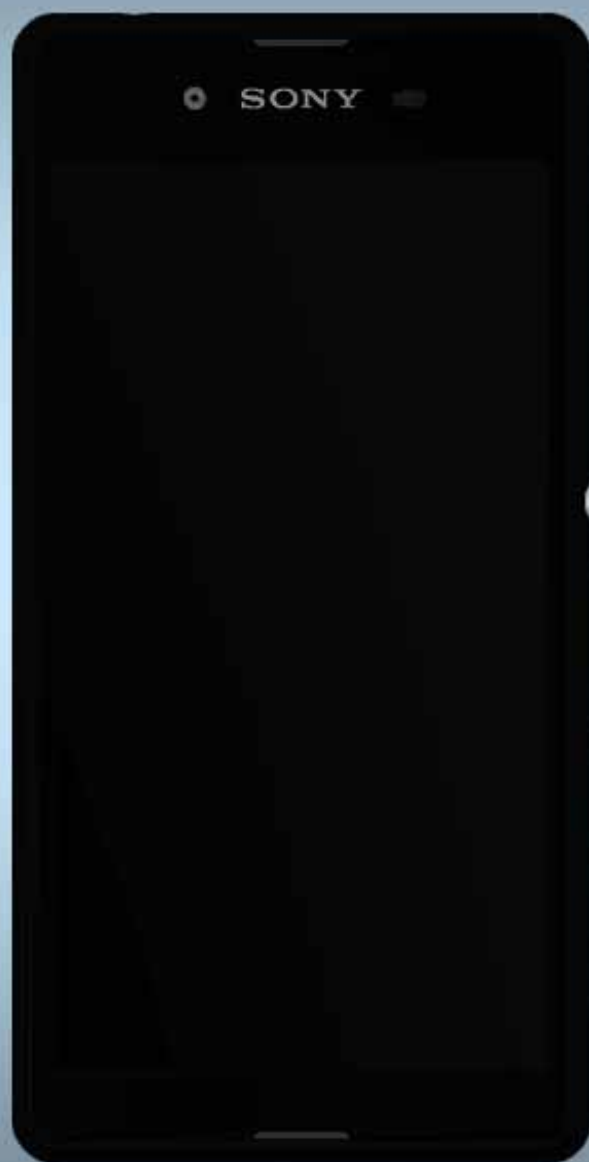


Test Instructions

- mechanical -



Xperia™ E4 & E4 Dual
E2104, E2105, E2115, E2124

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

1 Pre-Test Preparation

1.1 Hardware

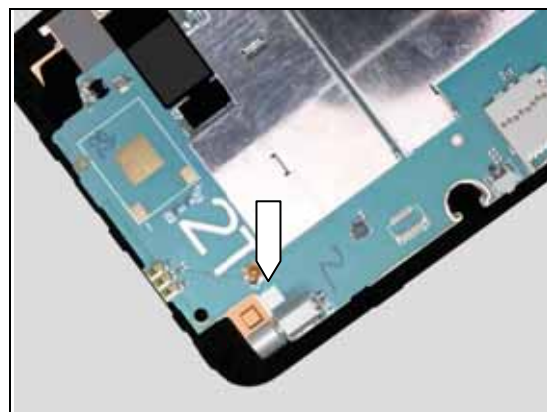
1.1.1 Water indicator inspection

Before starting any tests the Liquid Indicator has to be checked.

The indicator is located as shown in this picture after the Battery Cover has been removed.



2nd indicator is located as shown in this picture after the Main PBA has been disassembled, following Working Instruction 1294-4523.



Pre-Test Preparations

1.2 Test Enablers

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

Front:

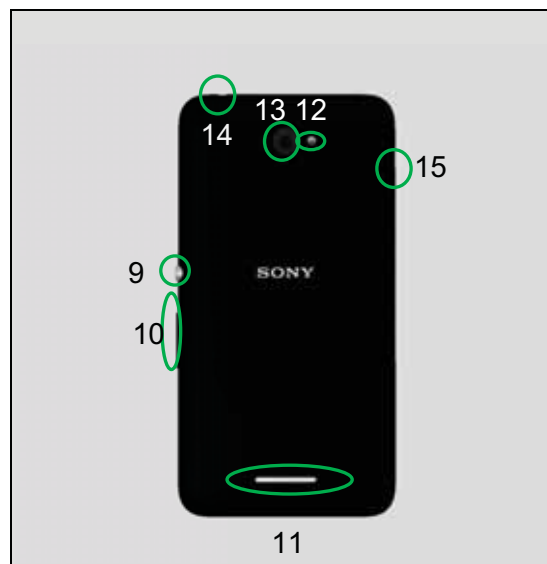
1. Back Key
2. Home Key
3. Multi Key
4. Microphone
5. Secondary Camera
6. Ambient Sensor, Proximity Switch
7. Earphone
8. Notification LED



