

Test Instructions

- mechanical -



Xperia™ ZL

C6502, C6503, C6506 & L35h

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**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 Label Mobile Phone has been lifter slightly.

If affected (red color) - handle the phone according to the local directives.

If not affected by liquid, proceed to the 'Pre-Test Preparation' below.

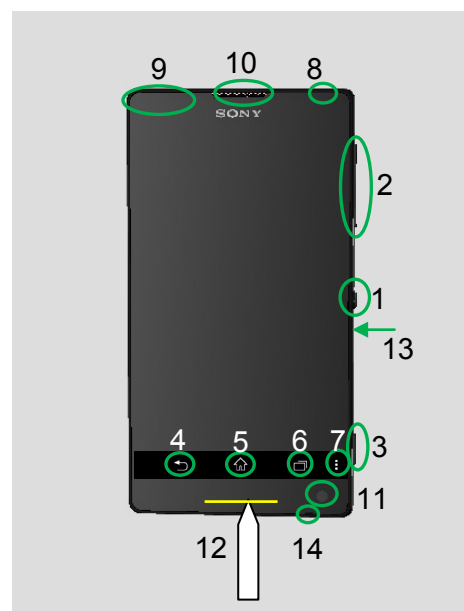


1.1.1 Test Enablers

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. Back Key
5. Home Key
6. Task Key
7. Menu key
8. Ambient Sensor
9. Proximity Switch
10. Earphone
11. Secondary Camera
12. Notification LED
13. IR-Led
14. Microphone



Back:

15. Audio Jack
16. Second Microphone
17. Camera
18. Port USB
19. Speaker
20. Flash LED
21. NFC



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, you find latest improvements on the support pages under the support news www.sonymobile.com/update

- Start up the phone and press call icon on screen.
- Pressing keypad combination: *##7378423##* (i.e. *##service##*)
- select 'Service info'
- select 'Software info'
- check the software file revisions and, 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 Micro USB to USB cable for this purpose!

Fully charged battery first, ensure the phone is powered off and proceed as follows:

- Open the Emma application and log in.
- Press and keep the Volume down key on the phone, connect the phone to the USB cable and then release the Volume down key.
- Select the appropriate service and follow the on-screen instructions.

NOTE: For phones with internal storage (built in "SD card" user memory), the only services which erase all user data in the internal memory and update the customization in the internal storage (MS CDF) are the Services "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")

2 Tests

2.1 Service Test Mode

Secure that STAMINA Mode is turned off!
Settings → Power management → STAMINA

Note: Please make sure the phone is in call setup when pressing these touching keypads to get into the Service menu!

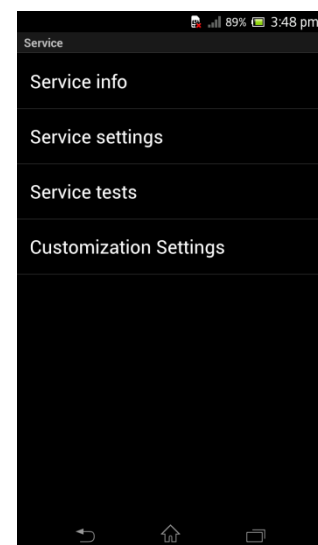
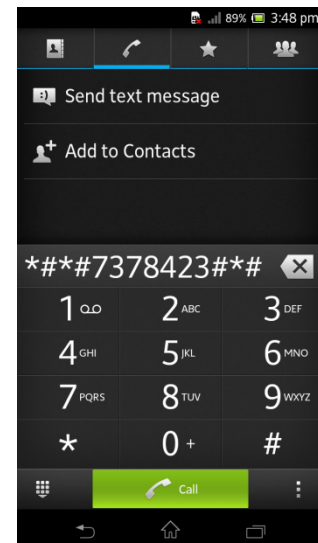
Start up the phone and enter the service menus:

- press the keypad combination with the following order:
##7378423##

- select 'Service tests'
- 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 pictures to follow will show a simplified basic phone for a general visualization of the service tests!

Tests: Service Tests

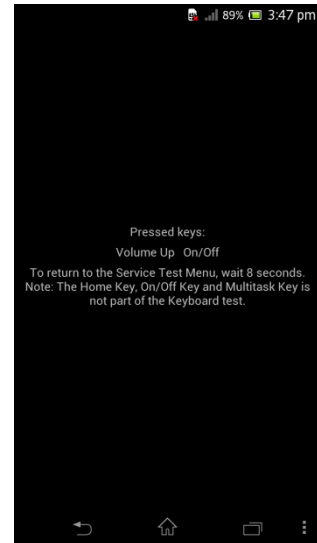
2.2 Service Tests

2.2.1 Keyboard & Switch

To return to the Service Test Menu, wait for 8 seconds.

Press all keys:

- Back key: notification on screen
- Auto Focus key(*half pressed*)/Camera key(*fully pressed*): notification on screen
- Volume Up key: notification on screen
- Volume Down key: notification on screen
- Power key: screen will go black, press Power key again
- Home key: Leaving Test menu for Screen lock /Unlock/
- Task key: Taskbar is shown, select Service Menu
- Menu Key: notification on screen



2.2.2 Touch Screen

Move your finger across the Display, a line will be drawn as you touch the Display.

Press Back key to return to Service Test Menu.



2.2.3 Display

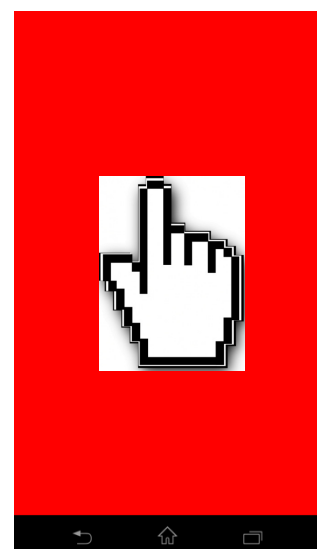
Minor variations in display brightness and color may occur between phones.

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

Two defective pixels are considered to be acceptable.

Touch the display using a finger. With every touch, the display will show six test patterns of White, Black, Red, Green, Blue and Rainbow colors on the full screen. Make sure that there are no missing segments and that the colors and contrast are OK.

Press Back key to return to Service Test Menu.



Tests: Service Tests

2.2.4 LED/Illumination

Check that the:

- Display Backlight illumination goes from low to high strength back to low again.
- Notification LED on the bottom changes, showing four colors in the following sequence: red, green, blue, and off.
- The illumination of Task, Home and Back keys goes from low to high strength back to low again.

