



# Working Instruction Electrical

Applicable for W350

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# 1 Read this first!

## CAUTION

*Keep all contact surfaces clean, no dirt or hand grease!*

*Protect the phone from ESD damages whenever it has been opened by using:*

- *ESD-wristband*
- *ESD-gloves*

## 2 Lead-free soldering

**KEEP ALL CONTACT SURFACES CLEAN OF DIRT AND HAND GREASE!**

**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.



All lead-free PBA's will be marked with this symbol.



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*

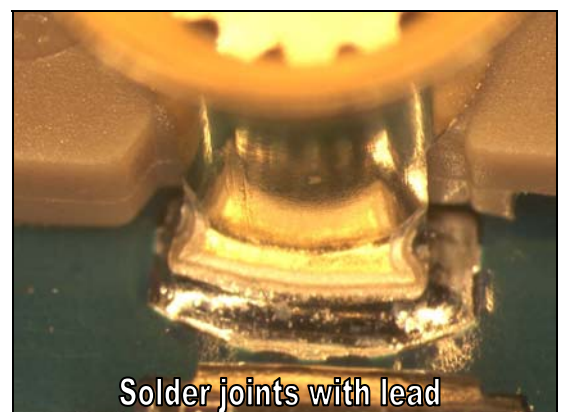
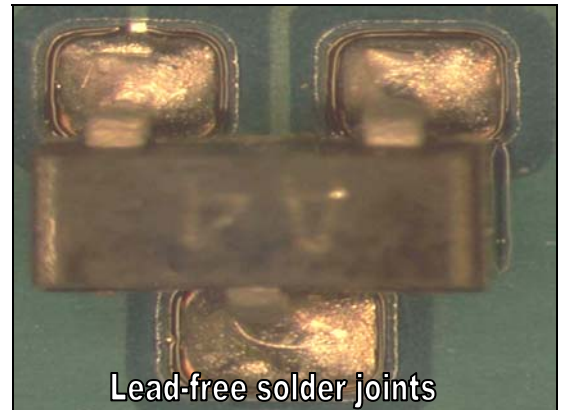
LFS (lead-free solder paste) characteristics:

- High melting point (typically 220°C)
- Low wet ability
- High surface tension
- Difficult to spread
- Recommended tip temperature = 370°C

**WHEN SERVICING PBA'S THAT HAVE BEEN MANUFACTURED WITH LFS (LEAD-FREE SOLDER PASTE), LFS MUST BE USED. IF NOT, THERE IS A HIGH RISK FOR 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 Hot air gun temperature requirements

The air temperature shall not exceed 360°C. The temperature shall be measured 5 mm from the nozzle outlet. If it's not possible to remove and/ or solder with 360°C a BGA Rework Station or another repair process shall be considered to ensure high process control.

Too high temperature can cause damage and cracks due to thermal stress on sensitive components, e.g. ceramic components like capacitors.

### 4 Soldering tip temperature requirements

The soldering tip temperature shall be minimum 310°C and maximum 370°C.

Too high temperature can cause damage and cracks due to thermal stress on sensitive components, e.g. ceramic components like capacitors.

## 5 BGA equipment reflow profiles

### 5.1 General

This section contains reflow profile recommendations for mobile phones and similar

They are just general recommendations and considerations have to be taken for every

The solder is secondary but could also affect the parameters.

In this document one alloy is specified: SnAgCu (Lead free) melting point 217°C

### 5.2 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.

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

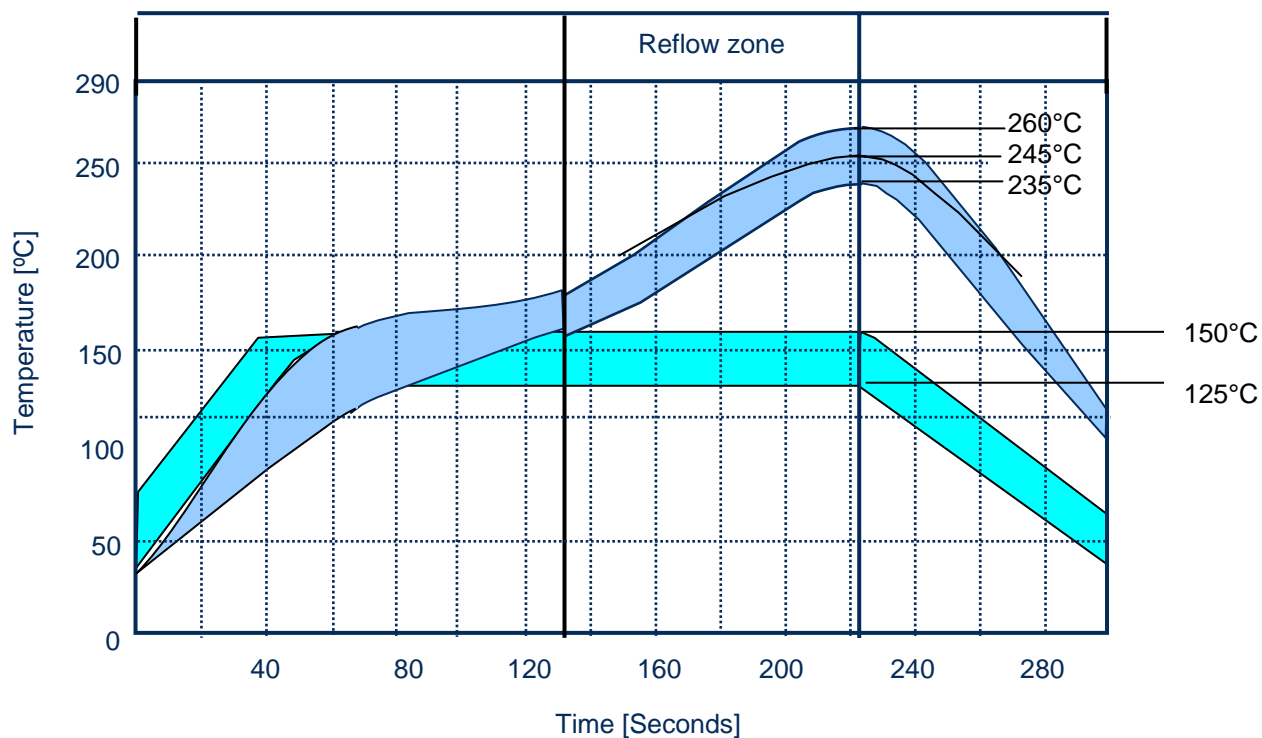
Make sure the nozzle does not affect any nearby placed components.