Back:

9. On/Off Key
10. Volume up/down Key
11. Speaker
12. LED Flash
13. Camera
14. USB Connector
15. Audio Jack Port

6



Pre-Test Preparations

1.3 Software

1.3.1 Software update

1.3.1.1 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.sonymobile.com/global-en/support/>

- Start up the phone
 - Note: Make sure the phone is in call setup.
- Press the following keypad combination: *#*#7378423#*#*
- Select 'Service info'
- Select 'Software info'
- Check the software file revisions and, if needed, update as described below:

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

1.3.1.2 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:

- Open the Emma application and log in.
- Press and hold 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 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!

Stamina mode needs to be turned off before entering Service Test Mode

Settings -> Power management -> STAMINA mode

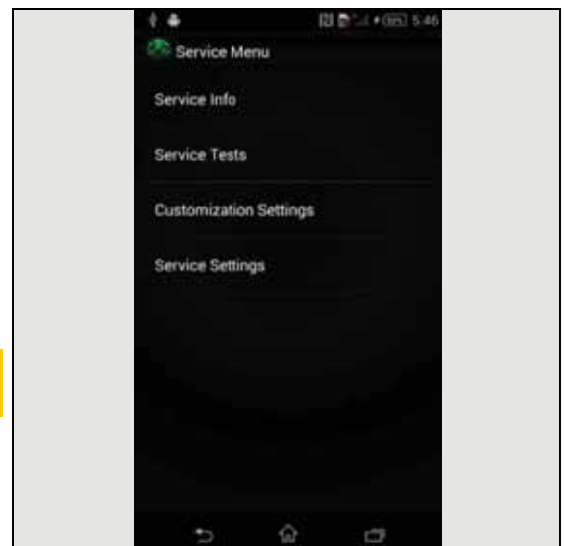
Start up the phone and enter the service menus:

- Press the following keypad combination: *****#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 following pictures will show a simplified basic phone for a general visualization of the service tests!

Tests

2.2 Service Tests

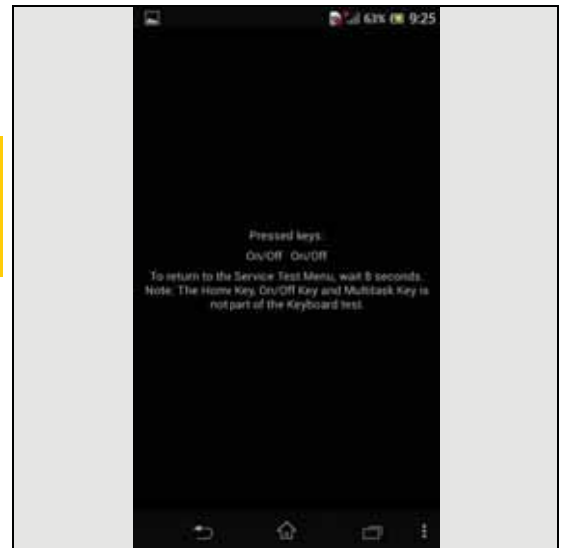
2.2.1 Keyboard & Switch

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

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

Press all keys on the:

- Back key
- Menu key
- Volume up key
- Volume down key



2.2.1 Touch Screen

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

Check all area of the touch screen as indicated by the two lines.

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



2.2.2 Display

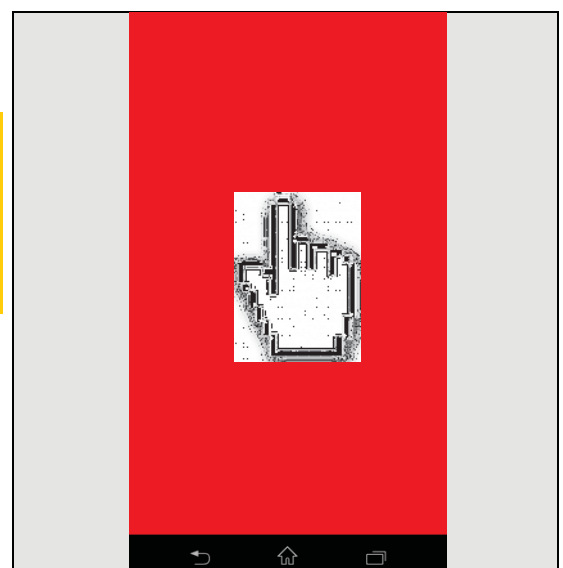
Minor variations in the display's brightness and color may occur between phones.

