



Working Instruction, Electrical

Applicable for T303

CONTENTS

1	Read this first!	2
2	Lead-free soldering	3
3	BGA equipment reflow profiles.....	5
3.1	General.....	5
3.2	Temperature Measurements	5
3.3	Reflow Profiles	6
4	Replacement of components	7
4.1	Shield Can Lid RF&BB	8
4.2	D501, D502, D505: Diode Schottky 30.0 V VMD2	9
4.3	D503: TVS Diode 5.0V 45pF	9
4.4	D504, D707, D708: Varistor 5.5V	10
4.5	D702: Varistor 18V	10
4.6	D710: Varistor 14V	11
4.7	D711: Diode Protection 5.0V.....	11
4.8	J401: BtB Connector Hinge FPC.....	12
4.9	J402: Keypad connector.....	12
4.10	J601: Microphone (SMD)	13
4.11	J901: RF Connector	13
4.12	U402: Illumination pump.....	14
4.13	U501: Charge IC	14
4.14	U502: IC Linear Charge Protection	15
4.15	U601: IC Audio Power Amplifier	15
4.16	U801: Bluetooth + FM Module.....	16
4.17	VIB1: SMD Vibrator	16
4.18	X201: Crystal 32.768KHZ.....	17
5	Revision history	18

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!***

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.



All lead-free PBAs 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 PBAS THAT HAVE BEEN MANUFACTURED WITH LFS (LEAD-FREE SOLDER PASTE), 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 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

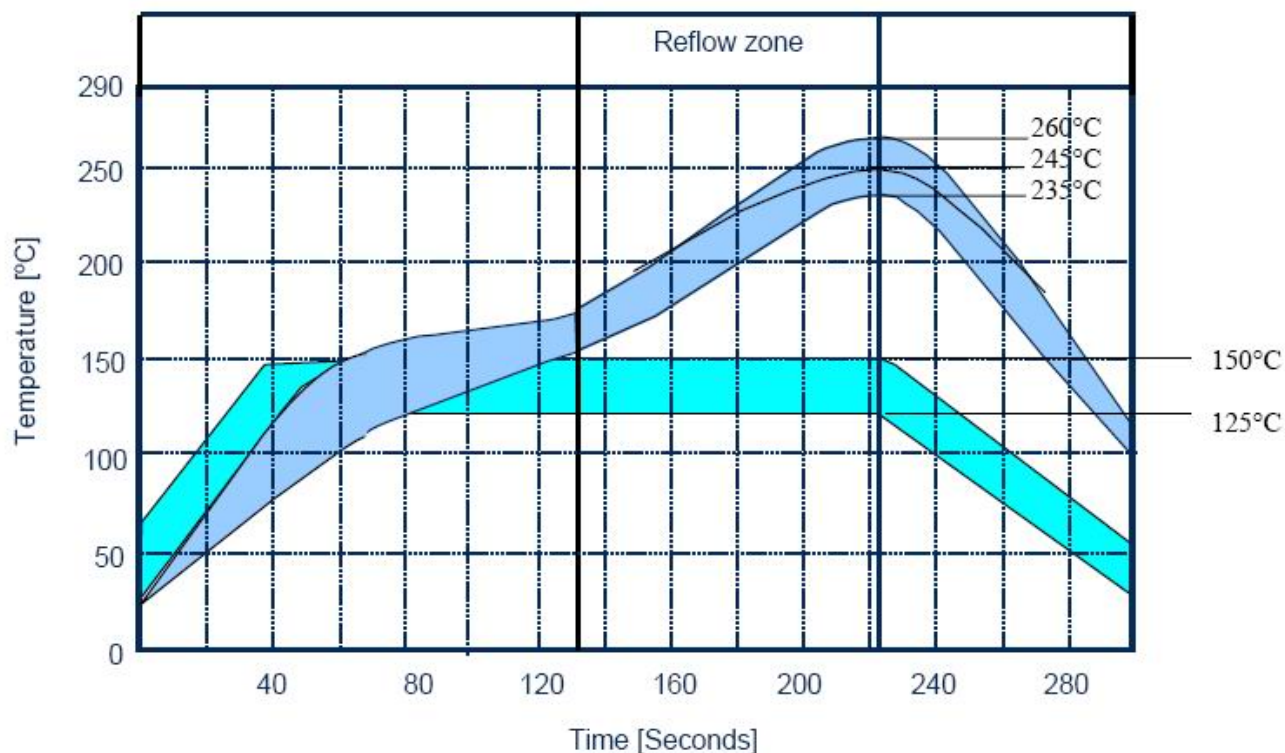
3.2 Temperature Measurements

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.
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. (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

