



Working Instruction, Electrical

Applicable for P1i and P1c

CONTENTS

1	Read this first!	2
2	Lead-free soldering	3
3	BGA equipment reflow profiles	5
3.1	General.....	5
3.2	Temperature measurement.....	5
3.3	Reflow profiles.....	6
4	Shield fence instruction.....	7
5	Replacement of components	8
5.1	B2000	Quartz/Crystal 32768MZ..... 9
5.2	B2510	Crystal 13 Mhz..... 9
5.3	D5001	Microphone..... 10
5.4	N3001	Bluetooth module..... 10
5.5	N5500	Stereo Headphone amplifier..... 11
5.6	B6000	Crystal 44 MHz..... 11
5.7	N5508	FM-radio WRDS..... 12
5.8	S2125,S2821	Side push switch..... 12
5.9	N5010	Asic Tjatte 3..... 13
5.10	N5505	Class AB audio amplifier..... 14
5.11	S2820	Jog dial..... 14
5.12	N6000	Wlan module..... 15
5.13	X2743	Camera socket..... 16
5.14	X3001, X6000	Antenna switch..... 16
5.15	D1100	Marlin GSM module..... 17
5.16	N1400	Ray UMTS module..... 17
5.17	N2000	Asic vinnenne..... 18
5.18	X4000	Battery connector..... 18
5.19	D2663	USB OnTheGO Transceiver..... 19
5.20	X2820	Display connector..... 19
5.21	X2821	Connector 24 pin..... 20
5.22	N4030	2.8V 150mA LINE REGULATOR..... 21
5.23	N4050	LDO 120mA Linear regulator..... 21
5.24	N4021, N4040	Step-down DC/DC converter..... 22
6	Revision history	22

1 Read this first!

CAUTION

- *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

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 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 wettability
- 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 BGA equipment reflow profiles

3.1 General

This document 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 paste 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 measurement

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 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.

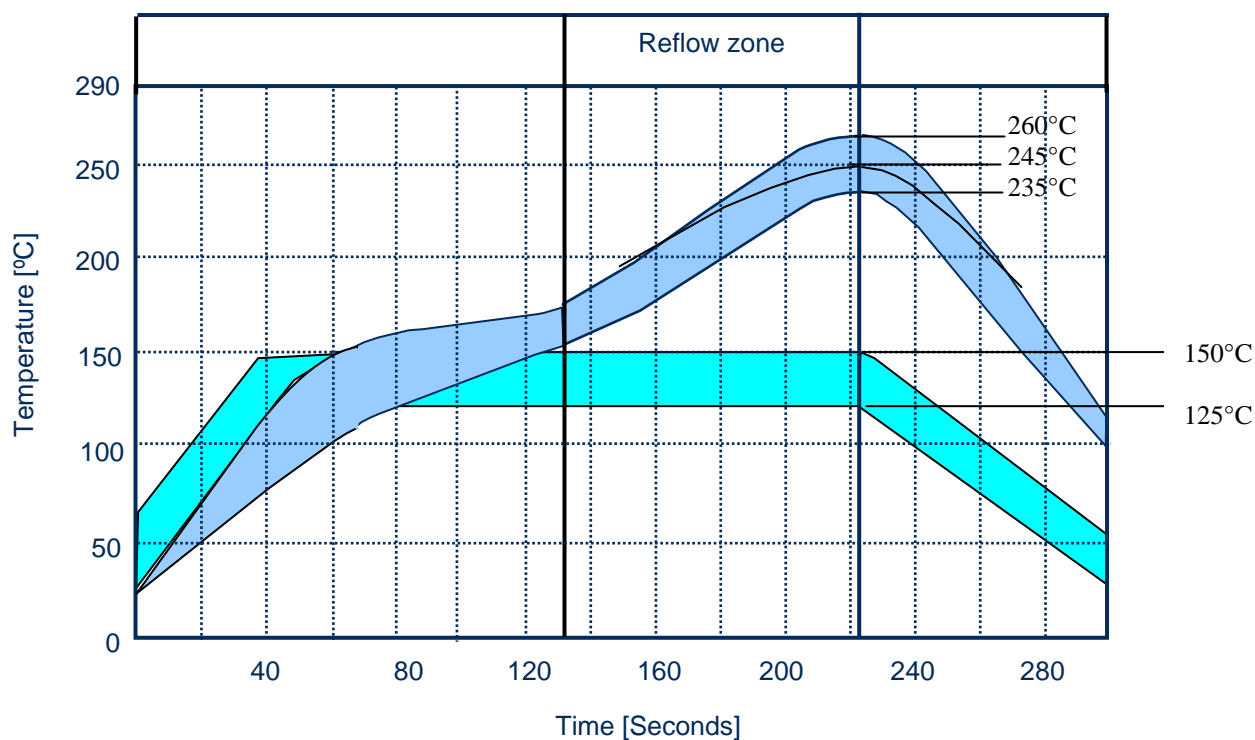
Make sure the nozzle does not affect any nearby placed components.

