



Working Instruction, Electrical

Applicable for K850i

CONTENTS

1	Read this first!	3
2	Lead-free soldering	4
3	Hot air gun temperature requirements	6
4	Soldering tip temperature requirements	6
5	Bottom heat requirements.....	6
6	BGA rework specifications.....	6
7	Shield fence instruction.....	6
8	Replacement of components	8
8.1	B2101 Osc XO 32.768 kHz LC.....	9
8.2	C2217 Capacitor 70.0 mF 3.3 V	9
8.3	C3137 Capacitor Ceramic 470,0 nF +/-10% 6,3 V K0402.....	10
8.4	C3160 Capacitor Ceramic 470,0 nF +/-10% 6,3 V K0402.....	10
8.5	D2000 ASIC BB Anja	11
8.6	D2010 Mem MCP 1 Gbit+0 kbit 0, Hz 0, V.....	11
8.7	D2105 IC Single bus buffer gate	12
8.8	D2404 IC IF ISP1508 ES3 (3.5*3.5*0.8)	12
8.9	D2420 IC IF 3.5x3.5x0.8 thin QFN	13
8.10	D2460 Level translator	13
8.11	E1000 Shield Can Fence	14
8.12	E1001 Shield Can Fence	14
8.13	E1002 Shield Can Fence	15
8.14	L2200 Ind WW 4.7 uH +-20% 2,95x2,95x0,9	15
8.15	L2401, L2402, L2403, L2404 Filter 0.0 Hz 0402	16
8.16	N1400 Module Bluetooth + FM STLC2592	17
8.17	N2000 ASIC Vera.....	17
8.18	N2201 IC Vreg 150 mA LDO.....	18
8.19	N2202 IC Vreg MAX8640, 1.8V	18
8.20	N2203 IC Vreg.....	19
8.21	N2205 IC Vreg.....	19
8.22	N2206 Voltage regulator 2,8V	20
8.23	N2208 IC Vreg.....	20
8.24	N2400 1-Bit Level Translator.....	21
8.25	N2401 IC ESD Prot CS-5	21
8.26	N2402 IC ESD Prot UDFN 6 2x2 mm	22
8.27	N2500 IC Vreg 8-pin LLP	22
8.28	N2525 ASIC 3-axis accelerometer	23
8.29	N3100 OPAMP 1W Pb-Free	23
8.30	N3101 ASIC Tjatte3 CSP20	24
8.31	N4101 IC Dri MAX8830 ES3 4x4 UCSP	24
8.32	N4200 Light Sensor.....	25
8.33	S2400, S2401, S2402, S2403 Side Push Switch.....	25



8.34	V2202 Trans P-ch FET	26
8.35	V2402 Diode Schottky 0,0	26
8.36	V2405 MOSFET Complementary N P 20 V (D S)	27
8.37	V2420, V2421 Zener Diode voltage regulator 15V 5%	27
8.38	V2425 Diode Protection 0.7 V SOD-882	28
8.39	V2428 LED Red	28
8.40	V2477, V2478 Diode Protection 5.0 V SOD-523	29
8.41	V2500 Trans P-ch FET WDFN6	29
8.42	X1200 Connector, RF Test	30
8.43	X1201, X1202, X1203 Antenna connector	30
8.44	X2200 Battery connector	31
8.45	X2409, X4300 Conn BtB 22 pin	31
8.46	X2410 Conn BtB 40 pin	32
8.47	X2511 Conn BtB 30 pin	32
8.48	X3105 Microphone connector	33
8.49	X4200 Conn BtB 26 pin	33
8.50	X4301 30 Pin BtB, male, (Camera)	34
8.51	N1200 Mod Radio EDGE Thor GSM/EDGE	35
8.52	N1210 Mammoth WLAN Radio Module	35
9	Revision history	36

1 Read this first!

CAUTION

Remove the Main Camera before you perform any repair action on the board by using Hot Air soldering equipment or BGA repair equipment.



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*

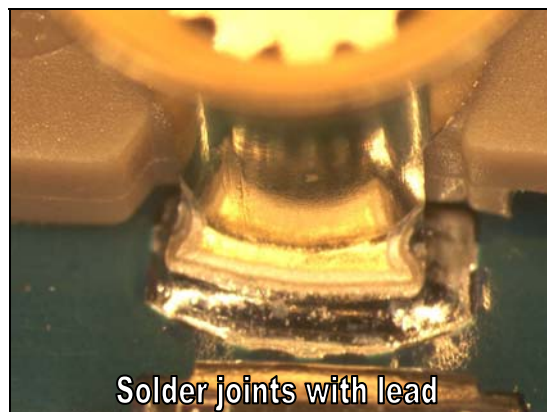
LFS (lead-free solder paste) characteristics:

- High melting point (typically 220°C)
- Low wettability
- High surface tension
- Difficult to spread
- Recommended tip temperature = 360°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 360°C.

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

5 Bottom heat requirements

In the chapter 8 "Replacement of components" there are components which require to us a bottom heater during repair to pre-heat the board and to level out the ΔT on the PBA. It will also minimize thermal stress.

The temperature on the PBA surface shall not exceed 150°C to minimize inter-metallic growth and thermal stress on PWB.

6 BGA rework specifications

For all components that is required to be replaced by using BGA Rework Station follow Technical Requirement, Generic document, Space ID:1207-2949 and Heat treatment document Space ID: 1206-4149

7 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.



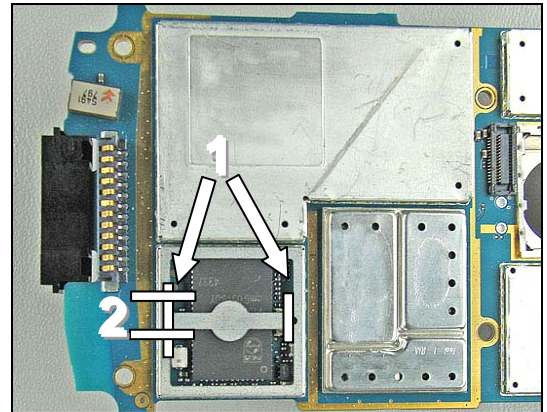
MAKE SURE THAT CUTTING PLIERS IS SHARP-EDGED TO PREVENT DAMAGING THE SHIELD CAN FENCE.

Remove the shield can lid, use a dentist hook.