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%)
- Flux, RMA no-clean flux
- Cutting pliers
- Shield fence pliers NTZ 112 537

CAUTION

- ***Keep all contact surfaces clean of dirt and hand-grease!***

MECHANICAL INSTRUCTIONS

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

4.1 Shield Can Lid RF&BB

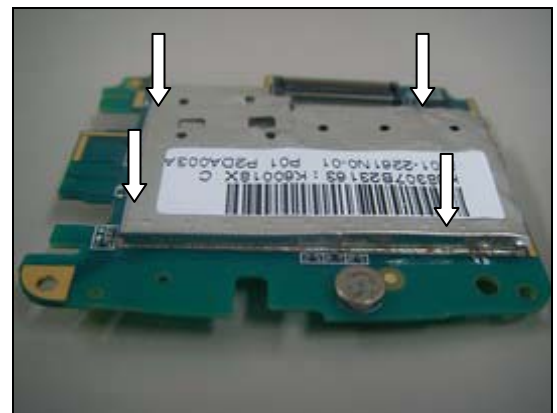
BE CAREFUL NOT TO DAMAGE ANY COMPONENTS SURROUNDING THE SHIELDING FRAME!

1. Use a dentist hook to raise the corner of Shield Can Lid RF.
2. Continue with the same procedure on all other corners to remove the lid



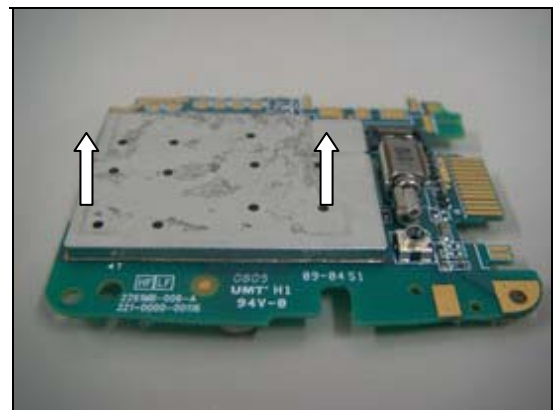
USE A NEW SHIELD CAN LID!

Press the shielding cover down to snap all hooks onto shielding frame until you hear a 'Click' sound.



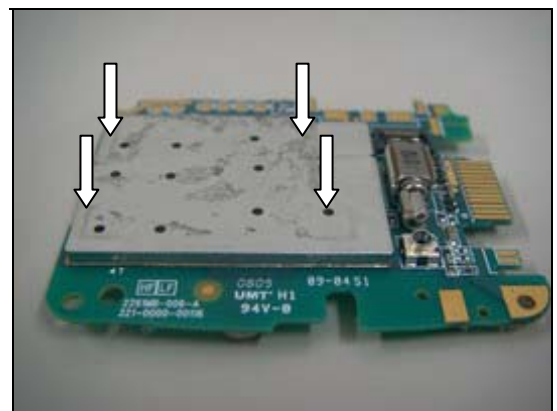
BE CAREFUL NOT TO DAMAGE ANY COMPONENTS SURROUNDING THE SHIELDING FRAME!

1. Use a dentist hook to raise the corner of Shield Can Lid BB.
2. Continue with the same procedure on all other corners to remove the lid



USE A NEW SHIELD CAN LID!

Press the shielding cover down to snap all hooks onto shielding frame until you hear a 'Click' sound.



