



Working Instruction, Electrical

Applicable for MD300

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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

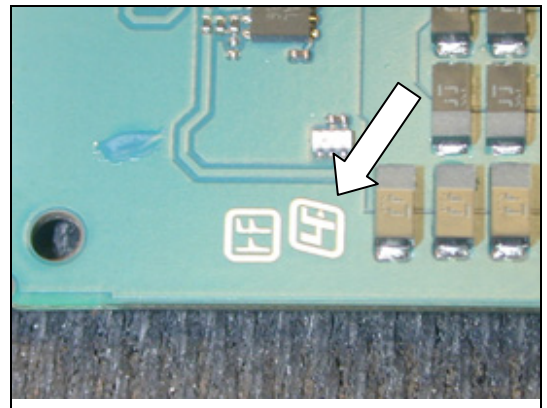
THIS PRODUCT IS MANUFACTURED WITH LEAD-FREE SOLDER AND LEAD-FREE COMPONENTS!

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. They are general recommendations and will need to be adjusted for different products, environments, and equipment.

The solder is secondary but could also affect the parameters. Only SnAgCu (Lead free) alloys, melting point 217°C, are acceptable.

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 dependant on the BGA replacement equipment.

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

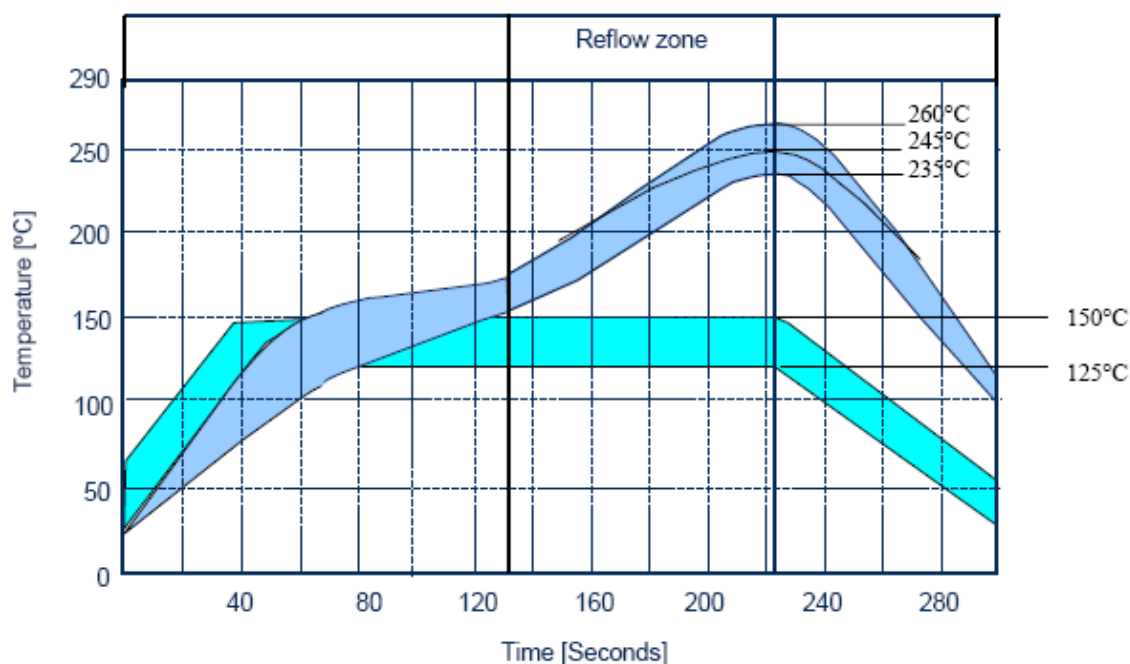
Make sure the nozzle does not affect any adjacent components.