**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!**

## 5.3 Reflow Profiles

### Sn/Ag/Cu (lead-free)



Ramp rate	< 3°C/sec
Ramp rate cooling	< 4°C/sec
Pre heating time	60-150 sec
Time above liquid	40-70 sec
Minimum temperature	230°C
Maximum temperature	245°C°
Maximum component temperature	260 °C
Time between 230 and 245	30 sec
Board temperature bottom side	160°C-185°C
Total time	Approx. 3-5min

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



## 6 Shield fence instruction

This instruction shows how to cut and bend the shield can fence to be able to replace components under the fence.  
Use a sharp-edged plier to cut the fence.  
Use Shield fence pliers NTZ 112 537 to bend the fence.



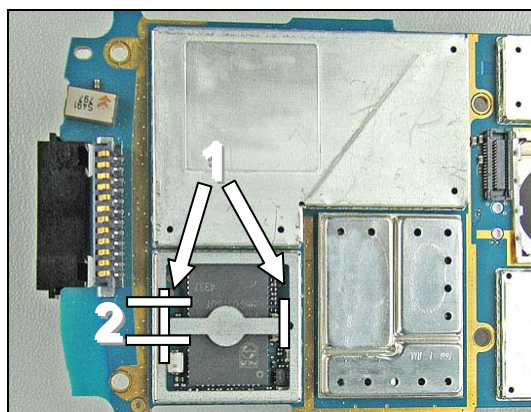
**MAKE SURE THAT CUTTING PLIERS IS SHARP-EDGED TO PREVENT DAMAGING THE SHIELD CAN FENCE.**

Remove the shield can lid, use a dentist hook.

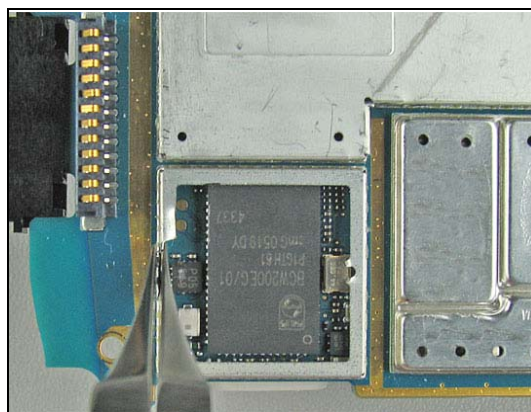
Remove the pick up area according to the white lines with cutting pliers. (1)

This pick up area is only used when machine mounting and there is no need to put it back again.

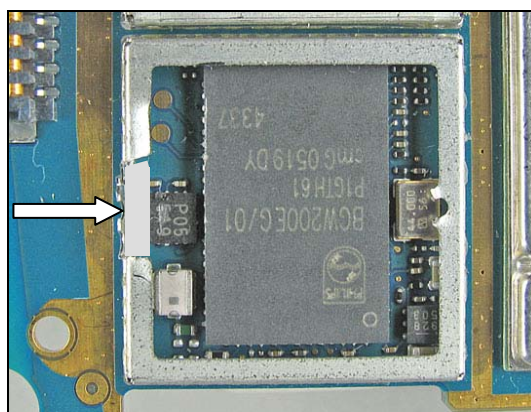
Cut the shield can fence according to the white lines with cutting pliers. (2)



Bend carefully the shield fence with shield fence pliers.  
Replace the components.



Replace the components.  
Bend carefully back the shield fence.  
Put back a **new** shield can lid.  
Press on all sides of the lid until you hear a "click" sound.





## 7 Replacement of components

### EQUIPMENT

- Dentist hook
- Shield fence pliers NTZ 112 537
- Hot air soldering equipment
- Soldering iron
- BGA repair equipment
- Pair of tweezers
- Soldering 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, no dirt or hand grease!***

***Protect the phone from ESD damages whenever it has been opened by using:***

- ***ESD-wristband***
- ***ESD-gloves***

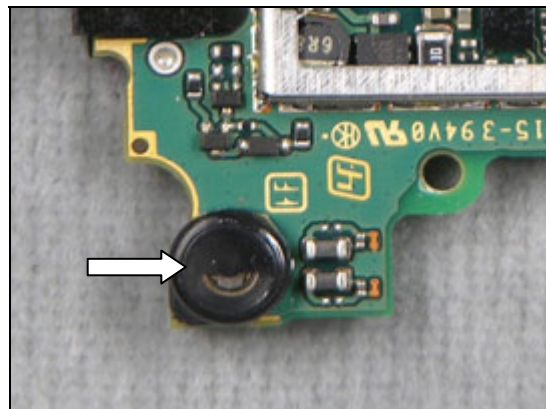
### MECHANICAL INSTRUCTIONS

For all the following part replacements, disassemble and assemble the phone as described in *Working Instruction 1211-3990*

