



Working Instruction, Electrical

Applicable for S500, W580

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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 listed 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

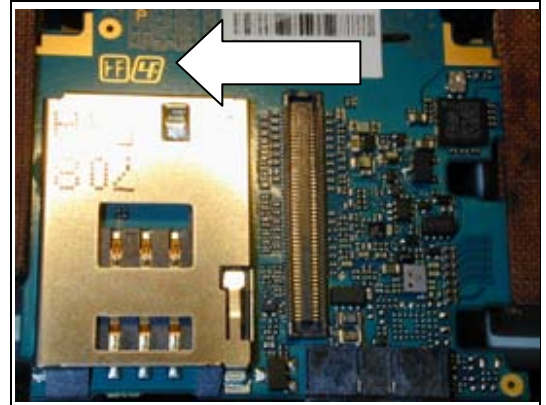
THIS PRODUCT IS MANUFACTURED WITH LEAD-FREE SOLDER AND LEAD-FREE COMPONENTS!

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 above the SIM connector.



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.

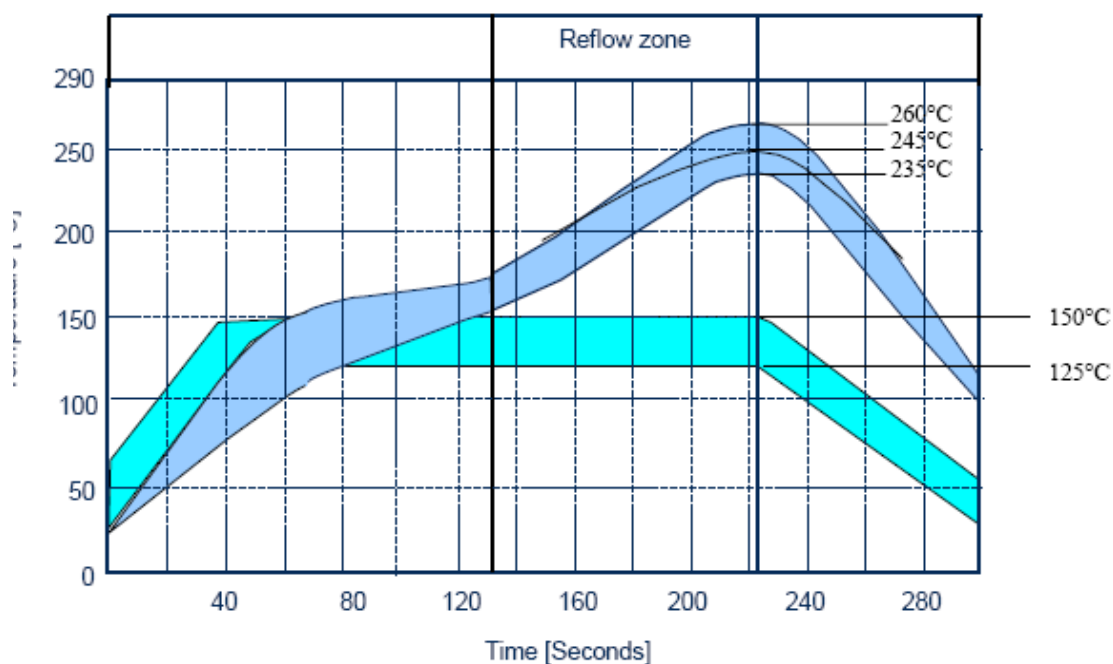
THESE VALUES ARE RECOMMENDATIONS AND MAY HAVE TO BE CHANGED DEPENDANT ON THE TYPE OF EQUIPMENT!

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 ΔT)
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 Equipment List.

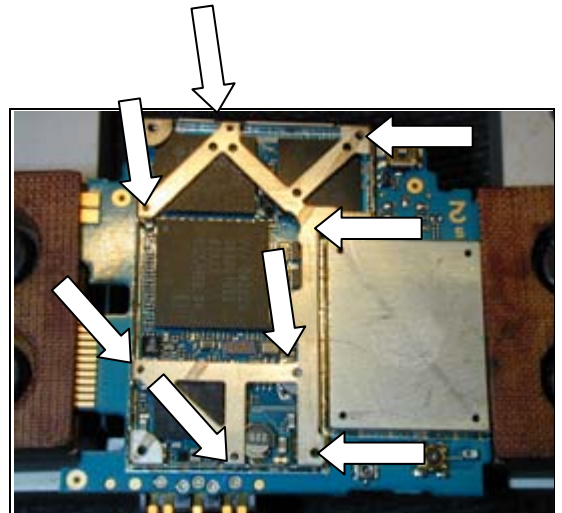
MECHANICAL INSTRUCTIONS

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

4.1

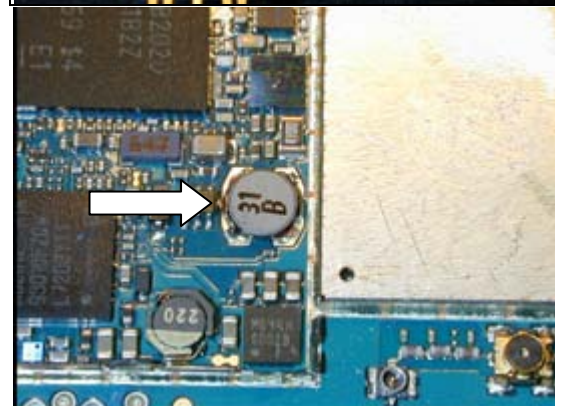
L1800 (10 μ H Coil), N1800 (Power/Light management WLP-36) and N2005 (Voltage Regulator):

The parts at positions L1800, N1800 and N2005 are under a fence overhang. Cut the overhang and remove the metal pieces.



