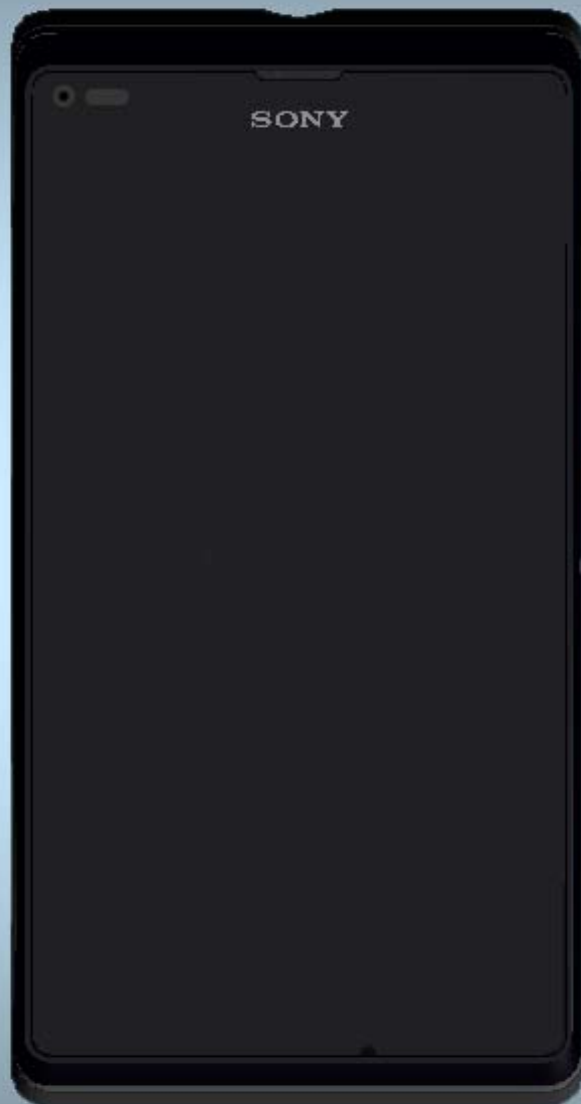


Test Instructions

- mechanical -



C2104,C2105,S36h

CONTENTS

1	Pre-Test Preparations	4
1.1	Hardware	4
1.1.1	Water indicator inspection.....	4
1.1.2	Test Enablers	4
1.2	Software	5
1.2.1	Software update.....	5
2	Tests	6
2.1	Service Test Mode.....	6
2.2	Service Tests	7
2.2.1	Keyboard & Switch	7
2.2.2	Touch Screen	7
2.2.3	Display.....	7
2.2.4	LED/Illumination	8
2.2.5	Speaker.....	8
2.2.6	Earphone	8
2.2.7	Microphone	9
2.2.8	Secondary Microphone	9
2.2.9	Vibrator	9
2.2.10	Camera	10
2.2.11	Secondary Camera	10
2.2.12	Flash LED	10
2.2.13	Bluetooth.....	11
2.2.14	WLAN.....	11
2.2.15	GPS	12
2.2.16	Compass	12
2.2.17	Accelerometer.....	12
2.2.18	Ambient Light Sensor	13
2.2.19	Proximity Switch.....	13
2.2.20	Real time clock (RTC).....	14
2.2.21	Total call time.....	14
2.2.22	External Memory.....	14
2.2.23	Security	15
2.2.24	FM radio.....	15
2.2.25	Battery Test.....	15
2.2.26	Flip Slider Counter.....	16
2.2.27	Verify Certificates	16
2.2.28	NFC Test.....	16
2.2.29	RX Diversity Test	17
2.3	Manual Tests.....	18
2.3.1	SIM	18
2.3.2	On/Off Key test	18
2.3.3	Back/Home/Menu keys test	18
2.3.4	Camera	19
2.3.5	Charging via USB (Charger or Computer).....	20
2.3.6	Internal Memory Test.....	20
2.4	Network Test.....	22

2.4.1	On-the-air call to mobile (no UMTS network available).....	22
2.4.2	On-the-air call to mobile (UMTS network available)	22
3	Revision History	23

For general information about test procedures, refer to
1220-1333: Generic Repair Manual – mechanical.

1 Pre-Test Preparations

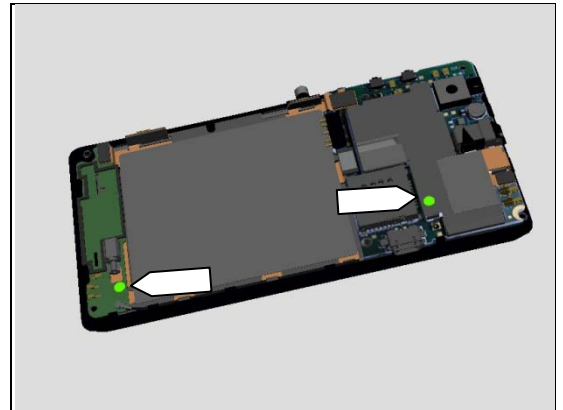
1.1 Hardware

1.1.1 Water indicator inspection

Before starting any tests the liquid intrusion indicator has to be checked.

The Water Indicator is located as shown in this picture after the Middle frame assembly is removed.

- If affected (red color) - handle the phone according to the local directives.
- If not affected by liquid, proceed to the 'Pre-Test Preparation' below.

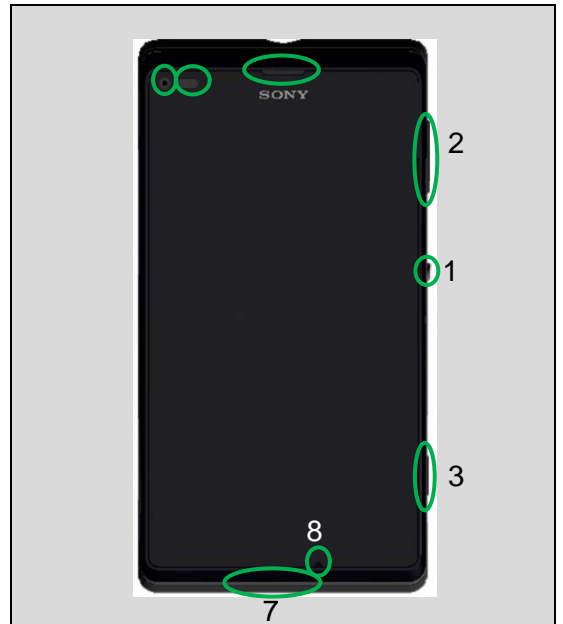


1.1.2 Test Enablers

These are items on the phone that are used during the test of the unit.

Front:

1. On/Off Key
2. Volume up/down Key
3. Camera Key
4. Secondary Camera
5. Ambient Sensor& Proximity Switch
6. Earphone
7. Led
8. Main MIC hole



Back:

9. Camera
10. Flash LED
11. 2nd MIC Hole
12. Speaker



Pre-Test Preparations

1.2 Software

1.2.1 Software update

1.2.1.1 Software version verification

Check the software version of the phone for fault verification. The latest improvements are found on the support pages under the support

news. <http://www.sonyericsson.com/cws/marketingurlportal?pageid=key.SupportZone.Overview>

Step 1: Start up the phone;

Note: Make sure the phone is in call setup.

Step 2: Press the following keypad combination: ***##7378423##**;

Step 3: Select 'Service info';

Step 4: Select 'Software info';

Step 5: Check the software file revisions and, if needed, update as described below.

For more information, refer to 1220-1333: Generic Repair Manual – mechanical.

1.2.1.2 Software version update

Mandatory first repair action!

Use the USB cable to connect with the Micro USB connector of the phone for this purpose!

Ensure the phone is powered off and proceed as follows.