If any tiny bright dots on the display are found, this indicates defective pixels which 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 Seven test patterns of White, Black, Red, Green, Blue, White, Rainbow Colors, on the 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.



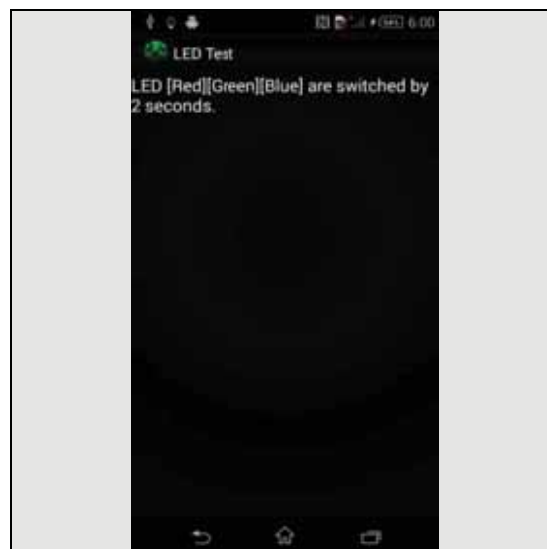
Tests: Service Tests

2.2.3 LED/ Illumination

Check that the:

- Notification LED changes, showing Three colors in the following sequence: red, green, and blue.
- Display Backlight illumination runs illumination cycle from low to high strength back to low again!

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

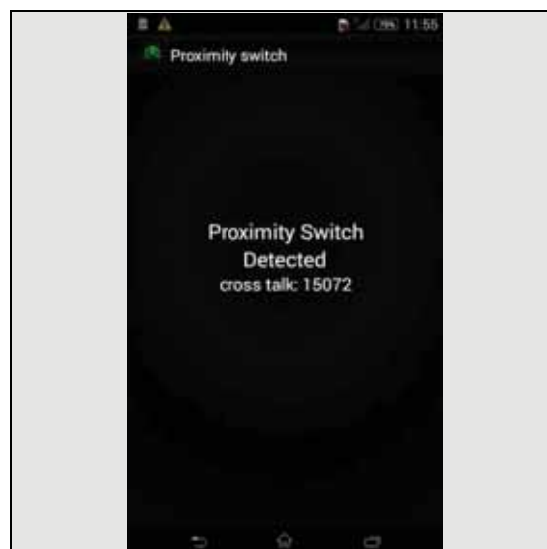


2.2.4 Proximity Switch

When entering into the test, the screen shows "Proximity Switch Not detected";

When covering the proximity switch area (on the right side of the earphone), the screen will show "Proximity Switch Detected";

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



Tests: Service Tests

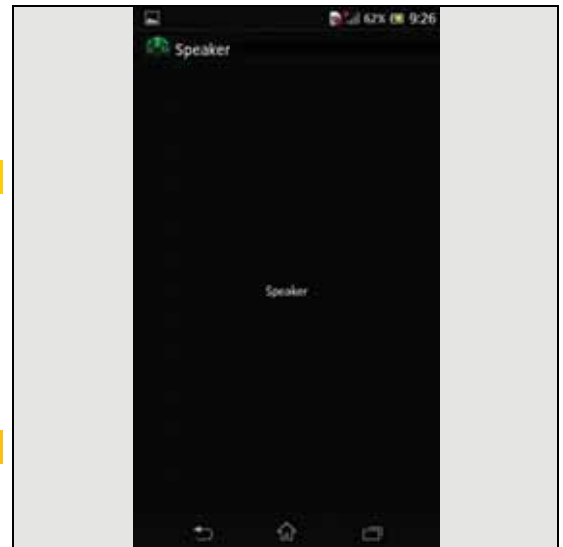
2.2.5 Speaker

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

Make sure that the sound from the speaker port is emitted loud and clear and that the test includes maximum volume.