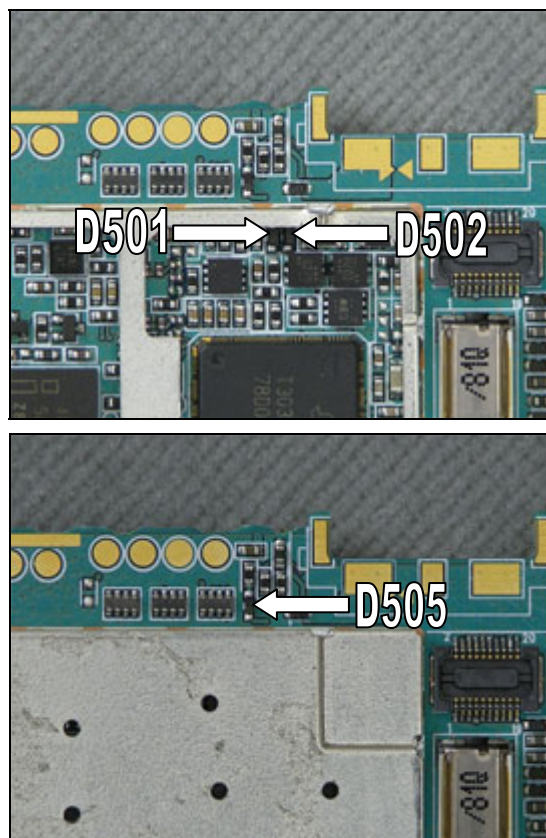
4.2 D501, D502, D505: Diode Schottky 30.0 V VMD2

REMOVE SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

Use hot air soldering equipment to replace D501 and D502.

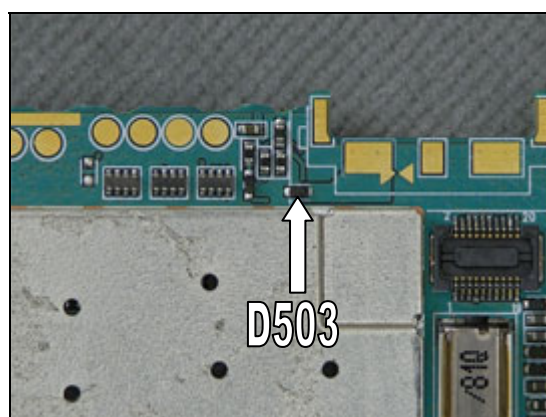
ATTACH A NEW SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

Use hot air soldering equipment to replace D505.



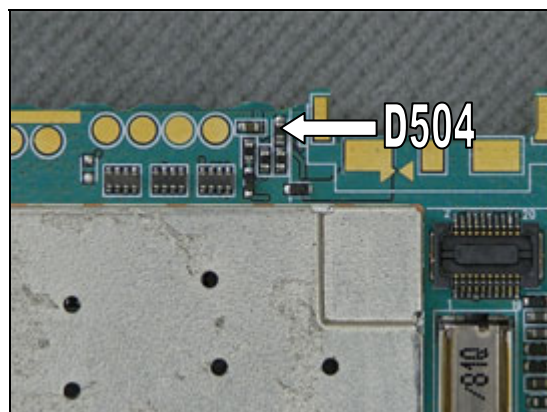
4.3 D503: TVS Diode 5.0V 45pF

Use hot air soldering equipment to replace the D503.

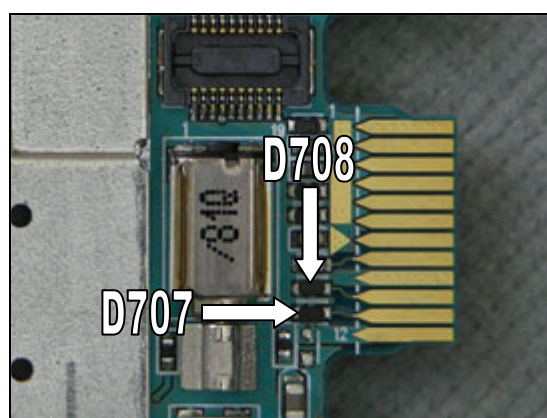


4.4 D504, D707, D708: Varistor 5.5V

Use hot air soldering equipment to replace D504.

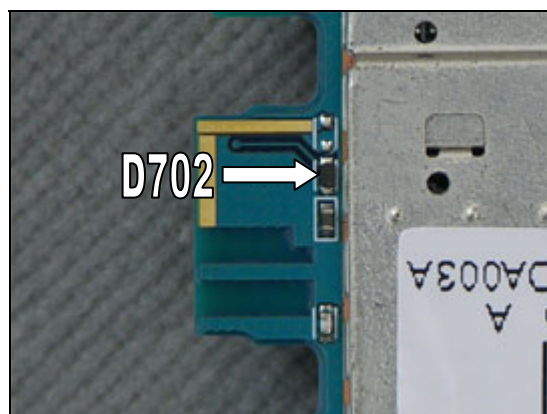


Use hot air soldering equipment to replace D707 and D708.