Step 1: Open the Emma application and log in;

Step 2: Press and hold the Volume Down key on the phone, connect the phone to the USB cable and then release the Volume Down key.

Step 3: Select the appropriate service and follow the on-screen instructions.

Note: For phones with eMMC flash memory (built in "SD card" memory), the only service which erase this eMMC memory is Service's "Refurbish" and "Customize". See also emma User Guide info. http://emma.extranet.sonyericsson.com/documents/emma_user_guide.pdf (see "Service Types" and "Aspects of large files").

In Swap flow, when change a phone from Customer A to Customer B, always use the service Customization script.

2 Tests

2.1 Service Test Mode

Note: Make sure the phone is in call setup when pressing these touching keypads to get into the Service Menu!

Start up the phone and enter the Service Menu.

Step 1: Press the following keypad combination:

##7378423##;

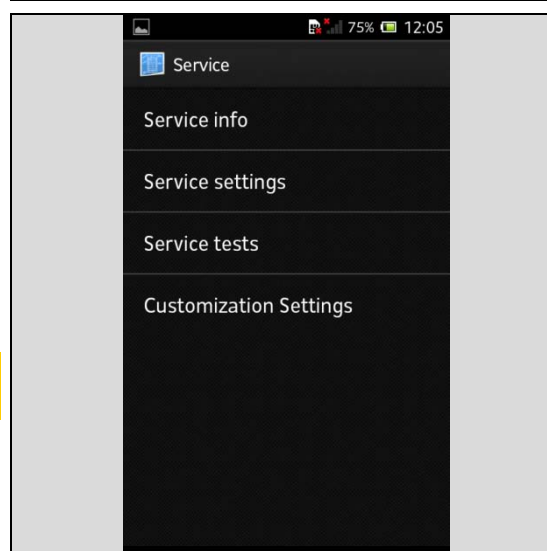
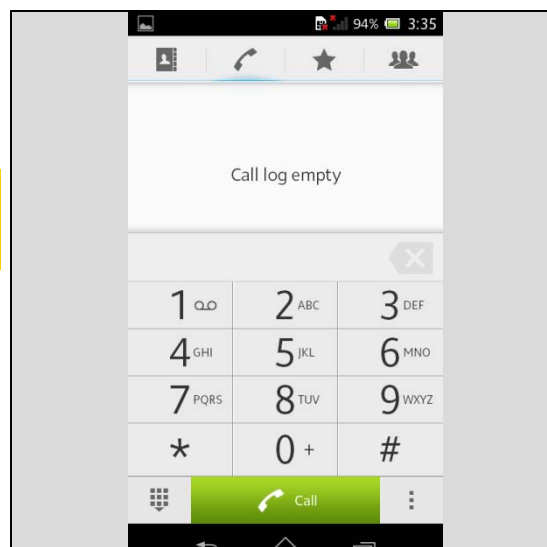
Step 2: Select 'Service Tests';

Step 3: Select one of the tests and follow the test instructions as described below.

To stop the test and return to the 'Service Tests' menu, press the Back key.

For more information, refer to

1220-1333: Generic Repair Manual - mechanical



The following pictures will show a simplified basic phone for a general visualization of the service tests!

Tests

2.2 Service Tests

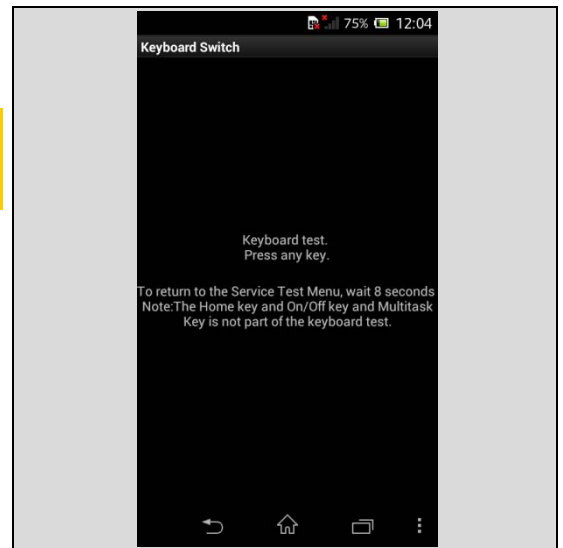
2.2.1 Keyboard & Switch

Text Note: The Home Key, On/Off key, and Multitask key are not part of the keyboard test, but are in the Manual tests.

Press the following keys:

- Back Key
- Auto focus/Camera Key
- Volume Up Key
- Volume Down Key
- Menu Key

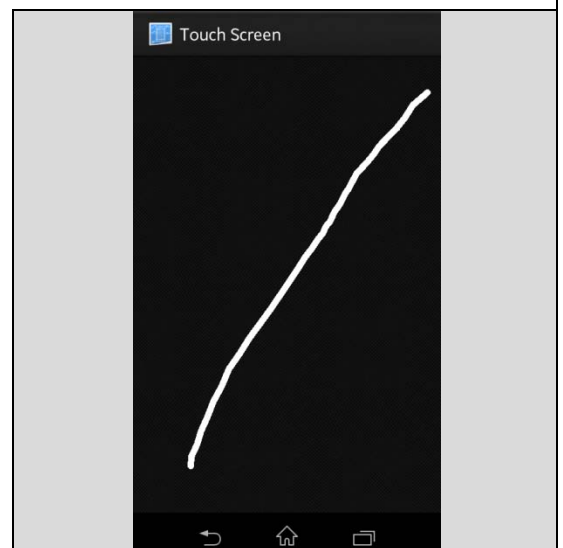
Press the touch screen to return to the Service Test Menu.



2.2.2 Touch Screen

Move a finger across the touch screen, a line will be drawn as it touches.

Press the Back key to return to the Service Test Menu.



2.2.3 Display

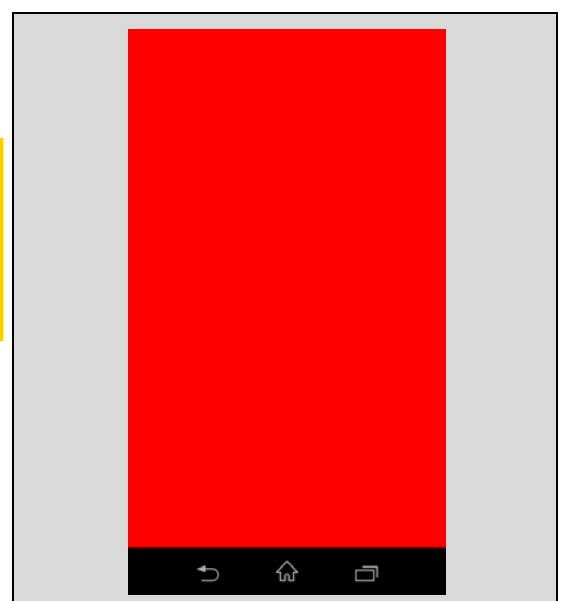
Minor variations in the display's brightness and color may occur between phones.

There may be tiny bright dots on the display, called defective pixels and which occur when individual dots have malfunctioned and cannot be adjusted.

Two defective pixels are considered to be acceptable.

The display will show the test patterns of White, Black, Red Green, Blue, White and Rainbow colors on full screen. Make sure that there are no missing segments and that the colors and contrast are OK.

Press the Back key to return to the Service Test Menu.