## 7.1 B2201 Microphone

**REMOVE THE MICROPHONE GROMMET AND PROTECT THE OPENING IN THE MICROPHONE WITH CAPTON TAPE**

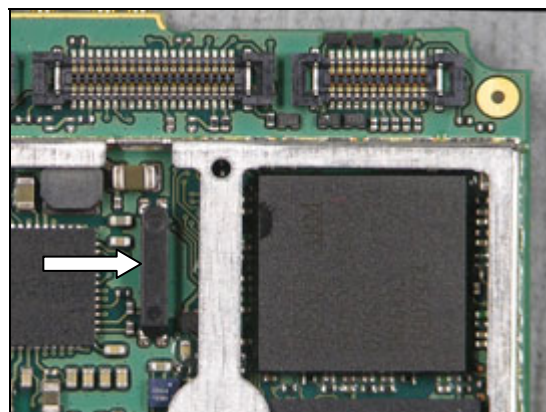
Replace the Microphone with Hot Air repair equipment



## 7.2 B5506 Quartz Crystal (32.768 kHz)

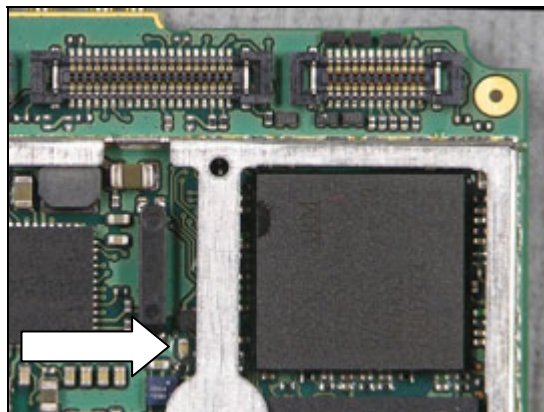
Remove the Quartz Crystal with Hot Air repair equipment

Mount the new Quartz Crystal with Soldering Iron.



### 7.3 C2210 Capacitor Ceramic 470 nF +/-10% 6,3 V

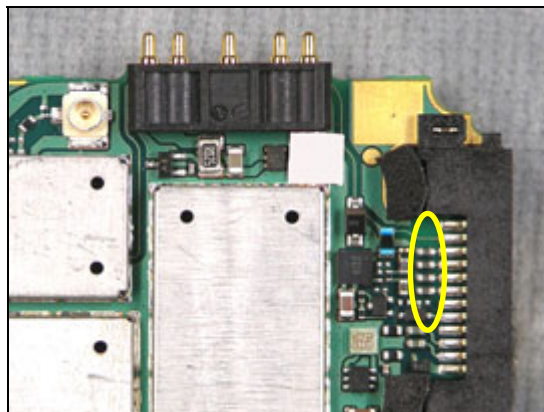
Replace the Capacitor with Hot Air repair equipment



### 7.4 L2601,L2602,L2603 and L2604 Filter 0.0 Hz 0402

**REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

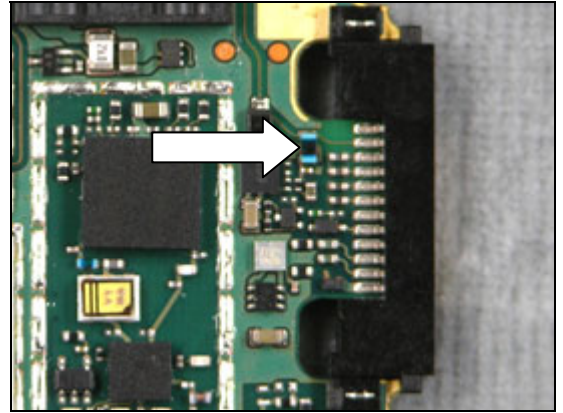
Use Hot Air soldering equipment to replace the Filters.



## 7.5 L2605 Inductor 1kohm

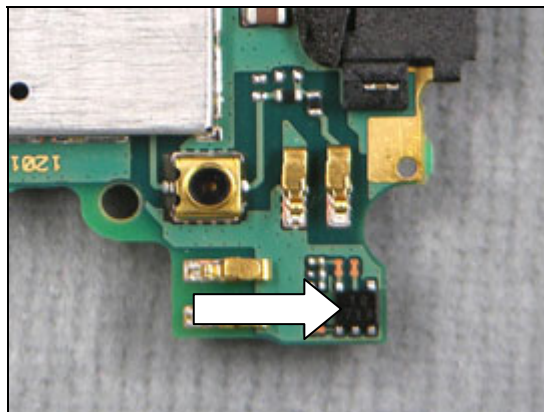
**REMOVE THE GASKET SYSTEMCONNECTOR NEARBY AND  
PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

Use Hot Air soldering equipment to replace the Inductor.



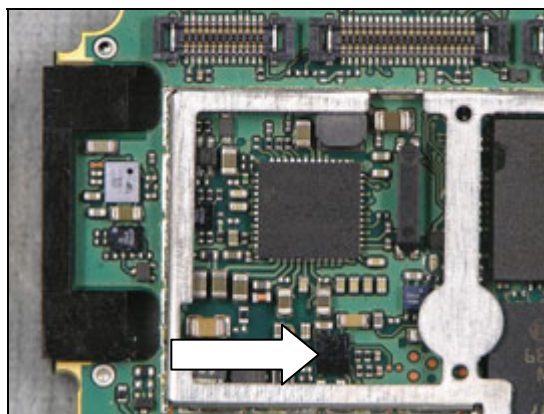
## 7.6 N0320 Flip Sensor

Use Hot Air soldering equipment to replace the Flip Sensor.



