



# Working Instruction, Electrical

Applicable for J220 and J230


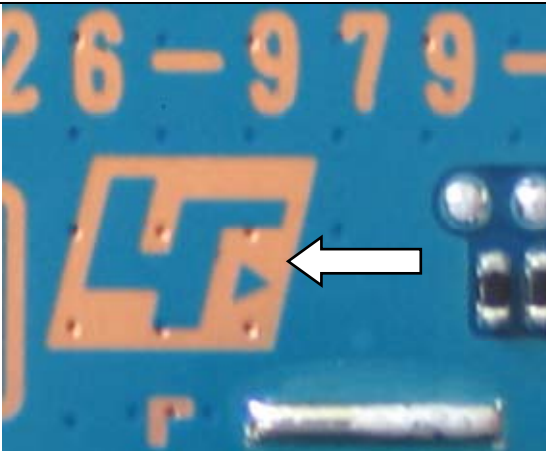

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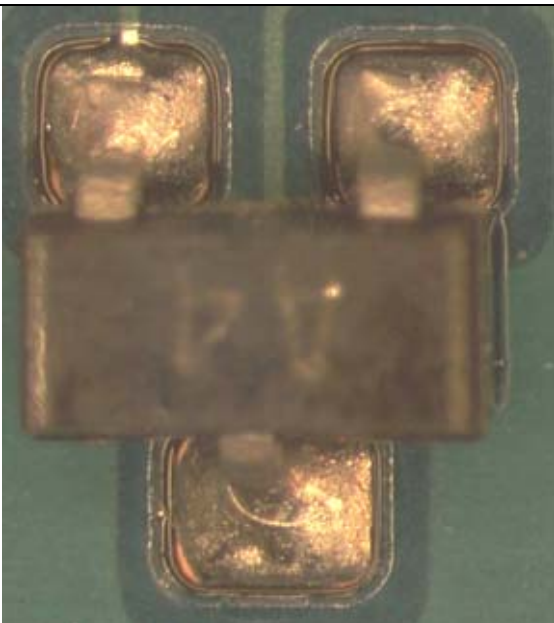

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# 1 Lead free soldering

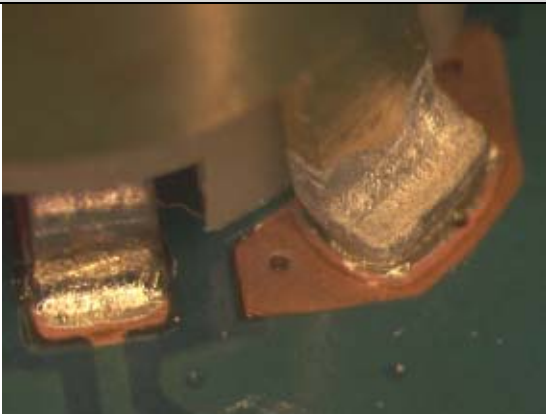
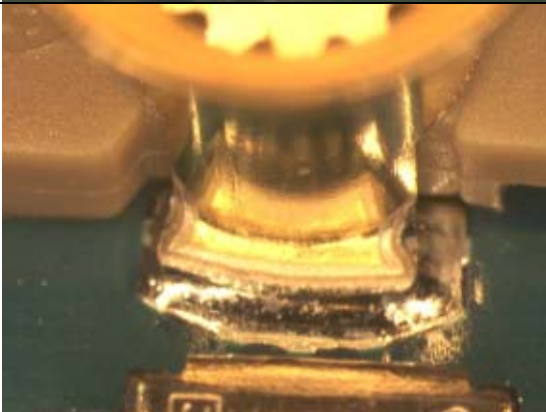
## Instruction

Keep all contact surfaces clean of dirt and fingerprints.