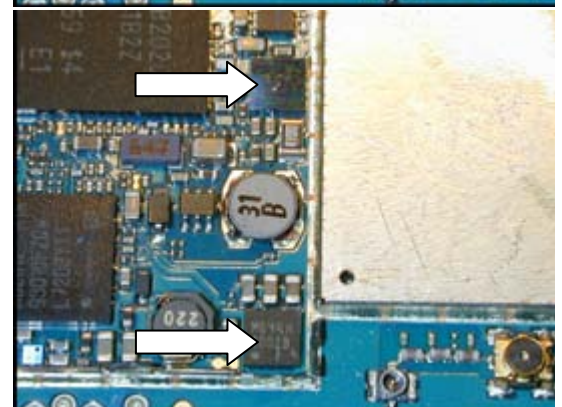
L1800 (10 μ H Coil)

Use hot air equipment to remove and replace the coil.



N1800 (Power/Light management WLP)

Use hot air equipment to remove and replace the IC



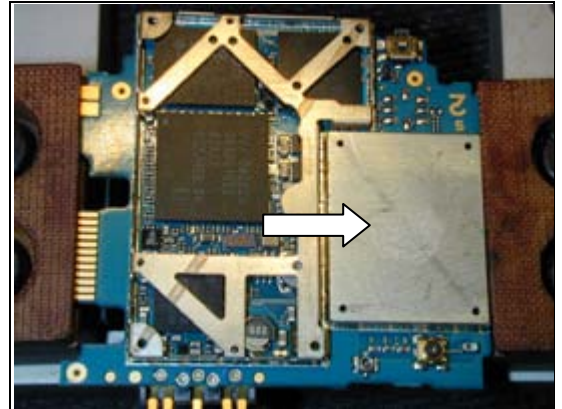
N2005 (Voltage Regulator)

Use hot air equipment to remove and replace the Reg.

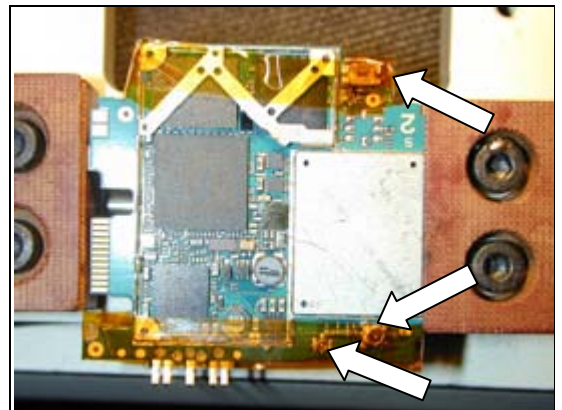
4.2

B100 (VCTCXO module), N101 (RF ASIC), N200 (2.8V regulator), N201 (PA Module), and Z102 (Front End Module)

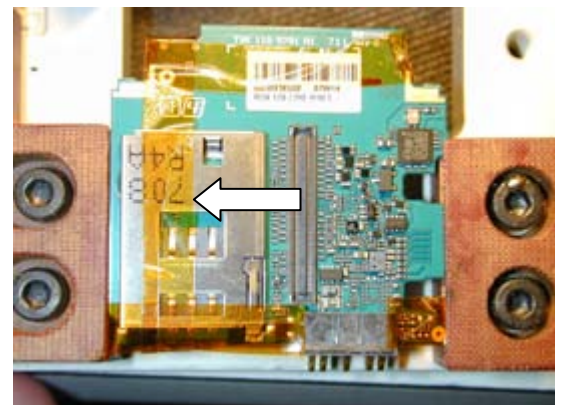
The parts at positions B100, N101, N200, N201, and Z102 are located under a one-piece shield can. Use a large hot air device to remove this can to repair these parts.



Use heat resistant tape to protect the RF Test Connector, Antenna Connector, and the Power switch.



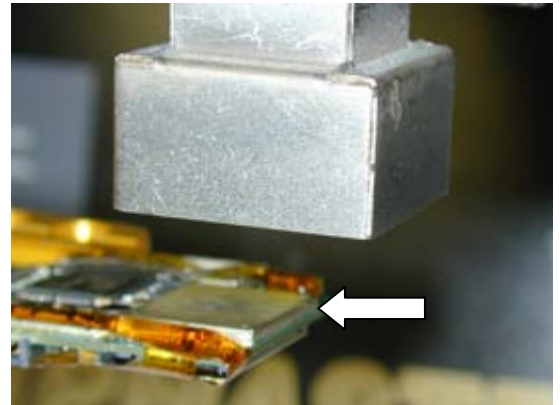
Use heat resistant tape to hold the SIM connector in place.



4.3

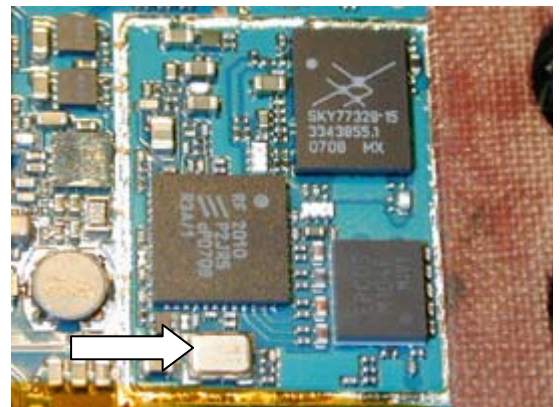
B100 (VCTCXO module), N101 (RF ASIC), N200 (2.8V regulator), N201 (PA Module), and Z102 (Front End Module) *Continued*

Place the shield can under the hot air nozzle. Apply hot air until the solder flows and remove the can.