## 7.7 N1201 IC LED Driver

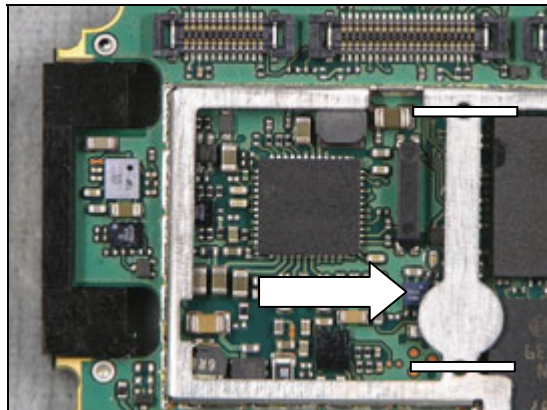
Use Hot Air soldering equipment to replace the IC LED Driver



## 7.8 N2201 IC Audio PA

***CUT THE FENCE AS MARKED IN PICTURE***

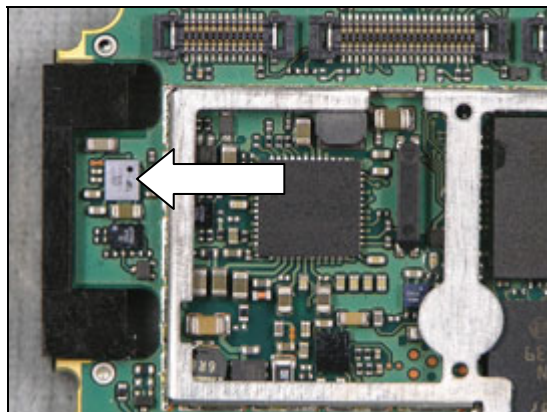
Replace the IC Audio PA with Hot Air soldering equipment



## 7.9 N2203 ASIC Tjatte3 CSP20

***REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE***

Use Hot Air soldering equipment to replace the ASIC Tjatte 3 CSP20.

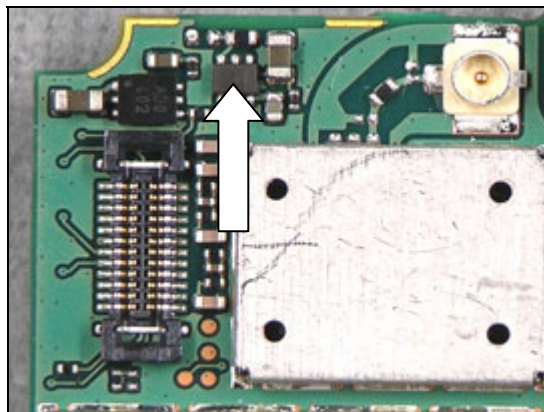




## 7.10 N2503 IC Vreg

**PROTECT THE *BtB* CONNECTOR NEARBY WITH CAPTON TAPE**

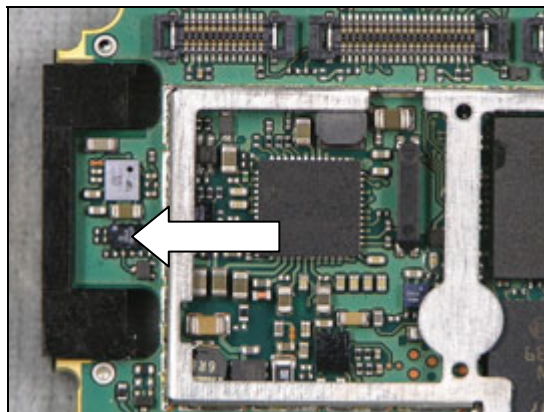
Use Hot Air soldering equipment to replace the IC Vreg



## 7.11 N2601 DUAL Analog Switch DUAL SPDT, 2.0 HighSp

**REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

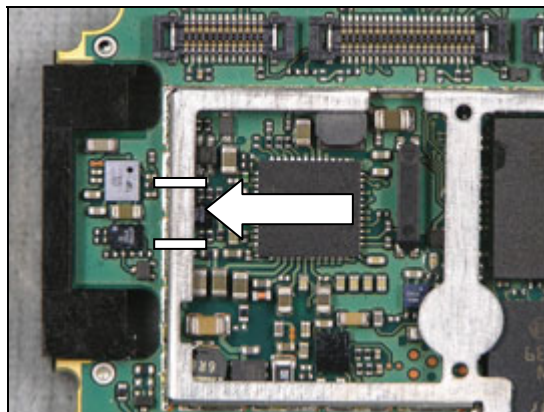
Use Hot Air soldering equipment to replace the DUAL Analog Switch



## 7.12 N2602 DUAL Analog Switch DUAL SPDT, 2.0 HighSp

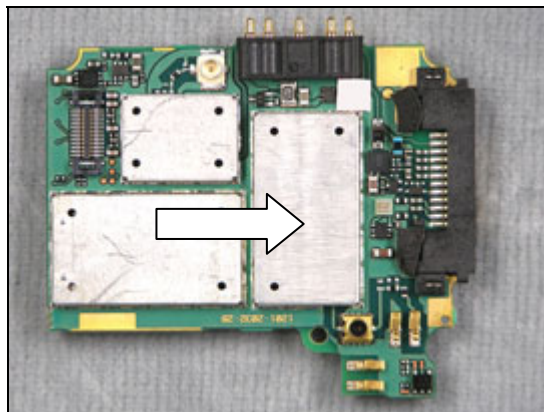
***IF NESSESARY CUT THE FENCE AS MARKED IN PICTURE***

