

Repair Hints

Service-Level 3 & 4

2650



RH-53



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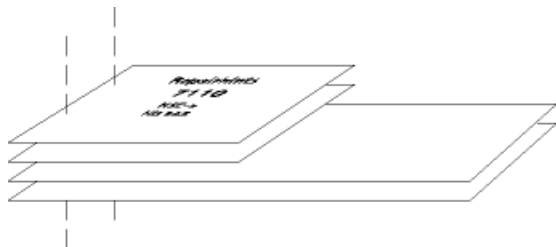
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General



- How to use this document

Put the colored schematics behind this manual.

Now you are able to follow these specifications with graphical layouts and it is easier for you to find the components and measuring points.

- Component characteristics

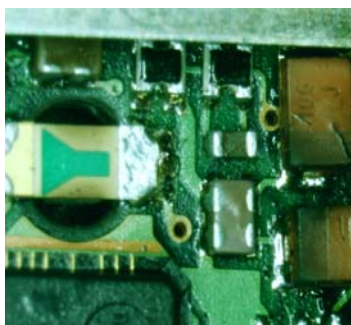
Some components contain important data such as tuning values or security data; therefore several steps described are only feasible if you are able to reflash/ realign the phone and/or rewrite IMEI/SIMlock in certain cases. Please pay attention to separate notes.

- Broken balls / underfill, μ BGAs

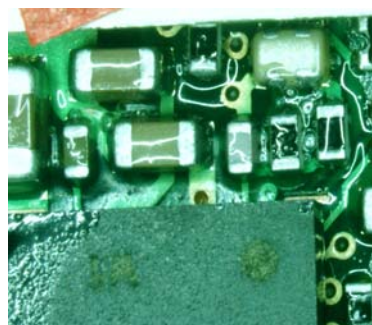
All replaceable (not underfilled) μ BGA components must be renewed after removing. Reflow with uncontrolled hot-air fan is strictly forbidden! It is also not recommended only to reflow the old μ BGA using a μ BGA rework station! μ BGA must only be soldered with NMP approved μ BGA rework machines (e.g. Zevac/ OK-Metcal/ Martin) to get durable solder joints.

Check soldering points after removing a μ BGA; if necessary rework oxidated solderings (broken balls) carefully by tinplating these areas with few flux and a hot soldering iron. Before placing a new component remove the tin and clean the PWB; e.g. with help of solder wick and flux cleaner such as "Kontakt LR". Use only recommended flux type and an appropriate amount of it – avoid drowning the PWB in flux as this will lead to additional faults!

Also check underfilled parts for broken underfill material below. In this case carefully evaluate possible repair actions as the phone probably was exposed to strong mechanical stress.



"rework" done with
uncontrolled hot air



PWB drowned in flux

- Work precautions

Whenever working with chemicals (e.g. flux or alcohol), always wear safety glasses and gloves! Furthermore always check corresponding material safety data sheets and check for restrictions given by your home country legislation!

- PWB handling & cleaning

To avoid damages of PWB and / or components through electrostatic discharging, handle the module in ESD protected areas only (as shown on next page). When handling PWBs outside an ESD-bag always wear ESD-wristbands, which must be connected to earth bonding point, and gloves to avoid corrosion and fingerprints. Damage by electrostatic discharge often leads to a module not failing directly but after a short period of time!

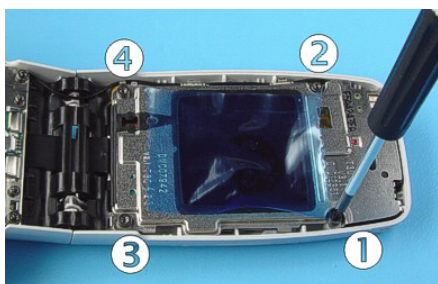
For cleaning use only appropriate materials; do not use scratching or rubbing tools. Useful tools for cleaning are flux cleaners such as isopropyl alcohol or "Electrolube FLU" in connection with ionized compressed air (see also General SB 211). For shield disassembling or any other rework on the PWB always place the PWB into the rework jig RJ-14 to prevent damaging, e.g. connectors.

- Shieldings, screw torques

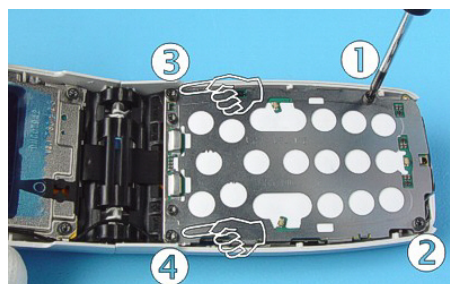
To avoid RF-problems it is not allowed to reuse any shielding that once has been removed from shielding frame. Always use new shieldings after successful repair!

For disassembly open the screws in the order that is shown in the pictures below. To tighten screws use reverse order and a torque T6 plus screwdriver adjusted to 27Ncm.

No screwing order is needed for the hinge screws, but please note, that the screws are Torx T5 plus. Only to tighten the screws use a torque of 5Ncm.



Upper part



Lower part

Disassembling (1-4) and assembling (4-1) order

- Realign after repair

Characteristics of replacement parts may vary.