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



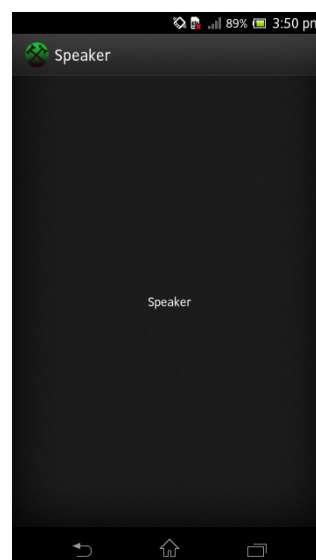
2.2.5 Speaker

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

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

Press Volume up/Volume down key to adjust speaker volume.

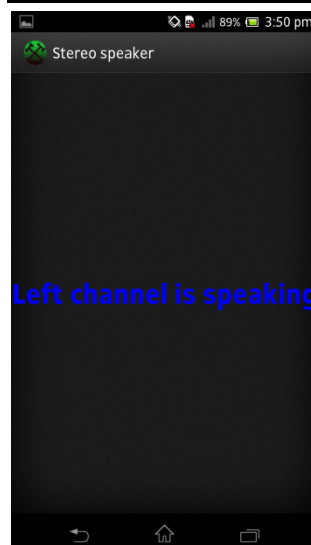
Press Back key to return to Service Test Menu.



2.2.6 Stereo speaker

N/A – Do not use!

Press Back key to return to Service Test Menu.



Tests: Service Tests

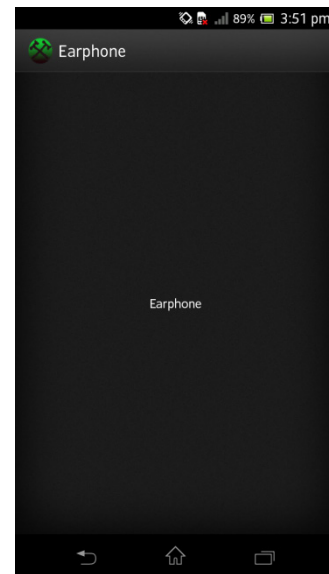
2.2.7 Earphone

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

Make sure that the sound from the Earphone port on the top of the phone is emitted loud and clear and that the test include maximum volume.

Press Volume up/Volume down key to adjust earphone volume.

Press Back key to return to Service Test Menu.



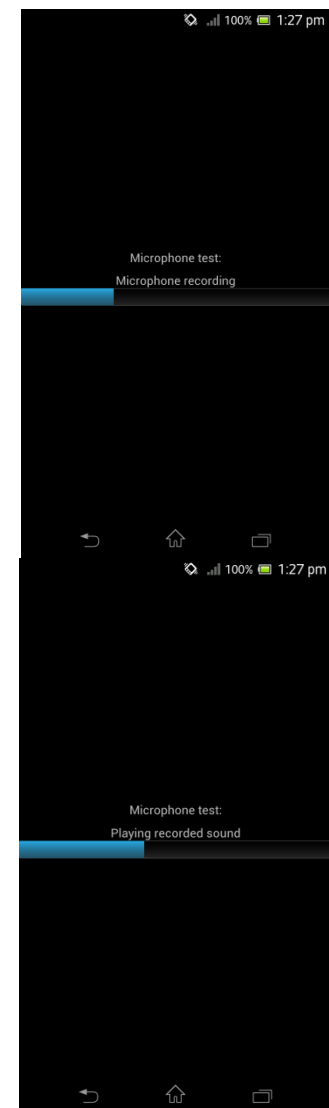
2.2.8 Microphone

The previous test 'Speaker' should have been successfully carried out before doing this test!

The phone will start to record and after approximately ten seconds the sound is played back through the Speaker.

- Speak into the microphone during the 'Microphone Recording' phase.
- Check the quality by listening to the recording from the Speaker during the 'Playing recorded sound' phase at maximum volume.

Press Back key to return to Service Test Menu.



Tests: Service Tests

2.2.9 Secondary Microphone

The previous test 'Speaker' should have been successfully carried out before doing this test!

The phone will start to record and after approximately ten seconds the sound is played back through the Speaker.

- Speak into the microphone during the 'Microphone Recording' phase.
- Check the quality by listening to the recording from the Speaker during the 'Playing recorded sound' phase at maximum volume.

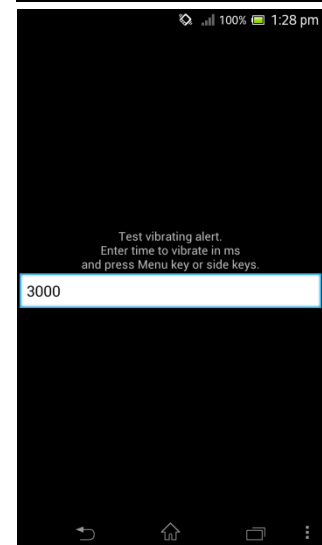
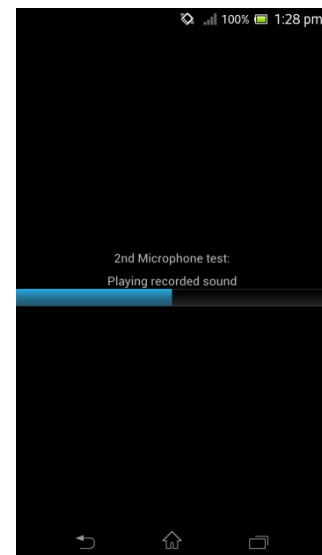
Press Back key to return to Service Test Menu.

2.2.10 Vibrator

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

It is possible to modify the duration of this test.

Press Back key to return to Service Test Menu.