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 ΔT)
Bottom heat temperature	125°C-150°C
Total time	Approx. 4-7 min

4 Replacement of components

EQUIPMENT

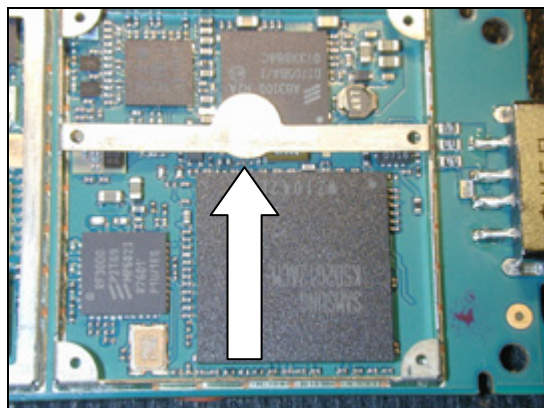
For equipment information, refer to the Electrical and Mechanical Equipment Lists.

MECHANICAL INSTRUCTIONS

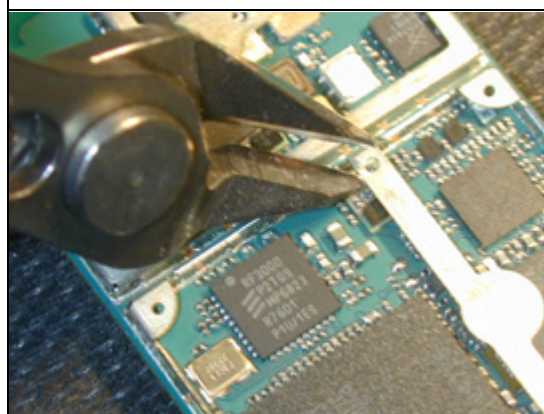
For disassembly and reassembly information, refer to the Mechanical Working Instruction.

4.1 D1000, V600:

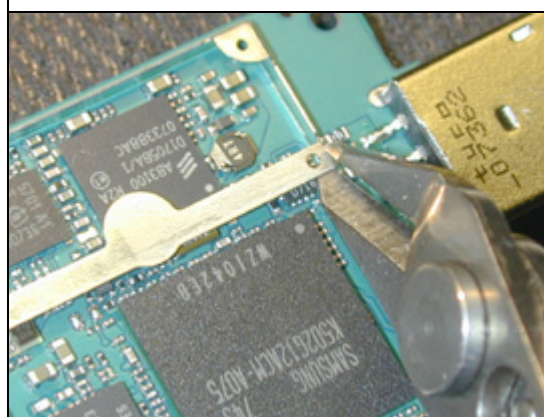
The parts at these positions are under a crossbar of the shield fence.



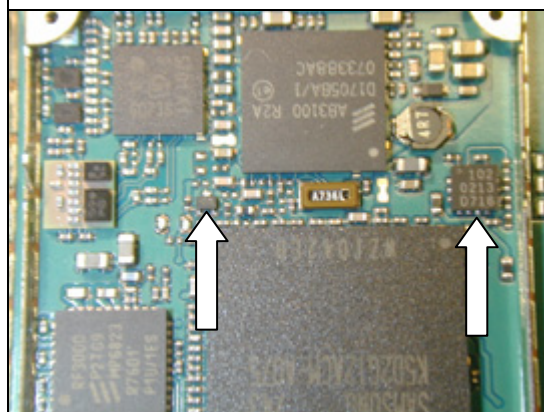
Cut one side of the crossbar as close to the side wall as possible.



Cut the other side of the crossbar as close to the side wall as possible.



The parts may be replaced now.