Replace the DUAL Analog Switch with Hot Air soldering equipment

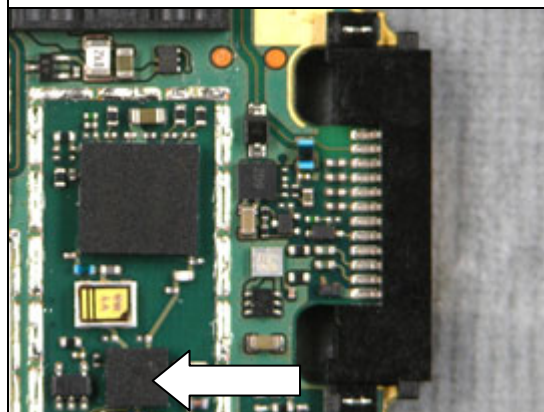


## 7.13 N5301 Quad Band Antenna Switch (GSM/850/900/180)

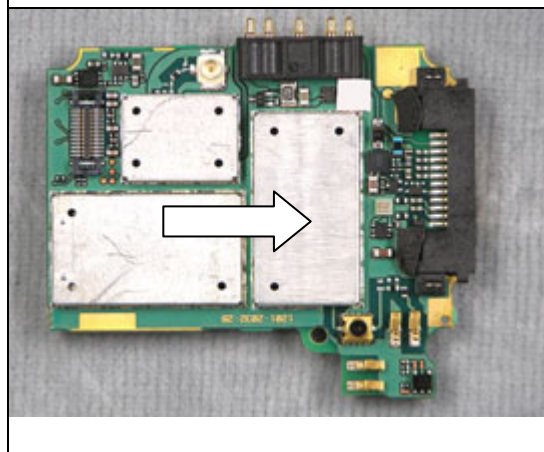
Use BGA soldering equipment to remove the Shield can marked by arrow in picture.



Use BGA soldering equipment to replace the Quad Band Antenna Switch



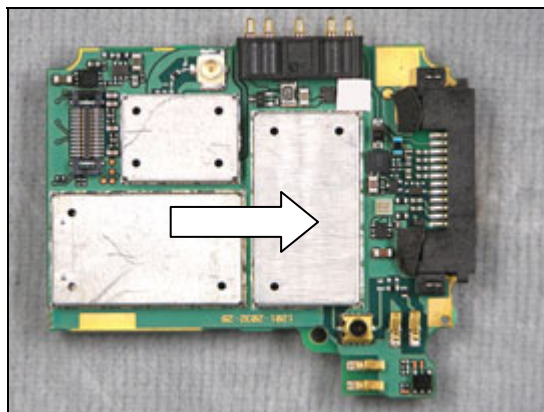
Use BGA soldering equipment to mount the new Shield can



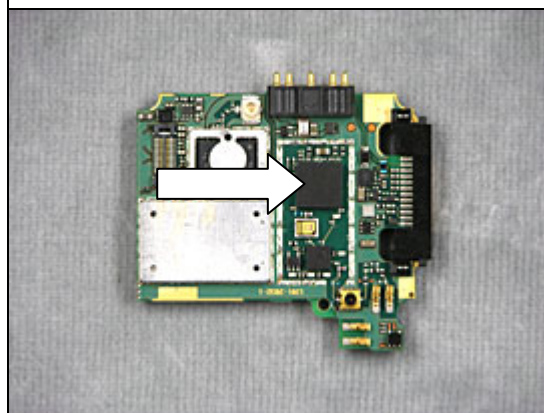
## 7.14 N5700 Mod PA EDGE

### **REMOVE THE GASKET SYSTEMCONNECTORS FIRST**

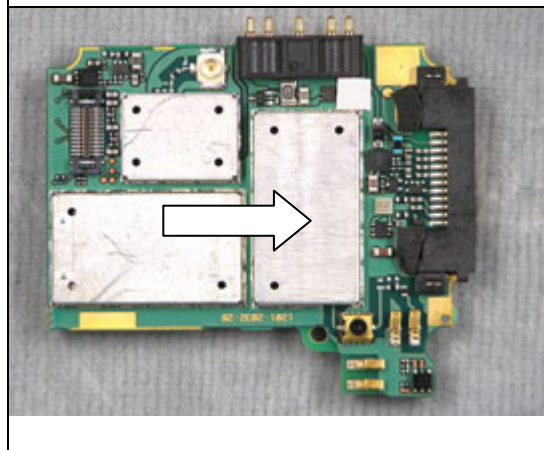
Use BGA soldering equipment to remove the Shield can marked by arrow in picture.



Use BGA soldering equipment to replace the Mod PA EDGE

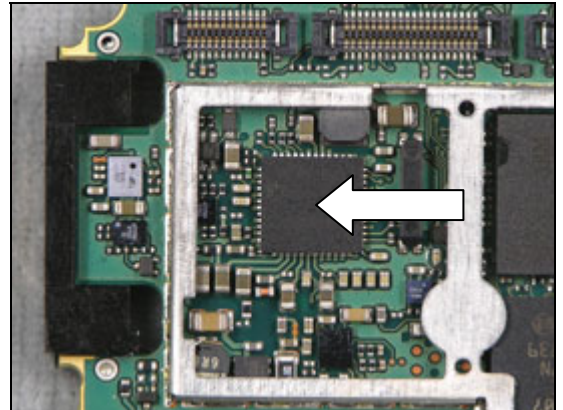


Use BGA soldering equipment to mount the new Shield can



## 7.15 N7520 ASIC Power Management

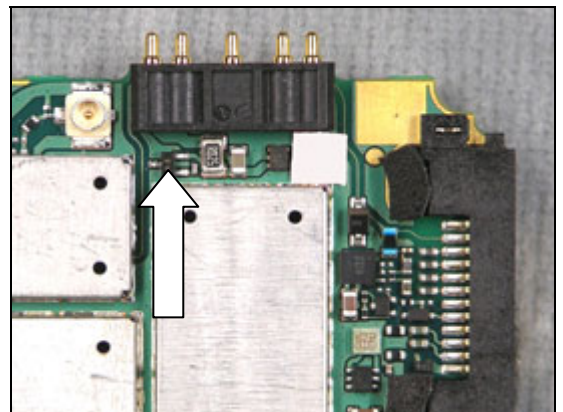
Use BGA soldering equipment to replace the ASIC Power Management