Tests: Service Tests

2.2.11 Camera

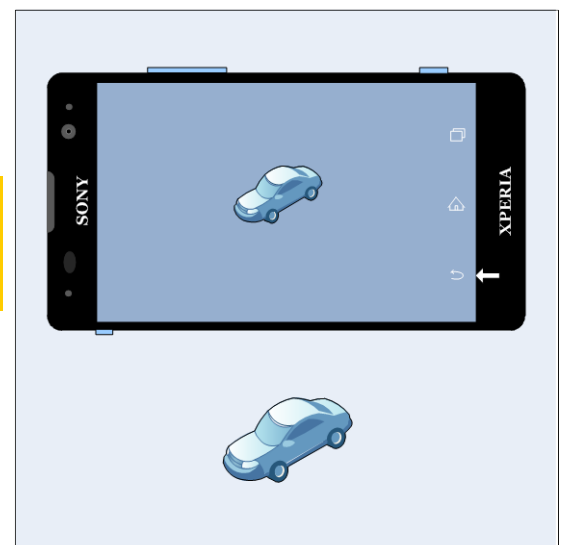
See Manual Test: Camera !

2.2.12 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.



Only symbolic view

Tests: Service Tests

2.2.13 Flash LED

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

Press Back key to return to Service Test Menu.



Only symbolic view

2.2.14 Bluetooth

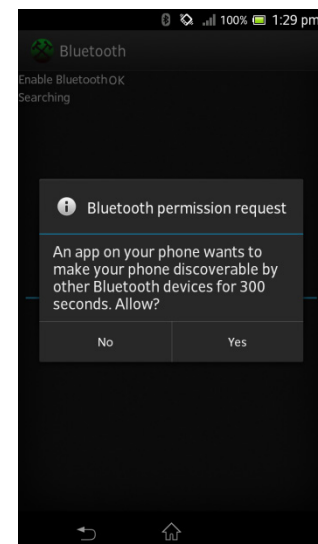
During this test, the distance between the phone and the target Bluetooth device must be 1.5 to 5 meters!
Make sure the target Bluetooth device is enabled and visible always!

The Bluetooth test will be done in following sequences:
Step 1: Enable Bluetooth; wait 4-5 seconds, shows OK;

There is a permission request, select 'Yes'.

Step 2: Search;

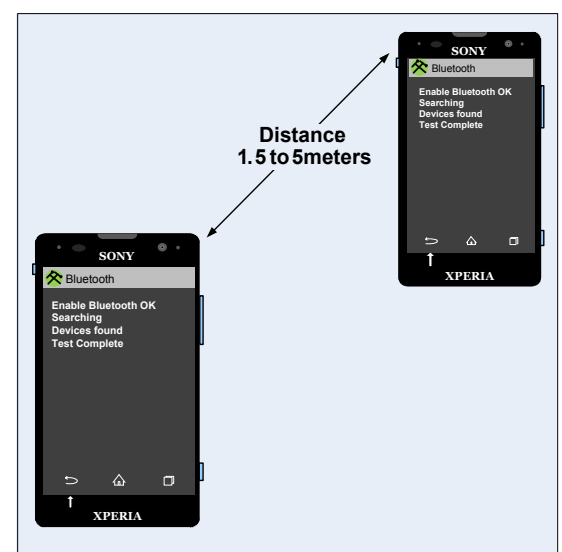
Step 3: Show the Device Found list;



Step 4: Select the Target Bluetooth Device, and Type PIN code to pair.

Step 5: Type the Pairing PIN code on Target Bluetooth Device also, when succeeded, it shows "Test Complete".

Press Back key to return to Service Test Menu.



Only symbolic view

Tests: Service Tests

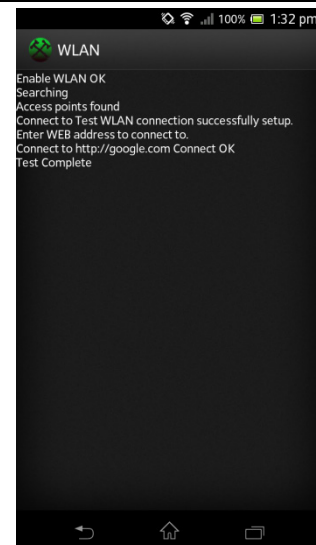
2.2.15 WLAN

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

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.



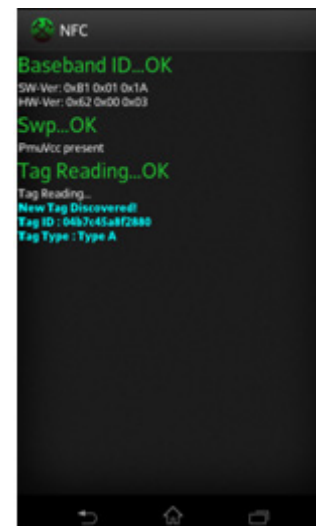
2.2.16 NFC

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 Cover Battery Assy.
- Step 4: When Tag is identified, a sound will be made and an OK message will be displayed.

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



Tests: Service Tests

2.2.17 GPS

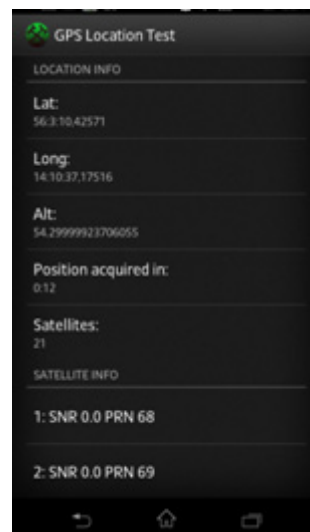
Enter GPS Location Test, wait some time to get GPS location data.

If permission is requested, select 'Yes'!

Note: You may have to tap the screen the first time to prevent the screen to go in off mode, since turning screen on with Power key will end the test.

Press Back key to return to Service Test Menu.

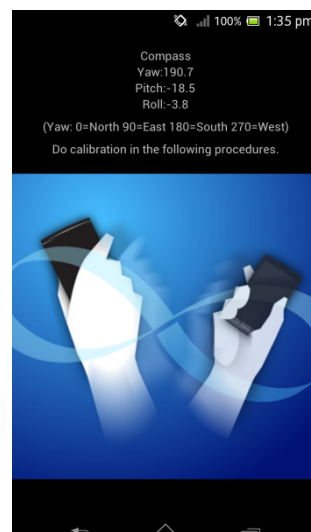
***For GPS testing, refer to
1220-1333: Generic Repair Manual – mechanical***



2.2.18 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 Back key to return to Service Test Menu.