Tests: Service Tests

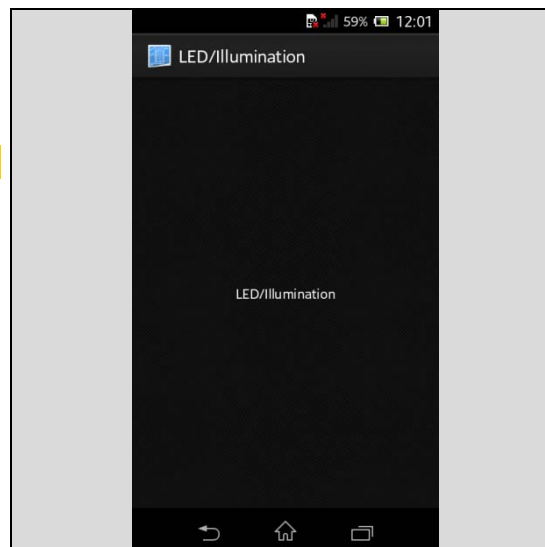
2.2.4 LED/Illumination

Note: Please un-plug USB connection during this test!

Check that the:

- Display Backlight illumination changes.
- Notification LED on bottom side changes.

Press the Back key to return to the Service Test Menu.



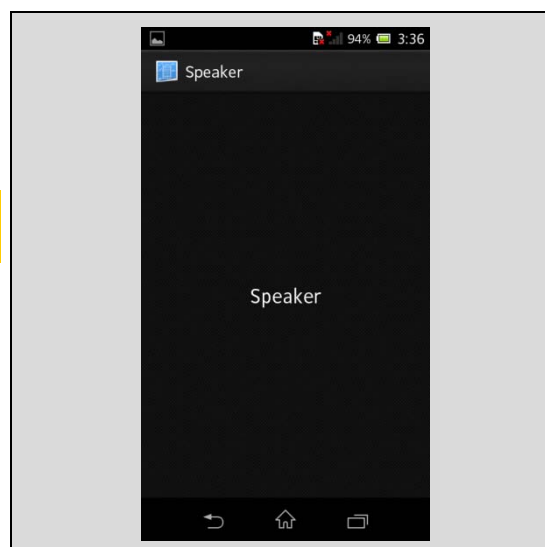
2.2.5 Speaker

Do not hold the phone close to an ear during this test!

Do not insert a headset during this test!

Make sure that the sound from the speaker port of the bottom back side of the phone is emitted loud and clear. The test includes maximum volume.

Press the Back key to return to the Service Test Menu.



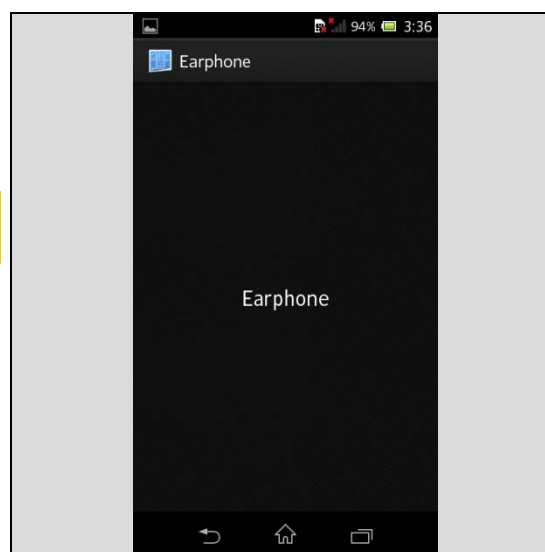
2.2.6 Earphone

Do not hold the phone close to an ear during this test!

Do not insert a headset during this test!

Make sure that the sound from the speaker port of the bottom back side of the phone is emitted loud and clear. The test includes maximum volume.

Press the Back key to return to the Service Test Menu.



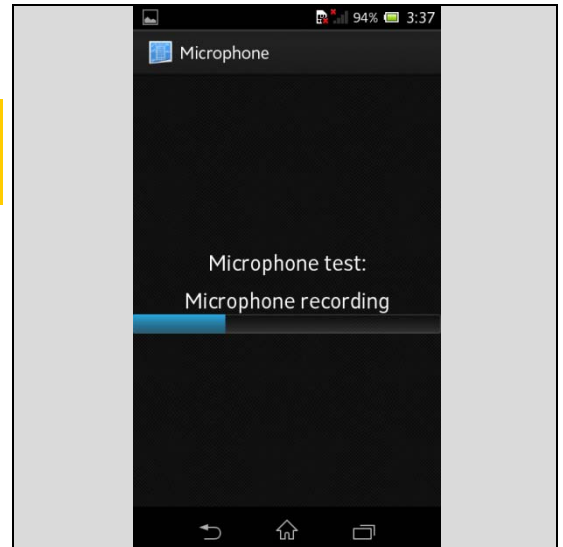
Tests: Service Tests

2.2.7 Microphone

The previous 'Speaker' test must have been successfully carried out before doing this test!
Do not insert a headset during this test!

- Step 1: speak into the microphone during the recording phase;
 Step 2: Check the quality by listening to the recording from the speaker during the playing phase at maximum volume.

Press the Back key to return to the Service Test Menu.

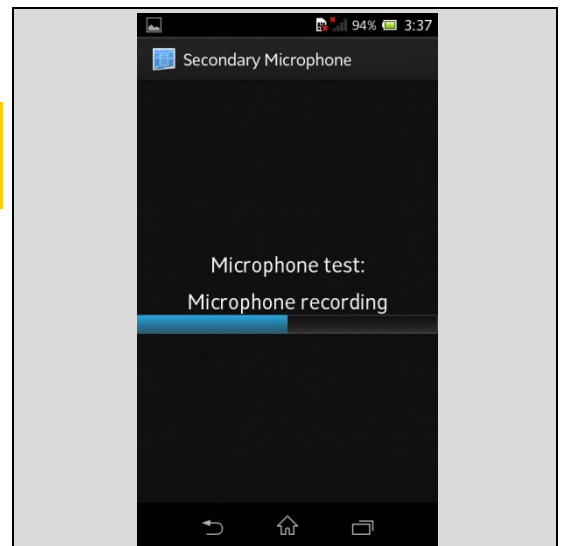


2.2.8 Secondary Microphone

The previous 'Speaker' test must have been successfully carried out before doing this test!
Do not insert a headset during this test!

- Step 1: speak into the 2nd microphone during the recording phase;
 Step 2: Check the quality by listening to the recording from the speaker during the playing phase at maximum volume.

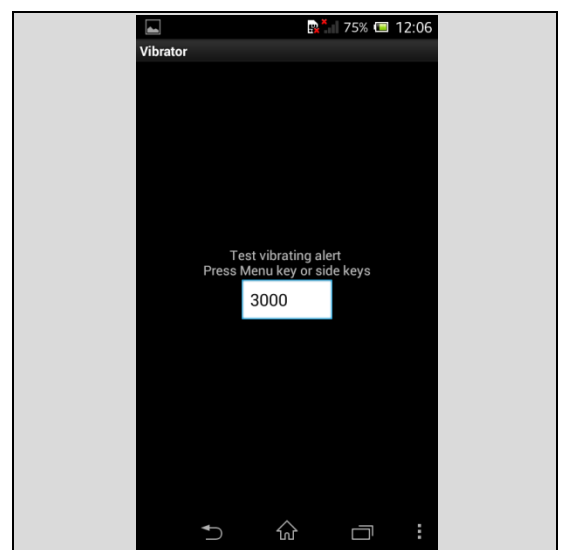
Press the Back key to return to the Service Test Menu.



2.2.9 Vibrator

Press Menu key or Side keys to start the vibrator test.

Press the Back key to return to the Service Test Menu.