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

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

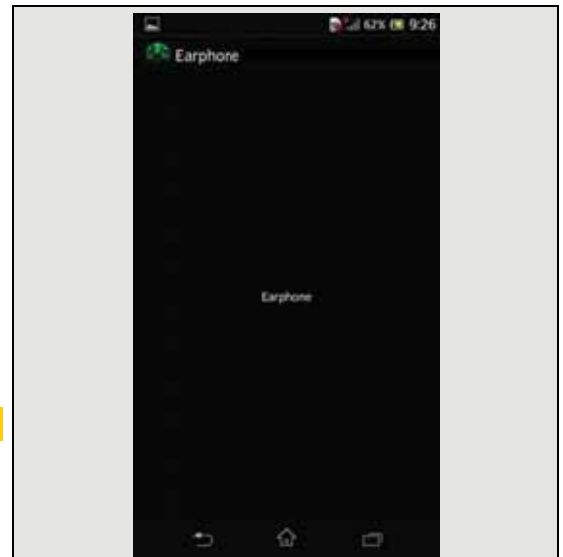


2.2.6 Earphone

Make sure that the sound from the earphone port is emitted loud and clear and the test includes maximum volume.

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

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

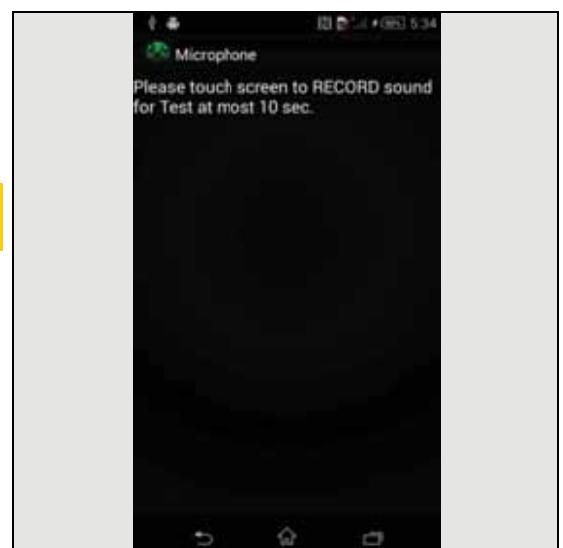


2.2.7 Microphone

The previous 'Speaker' test must 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.
Step 1: Press Touch Screen to record sound for test 10 seconds.

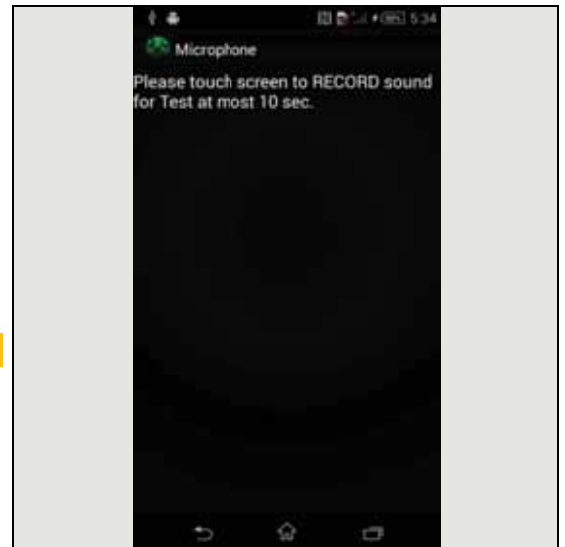
Step 2: Press Touch Screen to stop recording.



Tests: Service Tests

Step 3: Check the quality by listening to the recording from the speaker during the 'Playing recorded sound' phase at maximum volume.

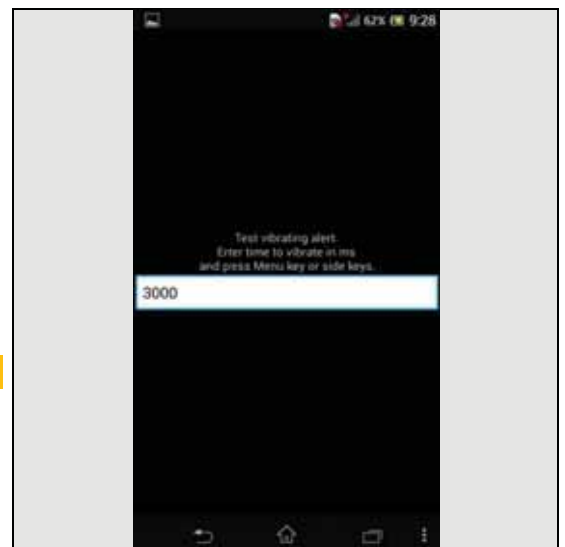
Press the Back key to return to the Service Test Menu.