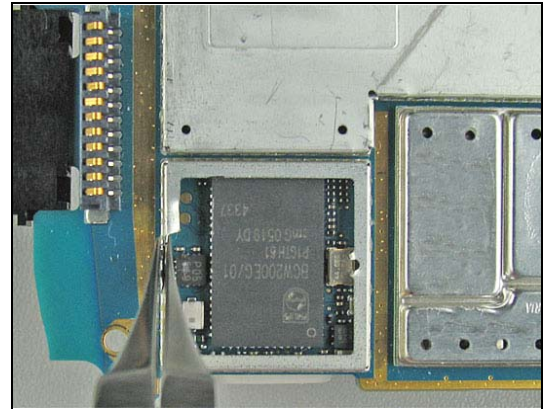
Remove the pick up area according to the white lines with cutting pliers. (1)

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

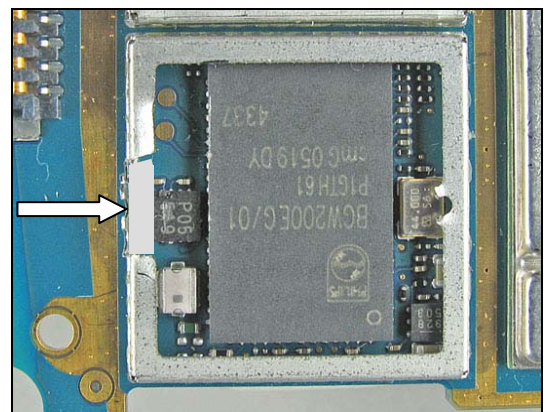
Cut the shield can fence according to the white lines with cutting pliers. (2)



Bend carefully the shield fence with 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.



8 Replacement of components

EQUIPMENT

- Dentist hook
- Shield fence pliers NTZ 112 537
- Hot air soldering equipment
- Bottom heat 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:

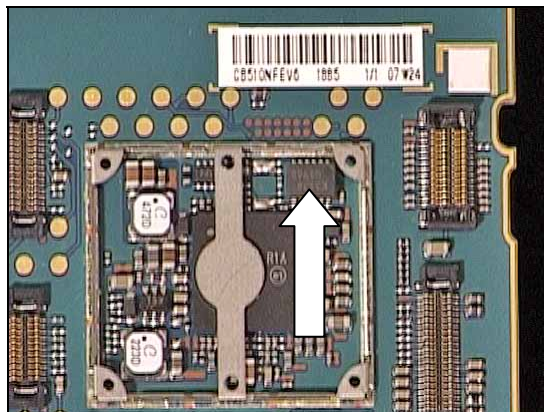
- ***ESD-wristband***
- ***ESD-gloves***

MECHANICAL INSTRUCTIONS

For all the following part replacements, disassemble and assemble the phone as described in *Working Instruction 3/00021-1/FEA 209 544/131*.

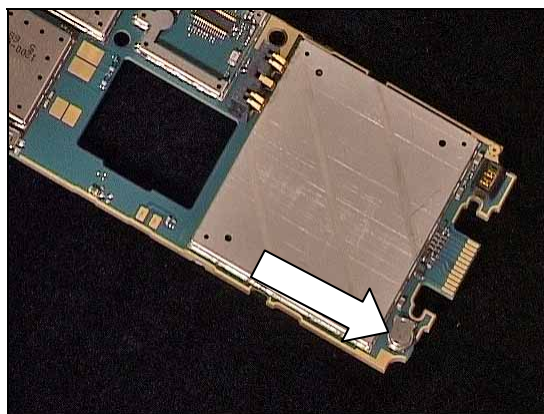
8.1 B2101 Osc XO 32.768 kHz LC

Replace the Oscillator with BGA repair equipment.
Only SL4.



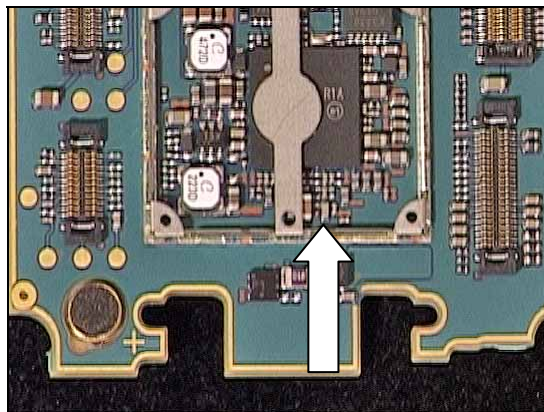
8.2 C2217 Capacitor 70.0 mF 3.3 V

Replace the Capacitor with Hot air soldering equipment.
Maximum temperature 330°C.
Bottom heat is required.



8.3 C3137 Capacitor Ceramic 470,0 nF +/-10% 6,3 V K0402

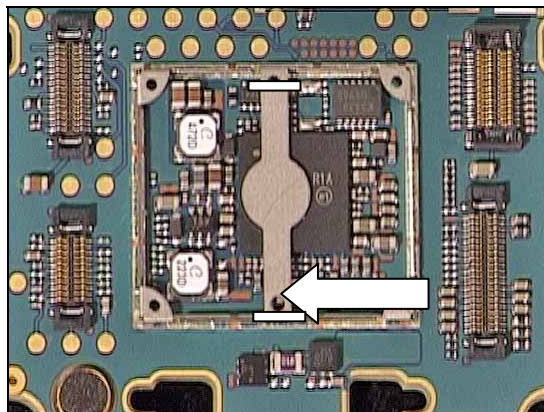
Replace the Capacitor with Hot air soldering equipment



8.4 C3160 Capacitor Ceramic 470,0 nF +/-10% 6,3 V K0402

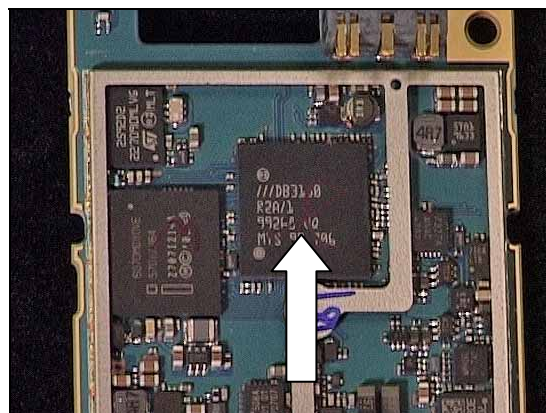
Cut the shield can fence according to the white lines with cutting pliers.

Replace the Capacitor with Hot air soldering equipment.



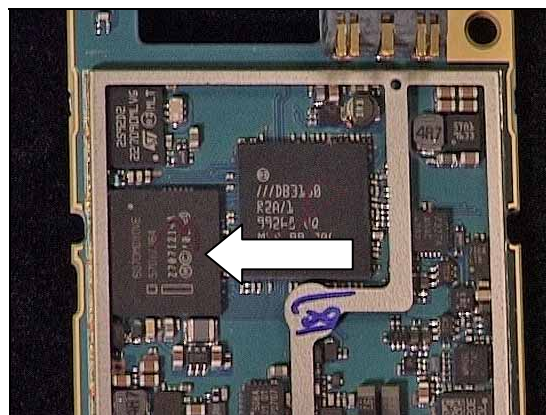
8.5 D2000 ASIC BB Anja

Replace the Anja Asic with BGA repair equipment.
Only SL5.