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 250° 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
Bottom heat temperature	125°C-150°C
Total time	Approx. 4-7 min

* The higher temperature in case the board has extremely high ΔT .

4 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 pliers to cut the fence.
Use Shield fence pliers NTZ 112 537 to bend the fence.



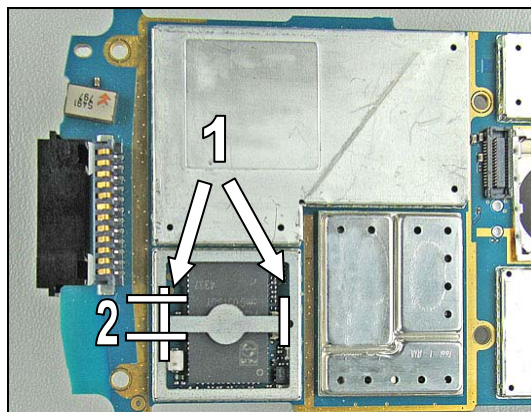
MAKE SURE THAT CUTTING PLIERS IS SHARP-EDGED TO PREVENT DAMAGING THE SHIELD CAN FENCE.

Remove the shield can lid, use a dentist hook.

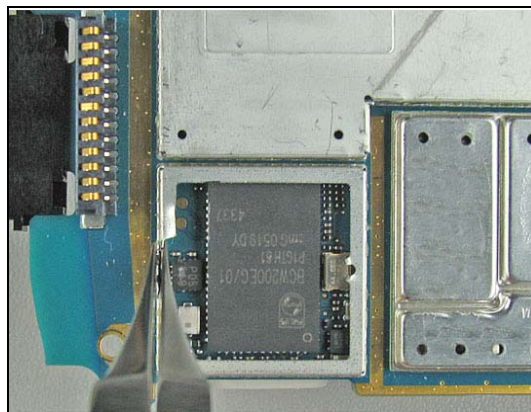
Remove the pick up area according to the white lines with a cutting plier. (1)

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 a cutting plier. (2)



Carefully bend the shield fence with a shield fence plier.
Replace the components.

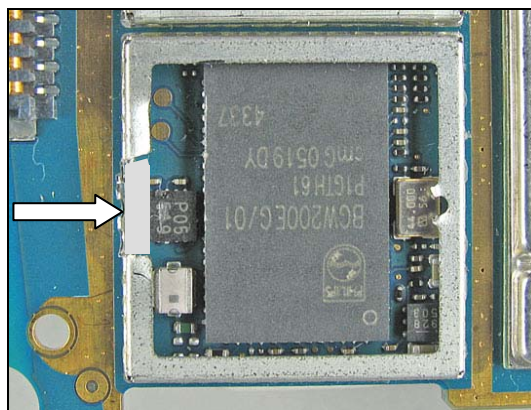


Replace the components.

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.



5 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

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 3/00021-1/FEA 209 544/126*.

5.1 B2000

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 a cutting plier.

This pick up area doesn't have to be replaced.

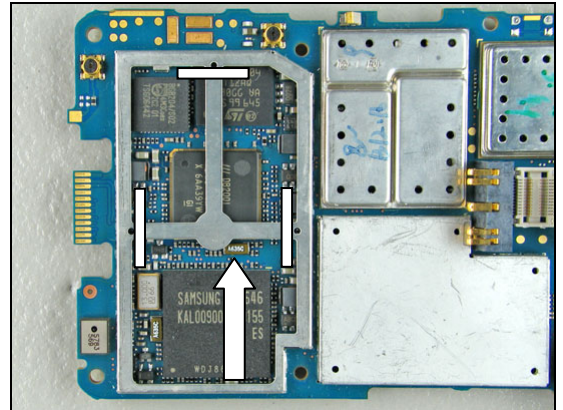
Replace the Crystal.

Use BGA repair equipment.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

Quartz/Crystal 32768MZ



Close up picture of B2000.

5.2 B2510

Remove the shield can lid.

Use a dentist hook.