To prevent additional faults after repair (e.g. low standby time, losing network etc.) it is necessary to retune phone values after repair; but never try to cover up a fault by justing the phone settings!

- Fault report in fault log (Phoenix)


It is very important to report all repaired failures in fault log after finishing the complete phone repair.

The report content should **only** contain the self-observed fault symptom, except "no fault found".



In this case the report content should contain the symptom code that is given from the customer, e.g. "Does not switch on"(2101) and the fault code "no fault found"(470).


If the symptom code from the customer is not the same as the observed symptom, use always the self-observed symptom code.

ESD Protection requirements

	<p>Electrostatic discharge can easily damage the sensitive components of electronic products. Therefore, every Service Supplier has to take care of at least some precautions, such as ESD restricted area, floor, table, covering, chair(s), shoes or wristbands.</p>
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For further information refer to the Partner Web Site document **“Service Supplier Requirements”**

	
<p>example of an <u>electrostatic protected area (epa)</u> set up source: www.armeka.com</p>	<p>example of a workbench set up source: www.warmbier.com</p>



example of a workbench and testers source: <http://www.armekaengineering.com>

Introduction

IMPORTANT:

This document is intended for use by authorized NOKIA service centers only.

The purpose of this document is to provide some further service information for NOKIA 2650 phones.

It contains a lot of collected tips and hints to find faults and repair solutions easily.

It also will give support to inexperienced technicians.

Saving process time and improving the repair quality is the aim of this document.

It is built up based on fault symptoms (listed in "Contents"), followed by detailed description for further analysis.

The document is to be used additionally to the service manual and other service information such as Service Bulletins. For that reason it does not contain any circuit or schematic diagrams.

All measurements are made using following equipment:

Nokia repair SW:	Phoenix version 2004.46.7.74
MCU SW:	DP36.0 MCU SW 5.19
Nokia module jig:	MJ-36
Digital multimeter:	Fluke 73
Oscilloscope:	Fluke PM 3380A/B
Spectrum Analyzer:	Advantest R3131 with an analog probe
RF-Generator / GSM Tester:	Rohde & Schwarz CMU 200

While every endeavour has been made to ensure the accuracy of this document, some errors may exist. If the reader finds any errors, NOKIA should be notified in writing, using the following procedure:

Please state:

title of the document + issue number/date of publication.

page(s) and/or figure(s) in error.

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Chapter 1: Phone does not switch on

Pre-Check

Before any repair action if diode V100 is soldered correctly, criteria are the solder joints. In case not, UEM is defect!!! Swap the phone because UEM is not changeable!!!

Check the current consumption of the phone: if it increases directly to more than 0.5 ampere after pressing power key, most probably there is a short circuit in the phone. On the other hand, if the current consumption is zero, especially check the battery connector X105 if bent or soiled. In case the current consumption is around 50mA (please note that this value may vary depending on your service equipment!), first you should try is to perform a software update.

Repair instructions

If the pre-check gives no further information about the fault, first of all check following voltages and signals:

- Check battery voltage at both sides of L260 – L262 and L263 – L265, ~4VDC
- Check 32.768kHz oscillator B200; voltage at both sides of crystal B200 usually is 0.5VDC; signals measured with an oscilloscope should appear as shown below:

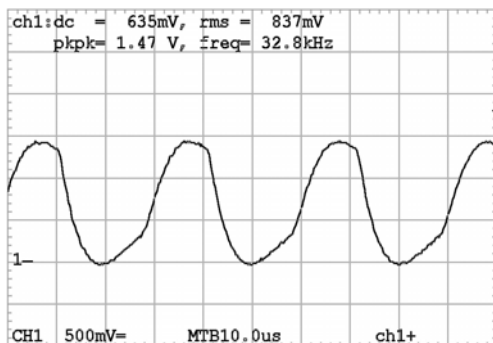


Fig.1: 32.678kHz at C209

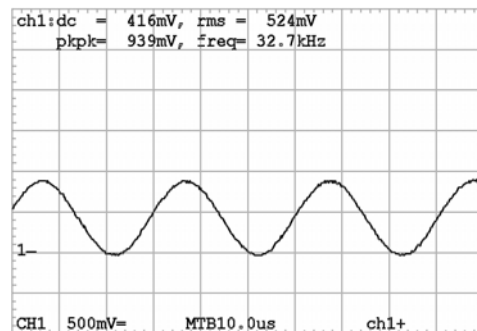


Fig.2: 32.768kHz at C210

- Check sleepclock at UPP and 26MHz system clock at B600. Oscillator signals have to appear on the oscilloscope as shown below:

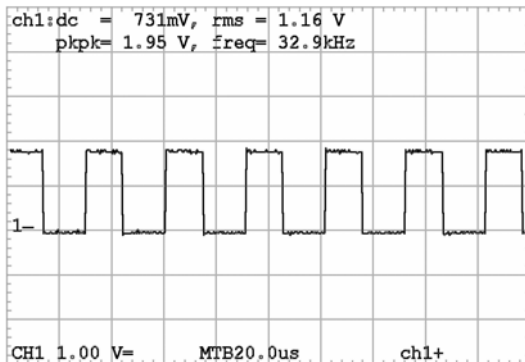


Fig.3: 32kHz sleepclock at J404

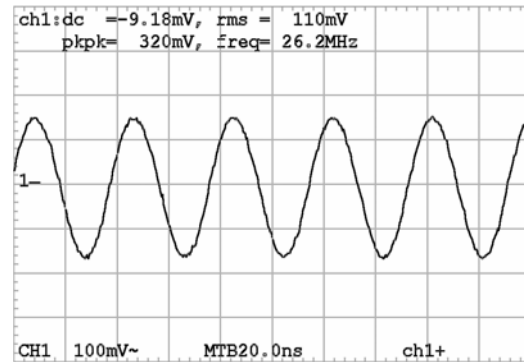


Fig.4: 26MHz at B600

Also ensure that the following voltages are measurable (at least for some milliseconds) after pressing the power switch:

- Check V_{CORE} = 1.8VDC at C208
- Check V_{flash1} = 2.8VDC at C205
- Check V_{ANA} = 2.8VDC at C206
- Check V_{IO} = 1.8VDC at C207
- Check V_{R3} = 2.8VDC at C227
- Check V_{PURX} = 1.8VDC at J402

If one value is not measurable or too low, check capacitors for short to ground. Probably UEMK (D200) is faulty. Swap the phone because UEM is not changeable!!

If signals are okay try to flash the phone. In case of any failure message during flashing, change combo memory (D450), and reflash phone again. If this does not succeed, probably UPP (D400) is faulty. Swap the phone because UPP is not changeable!!

Chapter 2: Not charging

Pre-Check

In case charging of battery is only time to time possible continue with chapter:

- Mechanical faults

If charging function does not work at all first run energy management calibration. Note that calibration only works with JBV-1, DA-27 docking station adapter and 12VDC power supply. In case of any failure message follow the repair instructions:

- Electrical faults

Repair instructions

Mechanical faults

If charging the phone is impossible only from time to time, especially check spring contacts of system connector I207 and battery connector X105 if bent, soiled or corroded. Also make sure that all related contact pads of the PWB are clean; if necessary clean them with a bit of alcohol. Do not use any scratching or rubbing tools!!!

Electrical faults

In most cases the root cause for a not working energy management calibration is a faulty fuse F100. Check resistance and replace it if necessary. If charging still does not work at all, check solder joints of diode V100 if soldered correctly. In case not soldered, UEM is defect!!! Swap the phone because UEM is not changeable!!!

To ensure the correct functioning of phone run energy management calibration whenever having changed a part in the charging circuit or when the flash circuit containing the tuning values has been exchanged!

Chapter 3: Insert SIM card

Pre-Check

First check the mechanical appearance of card reader I007 by disassembling the LCD module I002. Insert a SIM card and pay attention if SIM removal detection switch closes itself when the SIM card is inserted.

In case the detection switch does not close follow repair instructions:

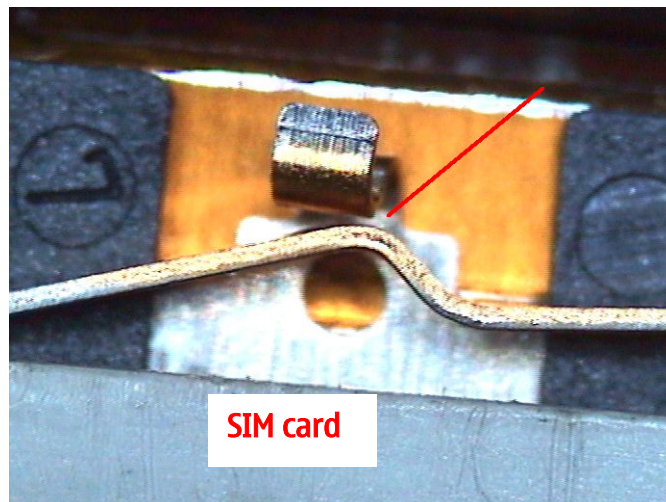
- Mechanical faults

Repair instructions

Mechanical faults

If SIM removal detection switch appears as shown in the picture below after having inserted SIM card, change LCD can Assy (A2).

Do not try to bend the detection switch back into right position!!!



Not closed detection switch with inserted SIM card

Chapter 4: Intermittent no service

Pre-Check

In most cases the root cause for intermittent no service is a mechanical fault. First disassemble the phone; and during the disassembling procedure watch if the coax cable (I106) is in right position and/or might be disconnected from coax connector X700. In case coax cable is disconnected or damaged follow repair instruction:

- Mechanical faults

Repair instructions

Mechanical faults

If the coax cable is disconnected, reconnect it again, and retest the phone. In case the coax cable is damaged, replace it and assemble the phone.

Note that the coax cable is not squeezed in the hinge spring (I103), and routed correctly in the whole phone after assembling. If you have routing problems with the coax cable use the disassembling and assembling videos from NOKIA Online.

Change history

Originator	Status	Version	Date	Comment
Competence Transfer Team	Approved	1.0	12/01/2005	Approved version