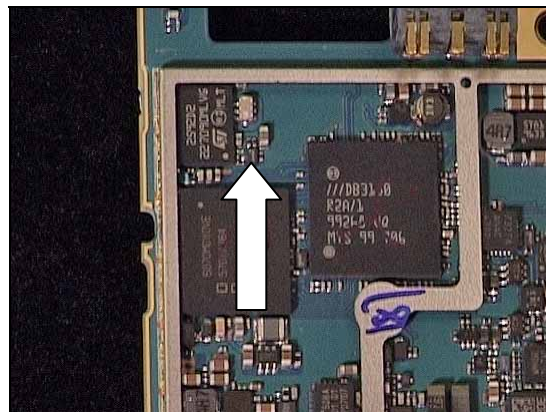
8.6 D2010 Mem MCP 1 Gbit+0 kbit 0, Hz 0, V

Replace the Memory with BGA repair equipment.
Only SL5.



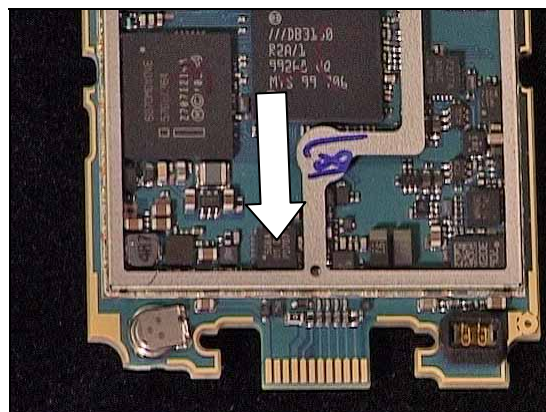
8.7 D2105 IC Single bus buffer gate

Replace the IC with Hot air soldering equipment.



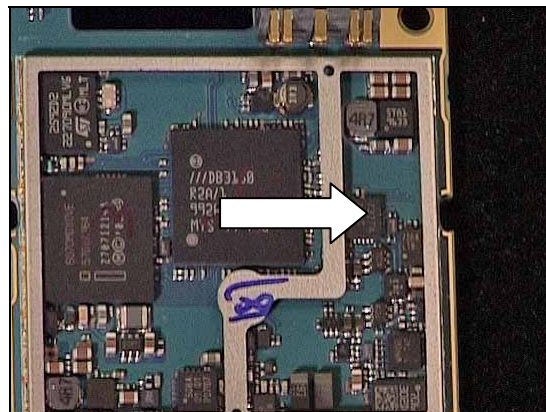
8.8 D2404 IC IF ISP1508 ES3 (3.5*3.5*0.8)

Replace the IC IF with Hot air soldering equipment.
Bottom heat is required.



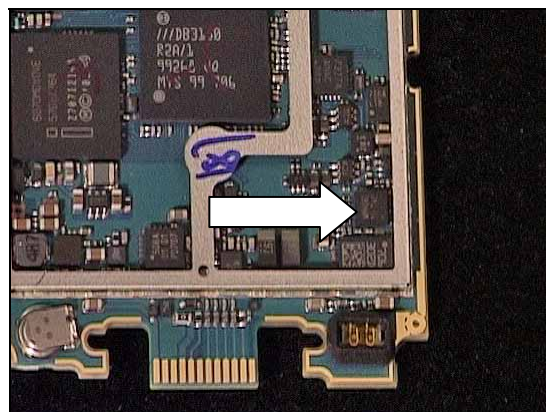
8.9 D2420 IC IF 3.5x3.5x0.8 thin QFN

Replace the IC with Hot air soldering equipment.
Bottom heat is required.



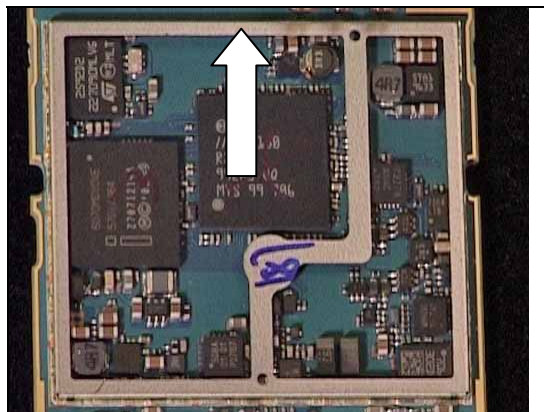
8.10 D2460 Level translator

Replace the Level translator with Hot air soldering equipment.
Bottom heat is required.



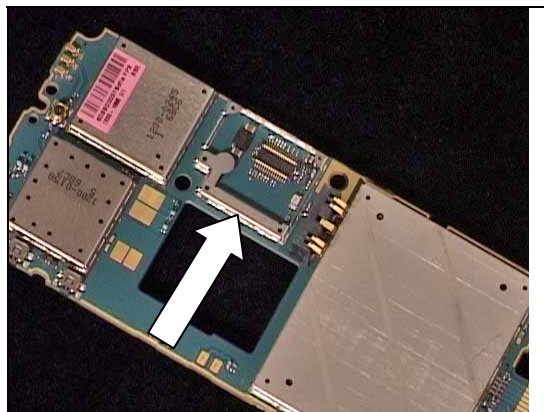
8.11 E1000 Shield Can Fence

Replace the Shield Can Fence with BGA repair equipment.
Only SL5.



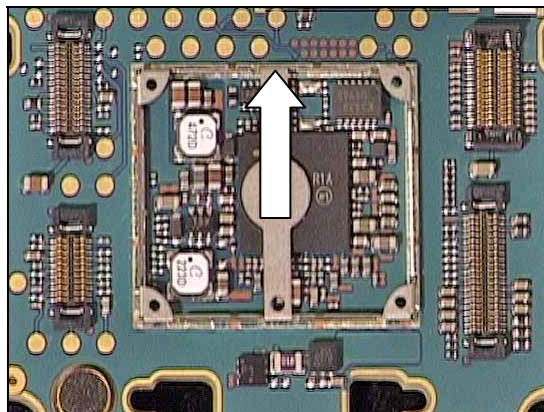
8.12 E1001 Shield Can Fence

Replace the Shield Can Fence with BGA repair equipment.
Only SL5.



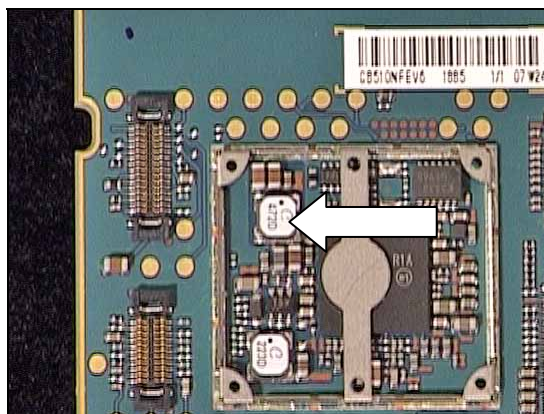
8.13 E1002 Shield Can Fence

Replace the Shield Can Fence with BGA repair equipment.
Only SL5.