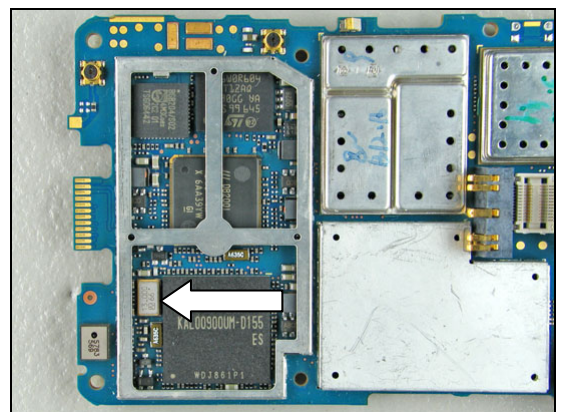
Replace the Crystal.

Use BGA repair equipment.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

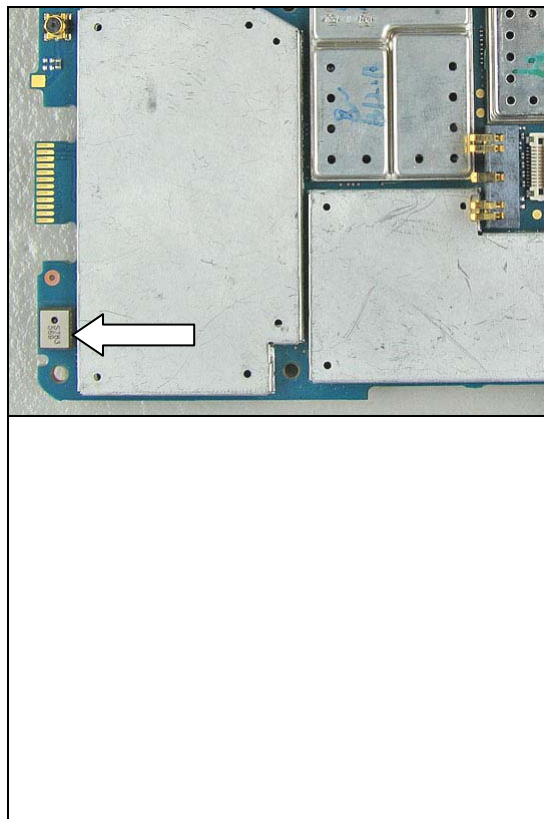
Crystal 13 Mhz



5.3 D5001

Replace the Microphone.
Use BGA repair equipment.

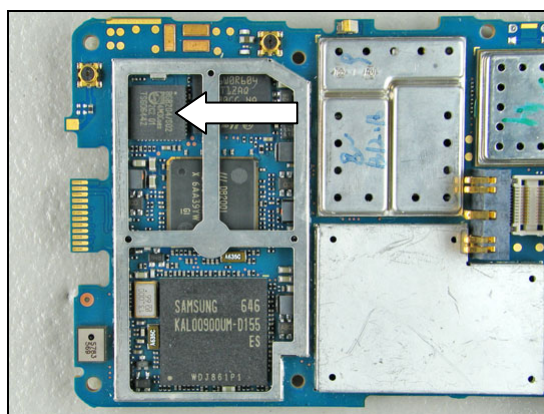
Microphone



5.4 N3001

Remove the shield can lid.
Use a dentist hook.
Replace the Bluetooth module.
Use BGA repair equipment.
Put back a **new** shield can lid.
Press on all sides of the lid until you hear a “click” sound.

Bluetooth module



5.5 N5500

FOLLOW THE SHIELD FENCE INSTRUCTION. (4)

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction

Replace the Stereo Headphone amplifier.

Use BGA repair equipment.

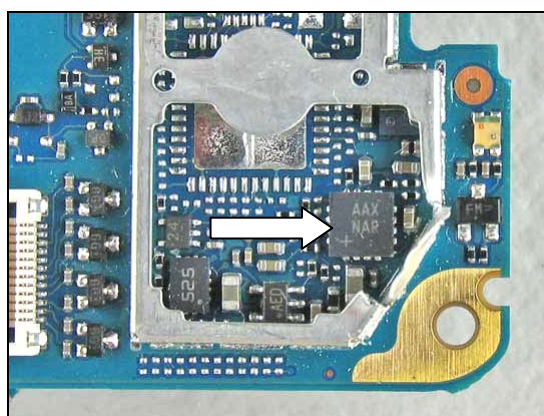
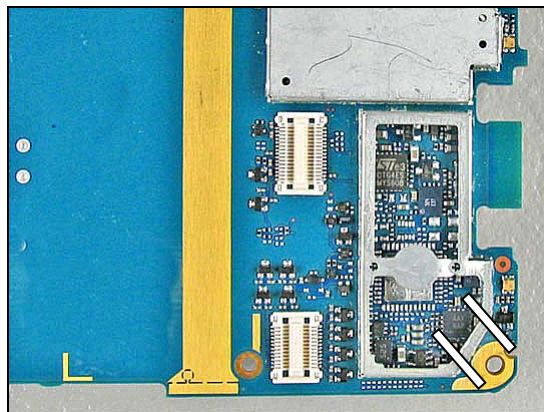
BEND CAREFULLY BACK THE SHIELD FENCE.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