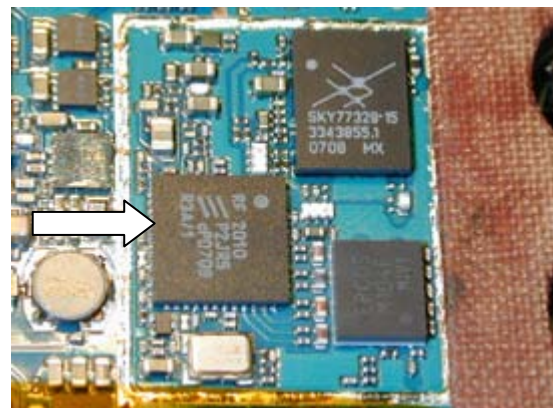
B100 (VCTCXO module)

Use hot air equipment to remove and replace the module.



N101 (RF ASIC)

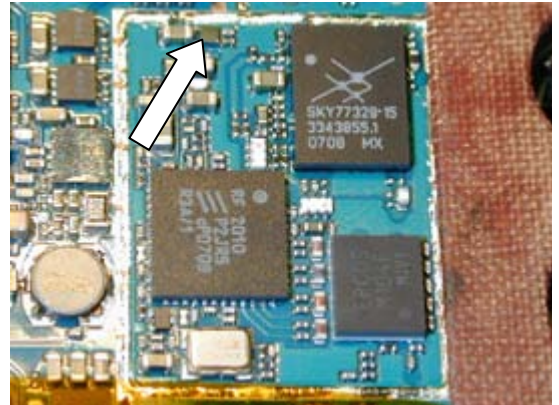
Use BGA repair equipment to remove and replace .





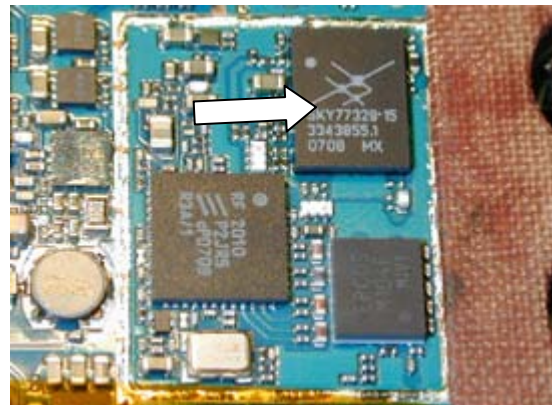
N200 (2.8V regulator)

Use hot air equipment to remove and replace the Reg.



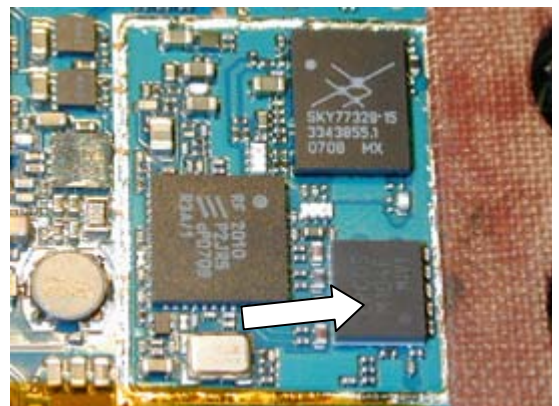
N201 (PA Module)

Use BGA repair equipment to remove and replace.



Z102 (Front End Module)

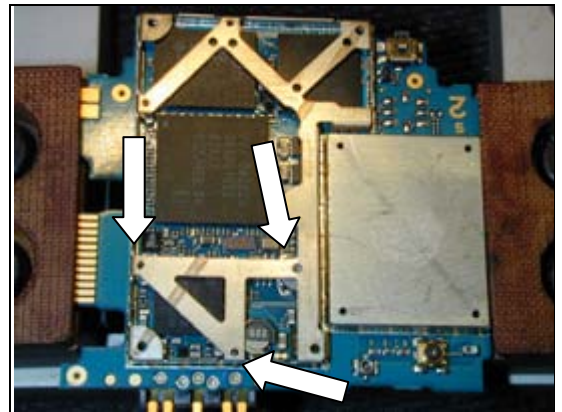
Use BGA repair equipment to remove and replace.



4.4

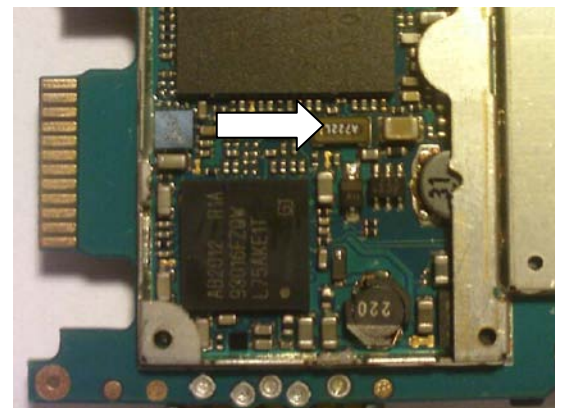
B300 (Crystal 32768 Hz), D1500 (IC), N2000 (ASIC Vincenne2) and V1800 (N-Chal Fet) :

The parts at positions B300, D1500, N2000 and V1800 are under cross bars. Cut the ends of the cross bars and remove the metal pieces.