2.2.8 Vibrator

Press the Menu key or side keys to start the vibrator test. It is possible to modify the duration of this test.

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



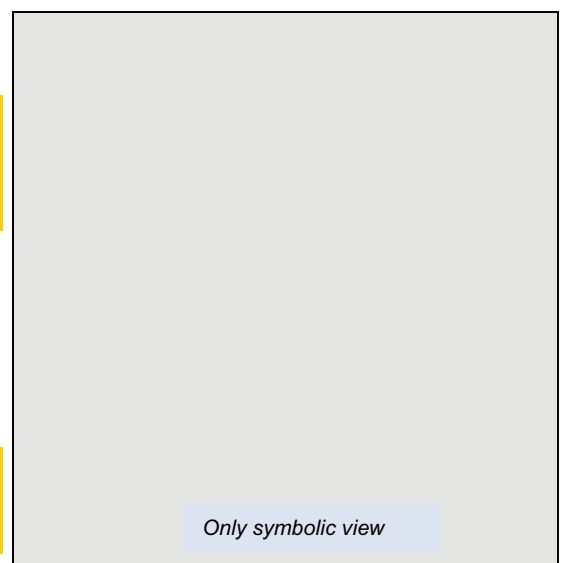
2.2.9 Camera

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 at the back of the phone) at an object press preview and check the quality of the image shown in the display.

Press capture to take picture and preview the photo's auto focus quality, then delete picture.

**Photos are taken but not saved during this test!
Press "Turn Off" or the Back key to return to the Service Test Menu.**



Tests: Service Tests

2.2.10 Front 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 at the Front of the phone) at an object press preview and check the quality of the image shown in the display.

Press capture to take picture and preview the photo's auto focus quality, then delete picture.

**Photos are taken but not saved during this test!
Press "Turn Off" or the Back key to return to the Service Test Menu.**

Only symbolic view

Only symbolic view

2.2.11 Flash LED Test

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

Press "Leave this page" or Back key to return to Service Test Menu.

Tests: Service Tests

2.2.12 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;

If there is a permission request, select 'Yes'.

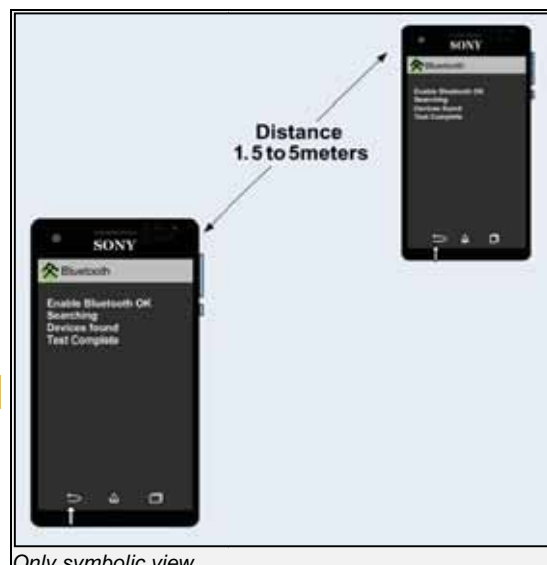
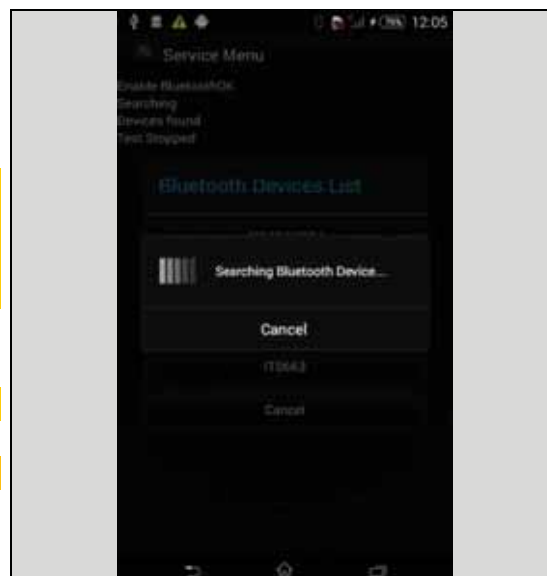
Step 2: Scanning

Step 3: Show the Device Found list;

Step 4: Select the Target Bluetooth Device, and type the PIN code to pair;