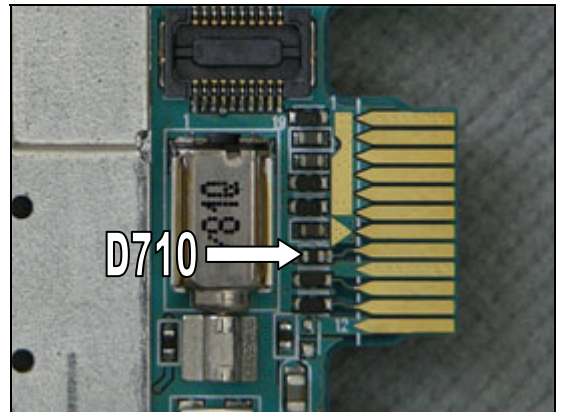
4.5 D702: Varistor 18V

Use hot air soldering equipment to replace D702.



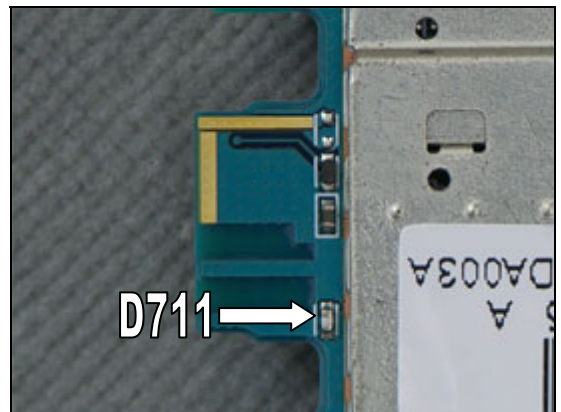
4.6 D710: Varistor 14V

Use hot air soldering equipment to replace D710.



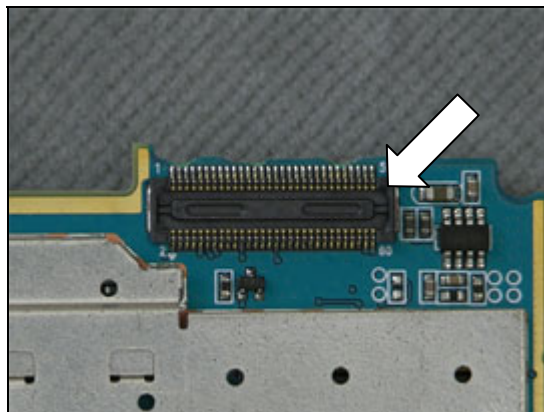
4.7 D711: Diode Protection 5.0V

Use hot air soldering equipment to replace D711.