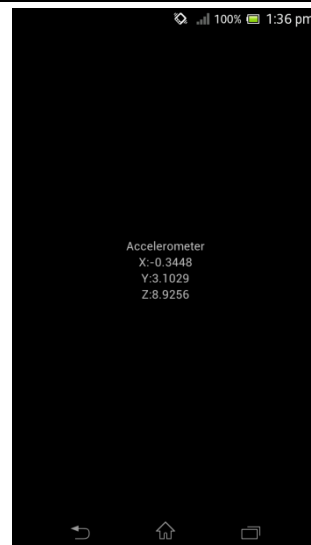


Tests: Service Tests

2.2.19 Accelerometer

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

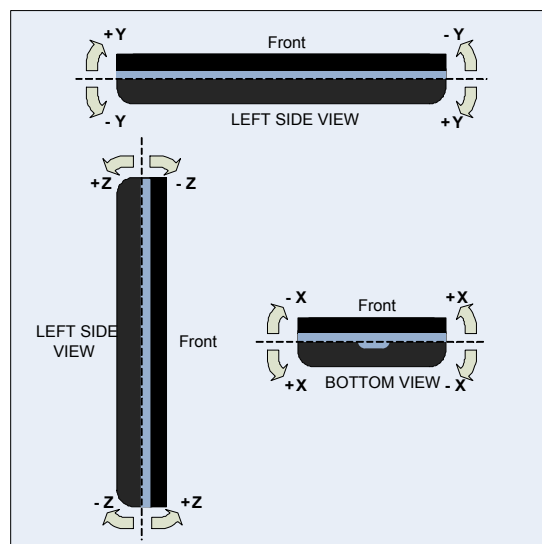
Press Back key to return to Service Test Menu.



By tilting the phone in various directions, the X: Y: Z values will change in size and polarity depending on 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 Back key to return to Service Test Menu.



Only symbolic view

Tests: Service Tests

2.2.20 Gyroscope

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

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

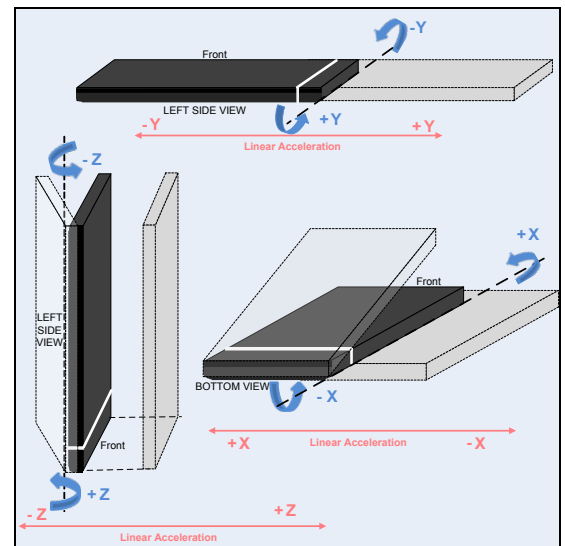
Press Back key to return to Service Test Menu.



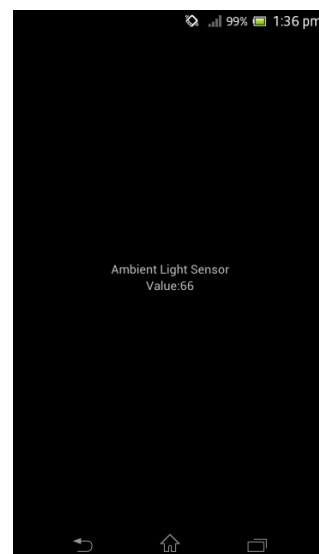
Check "Gravity Values" "Linear Acceleration Values" "Rotation Vector Values" and "Gyroscope Values" by moving the phone:

"Gravity Values" can be refer to Accelerometer;
 "Linear Acceleration Values" and "Rotation Vector Values" are in accordance with the action shown in the picture.
 "Gyroscope Values" are updated while moving the phone.

Press Back key to return to Service Test Menu.



Only symbolic view



2.2.21 Ambient Light Sensor

The Ambient light test states a value.

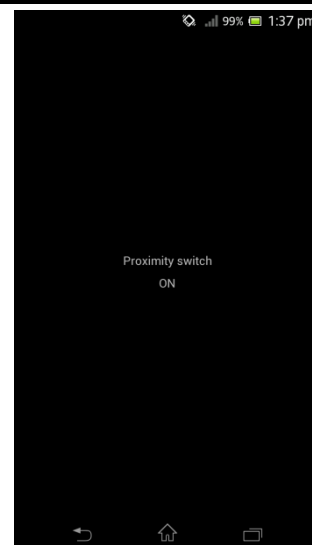
Validate when, covering the Ambient Light Sensor (on the right side of the Ear Speaker), the value will decrease.

Tests: Service Tests

2.2.22 Proximity switch

***The previous test 'Speaker' should have been successfully carried out before doing this test!
Make sure the phone is not in 'silent mode' before performing this test.***

When entering into the test, the screen shows "Proximity switch OFF" and a tone is emitted.



When covering the proximity area (on the left side of the Ear Speaker) with a paper at 5-8cm distance, the screen shall show 'Proximity switch ON' and change the tone (frequency).

Covering with different material will give different outcome!

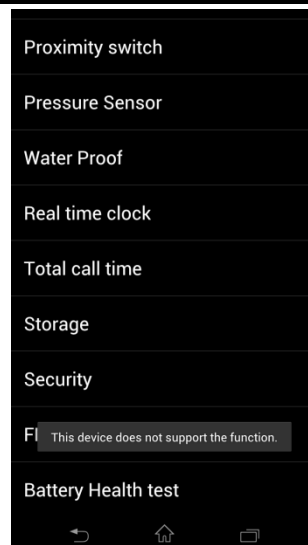
Press Back key to return to Service Test Menu.

Tests: Service Tests

2.2.23 Pressure Sensor

N/A.

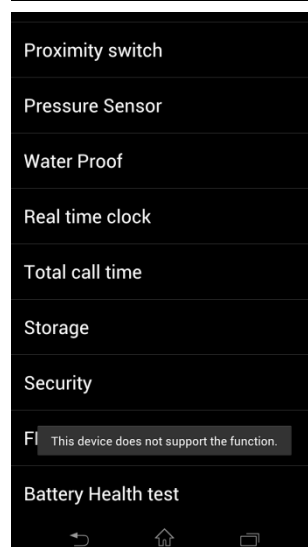
This test is not available for this product!



2.2.24 Water Proof

N/A.