## 7.16 V0302 ESD Diode

***USE CAPTON TAPE TO PROTECT THE CONN POGOPIN PLUG 5P***

Replace the Diode Protection with Hot air soldering equipment

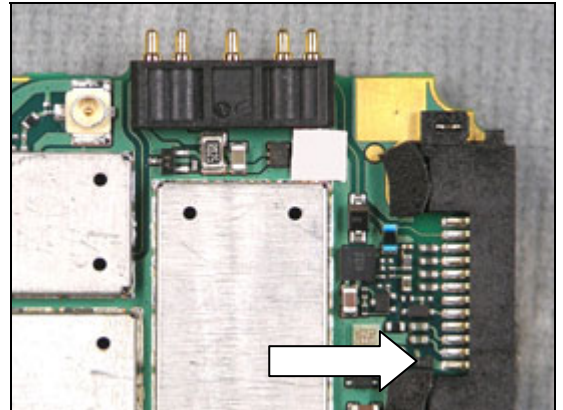




## 7.17 V0611 Diode Protection 15.0 V SOD882

**REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

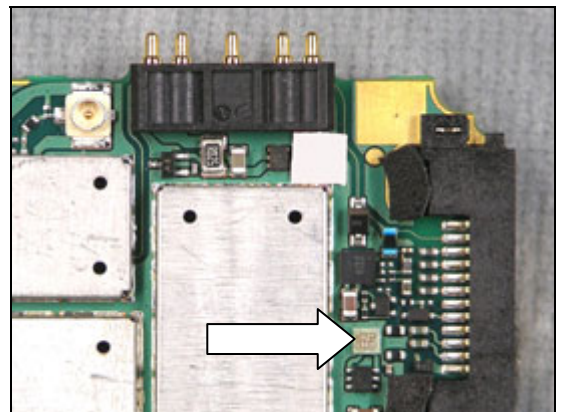
Replace the Diode Protection 15.0 V SOD882 with Hot air soldering equipment



## 7.18 V0636 Transistor

**REMOVE THE GASKET SYSTEMCONNECTORS BEFORE REPLACING THE TRANSISTOR**

Replace the Transistor with Hot air soldering equipment

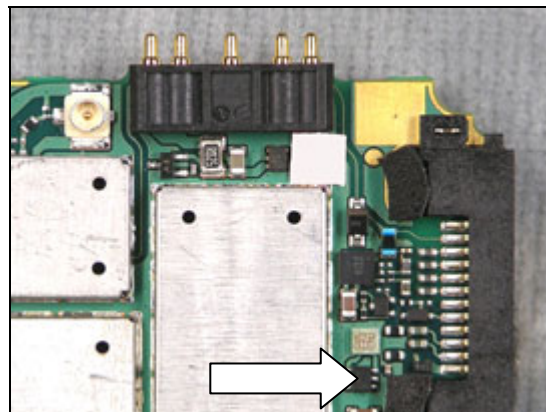




## 7.19 V0637 Diode Schottky

**REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

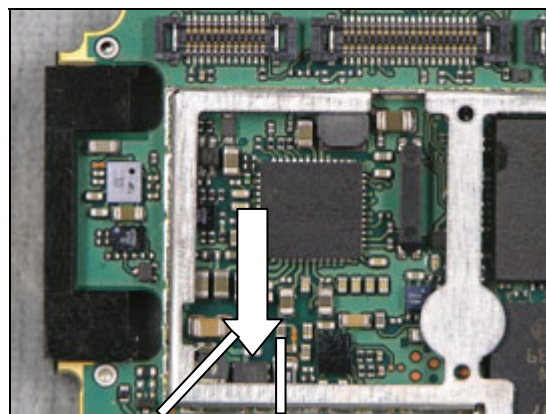
Replace the Diode Schottky with Hot air soldering equipment



## 7.20 V1220 MOSFET & Schottky Diode

**IF NESSESARY CUT THE FENCE AS MARKED IN PICTURE  
SEE CHAPTER 6 SHIELD FENCE INSTRUCTION**

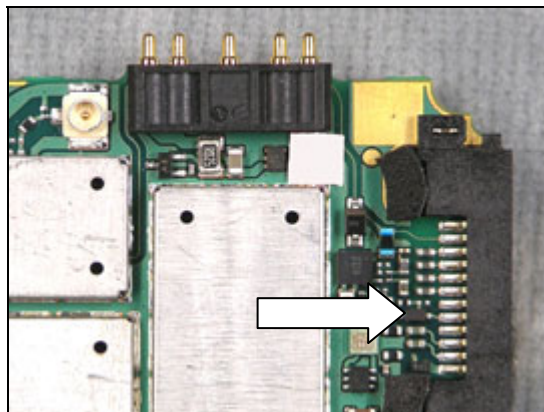
Replace the MOSFET & Schottky Diode with Hot air soldering equipment



## 7.21 V2611 DIODE/ESD Protector 5.6 V

**REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

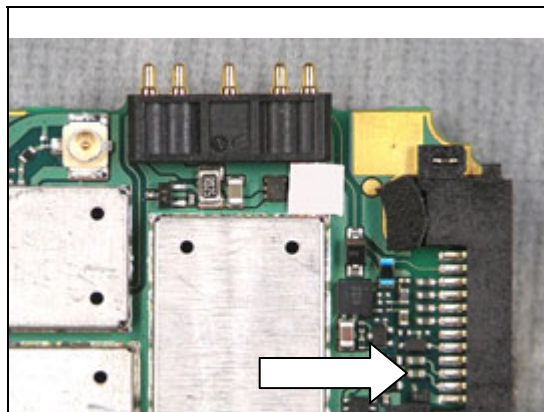
Replace the DIODE/ESD Protector 5.6 V with Hot air soldering equipment