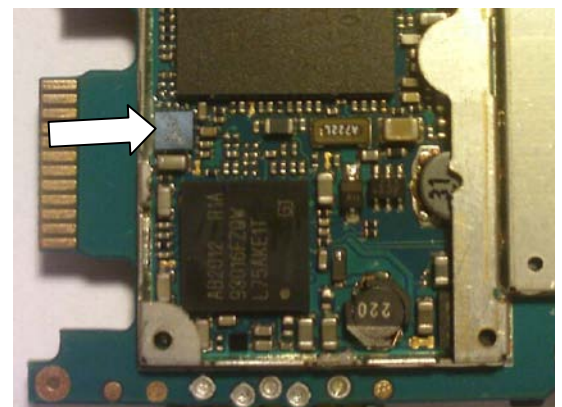
B300 (Crystal 32768 Hz)

Use hot air equipment to remove and replace the Crystal.



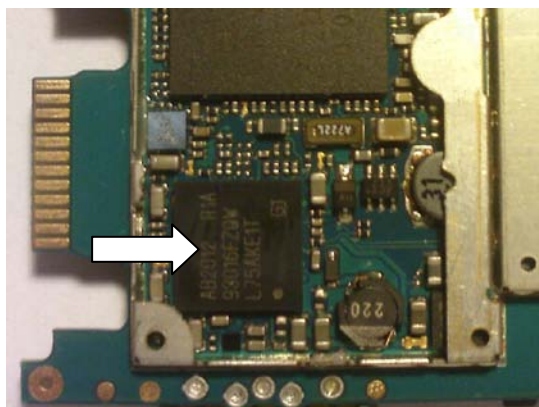
D1500 (IC), Some units with older manufacture dates will have glue spilled over onto D1500. For these phones, this part cannot be replaced.

Use hot air equipment to remove and replace the IC



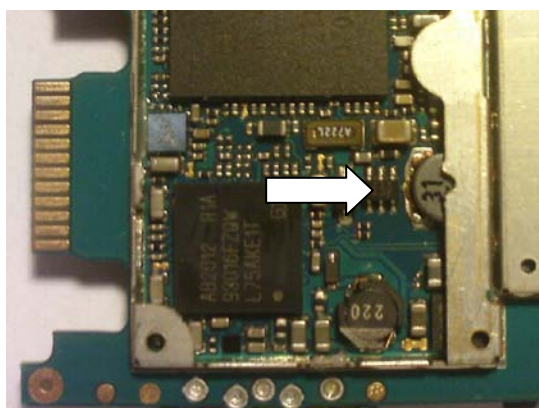
N2000 (ASIC Vincenne2)

Use BGA repair equipment to remove and replace .



V1800 (N-Chal Fet)

Use hot air equipment to remove and replace the Fet

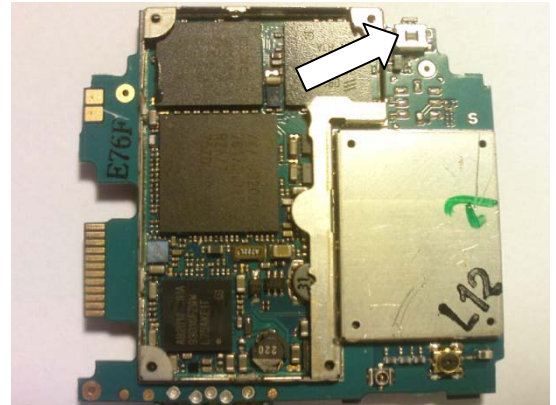


4.5

S1900 (Side push switch), V1900 (diode) and N1300 (Accelerometer)

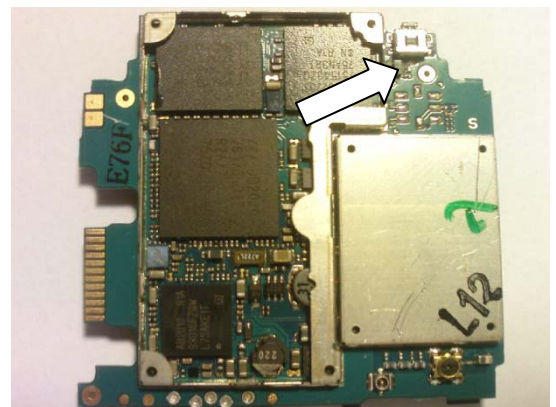
S1900 (Side push switch)

Use hot air soldering equipment to remove the switch.
Use a soldering iron to replace the switch.
Do NOT use flux when performing this action, the flux will ruin the switch.



V1900 (Diode)

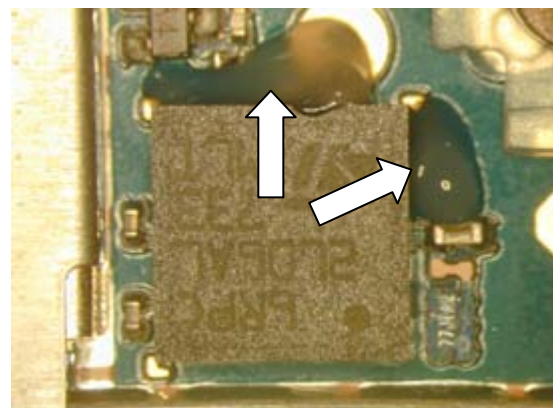
Use a soldering iron to remove and replace the diode



N1300 (Accelerometer)

Some units with more recent manufacture dates will have glue applied to the sides of N1300. For these phones, this part cannot be replaced.