Close-up picture of N5500.

Stereo Headphone amplifier



5.6 B6000

Remove the shield can lid.

Use a dentist hook.

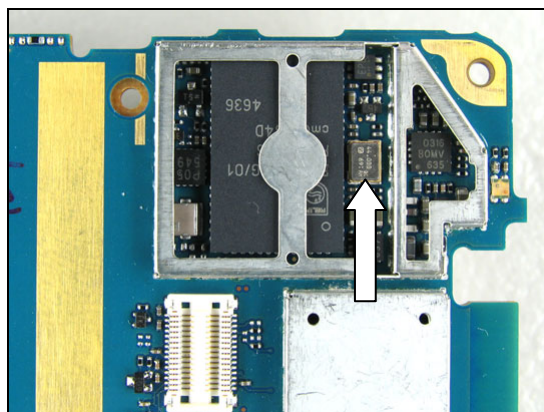
Replace the Crystal.

Use BGA repair equipment.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

Crystal 44 MHz



5.7 N5508

FOLLOW THE SHIELD FENCE INSTRUCTION. (4)

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction

Replace the FM-Radio WRDS.

Use BGA repair equipment.

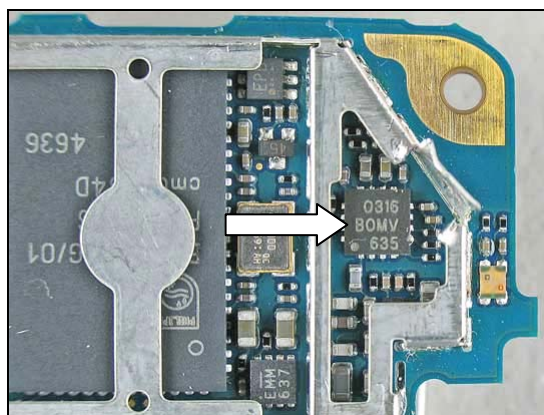
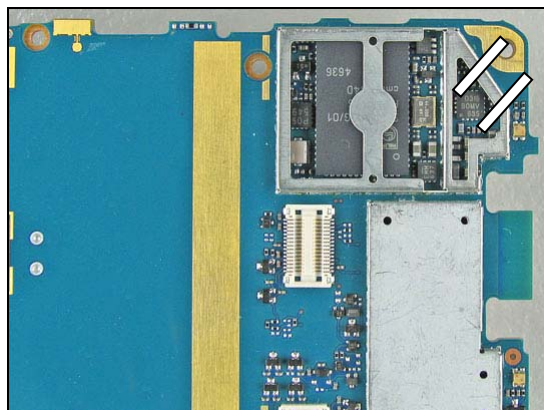
BEND CAREFULLY BACK THE SHIELD FENCE.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a “click” sound.

Close-up picture of N5508.

FM-radio WRDS

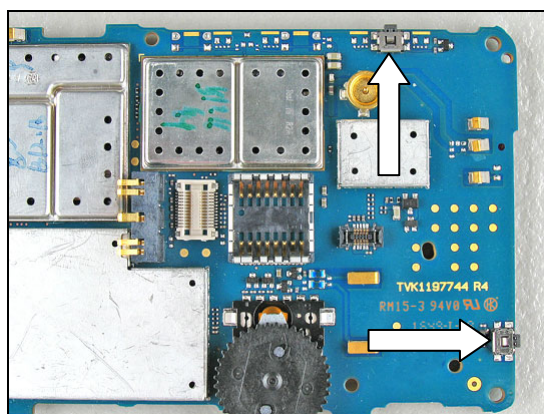


5.8 S2125,S2821

Replace the side push switches.

Use soldering iron or hot air equipment.

Side push switch



5.9 N5010

FOLLOW THE SHIELD FENCE INSTRUCTION. (4)

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction

Replace the Asic Tjatte 3.