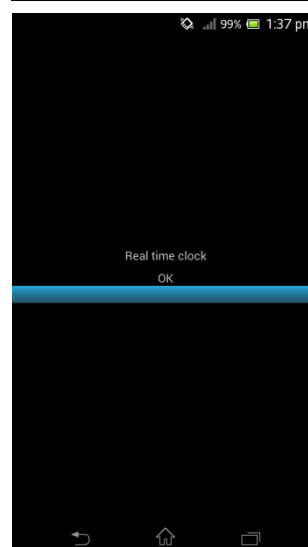
This test is not available for this product!



2.2.25 Real time clock

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.

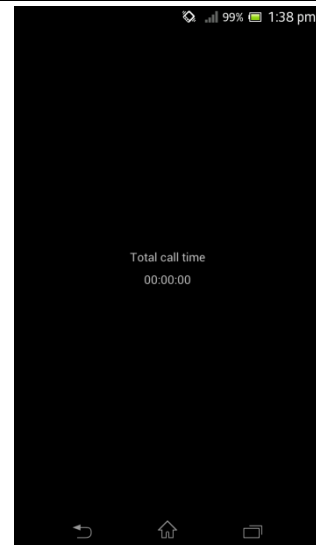


Tests: Service Tests

2.2.26 Total call time

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

Press Back key to return to Service Test Menu.



2.2.27 Storage

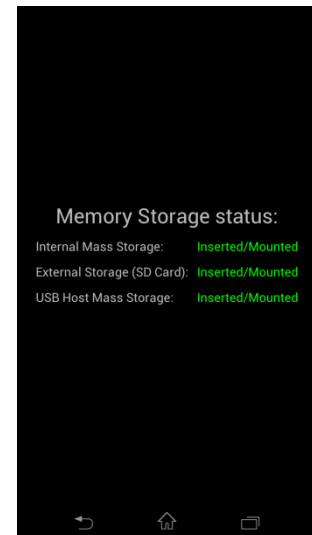
Memory Storage status:

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

Attach USB Adaptor between phone and an USB disk as shown in picture.

- Internal Mass Storage is 'Inserted/Mounted' as shown on the screen;
- External Storage (SD Card) is 'Inserted' as shown on the screen;
- The USB Host Mass Storage status is shown on the screen.

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

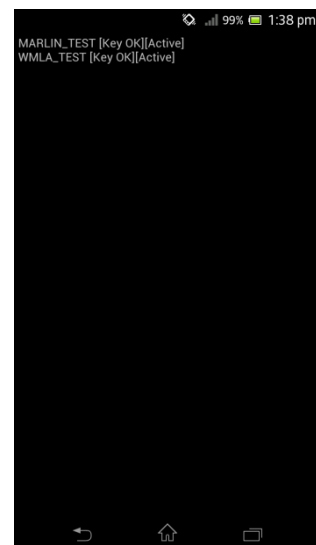


2.2.28 Security

The DRM keys are shown in the display.

There may be some different content showed based on the different market software versions.

Press Back key to return to Service Test Menu.



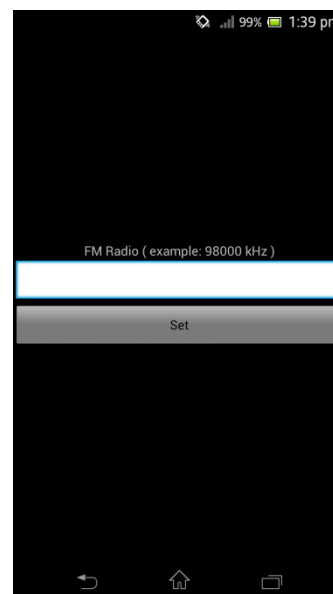
Tests: Service Tests

2.2.29 FM Radio

Verify that the phone can detect a radio station:
Connect a headset and then set your local radio station in kHz.

Verify that the reception and sound quality is normal.

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



2.2.30 Battery Health test

N/A.

This test is not available for this product!

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



2.2.31 Flip slider counter

N/A.

This test is not available for this product!

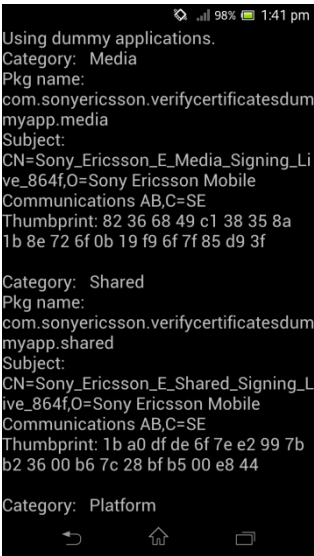
Press the Back key to return to the Service Test Menu.



Tests: Service Tests

2.2.32 Verify certificates

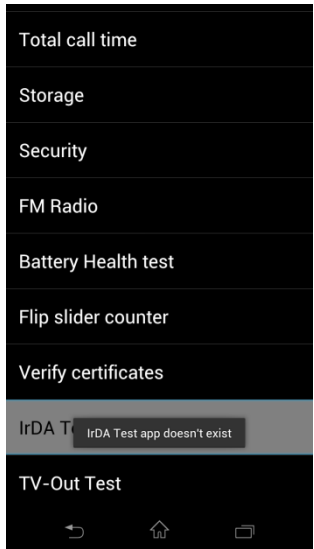
N/A.



2.2.33 IrDA Test

N/A.

This test is not available for this product!



Tests: Service Tests

2.2.34 TV-Out Test

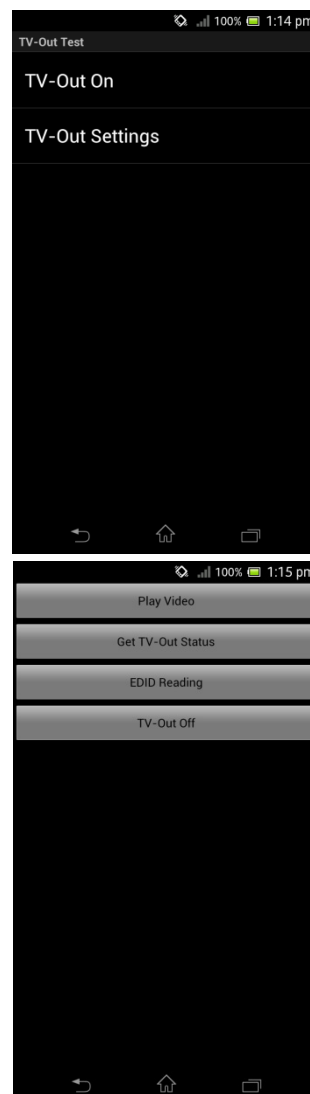
MHL adapter, HDMI Tape A Cable, charger and TV should be connected with the phone before the start of this test!