## 7.22 V2613 ESD Protection

**REMOVE THE GASKET SYSTEMCONNECTORS AND PROTECT THE SYSTEM CONNECTOR WITH CAPTON TAPE**

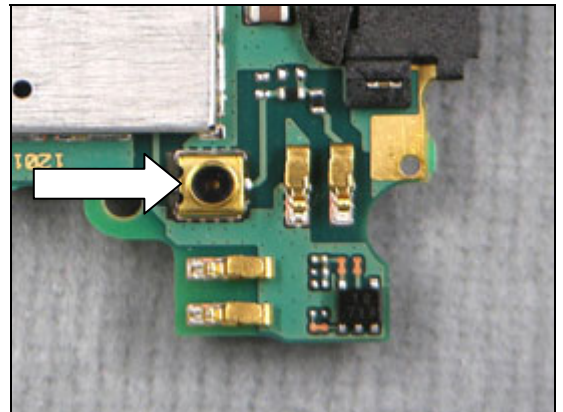
Replace the ESD Protector with Hot air soldering equipment



## 7.23 W5301 RF Connector

Remove the RF Connector with Hot air soldering equipment

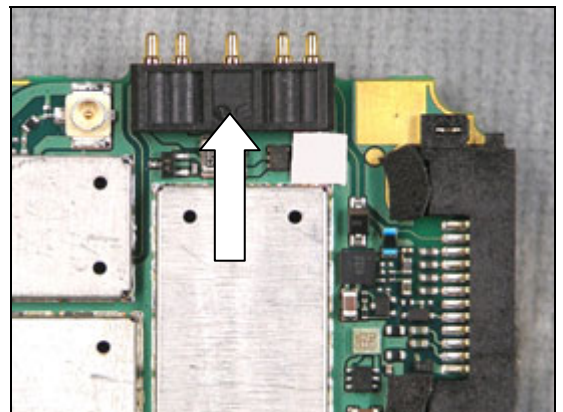
Mount the new RF Connector with Soldering iron