Use BGA repair equipment.

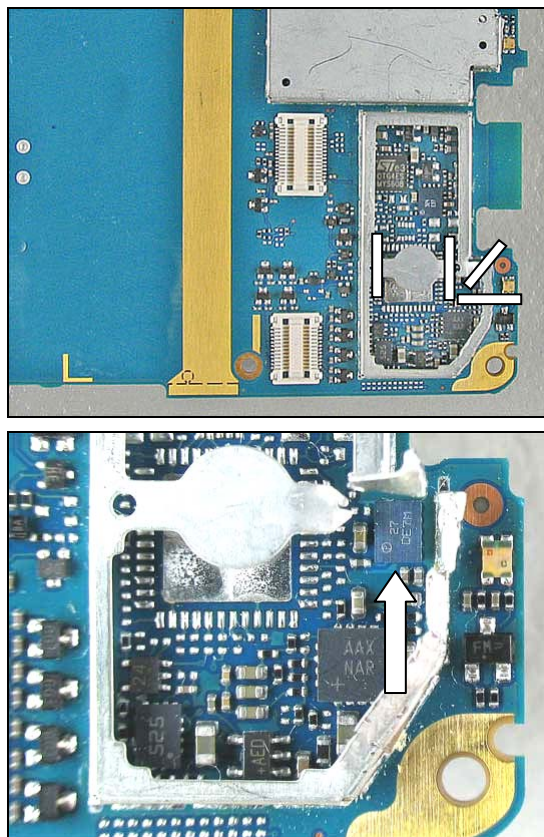
BEND CAREFULLY BACK THE SHIELD FENCE.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a “click” sound.

Close-up picture of N5010.

Asic Tjatte 3



5.10 N5505

FOLLOW THE SHIELD FENCE INSTRUCTION. (4)

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction.

Replace the Audio amplifier.

Use BGA repair equipment.

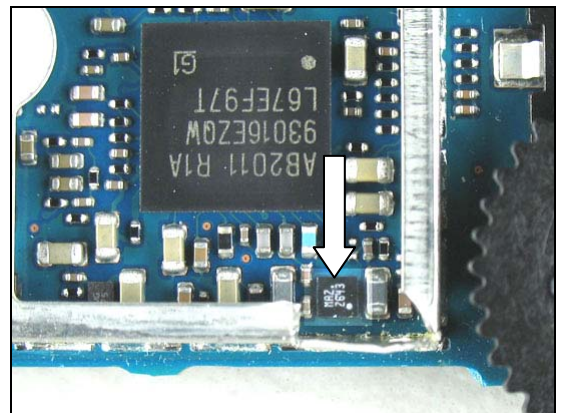
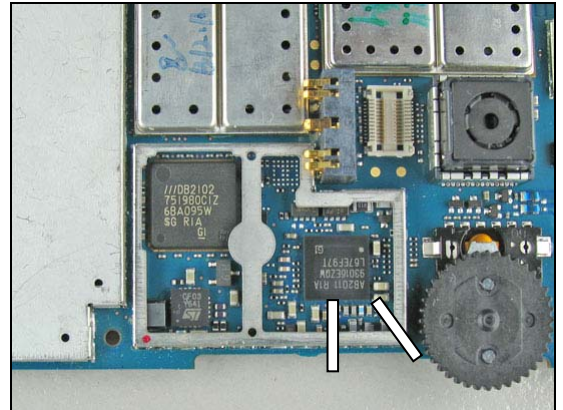
BEND CAREFULLY BACK THE SHIELD FENCE.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

Close-up picture of N5505.

Class AB audio amplifier

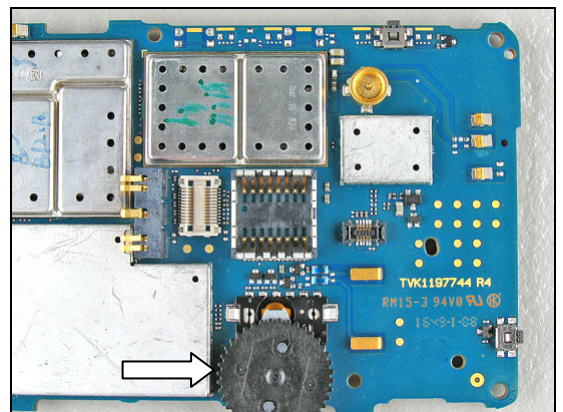


5.11 S2820

Replace the Jog dial.

Use soldering iron.