Press 'TV-Out On'.

(TV-Out Settings is usually not needed since the unit should be in automatic resolution and the TV-Out monitor should set the resolution automatic. If you get no picture on the TV-Out monitor you can try different resolutions under TV-Out Settings.)

Step 1: Attach cable between phone and TV-Out;

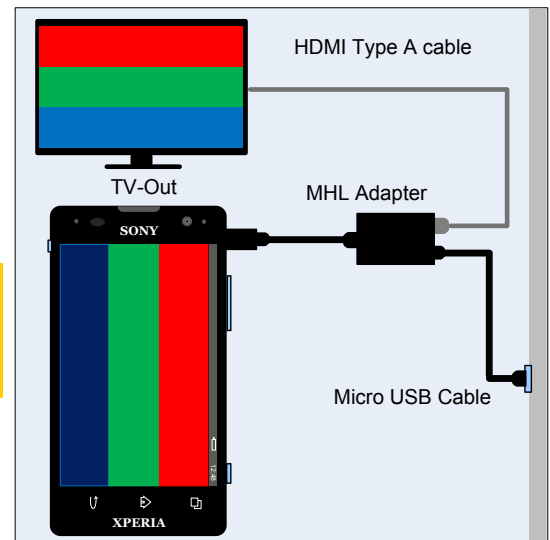
Step 2: Press 'Play Video'.



Tests: Service Tests

Receive a test tone and a red-green-blue test picture in the TV-Out Monitor and phone.

Note: If the TV-Out Monitor doesn't automatically identify the picture, the Monitor may require to set the TV-Out port chosen as source manually in the Monitors menus.



Only symbolic view

Press 'Get TV-Out Status':

You should now get:

Power Status: Active

HPD Status: H

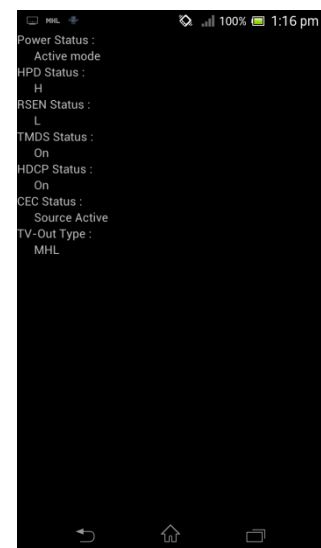
RSEN Status: L or H (Might differ between TVs)

TDMS Status: On

HDCP Status: On

CEC Status: Active

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



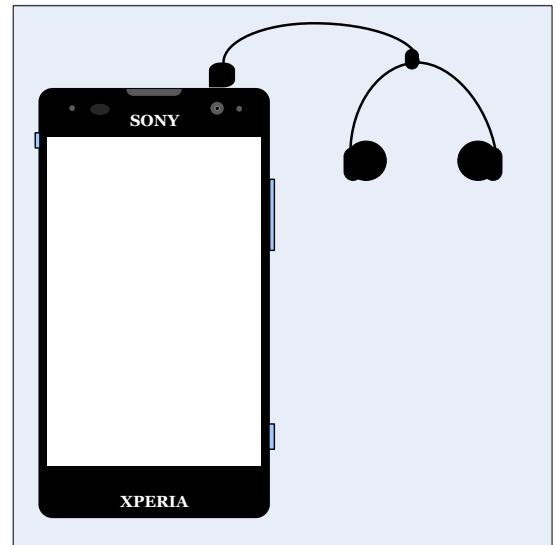
Tests: Service Tests

2.2.35 Audio Jack test

Connect a Sony CTIA headset.

Repeat the test of “2.2.5 Speaker”, “2.2.7 Earphone” and “2.2.8 Microphone”.

Make sure that the sound from Headset earphone ports are emitted loud and clear.



Tests

2.3 Manual Tests

2.3.1 SIM

Verify that the phone can detect a SIM card:

Step 1: Insert a Micro SIM card, and start the phone;

If the SIM card is detected by the phone, the start-up procedure will continue.

Step 2: Pull down the Status Bar (put finger next to the receiver and drag the menu down from the Status Bar);

Step 3: See SIM card operator name.

The SIM card operator name will be displayed above the Time Clock when phone is in Lock status.

If not detected, the message 'Emergency call only' will be displayed instead in the pull down Status Bar.

Press Back key to return to Standby Menu.

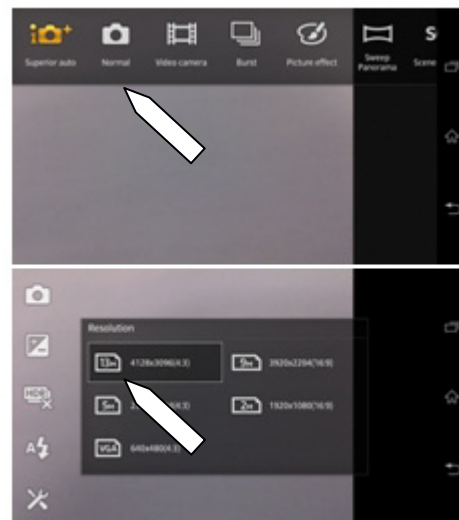


Tests: Manual Tests

2.3.2 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.

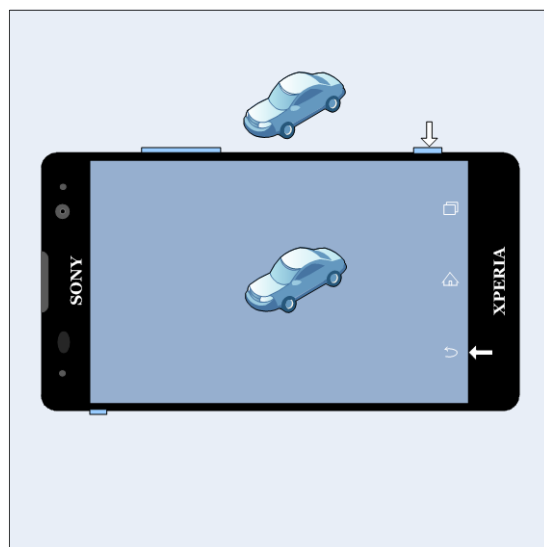


Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

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.