Use hot air equipment to remove and replace the the accelerometer.



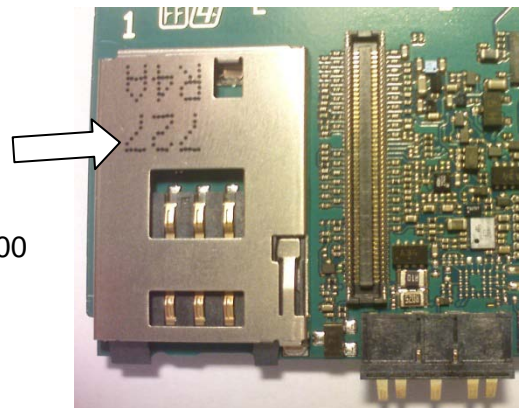
4.6

X1402 (Sim Reader), X1900 (100 Pin BtB) and B1200 (MR sensor)

X1402 (Sim reader)

Use BGA repair equipment to remove and replace the *SIM* reader.

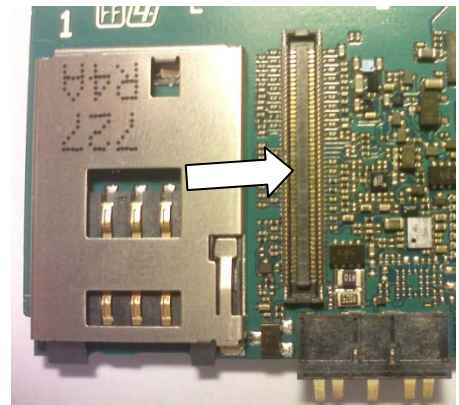
Use heat resistant tape to protect the BtB connector X1900
And battery connector X600



X1900 (100 Pin BtB)

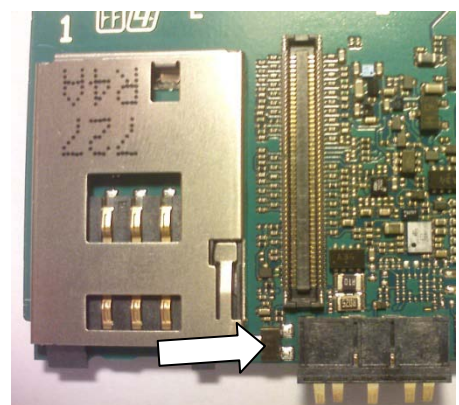
Use BGA repair equipment to remove and replace the connector.

Use heat resistant tape to protect the SIM reader X1402 and battery connector X600



B1200 (MR Sensor)

Use a soldering iron to remove and replace the sensor





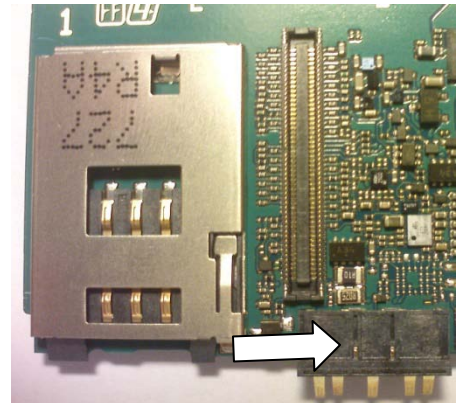
4.7

X600 (Connector) and V604 (P-Channel Mosfet)

X600 (Connector)

Use BGA repair equipment to remove and replace the *battery connector*.

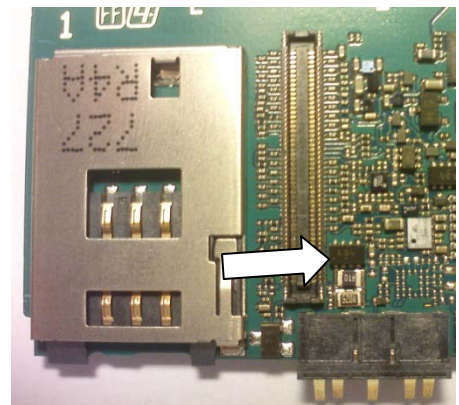
Use heat resistant tape to protect the BtB Connector X1900.



V604 (P-Channel Mosfet)

Use hot air equipment to remove and replace the Mosfet.

Use heat resistant tape to protect the BtB Connector X1900.