Jog dial



5.12 N6000

FOLLOW THE SHIELD FENCE INSTRUCTION. (4)

Remove the shield can lid.

Use a dentist hook

Cut the fence according to the white lines.

Follow the shield fence instruction

Replace the Wlan module.

Use BGA repair equipment.

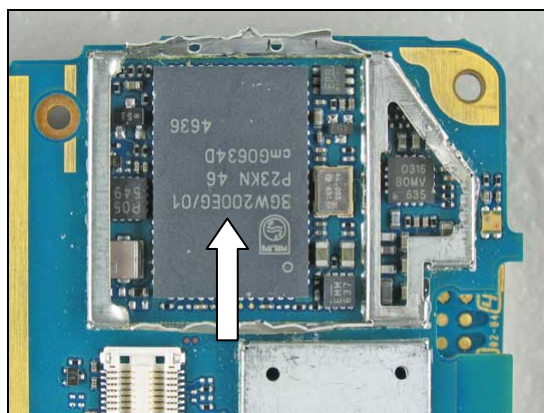
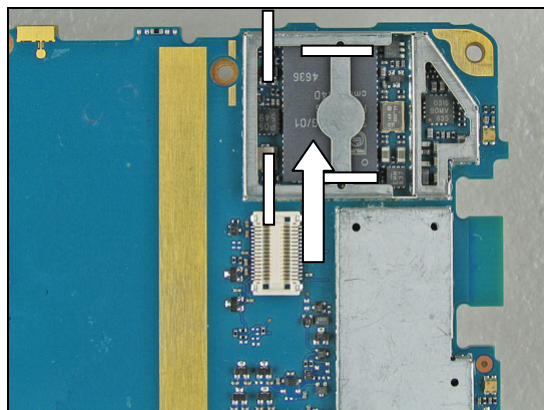
BEND CAREFULLY BACK THE SHIELD FENCE.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a “click” sound.

Close-up picture of N6000.

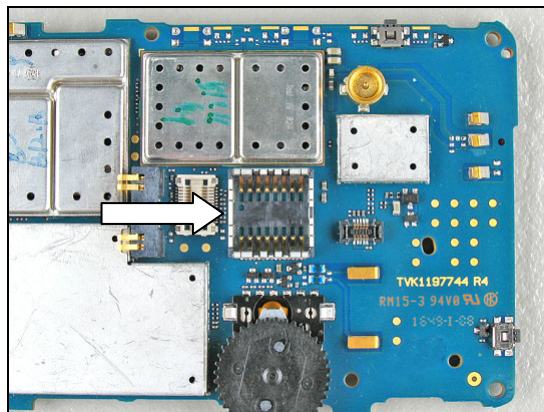
Wlan module



5.13 X2743

Replace the camera socket.
Use BGA repair equipment.

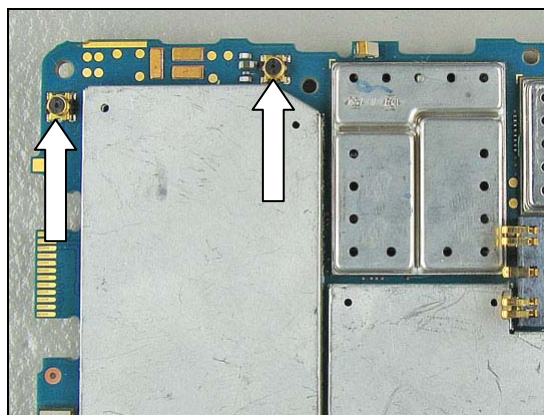
Camera socket



5.14 X3001, X6000

Replace the Antenna switches.
Use soldering iron or hot air equipment.

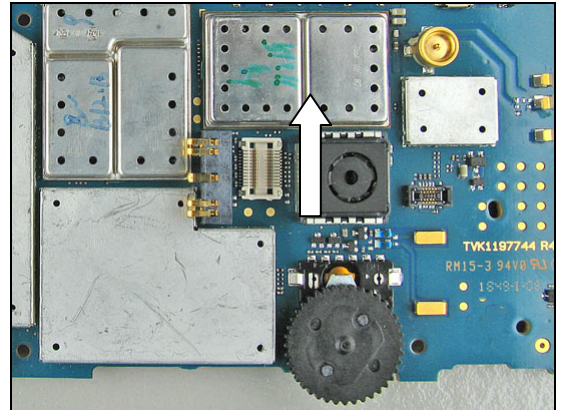
Antenna switch



5.15 D1100

Replace the Marlin module.
Use BGA repair equipment.