Tests: Service Tests

2.2.10 Camera

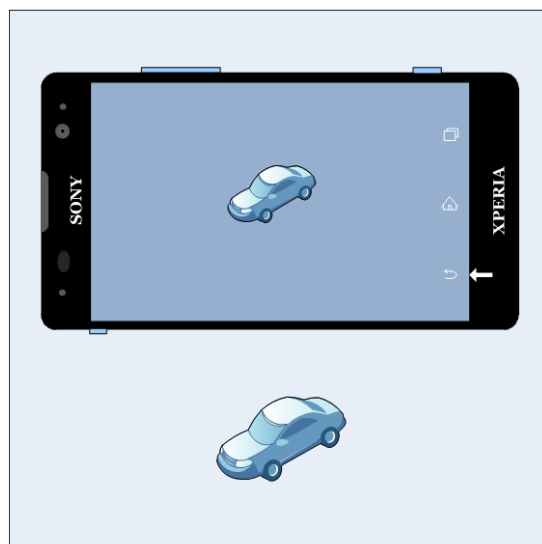
See Manual Test: Camera !

2.2.11 Secondary Camera

Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

Aim the camera (located in front of the phone) at an object and check the quality of the image shown in the display.

Press Back key to return to Service Test Menu.



2.2.12 Flash LED

Check the Flash LED at the back side of phone that whether it's turned on.

Press the Back key or the button of 'Leave this page' to return to the Service Test Menu.



Tests: Service Tests

2.2.13 Bluetooth

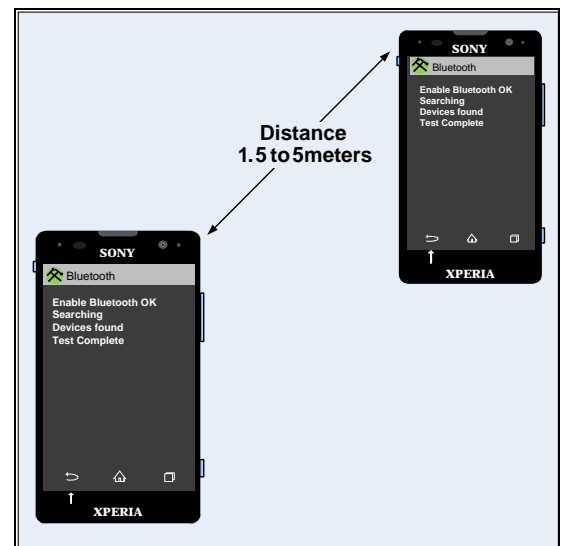
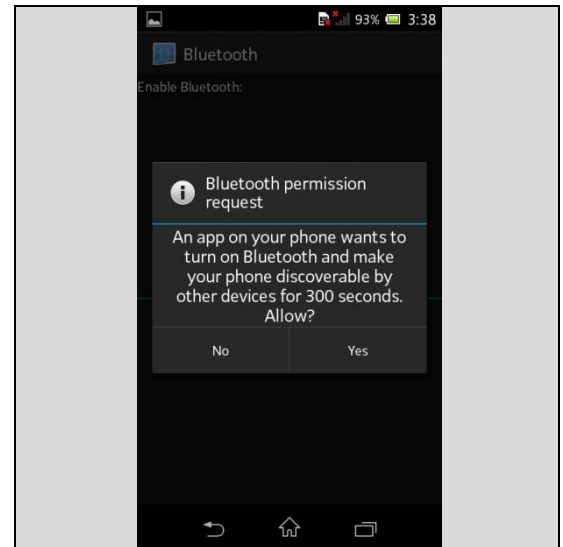
Verify that the Bluetooth communication function properly:
During this test, the distance between the phone and the target Bluetooth device must be 1.5 to 5 meters!

- Step 1: Press the button on the right side to turn on Bluetooth;
Step 2: Select 'Bluetooth' and search other Bluetooth device;

Step 3: Choose a device to link after a list of Bluetooth devices is shown up.

If a link can be established, the Bluetooth function is regarded to be fully functional.

Press the Back key to return to the Service Tests Menu.



2.2.14 WLAN

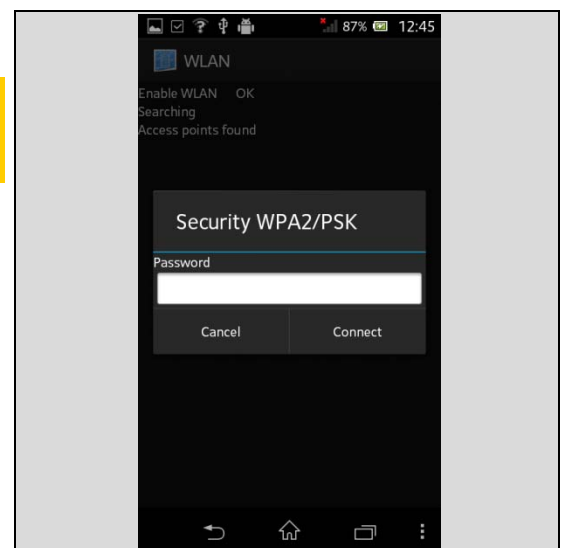
Make sure there's WLAN network before performing this test!

Make sure turn on WLAN first (Menu->Setting->WLAN)!

The WLAN test will be done in following sequences:

- Step 1: Enable WLAN; wait 4-5 seconds, shows OK;
Step 2: Search;
Step 3: Access points Found list;
Step 4: Select the Target WLAN network, and type the password to get connected;
Step 5: Enter a web address (ex. Google.com)
Step 6: When Connection succeeded, it shows "Test Complete".

Press Back key to return to Service Test Menu.



Tests: Service Tests

2.2.15 GPS

Make sure turn on GPS first (Menu->Setting->Location service)!

Verify that the GPS function properly:

Step 1: Go to *GPS test*;

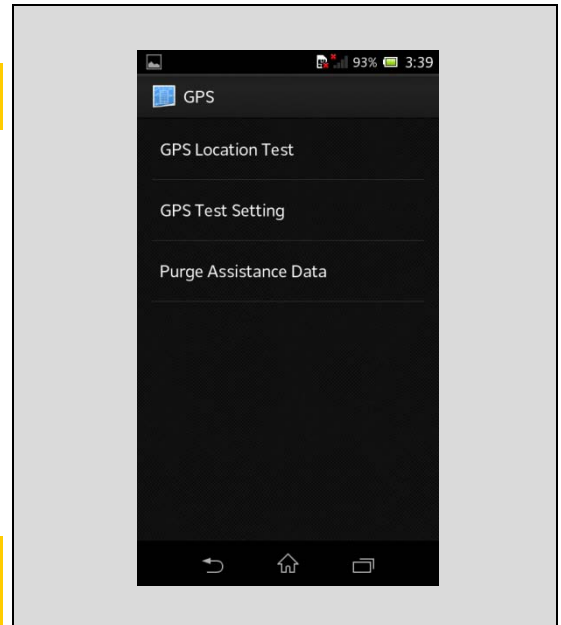
Step 2: The phone will be searching for available *satellites* and in 'Position Getting' status in 5 minutes;

Step 3: The GPS Data (Longitude, Latitude, Altitude, Acquired Time, Satellites Used, Pseudorandom Noise(PRN) code and Signal to Noise Ratio(SNR)) could be shown if GPS test works successfully.

If the positioning time is over 5 minutes and does not get location info, the test is failed.

Press the Back key to return to the Service Test Menu.

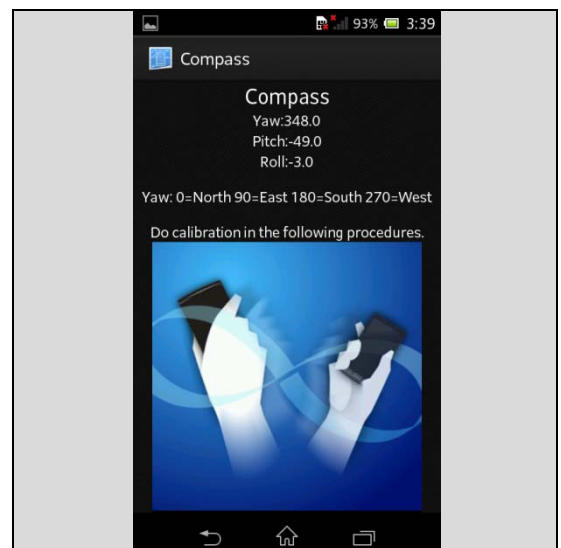
For GPS testing, refer to 1220-1333: Generic Repair Manual – mechanical.