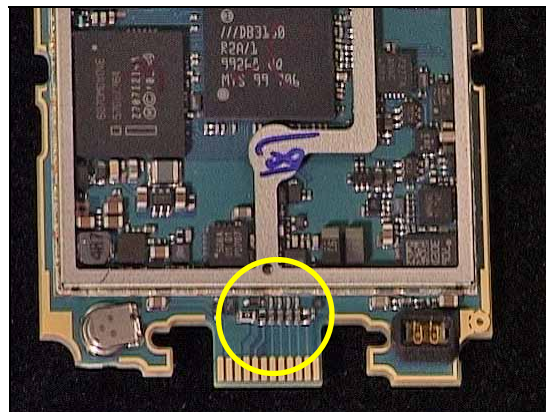
8.14 L2200 Ind WW 4.7 uH +-20% 2,95x2,95x0,9

Replace the Ind WW with Hot air soldering equipment.



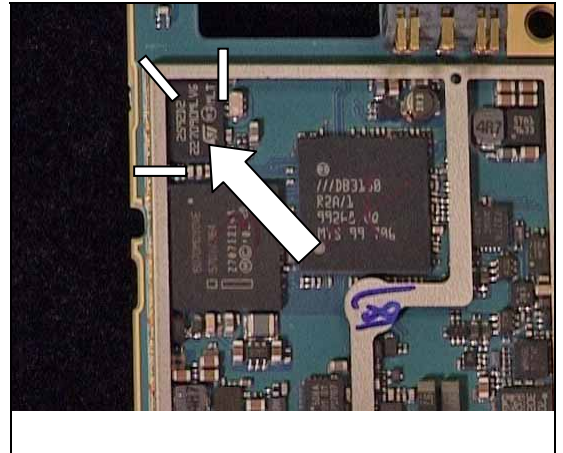
8.15 L2401, L2402, L2403, L2404 Filter 0.0 Hz 0402

Replace the Filters with Hot air soldering equipment.



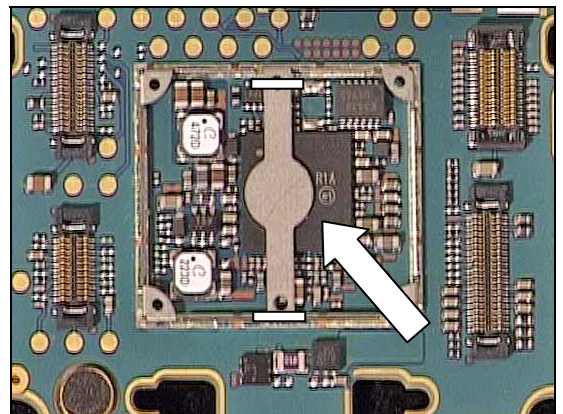
8.16 N1400 Module Bluetooth + FM STLC2592

Cut and bend the shield can fence to be able to replace components under the fence according Shield Fence Instruction (4)
 Replace the Bluetooth module with BGA repair equipment.
Only SL4.



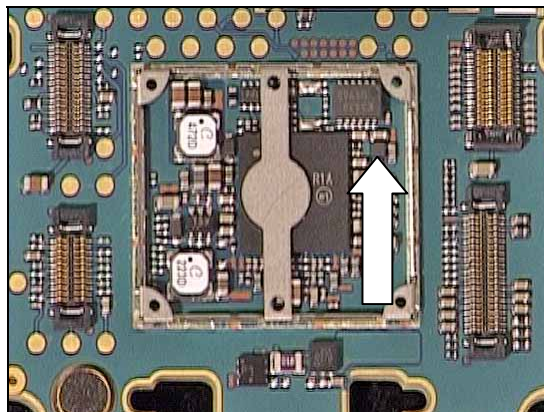
8.17 N2000 ASIC Vera

Cut the pick up area to be able to replace components under the fence according Shield Fence Instruction (4)
 Replace the Asic Vera with BGA repair equipment.
Only SL5.



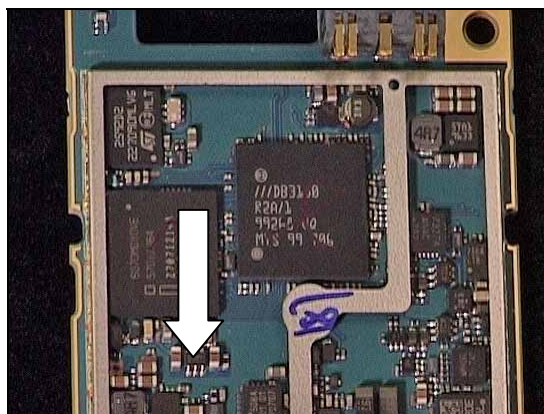
8.18 N2201 IC Vreg 150 mA LDO

Replace the IC Vreg with Hot air soldering equipment.



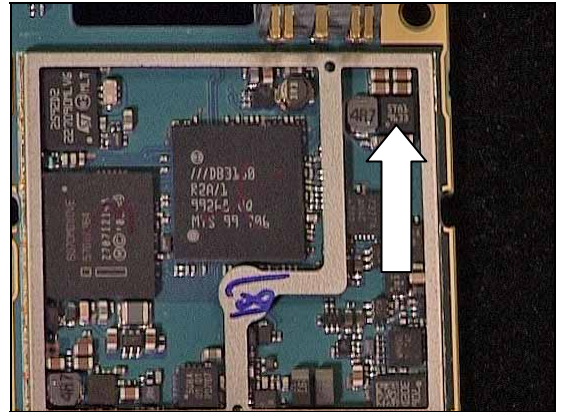
8.19 N2202 IC Vreg MAX8640, 1.8V

Replace the IC Vreg with Hot air soldering equipment.



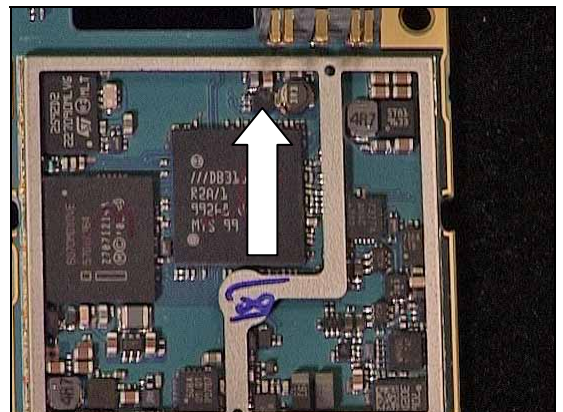
8.20 N2203 IC Vreg

Replace the IC Vreg with Hot air soldering equipment.



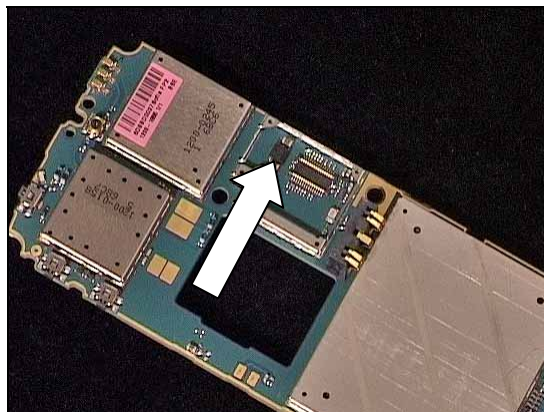
8.21 N2205 IC Vreg

Replace the IC Vreg with Hot air soldering equipment.



