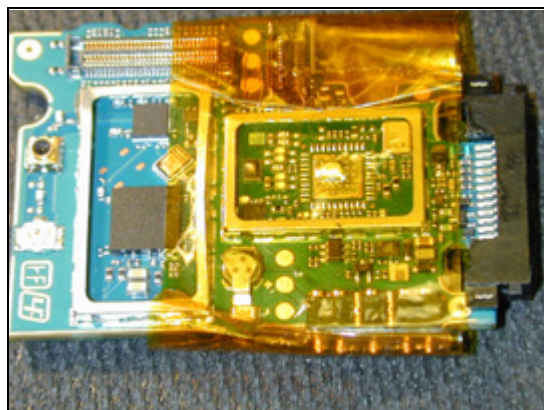
## 4.5 X2600: System Connector

Apply heat-resistant tape to the adjacent components.

Use a large hot air device to reflow the solder.

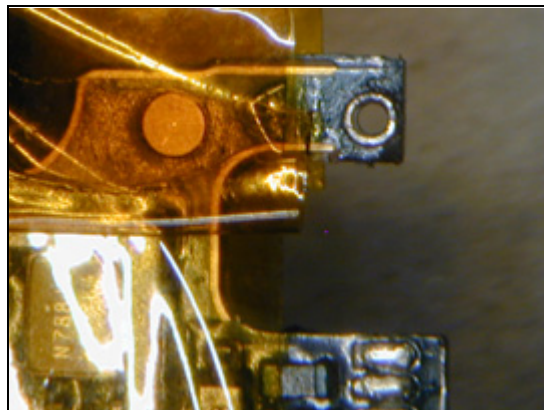
Remove the component.

The two through holes will have excess solder in them.

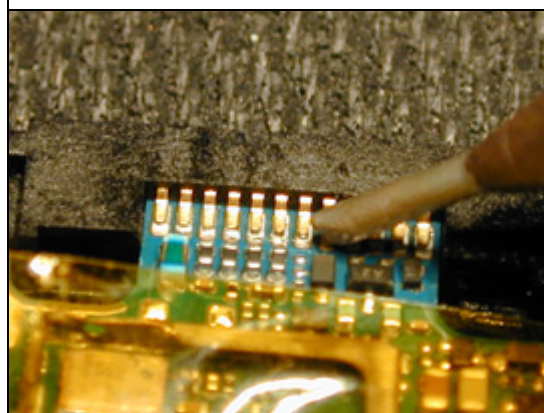


## 4.6 X2600: System Connector *Continued*

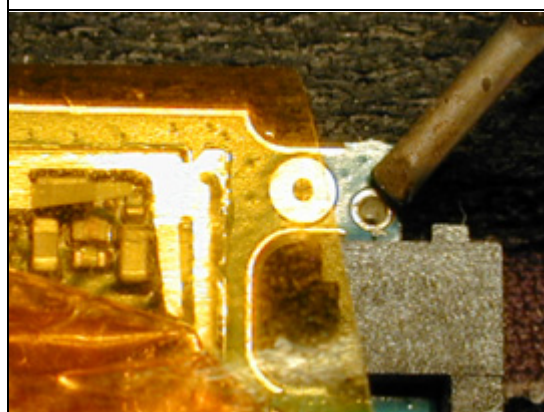
Remove the solder from the through holes.



Place the new part on the board and solder the leads.



Turn the board over and solder the pegs in the holes.





## 4.7 Revision History

Rev.	Date	Changes / Comments
1	2008-Feb-29	Initial Release