2.2.16 Compass

Do calibration with hand movements as shown in the phone, and then check the actual direction with measured value. (Yaw:0=North, 90=East, 180=South, 270=West)

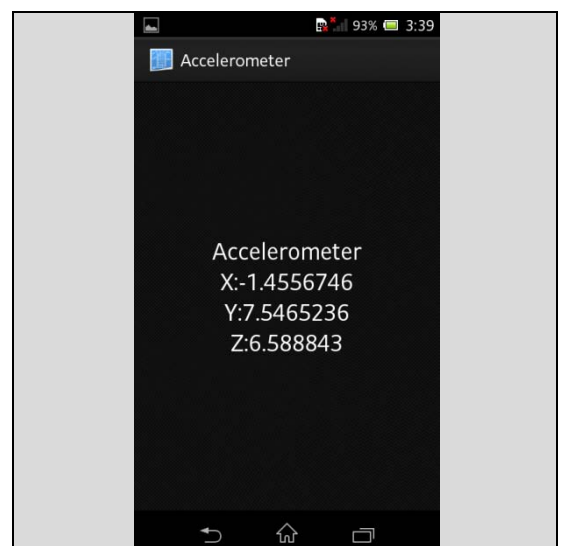
Press the Back key to return to the Service Test Menu.



2.2.17 Accelerometer

The accelerometer test displays the actual position of the phone as a 3D coordinate X: Y: Z.

Press the Back key to return to the Service Test Menu.

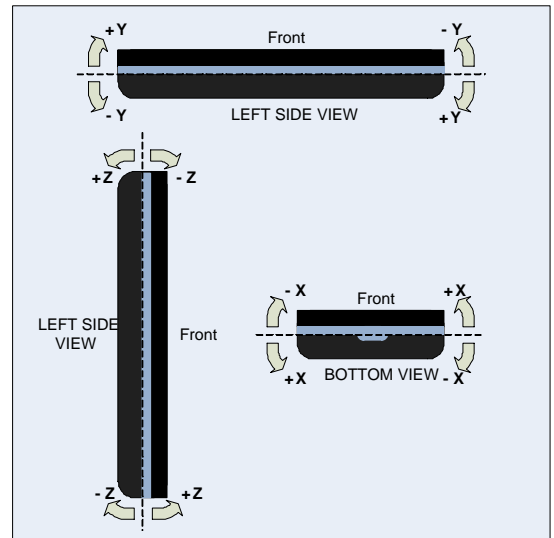


Tests: Service Tests

By tilting the phone in various directions, the X: Y: Z values will change in size and polarity depending on the angle and direction as shown in the adjacent picture.

Check by tilting the phone that the X: Y: Z values shown in the display are in accordance with the tilting shown in the picture.

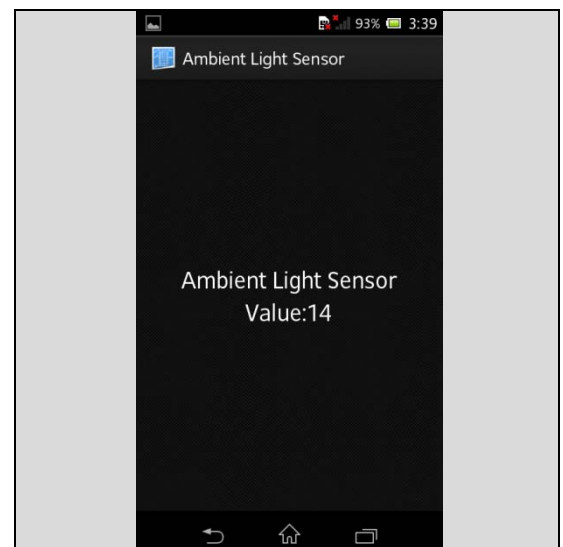
Press the Back key to return to the Service Test Menu.



2.2.18 Ambient Light Sensor

The Ambient light test states a value. The value should increase when the window gets more light and decrease when the window gets less light.

Press the Back key

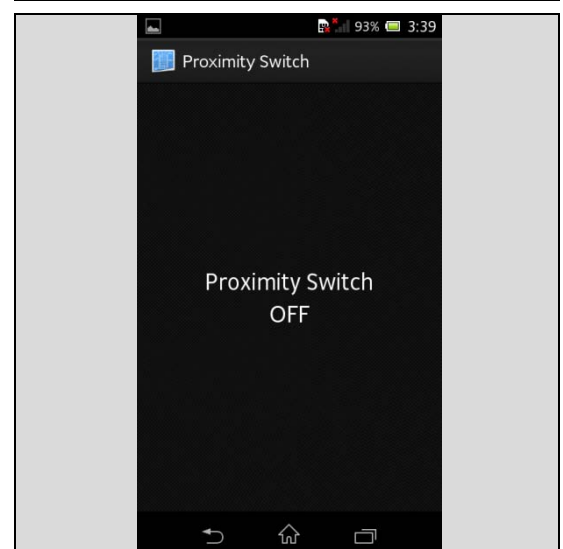


2.2.19 Proximity Switch

When entering into the test, the screen shows "Proximity switch OFF";

When covering the proximity switch area (on the left side of the earphone), the screen will show "Proximity switch ON";

Press the Back key to return to the Service Test Menu.

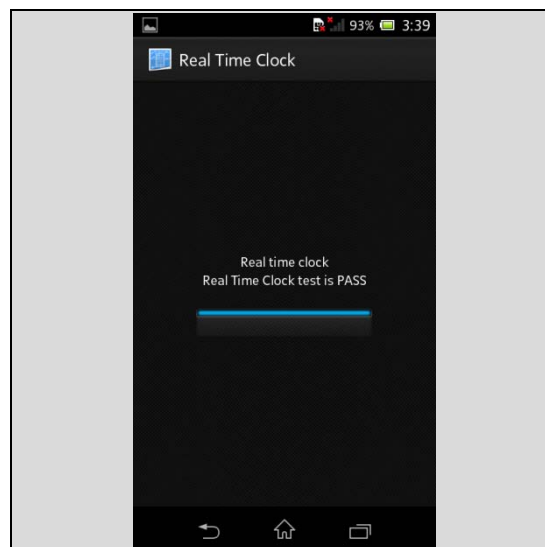


Tests: Service Tests

2.2.20 Real time clock (RTC)

During the actual test the text 'Real time clock / Please wait' is displayed, then followed by a message stating whether the test was OK or not.

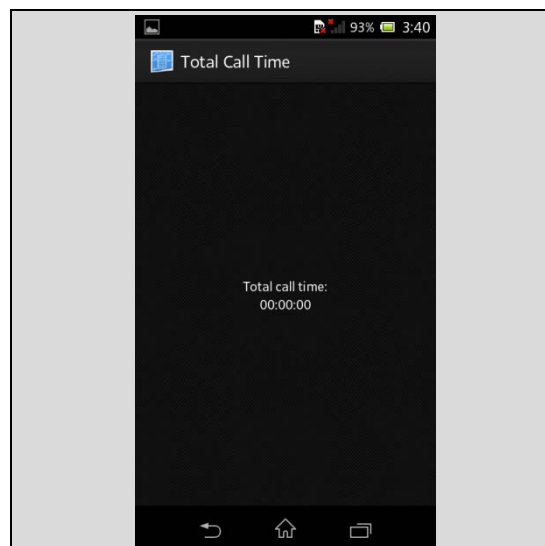
Press Back key to return to Service Test Menu.