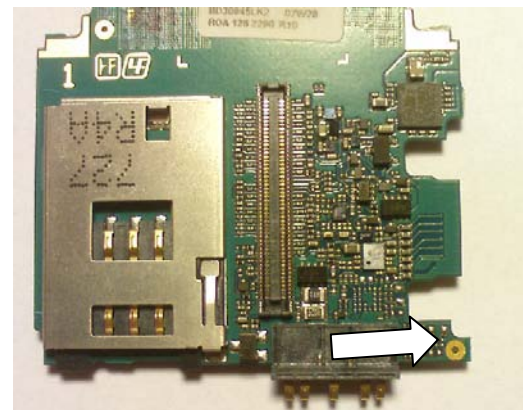


4.8

N900 (2.8V Reg) and N901 (FM-Radio + RDS)

N900 (2.8V Reg)

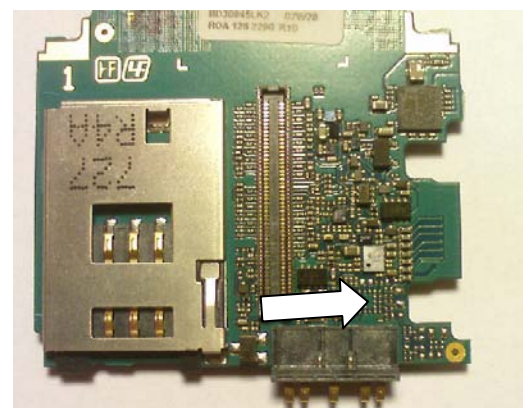
Use hot air equipment to remove and replace the Reg.



N901 (FM-Radio +RDS)

Use hot air equipment to remove and replace the FM-Radio.

Use heat resistant tape to protect the battery Connector X600..

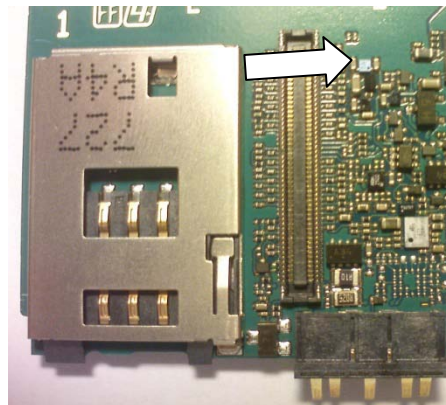


4.9

N700 (1.8V Reg), N701 (2.8V Reg) and N702 (1.3V Reg)

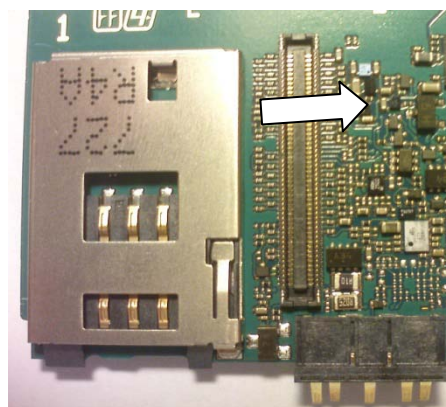
N700(1.8 Reg)

Use hot air equipment to remove and replace the Reg.



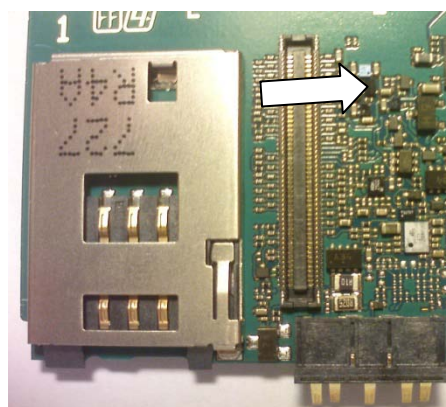
N701(2.8 Reg)

Use hot air equipment to remove and replace the Reg.



N702(1.3 Reg)

Use hot air equipment to remove and replace the Reg.

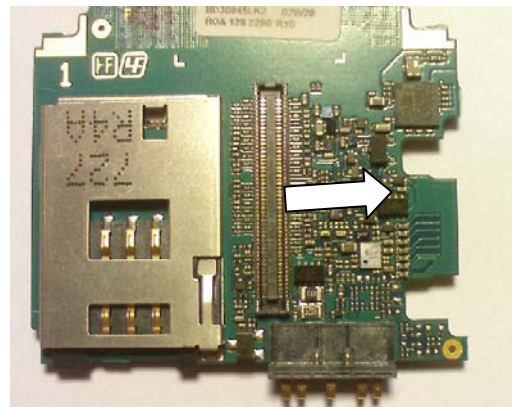


4.10

C1502 (1.0 uF), V602 (P-Channel mosfet) and V607 (Diode)

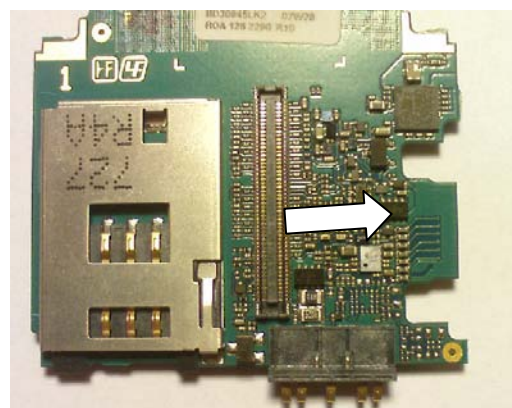
C1502 (1uF)

Use a soldering iron to remove and replace the cap.



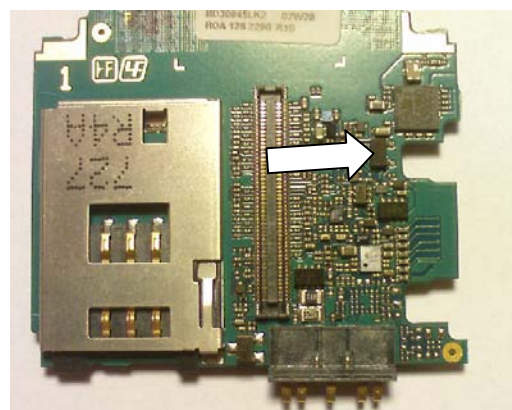
V602 (P-Channel Mosfet)

Use hot air equipment to remove and replace the mosfet.