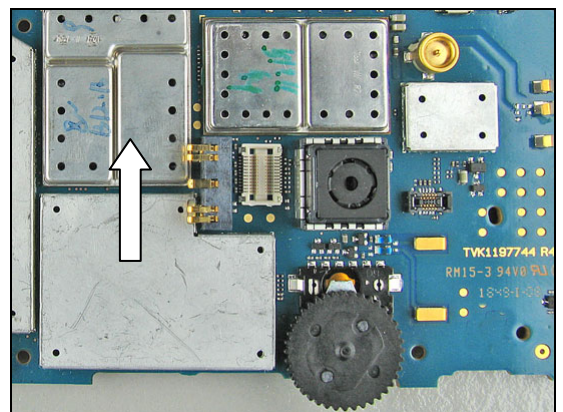
Marlin GSM module



5.16 N1400

Replace the Ray module.
Use BGA repair equipment.

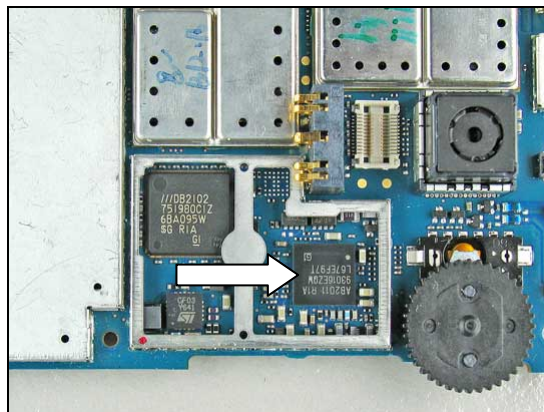
Ray UMTS module



5.17 N2000

Remove the shield can lid.
 Use a dentist hook.
 Replace the Asic Vinnenne module.
 Use BGA repair equipment.
 Put back a **new** shield can lid.
 Press on all sides of the lid until you hear a "click" sound.

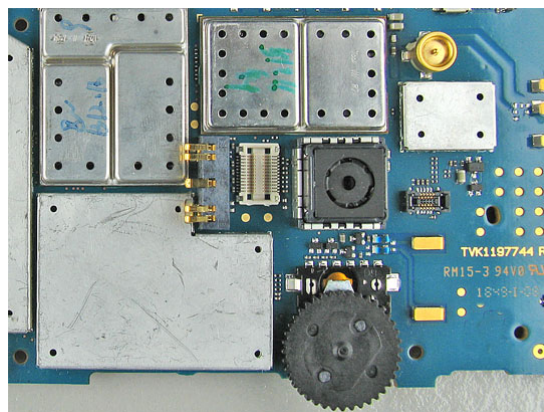
Asic vinnenne



5.18 X4000

Replace the Battery connector.
 Use BGA repair equipment

Battery connector



5.19 D2663

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 a cutting plier.

This pick up area doesn't have to be replaced.

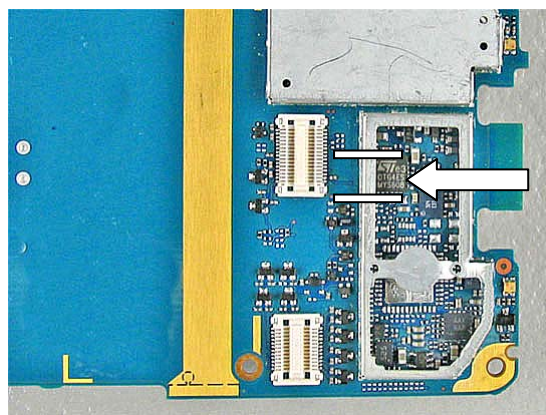
Replace the USB OnTheGo Transceiver.

Use BGA repair equipment.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.

USB OnTheGO Transceiver

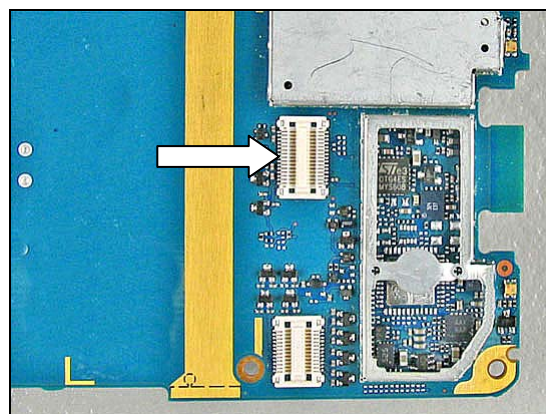


5.20 X2820

Replace the Display Connector.