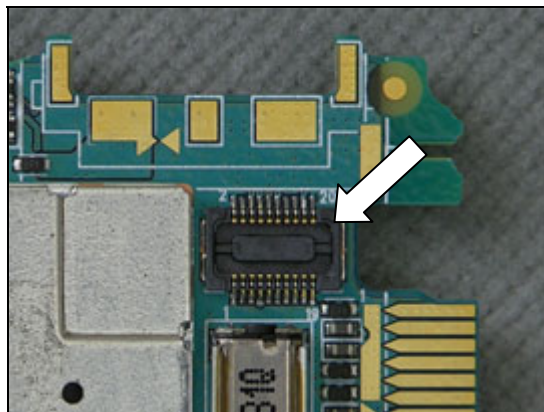
4.8 J401: BtB Connector Hinge FPC

1. Use hot air soldering equipment to remove J401.
2. Use soldering iron with very thin tip to replace a new component.



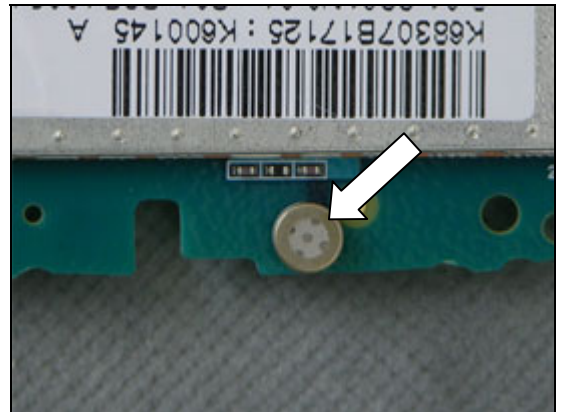
4.9 J402: Keypad connector

1. Use hot air soldering equipment to remove J402.
2. Use soldering iron with very thin tip to replace a new component.



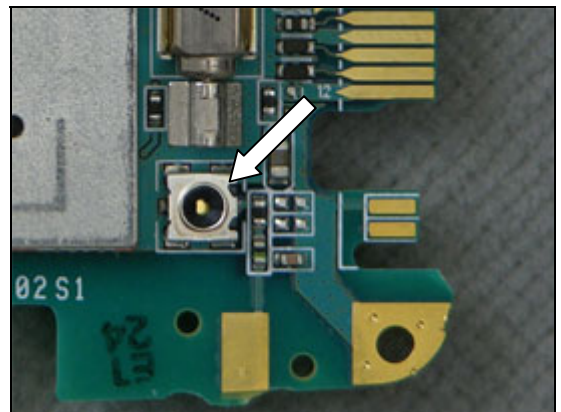
4.10 J601: Microphone (SMD)

Use hot air soldering equipment to replace J601.