V607 (Diode)

Use a soldering iron to remove and replace the diode

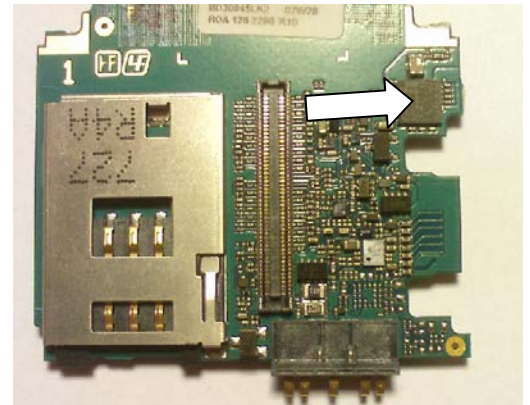


4.11

D1000 (Bluetooth)

D1000 (Bluetooth)

Use BGA repair equipment to remove and replace the the bluetooth.

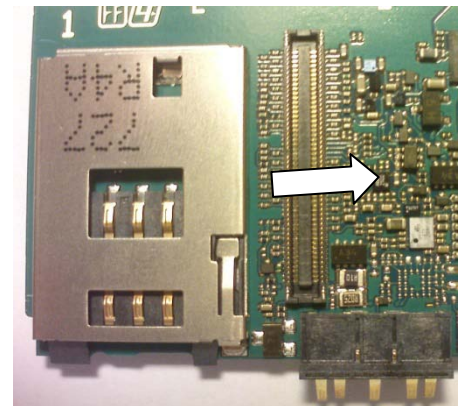


4.12

N2001 (OPAMP) and N2002 (EMI Filter)

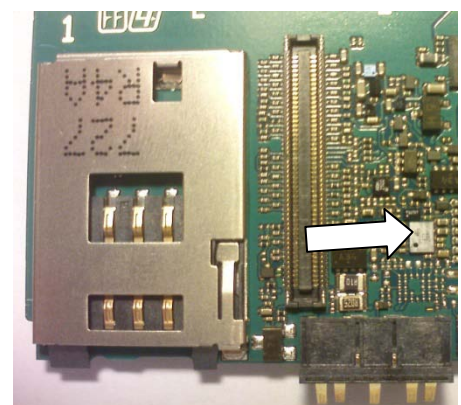
N2001 (OPAMP)

Use hot air equipment to remove and replace the opamp.



N2002 (EMI Filter)

Use hot air equipment to remove and replace the filter

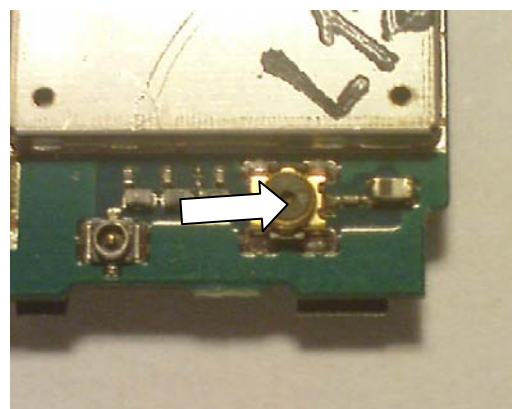


4.13

X100 (RF Con) and X101 (Con)

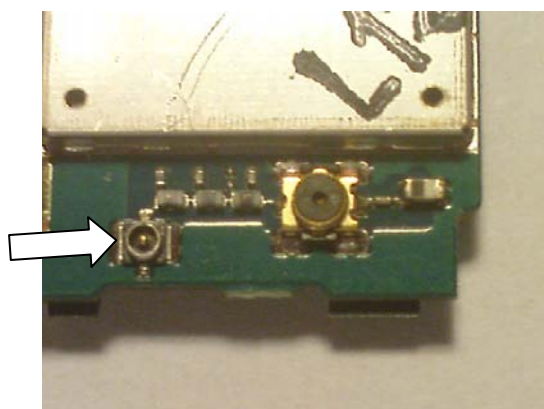
X100 (RF Connector)

Use hot air equipment to remove the connector.
Use a soldering iron to replace the connector.



X101 (Connector)

Use hot air equipment to remove the connector.
Use a soldering iron to replace the connector.

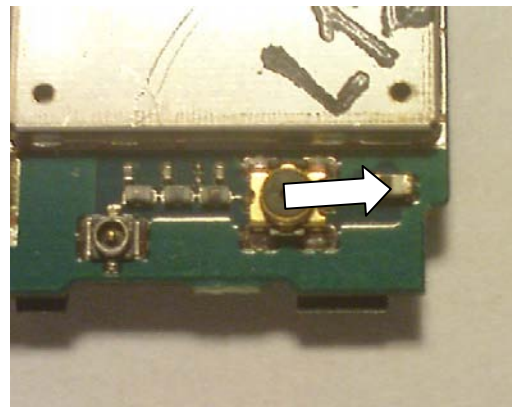


4.14

L100 (15nH) ,L113 (3.9nH),L116(1.0nH) and L117(1.8nH)

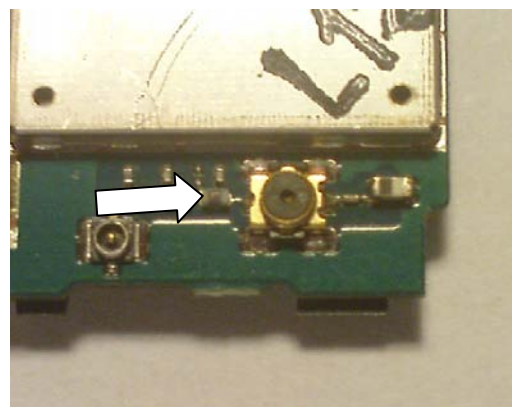
L100 (15nH)

Use a soldering iron to remove and replace the coil.