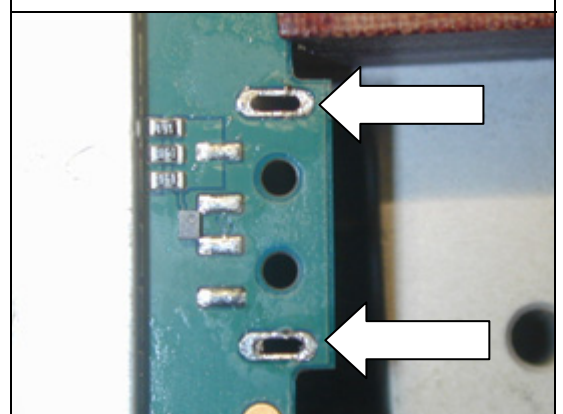
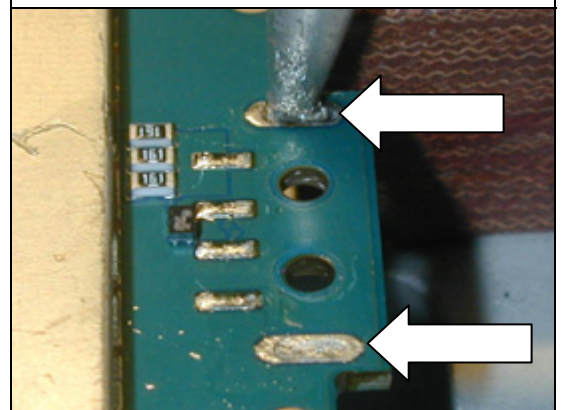
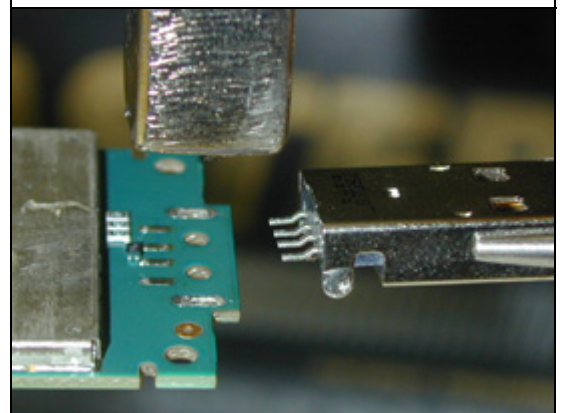
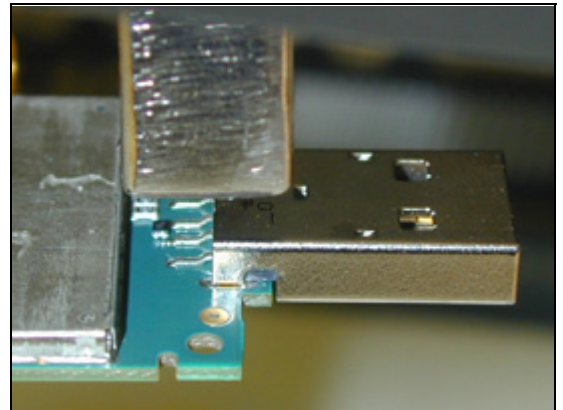
4.2 X1000 USB Connector:

Use a large hot air device to flow the solder.

Remove the part.

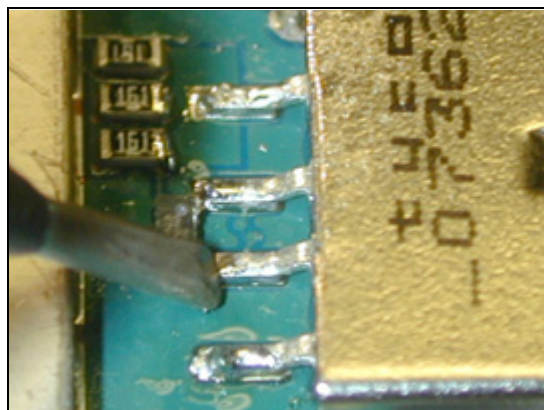
Remove solder from the ground pin holes.

Both ground pin holes need to be cleared.

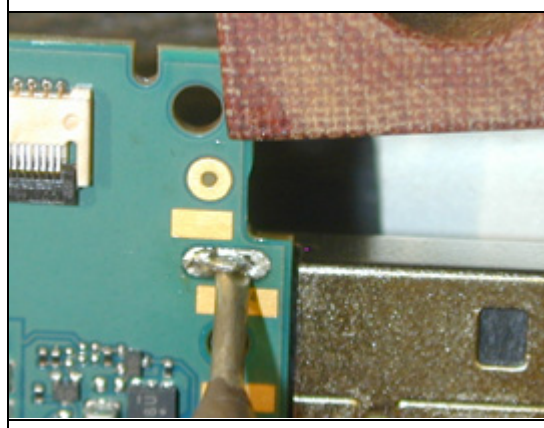


4.3 X1000 USB Connector: *Continued*

Place the new part with the ground pins in the ground pin holes, and then solder the leads.



Turn the PCB over and solder the ground pins,



5 Revision History

Rev.	Date	Changes / Comments
1	2008-Mar-12	Initial Release