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

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



2.2.13 WLAN

Make sure there's a 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: Searching;

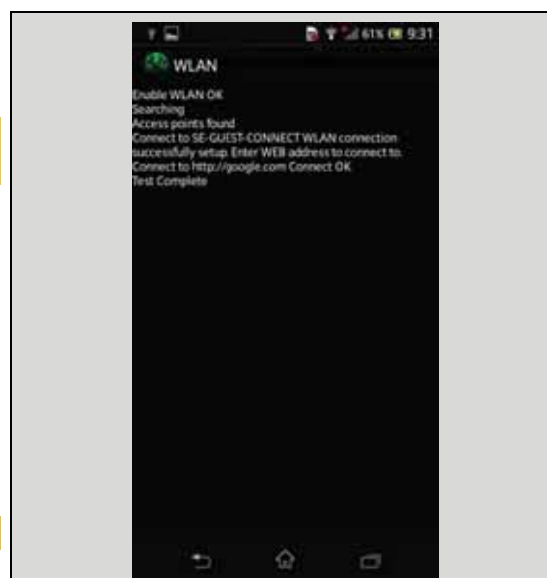
Step 3: Access points found list;

Step 4: Select the Target WLAN network, and type the password to get connected;

Step 5: Enter a web address (e.g. Google.com);

Step 6: When connection succeeded, it shows 'Test Complete'.

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

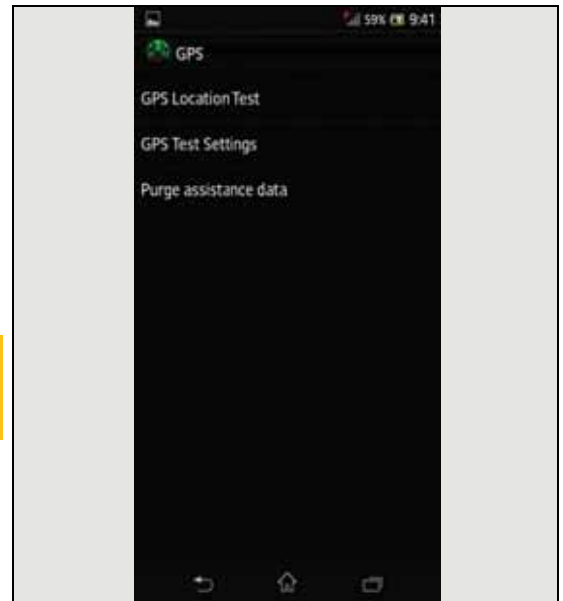


Tests: Service Tests

2.2.14 GPS

Enter the GPS Location Test and wait for the GPS location data.

**Press the Back key to return to the Service Test Menu.
For GPS testing, refer to
1220-1333: Generic Repair Manual – mechanical**



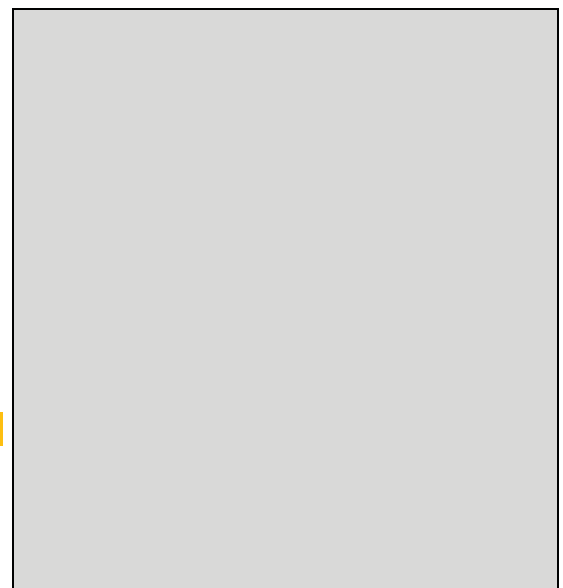
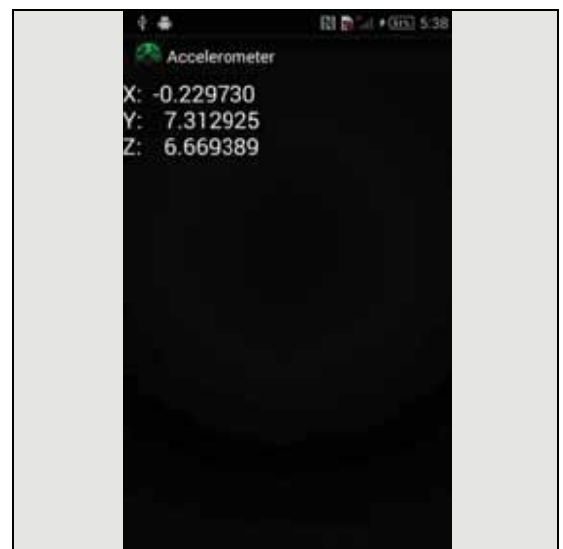
2.2.15 Accelerometer

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

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!