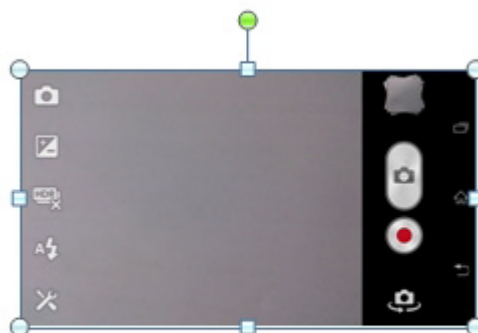
Only symbolic view

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

2.3.3 Charging via USB (Charger or Computer)

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

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

Do not start the phone.

- Connect a USB cable from a computer or charger to the phone.
- Verify that the phone is being charged by the notification LED and Battery icon in the display.

Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.

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

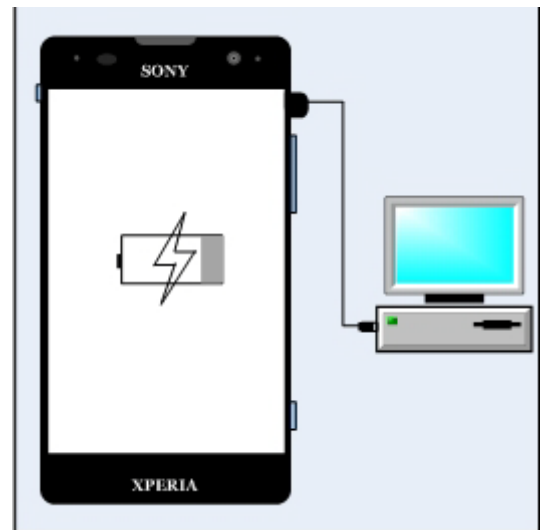
- Red: Battery level is between 0% and 10%;
- Orange: Battery level is between 11% and 89%;
- Green: Battery level is between 90% and 100%;

If above fails, perform below Diagnostic battery / Charging Status check.

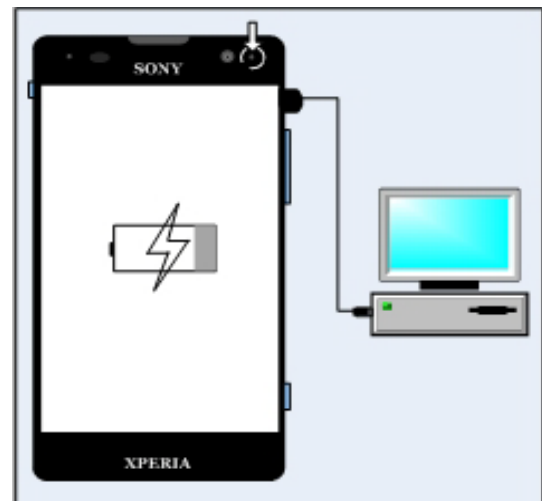
Perform a force shut down by pressing the OFF button, under the SIM card cover, until the unit vibrates four times then release the button. Then the phone will shut down.



If no vibration is detected, the battery might be discharged.

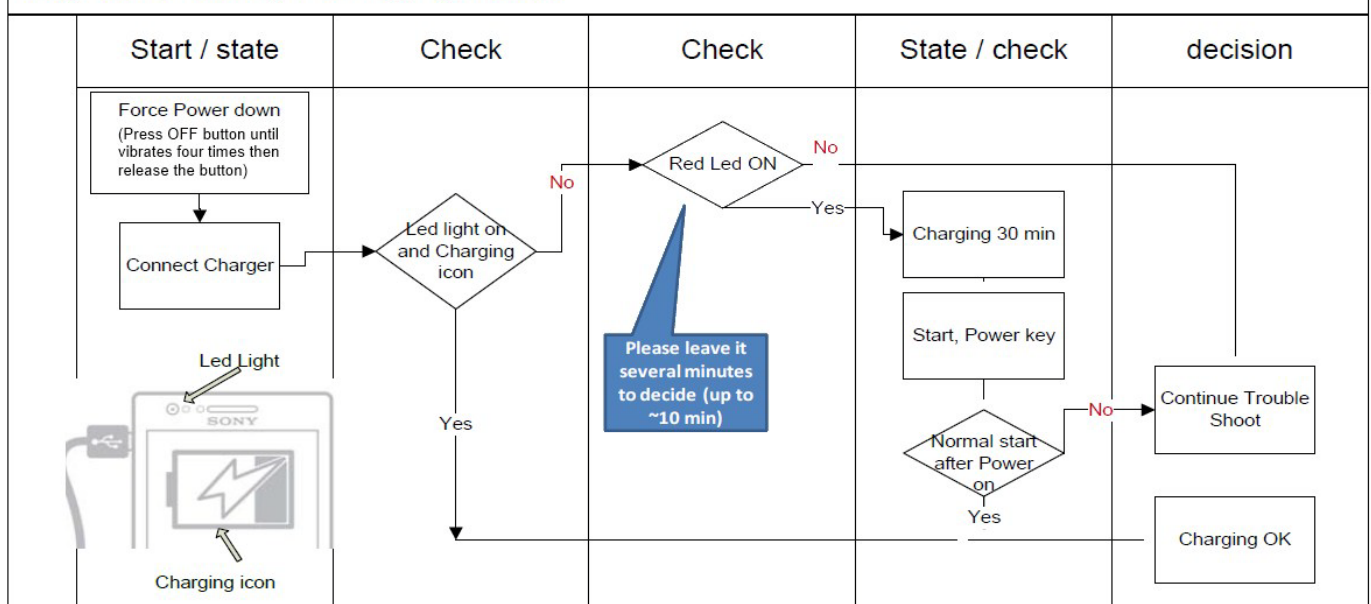


Only symbolic view



Only symbolic view

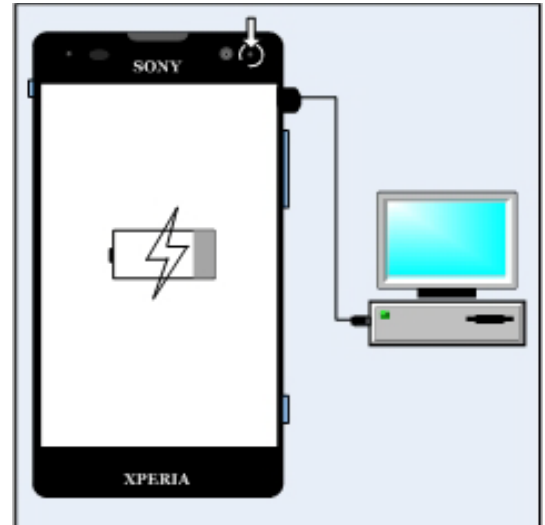
Diagnostic Battery / Charging Status



Tests: Manual Tests

2.3.4 Data Communication test

- Connect a USB cable from a computer to the started phone.
- Verify that Data Communication works by transferring a file from Computer to phone
- Erase the file



Only symbolic view

Tests: Manual Tests

2.3.5 Battery Test

If bad battery performance or capacity problem is claimed, the battery and charging function can be tested by using an application designed for this purpose.