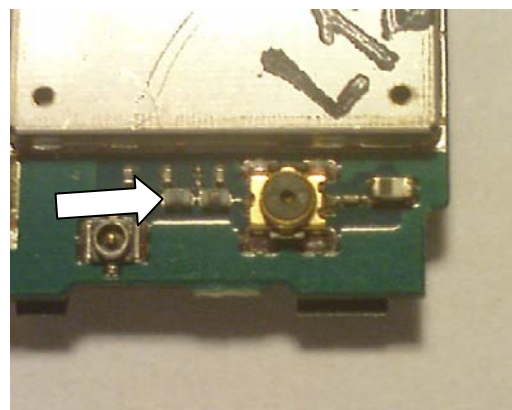
L113 (3.9nH)

Use a soldering iron to remove and replace the coil.



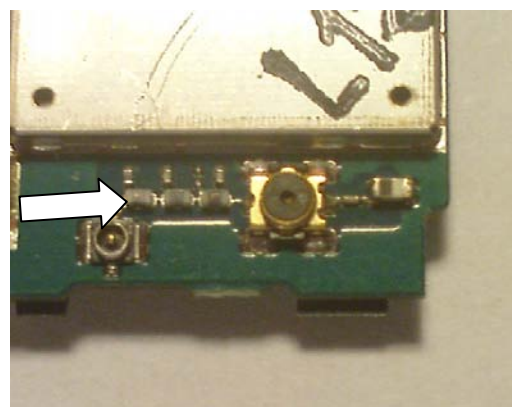
L116(1nH)

Use a soldering iron to remove and replace the coil.



L117(1.8nH)

Use a soldering iron to remove and replace the coil.

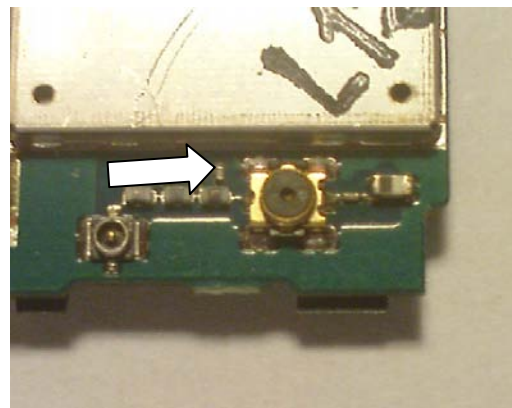


4.15

C155 (1pF) ,C156 (1.1pF) and L118 (18nH)

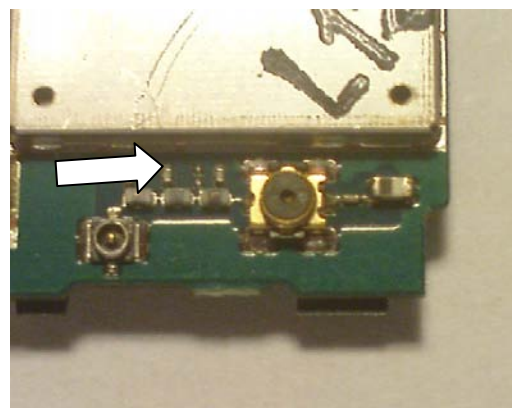
C115 (1pF)

Use a soldering iron to remove and replace the cap.



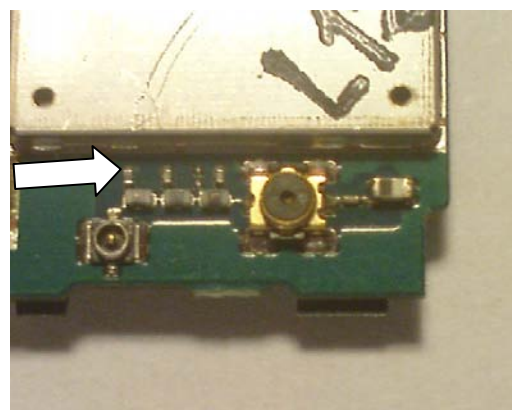
C156(1.1pF)

Use a soldering iron to remove and replace the cap.



L118(18nH)

Use a soldering iron to remove and replace the coil.





Revision History

Rev.	Date	Changes / Comments
A	2007-May-17	Initial Release
B	2007-July-18	Removed equipment list. Refer to separate document, Electrical Equipment List, for equipment requirements.
C	2007-Oct-17	Added N1300.
4	2008-Jul-10	Changed document number to new format. Added photos of D1500, USB transceiver with underfill glue spilled onto it.
5	2008-Aug-20	Added L1800.
6	2009-12-01	Remove L600 (22 uH Coil) and V605 (Schottky Diode) Added B300,B1200,C107,C155,C156,C1512,D1000,L100,L113,L116,L117,L118, N2000,N2001,N2002,N700,N701,N702,N900,N901,S1900,V602,V604,V607, V1800,V1900 X100,X101,X600,X1402,X1900