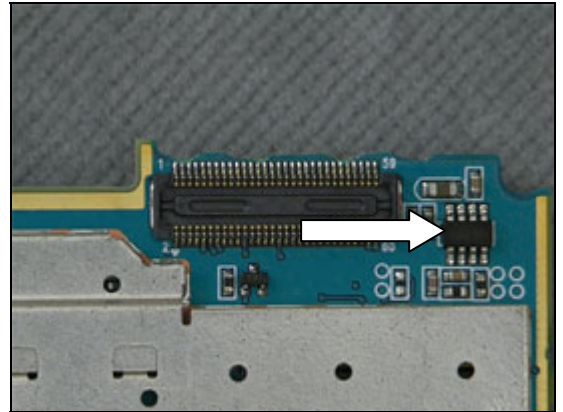
4.11 J901: RF Connector

1. Use hot air soldering equipment to remove J901.
2. Use soldering iron to replace a new component.



4.12 U402: Illumination pump

1. Use hot air soldering equipment to remove U402.
2. Use soldering iron to replace a new component.

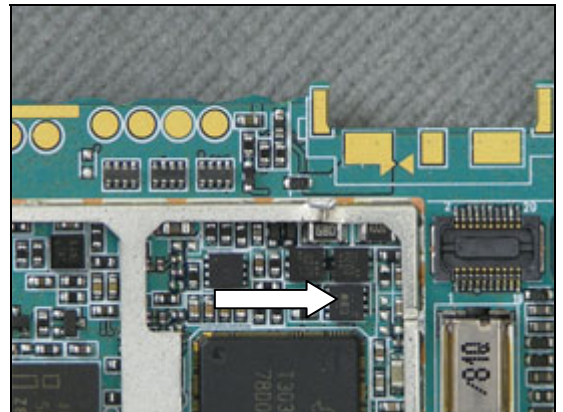


4.13 U501: Charge IC

REMOVE THE SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

1. Use hot air soldering equipment to remove U501.
2. Use soldering iron to replace a new component.

ATTACH A NEW SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

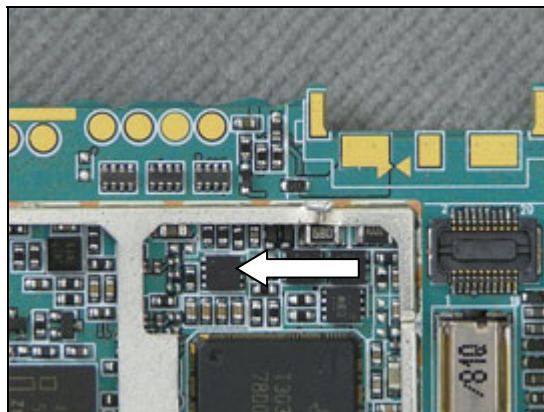


4.14 U502: IC Linear Charge Protection

REMOVE THE SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

1. Use hot air soldering equipment to remove U501.
2. Use soldering iron to replace a new component.

ATTACH A NEW SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

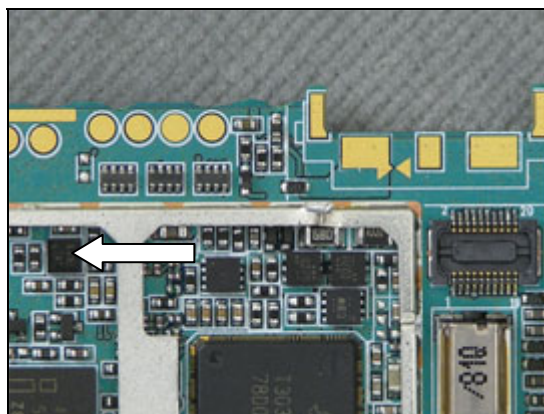


4.15 U601: IC Audio Power Amplifier

REMOVE THE SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

1. Use hot air soldering equipment to remove U601.
2. Use soldering iron to replace a new component.

ATTACH A NEW SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

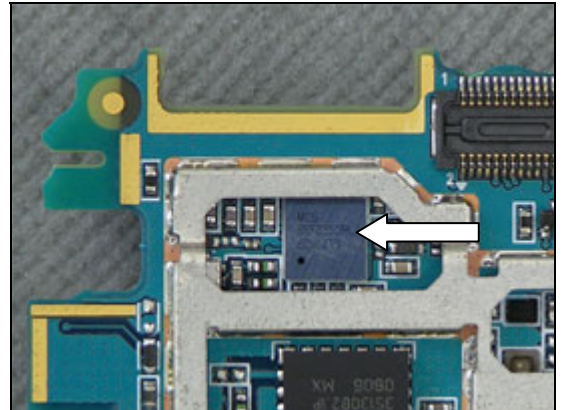


4.16 U801: Bluetooth + FM Module

REMOVE THE SHIELD CAN LID RF ACCORDING TO INSTRUCTIONS IN 4.1.

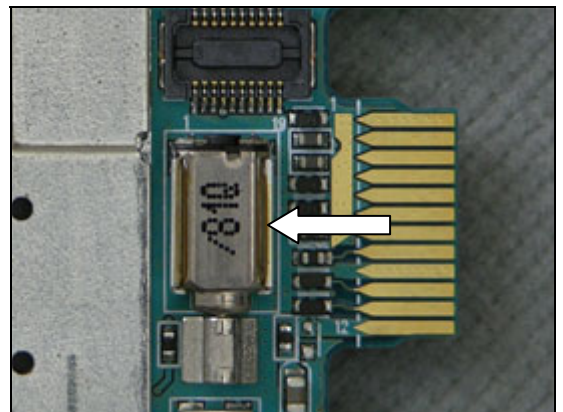
1. Use hot air soldering equipment to remove U801
2. Use BGA repair equipment replace a new component.

ATTACH A NEW SHIELD CAN LID RF ACCORDING TO INSTRUCTIONS IN 4.1.



4.17 VIB1: SMD Vibrator

1. Use hot air soldering equipment to remove VIB1.
2. Use soldering iron to replace a new component.

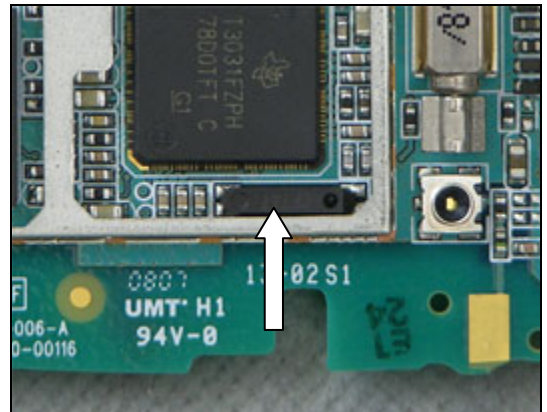


4.18 X201: Crystal 32.768KHZ

REMOVE THE SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.

1. Use hot air soldering equipment to remove U801
2. Use soldering iron with very thin tip replace a new component.

ATTACH A NEW SHIELD CAN LID BB ACCORDING TO INSTRUCTIONS IN 4.1.



5 Revision history

Rev.	Date	Changes / Comments
1	2008-07-10	1 st Release