2.2.21 Total call time

The total call time is displayed in the format HH:MM (hours: minutes).

Press the Back key to return to the Service Test Menu.

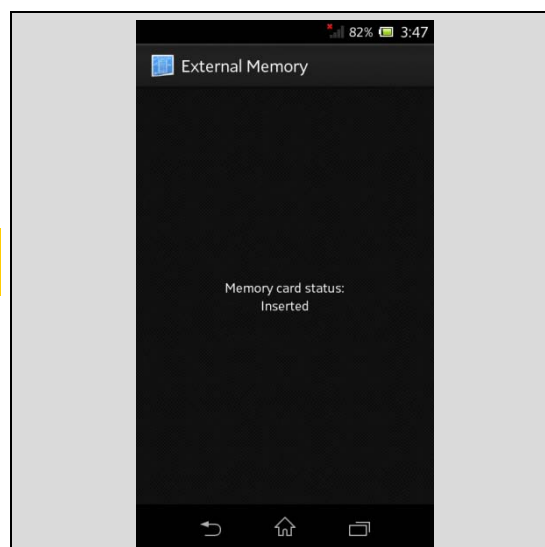


2.2.22 External Memory

A memory card should be inserted in the phone before the start of this test!

The phone should detect that the memory card is inserted.

Press the Back key to return to the Service Test Menu.

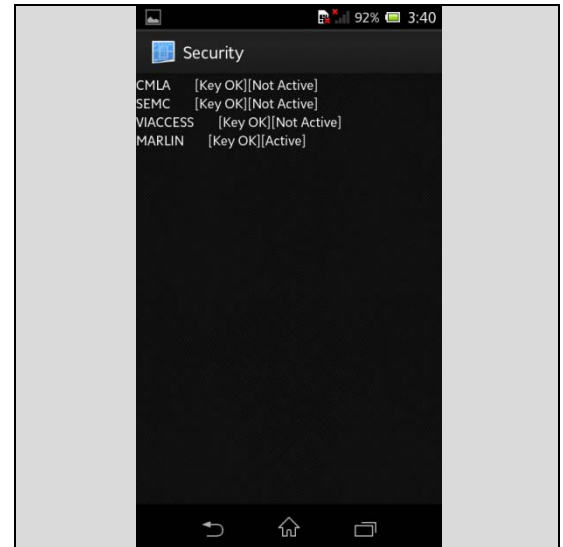


Tests: Service Tests

2.2.23 Security

Not Applicable, do not use.

Press the Back key to return to the Service Test Menu.



2.2.24 FM radio

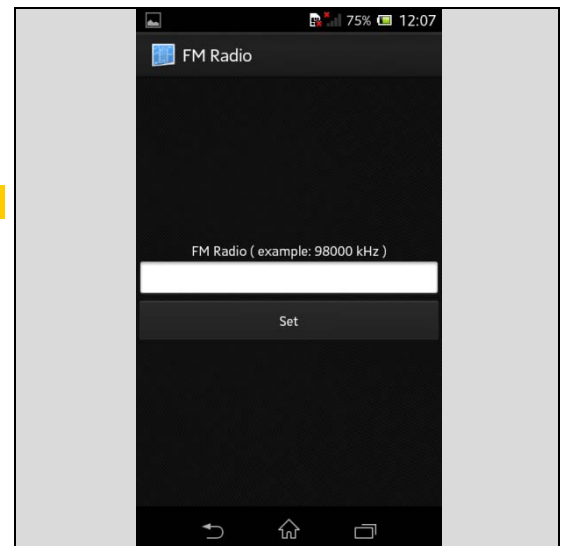
Use a CTIA type headset to do this test!

Connect a headset and then select the frequency of FM station.

Verify that the phone can detect a radio station.

Secure that the reception and sound quality is normal.

Press the Back key to return to the Service Test Menu.



2.2.25 Battery Test

Verify that charging of the battery functions properly:

Step 1: Go to *Battery check*;

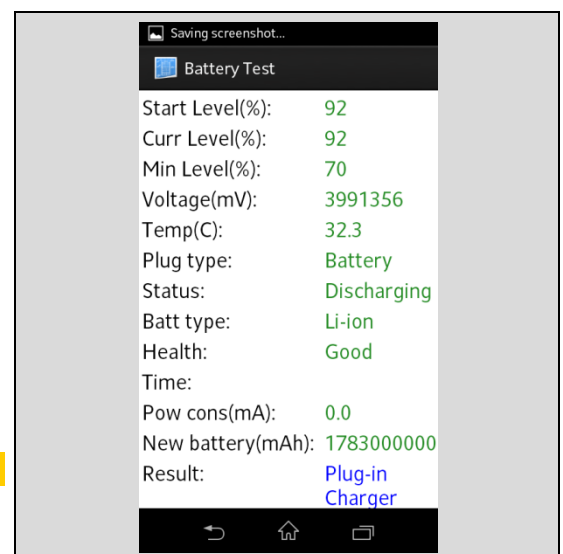
Step 2: Connect a wall charger or via USB to the system connector;

Verify that the display shows the phone is charging and also the info about battery health and battery level.

Step 3: Remove the charger from the system connector and certify that the display shows the phone is discharged and also the info about the battery health and battery level.

Connect a Sony charger (to secure correct result).

Press the Back key to return to the Service Test Menu.

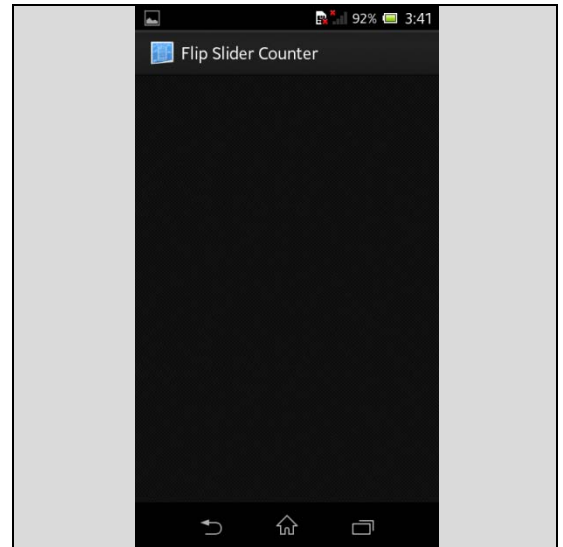


Tests: Service Tests

2.2.26 Flip Slider Counter

Not Applicable, do not use.

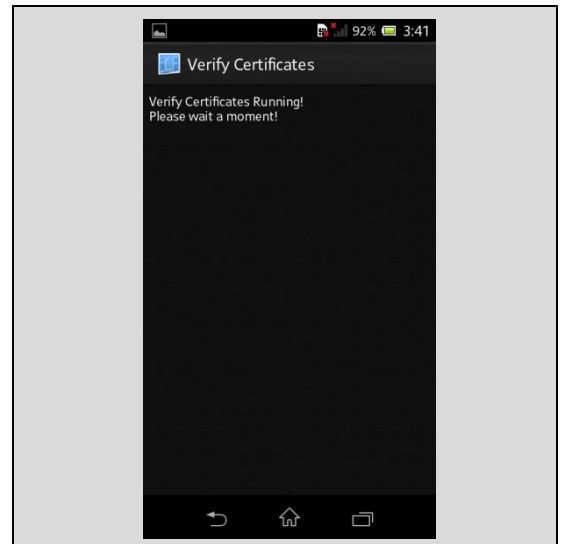
Press the Back key to return to the Service Test Menu.



2.2.27 Verify Certificates

Not Applicable, do not use.

Press the Back key to return to the Service Test Menu.