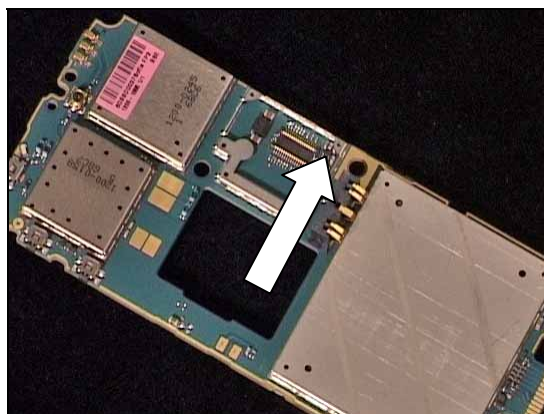
8.22 N2206 Voltage regulator 2,8V

Replace the Voltage regulator with Hot air soldering equipment.



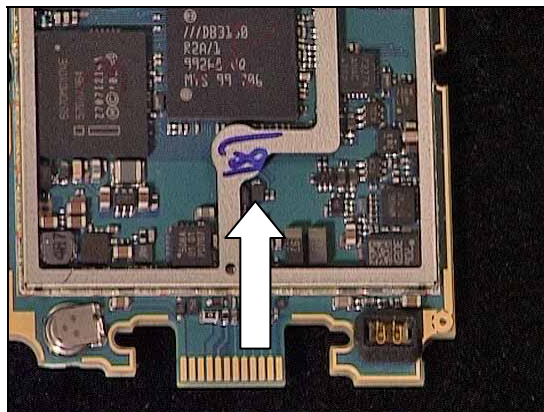
8.23 N2208 IC Vreg

Replace the IC Vreg with Hot air soldering equipment.



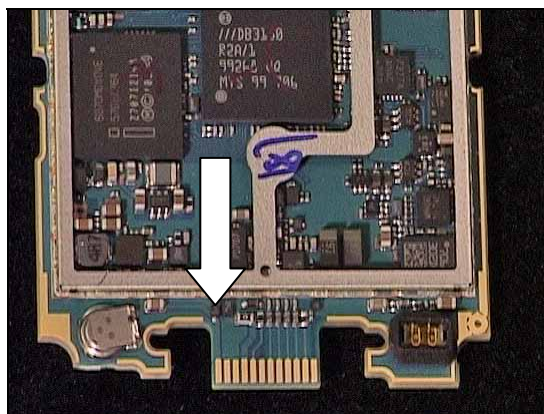
8.24 N2400 1-Bit Level Translator

Replace the 1-Bit Level Translator with Hot air soldering equipment.



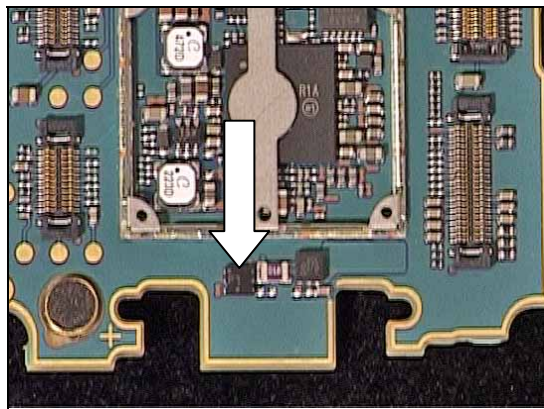
8.25 N2401 IC ESD Prot CS-5

Replace the IC ESD Prot with Hot air soldering equipment.



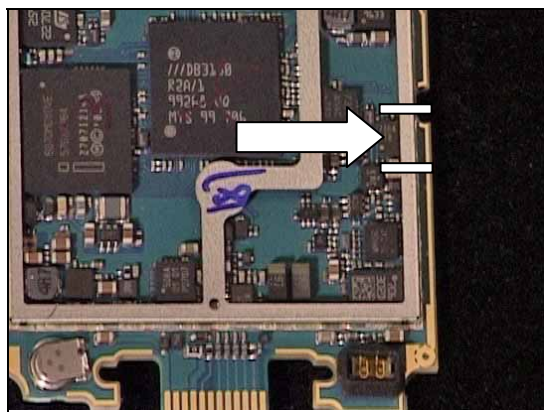
8.26 N2402 IC ESD Prot UDFN 6 2x2 mm

Replace the IC ESD Prot with Hot air soldering equipment.



8.27 N2500 IC Vreg 8-pin LLP

Cut and bend the shield can fence to be able to replace components under the fence according Shield Fence Instruction (4)
Replace the IC Vreg with Hot air soldering equipment.

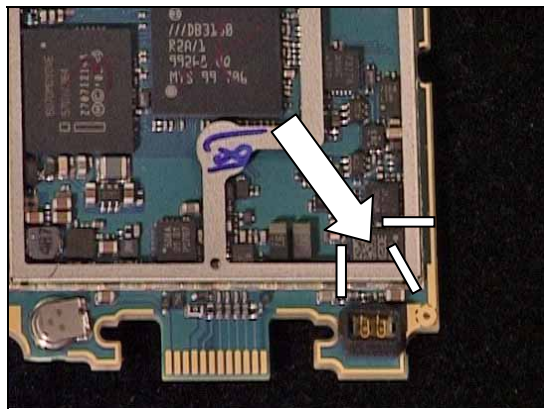


8.28 N2525 ASIC 3-axis accelerometer

Cut and bend the shield can fence to be able to replace components under the fence according Shield Fence Instruction (4)

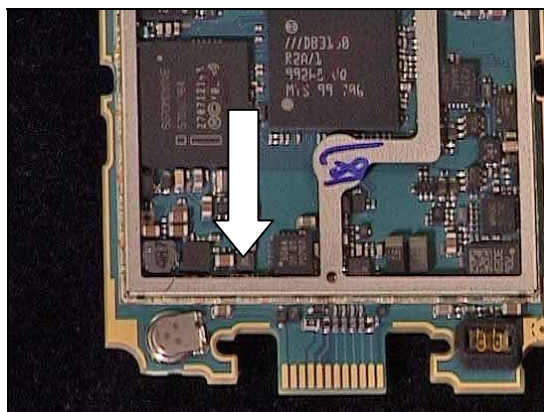
Replace the Asic 3-axis accelerometer with Hot air soldering equipment.

Bottom heat is required.