## 7.24 X0616 Conn Pogopin Plug 5p

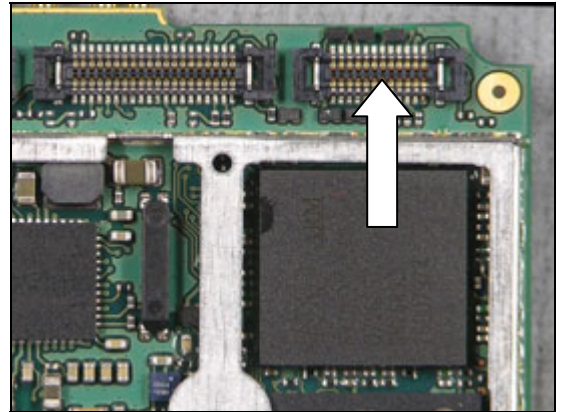
**REMOVE THE GASKET SYSTEMCONNECTORS**

Use BGA repair equipment to replace the Conn Pogopin 5P



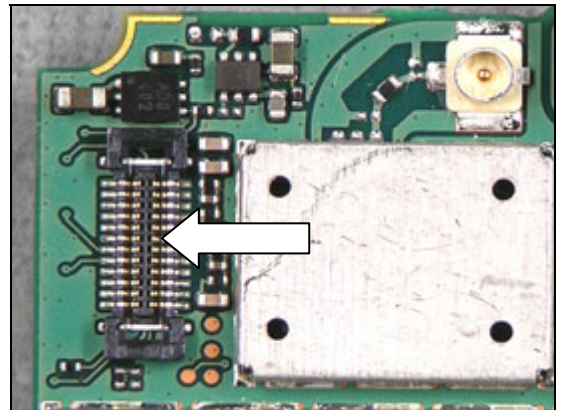
## 7.25 X1101 Conn BtB 24 pin

Use BGA repair equipment to replace the Conn BtB 24 pin



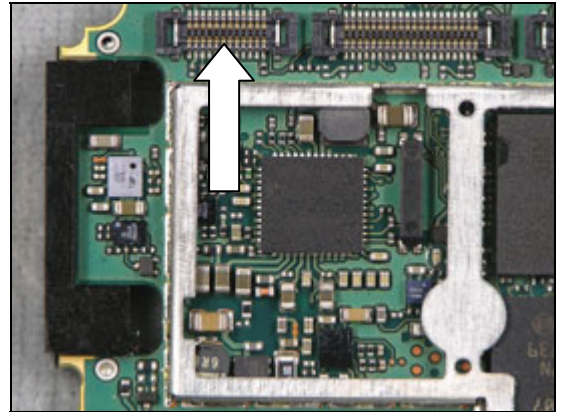
## 7.26 X1102 Conn BtB 24 pin

Use BGA repair equipment to replace the Conn BtB 24 pin



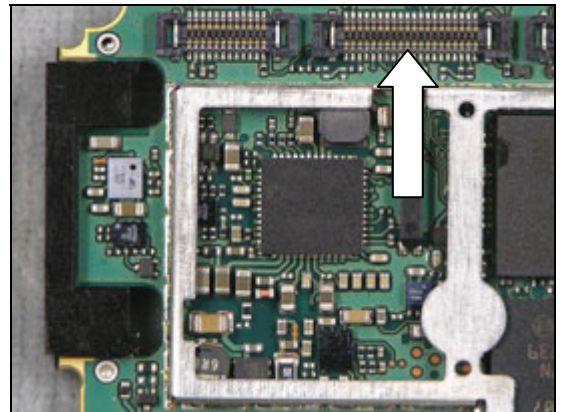
## 7.27 X1201 Conn BtB 24 pin

Use BGA repair equipment to replace the Conn BtB 24 pin



## 7.28 X1202 Conn BtB 40 pin

Use BGA repair equipment to replace the Conn BtB 40 pin

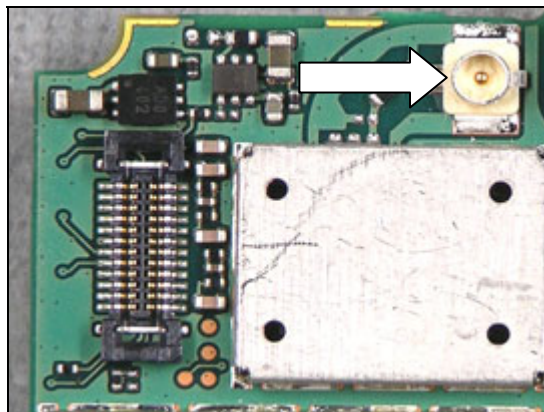




## 7.29 X2501 Coax Connector

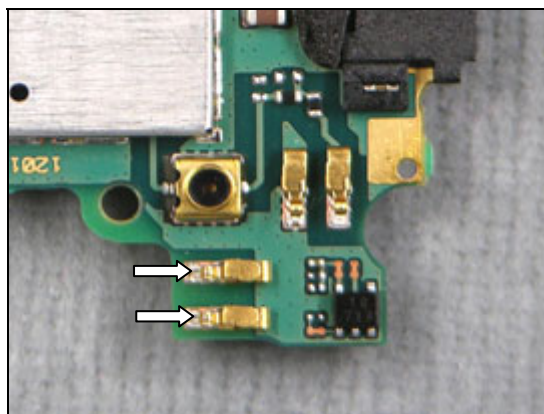
Use Hot Air soldering equipment to remove the Antenna Connector

Use soldering Iron or Hot Air soldering equipment to mount the new Antenna Connector



## 7.30 X2203,X2204 Antenna Connector (speaker connectors)

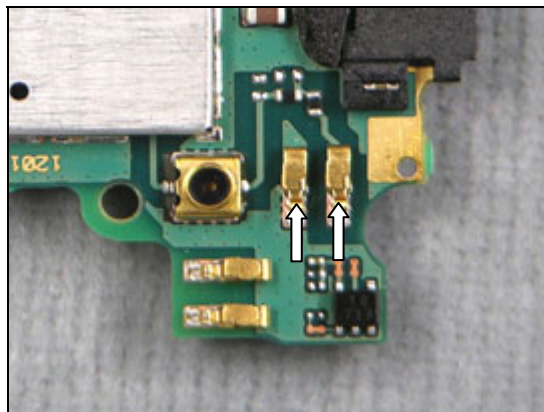
Use Hot Air soldering equipment to replace the Antenna Connectors.





## 7.31 X5300,X5301 Antenna Connector

Use Hot Air soldering equipment to replace the Antenna Connectors.



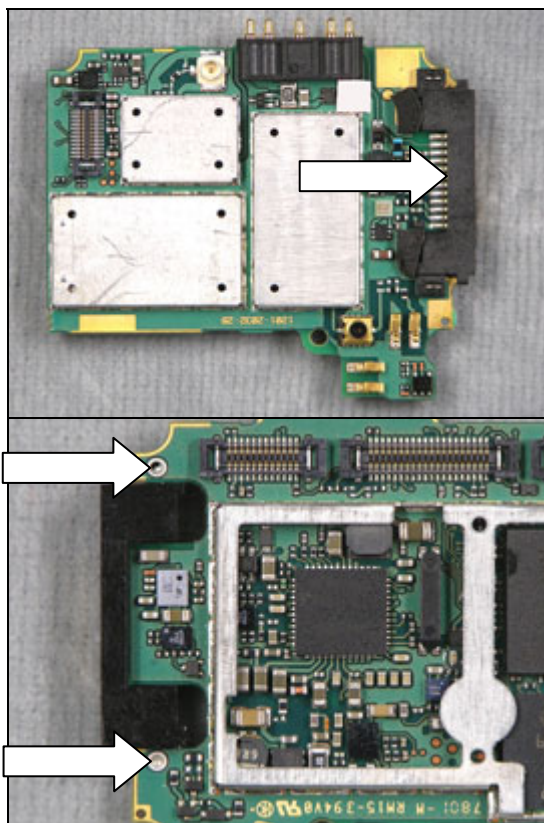
## 7.32 X2600 12p System Connector

### ***REMOVE THE GASKET SYSTEMCONNECTORS***

Remove the 12p System Connector with Hot Air soldering equipment

Mount a new System Connector with Soldering Iron

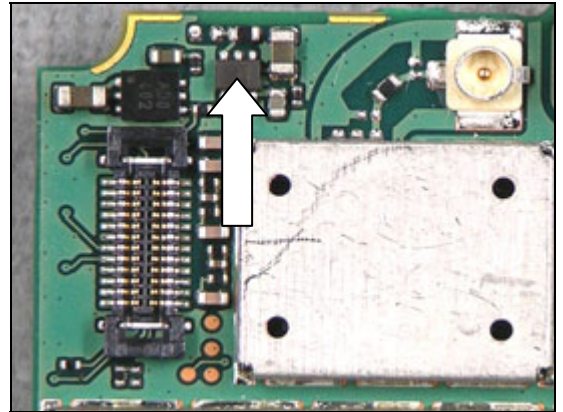
***USE A SOLDERING IRON TO SOLDER THE PINS THAT SECURES THE SYSTEM CONNECTOR***



## 7.33 N2503 IC Vreg

***PROTECT BTB CONNECTOR NEARBY WITH CAPTON TAPE***

Use Hot Air soldering equipment to replace the IC Vreg



## 8 Revision history

Rev.	Date	Changes / Comments
1	2008-05-06	First release