2.2.28 NFC Test

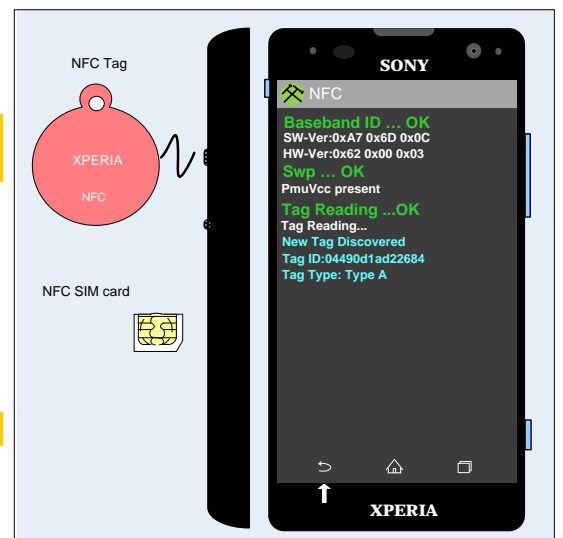
A NFC SIM card 3FF should be inserted in the phone before the start of this test!

The NFC test will be done in following sequences:

- Step 1: Select 'NFC';
- Step 2: NFC Diag Test;
- Step 3: After 'Tag Reading...Enabled' can be seen on the display, bring a NFC Tag close to the Label NFC on the Battery Cover.

Don't touch each other to avoid Battery Cover scratch.

Press the Back key to return to Service Test Menu.

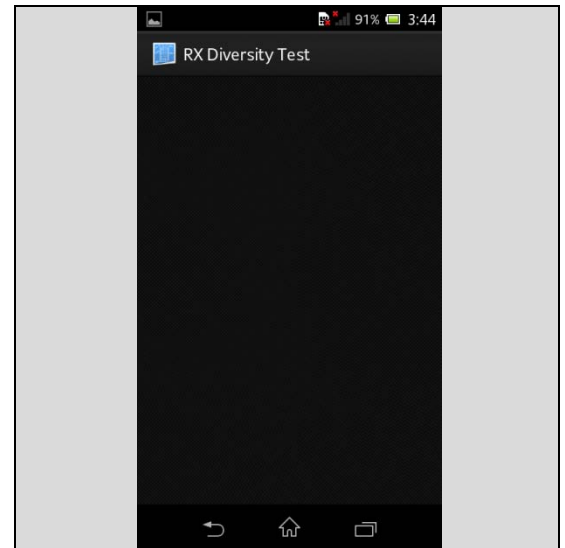


Tests: Service Tests

2.2.29 RX Diversity Test

To be ready on MR1 software.

Press the Back key to return to the Service Test Menu.



Tests

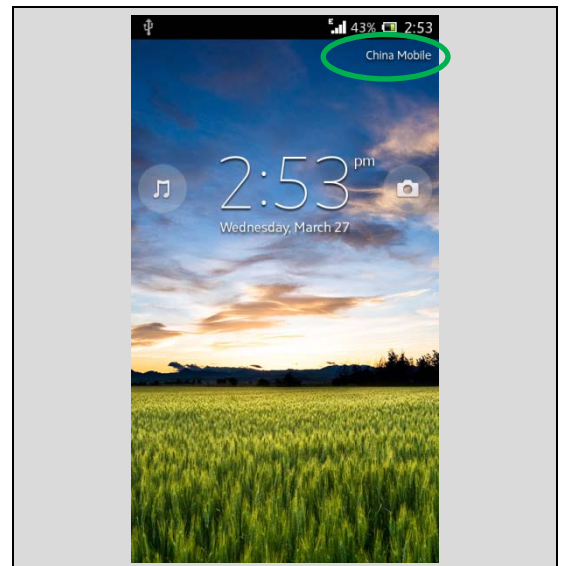
2.3 Manual Tests

2.3.1 SIM

Verify that the phone can detect a SIM card:

Insert a SIM card, install a battery and start the phone.

- If the SIM card is detected by the phone, the setting setup procedure will continue.
Check SIM card operator name (the SIM card operator name will be displayed when phone is in Lock status).
- If not detected, the message 'Emergency calls only | No SIM Card' will be displayed when phone is in Lock status.



2.3.2 On/Off Key test

- Press the On/Off key for a long time to turn the phone on or off.
- Press the On/Off key for a short time to enter Sleep mode or to wake it up from Sleep mode.



2.3.3 Back/Home/Menu keys test

During operation, press each key and the phone will go back to the each screen directly.

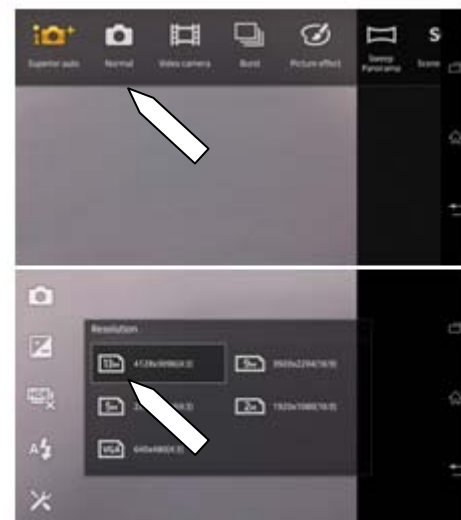


Tests: Manual Tests

2.3.4 Camera

Start the Camera app.

1. Tap Camera icon top left corner and chose Normal
2. Tap Settings icon in bottom left corner set Resolution to the highest available resolution in 4:3 format.

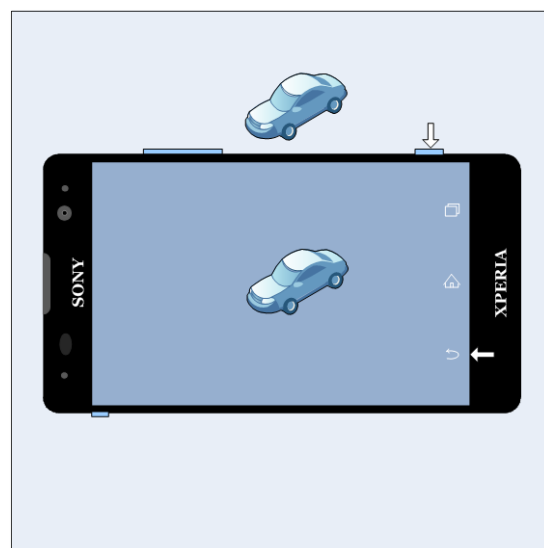


Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

Test 1: Aim the camera (located back of the phone) at an object and check the quality of the image shown in the display.

Take photo, tap the picture icon top right corner and check the quality of the image shown in the display, zoom in to check any suspected problems

Do the same thing at an object on a different distance to secure that autofocus works! Verify if any indicated problem appear in the same position in the picture.



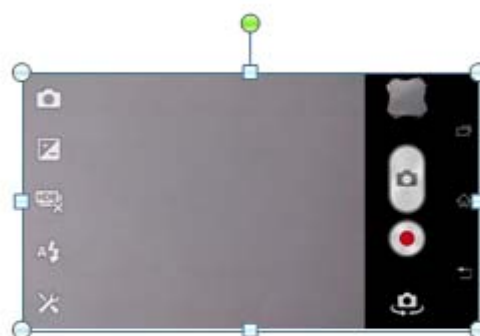
Only symbolic view

Test 2: Aim the camera at a white paper in good light conditions and take photo.

Tap the picture icon top right corner and check the quality of the image shown in the display, zoom in to check any suspected problems.

If a bad pixel etc. is indicated, check lens and paper and take second picture to verify the problem is in the same position in the picture and not due to external conditions.

Delete photos taken during this test!