By using this application the battery is tested in a fast and controlled environment.

This is especially convenient when phones with embedded batteries should be checked, to avoid unnecessary work to disassembly the phone to access the battery.

This test is designed to identify a faulty battery or a hardware issue in the phone or with the charger. The guide will describe different procedures depending on the battery level when the battery test is initiated.

The test is downloaded to the phone, using cable or Bluetooth, and executed.

The test is available in CSPN at Level: Mechanical,

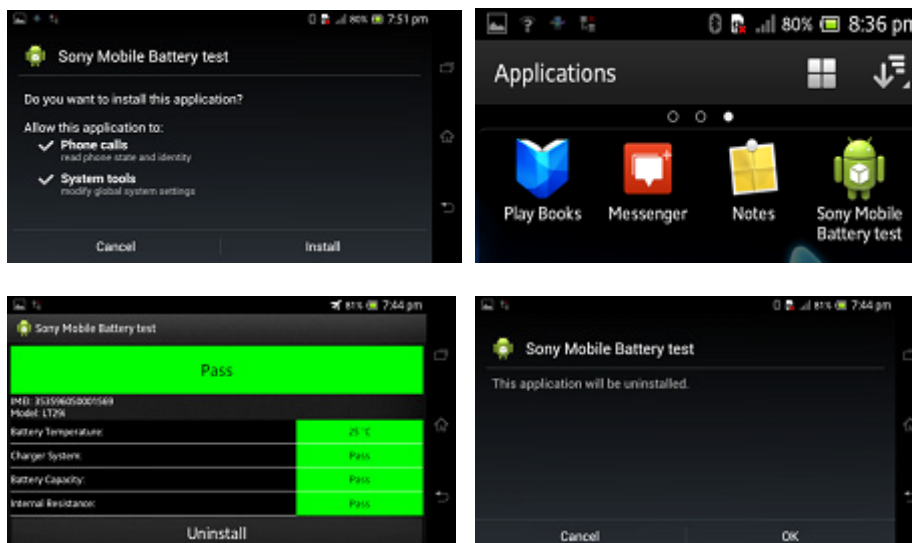
Title: **Sony Mobile Battery test Application 1266-2711.**

Unzip this file, where you find the application, installation and user guide content.

The Charger and charging cable is specified. (**Charger EP 800, Cable EC480**)

After the test the Sony Mobile Battery test.apk shall be removed by tap "Uninstall" "OK" in the application.

Error messages are described in the user guide for the Sony Mobile Battery test.



Tests: Manual Tests

2.3.6IR test

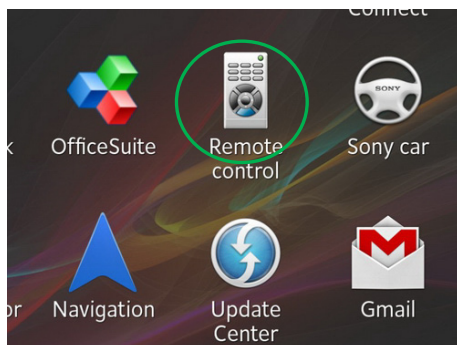
The IR lens position is beside the power on/off button.

Test of the IR function can be done using the “remote control app” in the phone software or similar.

The light of the IR led can be seen in a digital camera, phone cameras or tested directed towards a TV.

Go to the phone menu and open the “Remote control” app and perform a function check of IR led.

Remote control app



IR lens is beside the power on/off button



Tests: Manual Tests

2.3.7 Network Test

This test can only be performed if the phone has got 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!**

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

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Network mode ⇒ GSM only

Ensure that the Network Status icon show signal strength and show no symbol or E at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.3.6.2 Procedure' below.

UMTS (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Network mode ⇒ WCDMA only

Ensure that the Network Status icon show signal strength and show 3G or H+ (HSPA) at the top of the display.

To verify the radio functions (UMTS) of the phone, follow the '2.3.6.2 Procedure' below.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Network mode ⇒ LTE (preferred)/WCDMA/GSM

Ensure that the Network Status icon show signal strength and show LTE at the top of the display.

To verify the radio functions (LTE) of the phone, download data package by for ex. accessing the web.

Network Type can be checked in ⇒ settings ⇒ about phone ⇒ status ⇒ Mobile Network Type

2.3.7.2 Procedure

Step 1: Set up a call from a landline phone (PSTN).

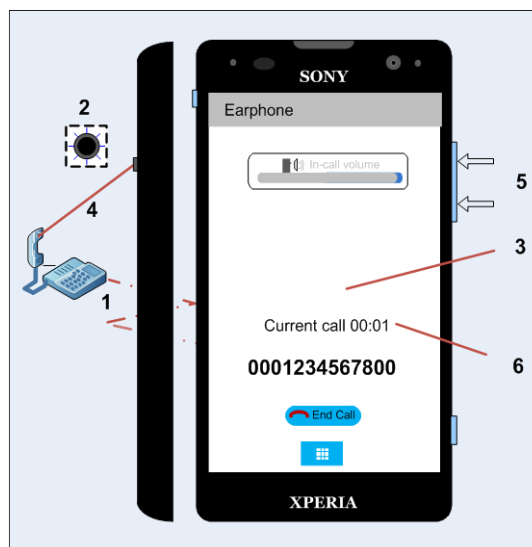
Step 2: Check that there is a ring signal.

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.



Only symbolic view

3 Revision History

Rev.	Date	Changes / Comments
1	2013-Feb-26	Initial release
2	2013-Feb-28	Information about STAMINA mode in Ch.2.1 added
3	2013-June-18	Camera updated and moved to manual test!