Use Hot air repair equipment.

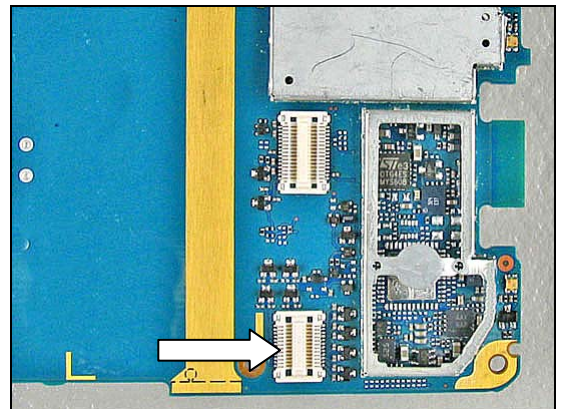
Display connector



5.21 X2821

Replace the Keyboard Connector.
Use Hot air repair equipment.

Connector 24 pin



5.22 N4030

2.8V 150mA LINE REGULATOR

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

Remove the shield can lid, use a dentist hook.

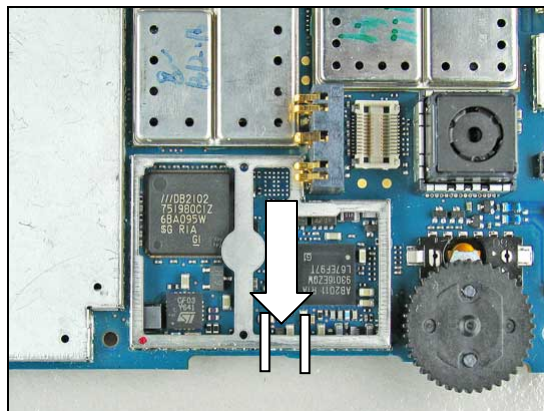
Remove the pick up area according to the white lines with a cutting plier.

This pick up area doesn't have to be replaced.

Replace the 2,8V 150mA Line Regulator.

Use Hot air repair equipment.

Put back a **new** shield can lid.



5.23 N4050

LDO 120mA Linear regulator

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 a cutting plier.

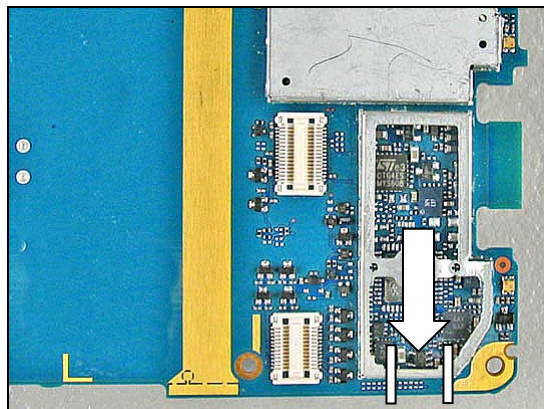
This pick up area doesn't have to be replaced.

Replace the LDO 120mA Line regulator.

Use Hot air repair equipment.

Put back a **new** shield can lid.

Press on all sides of the lid until you hear a "click" sound.



5.24 N4021, N4040

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 a cutting plier.

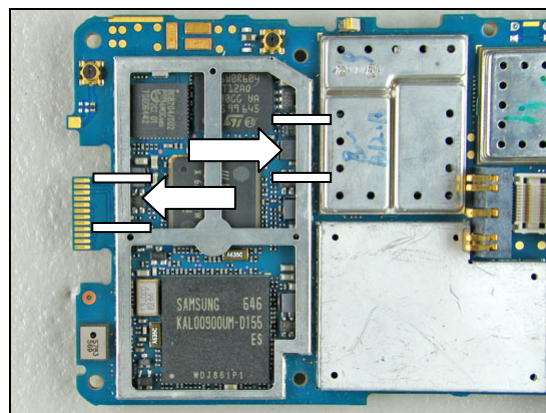
This pick up area doesn't have to be replaced.

Replace the Step-down DC/DC Converter.

Use Hot air repair equipment.

Put back a **new** shield can lid.

Step-down DC/DC converter



6 Revision history

Rev.	Date	Changes / Comments
A	2007-05-18	1 st preliminary version
B	2007-07-23	Text edited, picture added
C	2007-10-26	Added D2663
D	2007-11-15	Added V5000, V5001, N4021, N4040, N4030, N4050, X2821, X2820
5	2009-01-09	Deleted D2500