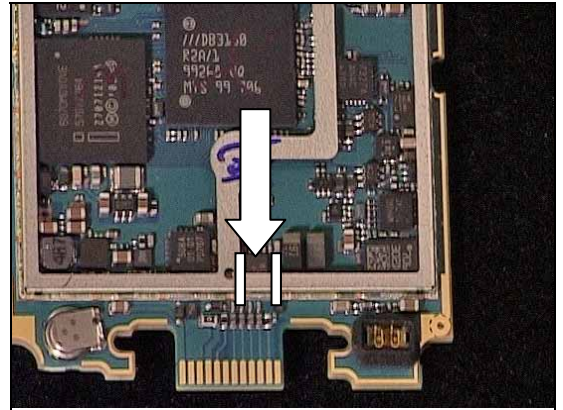
8.29 N3100 OPAMP 1W Pb-Free

Replace the OPAMP 1W with Hot air soldering equipment



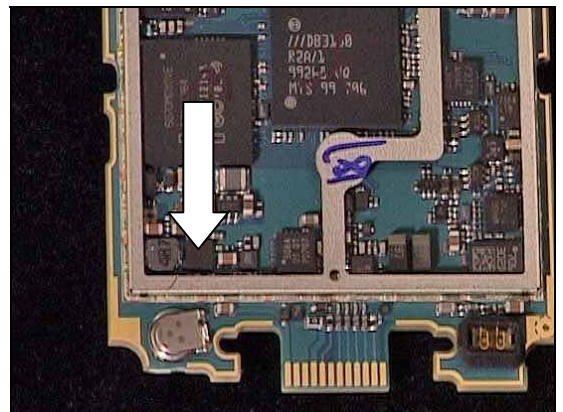
8.30 N3101 ASIC Tjatte3 CSP20

Cut and bend the shield can fence to be able to replace components under the fence according Shield Fence Instruction (4)
Replace the Asic Tjatte 3 with Hot air soldering equipment.
Bottom heat is required.



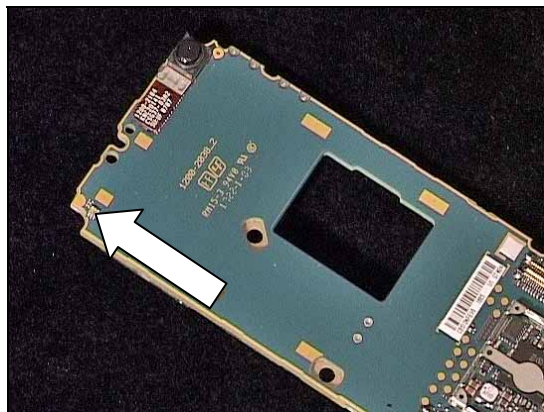
8.31 N4101 IC Dri MAX8830 ES3 4x4 UCSP

Replace the IC Dri with Hot air soldering equipment.
Bottom heat is required.



8.32 N4200 Light Sensor

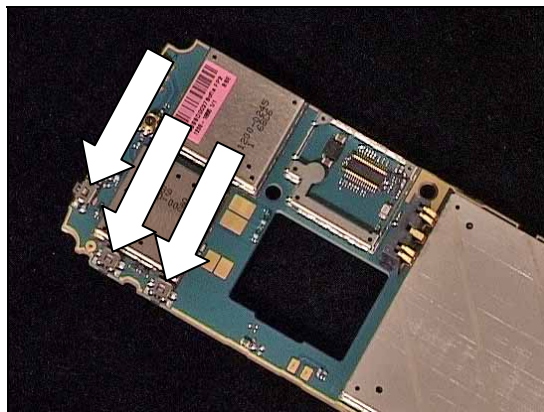
Remove the Light Sensor with Hot air soldering equipment.
Mount a new component with Soldering Iron.



8.33 S2400, S2401, S2402, S2403 Side Push Switch

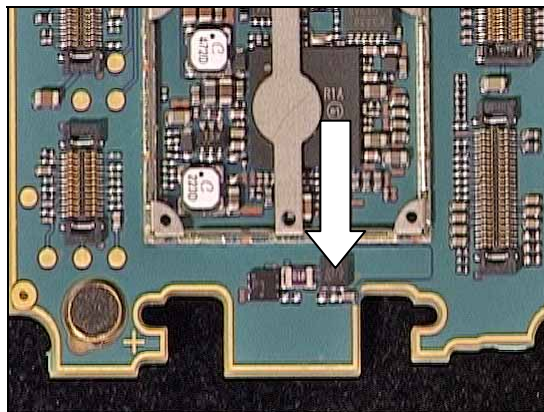
Remove Side key switches with Hot air soldering equipment
Mount new Side key switches with Soldering Iron.

NOTE: Use as little flux as possible to place the new part. Make sure flux does not get on the component body. Do not clean with alcohol the new mounted switch.



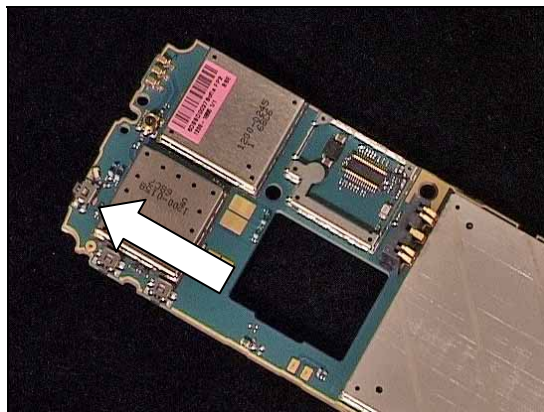
8.34 V2202 Trans P-ch FET

Replace the Trans P-ch Fet with Hot air soldering equipment.



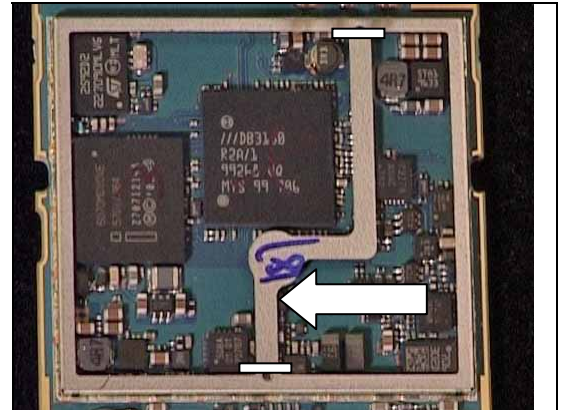
8.35 V2402 Diode Schottky 0,0

Replace the Diode Schottky with Soldering Iron.



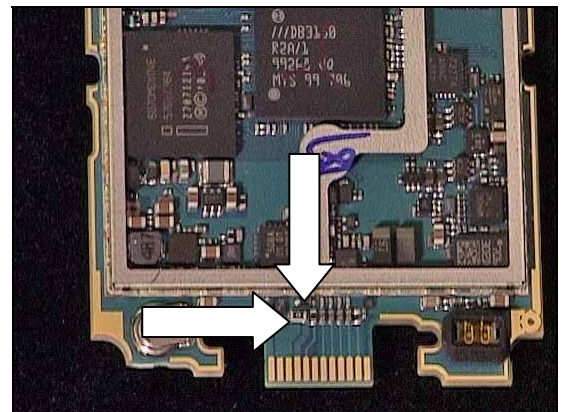
8.36 V2405 MOSFET Complementary N P 20 V (D S)

Cut the pick up area to be able to replace components under the fence according Shield Fence Instruction (4)
 Remove the Mosfet Complementary NP with Hot air soldering equipment.
 Mount a new component with Soldering Iron.