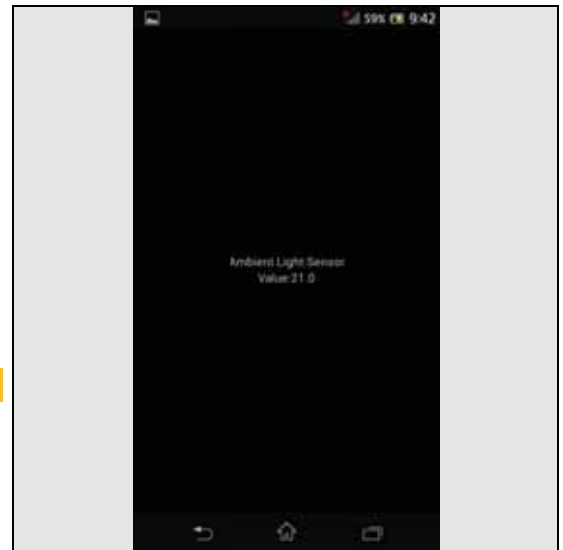


Tests: Service Tests

2.2.16 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.

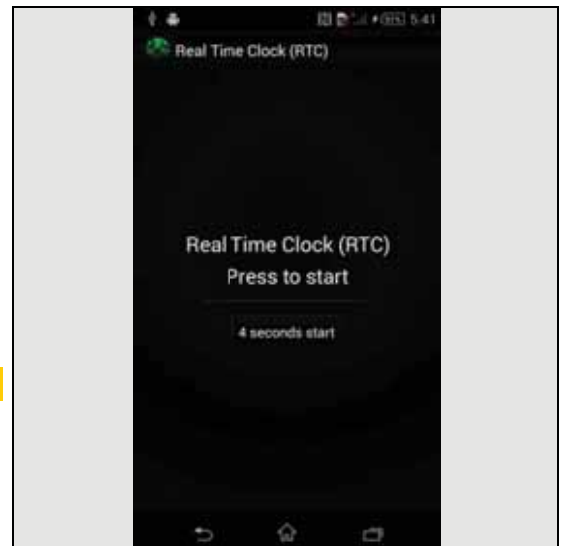
Press the Back key to return to the Service Test Menu.



2.2.17 Real time clock

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

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

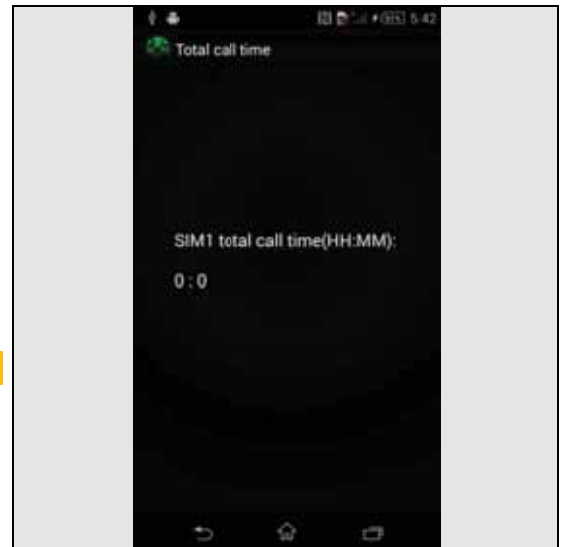


Tests: Service Tests

2.2.18 Total call time

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

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

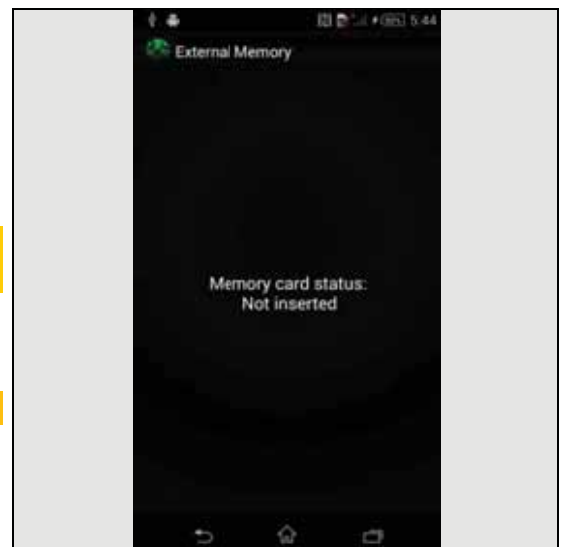


2.2.19 External Memory

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.