|   | Step-by-Step Instructions   |  |
|---|---|--|
| 1 | <p><b>NOTE!</b></p> <p>This product is manufactured with lead-free solder and lead-free components.</p> <p>During electrical repair, it is critical to make sure that no lead is introduced.</p> <p>The symbol indicates that the product is lead free.</p>   |   |
| 2 | <p>All lead free PBA will be marked with this symbol.</p>   |  |
| 3 | <p>A lead-free work area must be set up that is completely separated from work areas that are used to make leaded repairs.</p> <p>The lead free work area must also be clearly labelled with the lead free symbol as shown in the figure beside.</p> <p>The items in this table must remain lead free. They must be adequately labelled to make their lead-free status clearly and easily recognized.</p> |  |

|   | Step-by-Step Instructions   |  |
|---|---|--|
| 4 | <p><b>NOTE!</b></p> <p>When servicing PBA's that is produced with LFS (Lead free solder paste). LFS <b>MUST</b> used. If not, there is a high risk for unreliable soldering joints.</p> <p>LFS (Lead free solder paste) characteristics:</p> <p>High melting point (Typically 220°C)</p> <p>Low wet ability</p> <p>High surface tension</p> <p>Difficult to spread</p> <p>Recommended tip temperature 370°C</p> |  |
| 5 | <p>Lead-free solder joints are more difficult to inspect because they do not have shiny surfaces like leaded solder joints.</p> <p>Also, lead-free solder does not flow as well as leaded solder, so some of the solder pad area may remain exposed.</p> <p>Example of lead free solder joints.</p>   |   |
| 6 | <p>Example of solder joints with lead.</p>  |  |



|   | Step-by-Step Instructions            |   |
|---|--------------------------------------|---|
| 7 | Example of lead free solders joints. |   |
| 8 | Example of solder joints with lead.  |  |

## 2 BGA Equipment Reflow Profiles

### 2.1 General

This document contains recommendations for reflow profile for mobile phones and similar products. This is only general recommendation 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

### 2.2 Temperature measurement

At least 4 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.

The probes recommended to be soldered on the board but glue and capton tape could also be used if necessary.

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 near placed components.

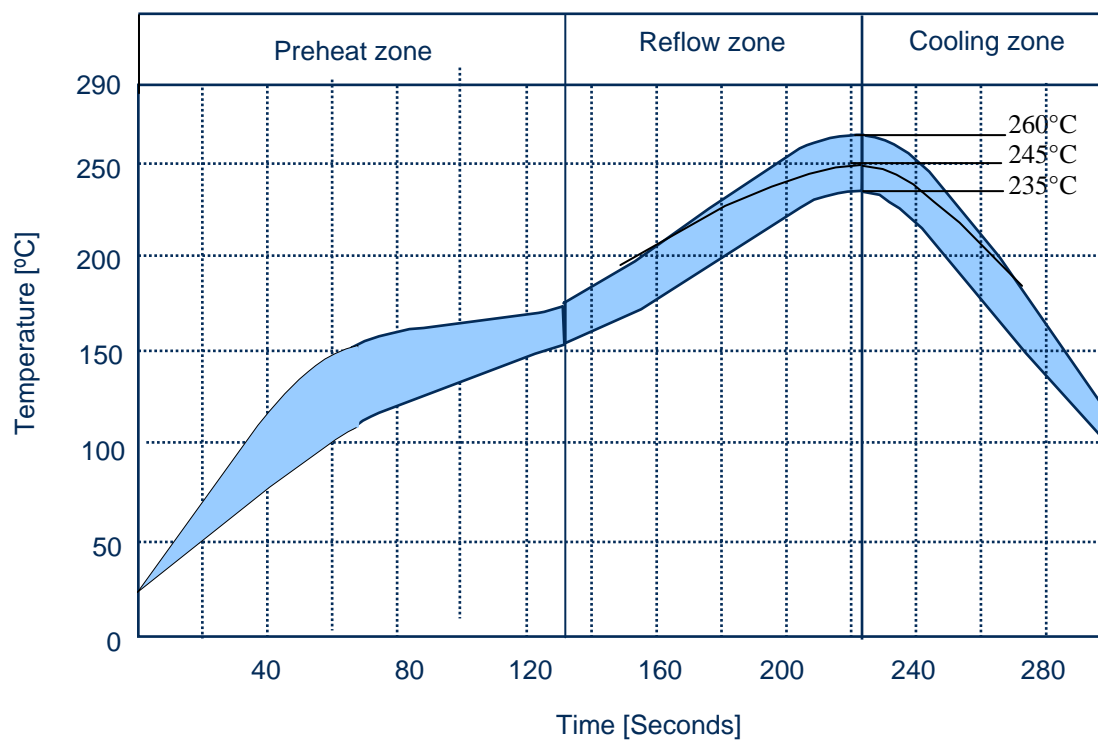
#### NOTE:

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 250C.