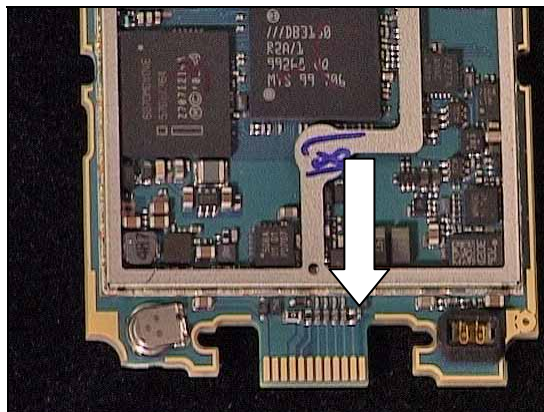
8.37 V2420, V2421 Zener Diode voltage regulator 15V 5%

Replace the Zener Diode with Hot air soldering equipment.



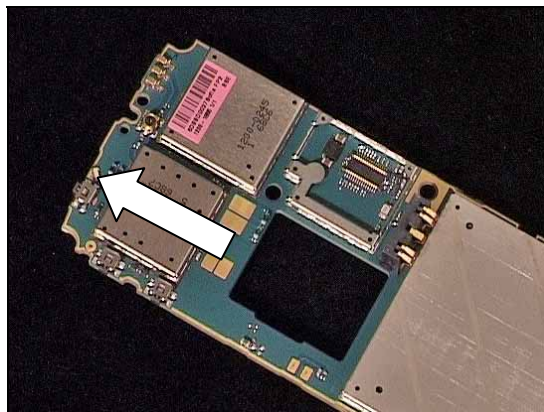
8.38 V2425 Diode Protection 0.7 V SOD-882

Replace the Diode Protection with Hot air soldering equipment.



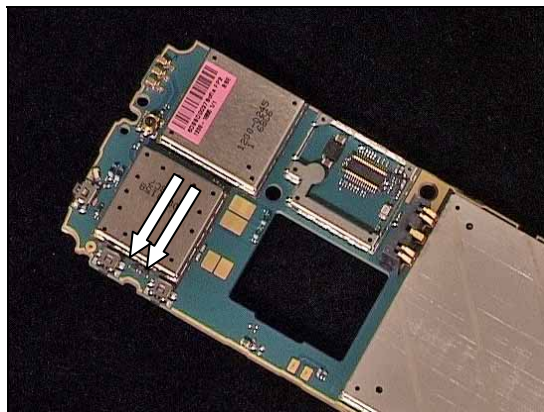
8.39 V2428 LED Red

Replace the LED Red with Soldering Iron.



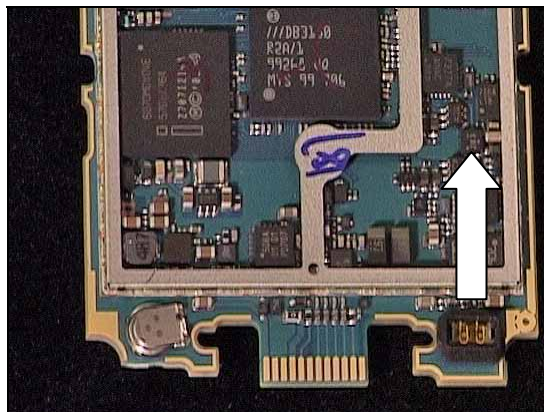
8.40 V2477, V2478 Diode Protection 5.0 V SOD-523

Replace the Diode Protection with Soldering Iron.



8.41 V2500 Trans P-ch FET WDFN6

Replace the Trans P-ch FET with Hot air soldering equipment.

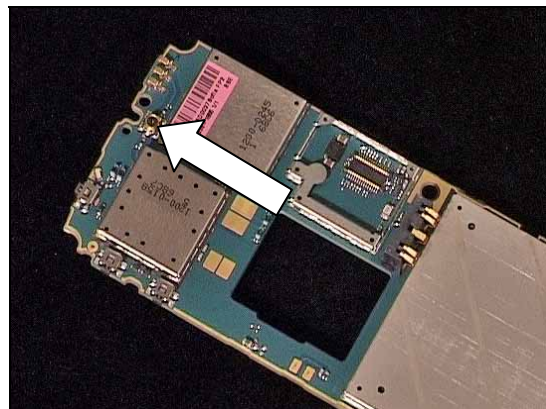


8.42 X1200 Connector, RF Test

Remove the RF Test Connector with Hot air soldering equipment

Mount a new component with Soldering Iron.

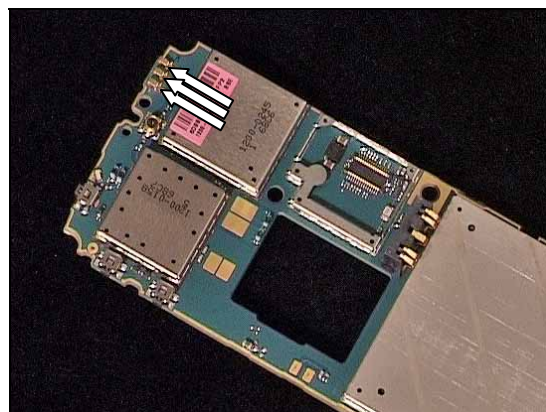
NOTE: Use as little flux as possible to place the new part. Make sure flux does not get on the component body. Do not clean with alcohol the new mounted switch.



8.43 X1201, X1202, X1203 Antenna connector

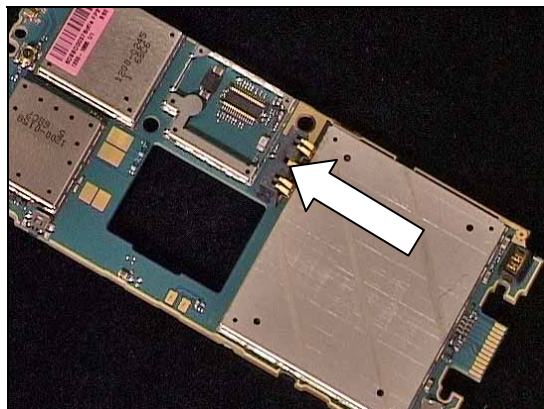
DO NOT CONTAMINATE THE TOP OF THE PIN CONNECTORS WITH FLUX OR SOLDER!

Replace Antenna pin connector with Hot air soldering equipment.



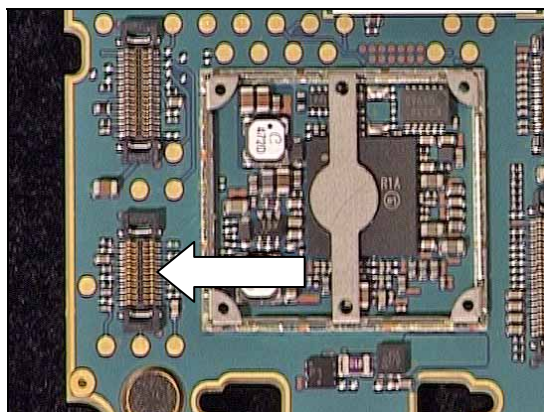
8.44 X2200 Battery connector

Replace the Battery connector with Hot air soldering equipment. Maximum temperature 330°C.
Bottom heat is required.