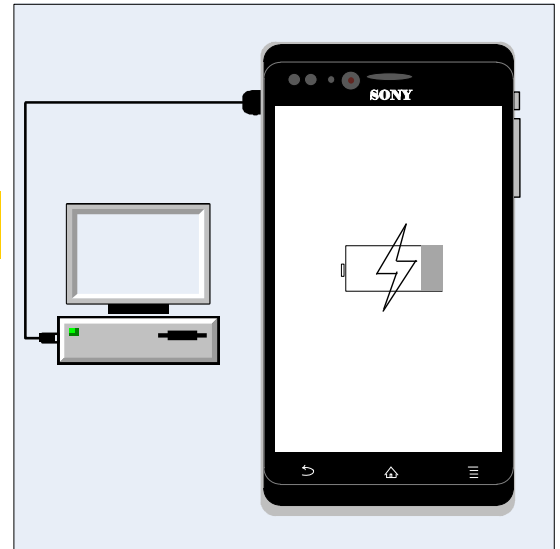
Tests: Manual Tests

2.3.5 Charging via USB (Charger or Computer)

Verify that the phone can charge the battery via a USB port:

Ensure that no computer application, such as PC Suite or Emma, is active!

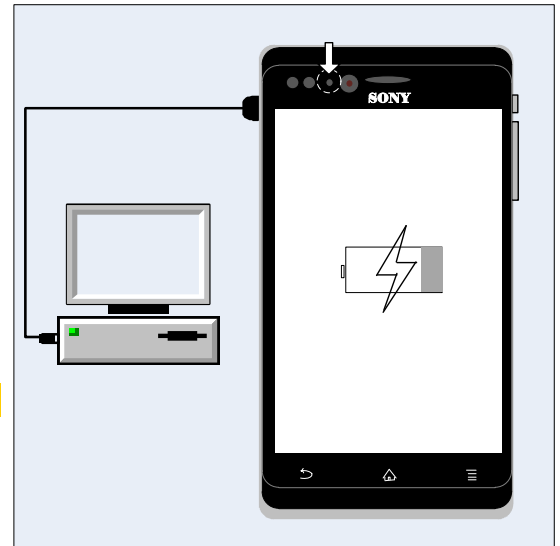
- Step 1: Insert a battery, but do not start the phone;
- Step 2: Connect a USB cable from a computer or charger to the phone;
- Step 3: Verify that the phone is being charged by the notification LED and the Battery icon in the display;
- Step 4: Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.



The Notification LED color status is depended on battery remaining capacity:

- Red: Battery level is between 1% and 14%;
- Orange: Battery level is between 15% and 89%;
- Green: Battery level is between 90% and 100%.

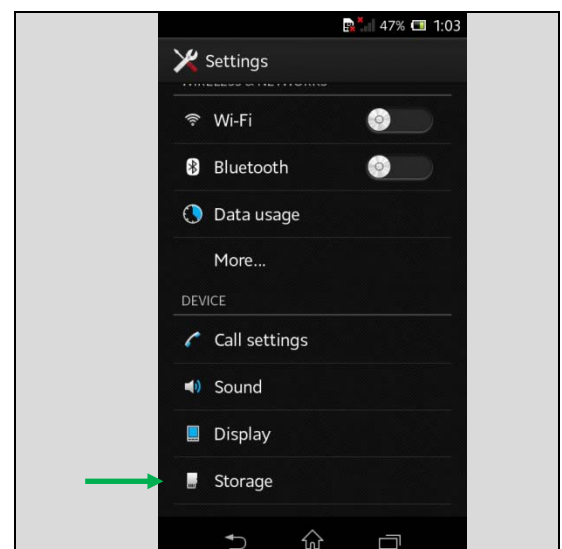
Sample phone are used in picture as reference only.



2.3.6 Internal Memory Test

Verify that the internal memory performs properly:

- Step 1: Press Menu key and go to *Settings*;
- Step 2: Press *Storage* and check the storage information;

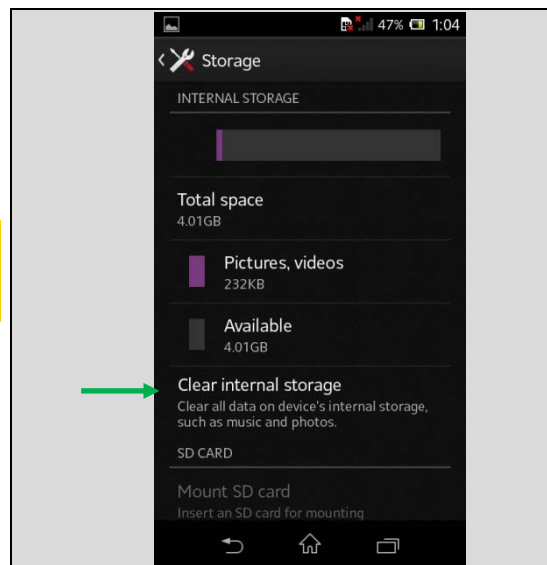


Tests: Manual Tests

Step 3: Clear internal storage.

Be careful that all the user data on this storage will be erased completely after selecting 'Clear internal storage'.

Verify that the display shows the total space of the phone is around 4GB.



Tests

2.4 Network Test

This test can only be performed if the phone has an activated SIM/USIM card (no Test SIM/USIM) and an available network signal!

**There are two versions of the test depending on whether a UMTS network is available or not!
If a UMTS network is available, the network test has to be done separately for GSM and UMTS!**

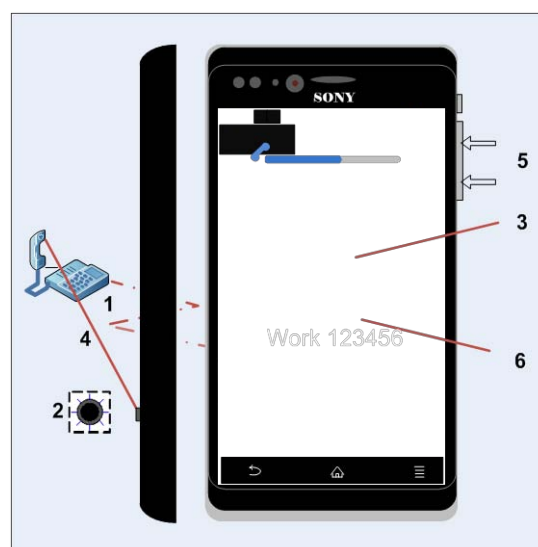
2.4.1 On-the-air call to mobile (no UMTS network available)

To verify the radio functions (GSM) of the phone, follow the '2.4.1.1 Procedure' below:

2.4.1.1 Procedure

- Step 1: Set up a call from a landline phone (PSTN).
- Step 2: Check that there is a ring signal.
- Step 3: Check that the display backlight illuminates.
- Step 4: Answer the call and check the sound quality in both phones.
- Step 5: Adjust the volume up and down with the side keys and verify that the sound level is altered.
- Step 6: End the call and check that the elapsed time is displayed and that the termination is done properly.

Sample phone are used in picture as reference only.



2.4.2 On-the-air call to mobile (UMTS network available)

GSM

Go to the phone menu and set:

Press Menu key → Settings ⇒ More... ⇒ Mobile networks ⇒ Network Mode ⇒ GSM only

To verify the radio functions (GSM) of the phone, follow the section '2.4.1.1 Procedure' above.

UMTS

Go to the phone menu and set:

Press Menu key → Settings ⇒ More... ⇒ Mobile networks ⇒ Network Mode ⇒ WCDMA only

Switch off the phone and then start it up again to enable search for an available UMTS signal.

Ensure that the UMTS/3G icon now is visible at the top of the display.

To verify the radio functions (UMTS) of the phone, follow the section '2.4.1.1 Procedure' above.

3 Revision History

Rev.	Date	Changes / Comments
1	2013-04-16	Initial release
2	2013-06-04	Update the chapter 2.2.4
3	2013-06-21	Camera updated and moved to manual test!