## 2.3 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 |
| Total time             | Appr. 4-7 min              |

\* The higher temperature in case the board has extremely high  $\Delta T$ .

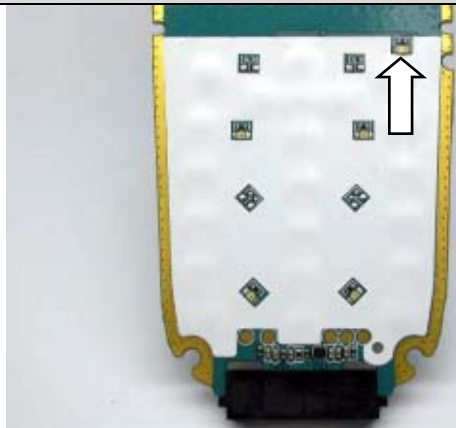
### 3 Replacement of parts

- 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%)  
**Use the soldering tip only for lead free solder paste.**
- Flux, RMA No-clean flux
- Cutting pliers
- Shield fence pliers NTZ 112 537

#### Instruction

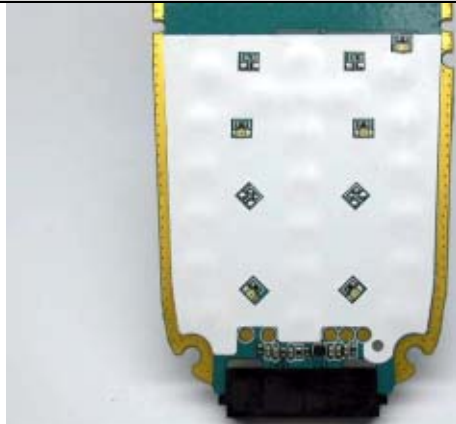
- Keep all contact surfaces clean of dirt and fingerprints.

### 3.1 LED Yellow

|   | Step-by-Step Instructions  |  |
|---|--|--|
| 1 | Replace the LED Yellow.<br>Use the hot air soldering equipment.<br>Recommend the temperature is 370°C. |  |

- Assemble the phone as described in *Working Instruction Mechanical*

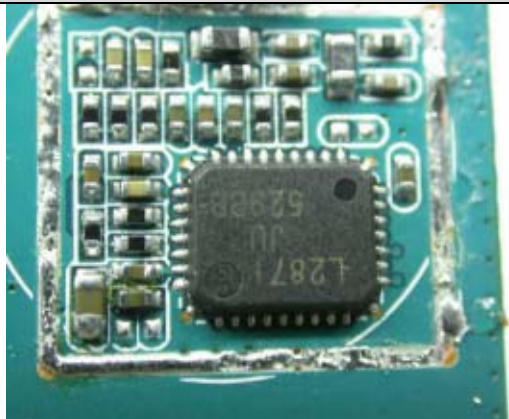
### 3.2 LED Red

|   | Step-by-Step Instructions   |  |
|---|---|--|
| 1 | Replace the LED Red.<br>Use the hot air soldering equipment.<br>Recommend the temperature is 370°C. |  |

- Assemble the phone as described in *Working Instruction Mechanical*

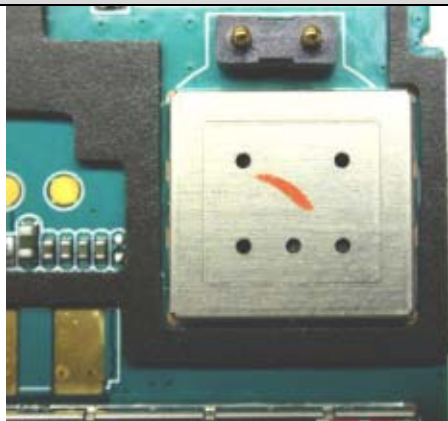


### 3.3 Melody IC

|   | Step-by-Step Instructions                               |  |
|---|---|--|
| 1 | Replace the Melody IC.<br>Use the BGA repair equipment. |  |