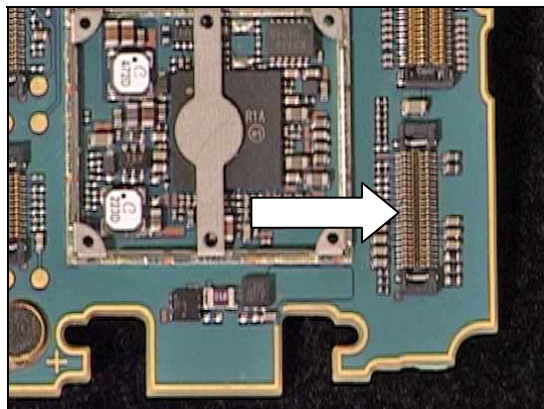
8.45 X2409, X4300 Conn BtB 22 pin

Remove the Conn BtB with Hot air soldering equipment.
Mount a new component with Soldering Iron or Hot air soldering equipment. Maximum temperature 330°C.
Bottom heat is required.



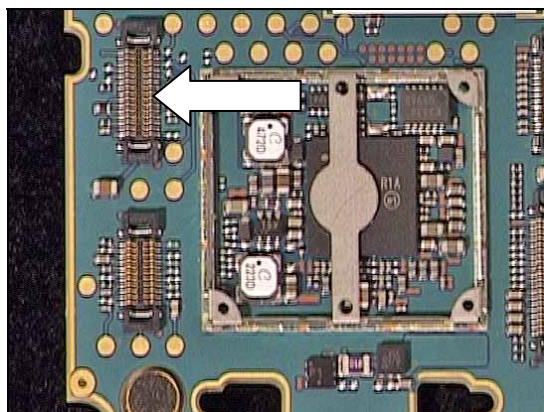
8.46 X2410 Conn BtB 40 pin

Remove the Conn BtB with Hot air soldering equipment.
Mount a new component with Soldering Iron or Hot air soldering equipment. Maximum temperature 330°C.
Bottom heat is required.



8.47 X2511 Conn BtB 30 pin

Remove the Conn BtB with Hot air soldering equipment.
Mount a new component with Soldering Iron or Hot air soldering equipment. Maximum temperature 330°C.
Bottom heat is required.



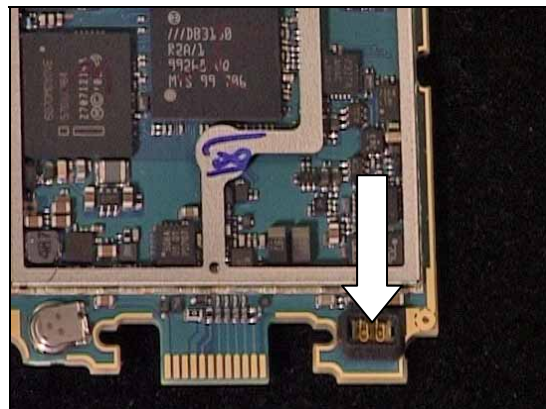
8.48 X3105 Microphone connector

REMOVE THE MICROPHONE GASKET FIRST

Remove the Microphone connector with Hot air soldering equipment.

Mount a new component with Soldering Iron.

Put back the microphone gasket.

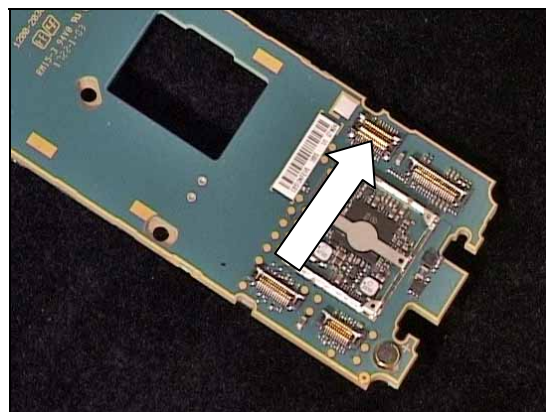


8.49 X4200 Conn BtB 26 pin

Remove the Conn BtB with Hot air soldering equipment.

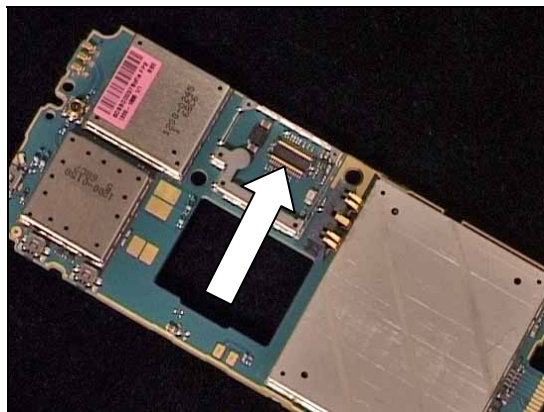
Mount a new component with Soldering Iron or Hot air soldering equipment. Maximum temperature 330°C.

Bottom heat is required.



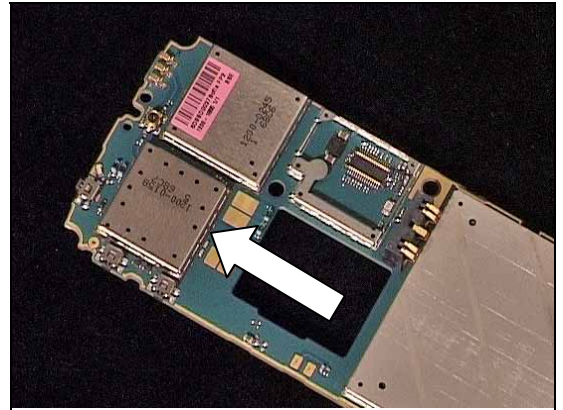
8.50 X4301 30 Pin BtB, male, (Camera)

Remove the Conn BtB with Hot air soldering equipment.
Mount a new component with Soldering Iron or Hot air
soldering equipment. Maximum temperature 330°C.
Bottom heat is required.



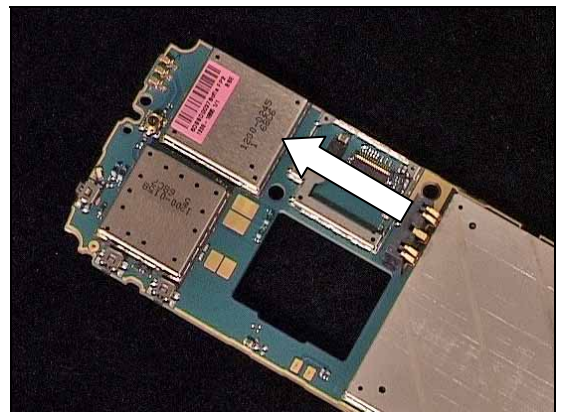
8.51 N1200 Mod Radio EDGE Thor GSM/EDGE

Replace the Radio Module with BGA repair equipment



8.52 N1210 Mammoth WLAN Radio Module

Replace the Radio Module with BGA repair equipment



9 Revision history

Rev.	Date	Changes / Comments
1	2007-10-09	Initial release
2	2008-01-18	N1200 and N1210
3	2008-01-24	BGA rework specifications added in Chapter 6