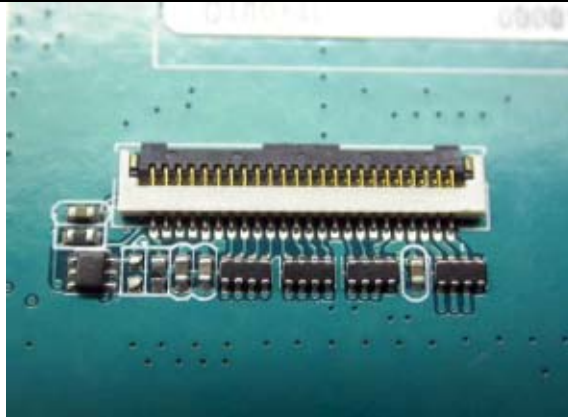
- Assemble the phone as described in *Working Instruction Mechanical*

### 3.4 Melody IC Shielding Can

|   | Step-by-Step Instructions   |  |
|---|---|--|
| 1 | Replace the Melody IC Shielding Can.<br>Use the BGA repair equipment. |  |

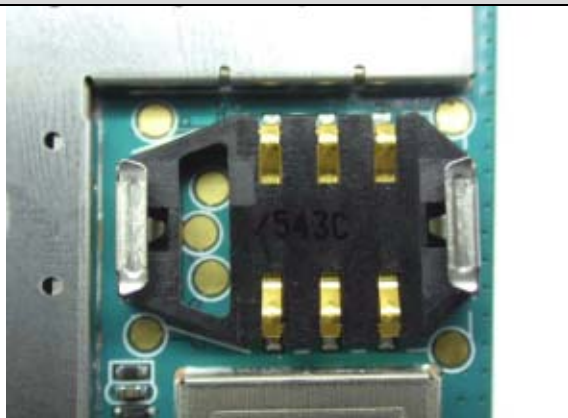
Assemble the phone as described in *Working Instruction Mechanical*

### 3.5 LCD Connector

|   | Step-by-Step Instructions                                   |  |
|---|---|--|
| 1 | Replace the LCD Connector.<br>Use the BGA repair equipment. |  |

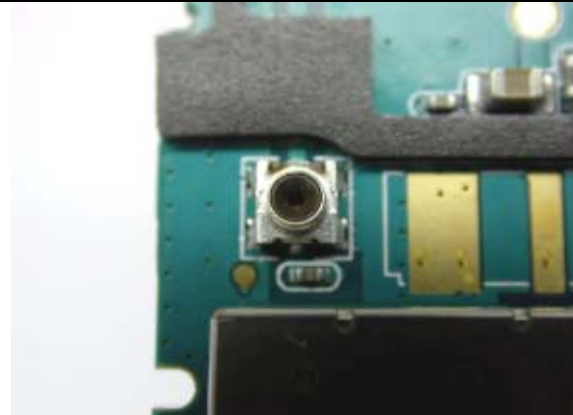
- Assemble the phone as described in *Working Instruction Mechanical*

### 3.6 SIM Connector

|   | Step-by-Step Instructions                                   |  |
|---|---|--|
| 1 | Replace the SIM Connector.<br>Use the BGA repair equipment. |  |

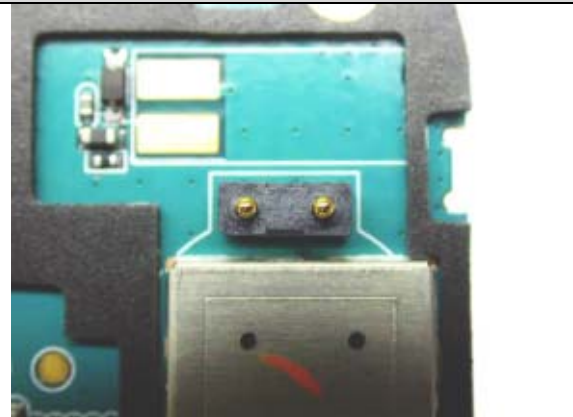
- Assemble the phone as described in *Working Instruction Mechanical*

### 3.7 RF Connector

|   | Step-by-Step Instructions                                  |  |
|---|--|--|
| 1 | Replace the RF Connector.<br>Use the BGA repair equipment. |  |


- Assemble the phone as described in *Working Instruction Mechanical*

### 3.8 Speaker Connector

|   | Step-by-Step Instructions                                       |  |
|---|---|--|
| 1 | Replace the Speaker Connector.<br>Use the BGA repair equipment. |  |

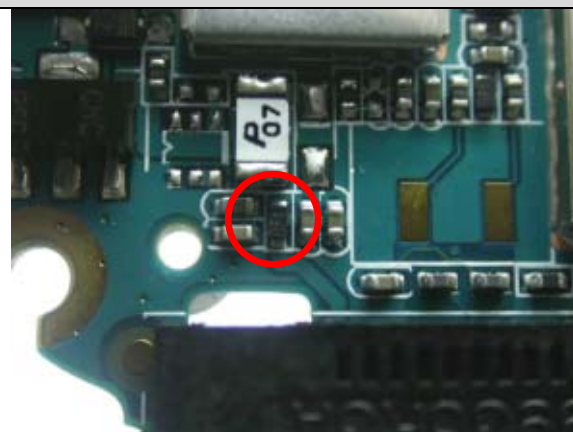
- Assemble the phone as described in *Working Instruction Mechanical*

### 3.9 Antenna Connector

|   | Step-by-Step Instructions                                       |  |
|---|---|--|
| 1 | Replace the Antenna Connector.<br>Use the BGA repair equipment. |  |

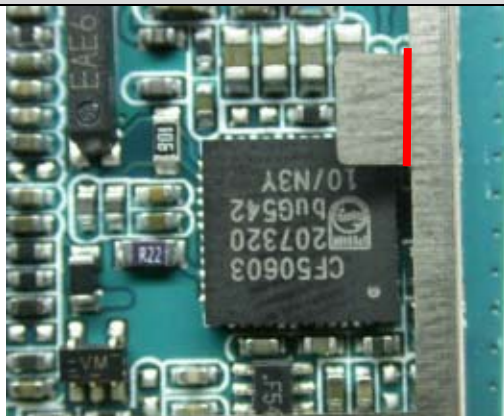
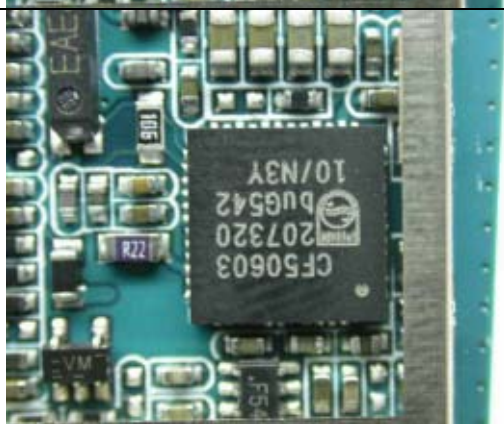
- Assemble the phone as described in *Working Instruction Mechanical*

### 3.10 TVS Diode

|   | Step-by-Step Instructions   |  |
|---|---|--|
| 1 | Replace the TVS Diode.<br>Use the Hot air soldering equipment.<br>Recommend the temperature is 370°C. |  |

- Assemble the phone as described in *Working Instruction Mechanical*

### 3.11 PMU

| Step-by-Step Instructions |  |   |
|---------------------------|--|---|
| 1                         | <p><b>NOTE!</b><br/>Make sure the pliers is sharp-edged enough to prevent the Shield Fence damaged.</p> <p>Remove the Shield Cover.</p> <p>Cut the fence according to the red line in the picture.</p> |   |
| 2                         | <p>Replace the PMU.<br/>Use the BGA repair equipment.</p>  |  |

- Assemble the phone as described in *Working Instruction Mechanical*

## 4 Revision History

| Rev. | Date       | Changes / Comments |
|------|------------|--------------------|
| A    | 2006-03-08 | Initial Release    |