2.2.20 Security

The DRM keys are shown in the display.

There may be different content shown based on different market software versions.

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

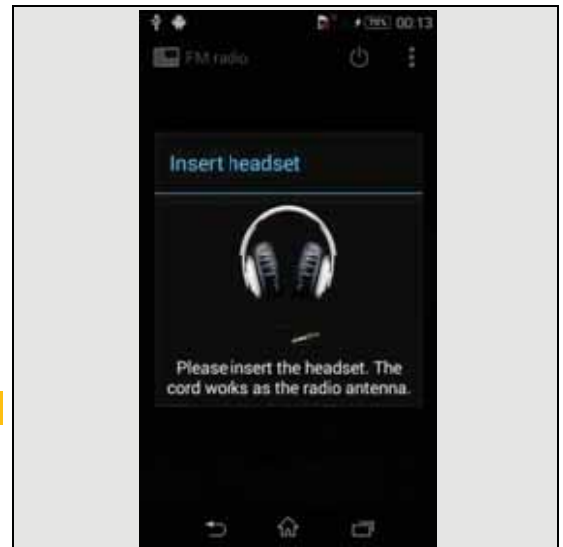


Tests: Service Tests

2.2.21 FM Radio

Verify that the phone can detect a radio station:
Connect a headset and then set your local radio station in Hz.
Verify that the reception and sound quality is normal.

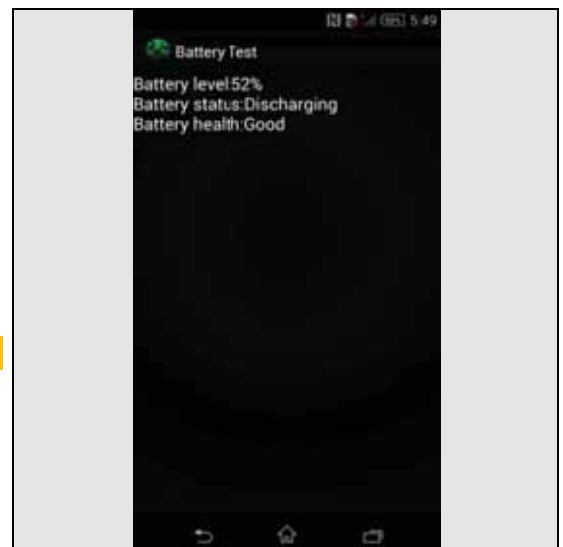
Press the Back key to return to the Service Test Menu.



2.2.22 Battery Status Check

N/A.

This test is not available for this product!



2.2.23 Verify certificates

When entering the test, four information categories will be shown: Media, Shared, Platform and Application.

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



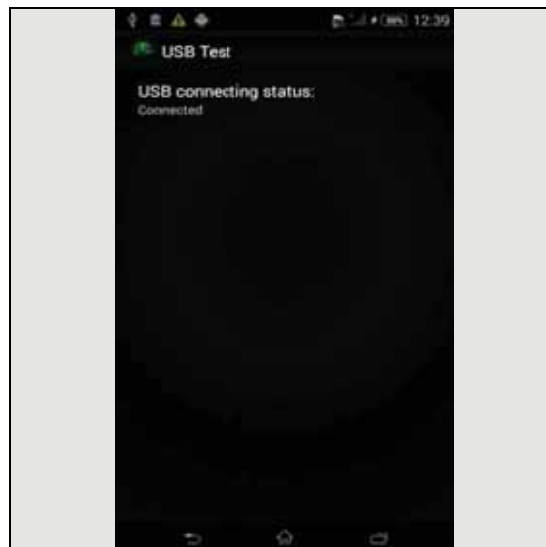
Tests: Service Tests

2.2.24 USB Test

Micro USB cable should be inserted in the phone with PC or charger before the start of this test!

USB connecting status should shows "Connected";

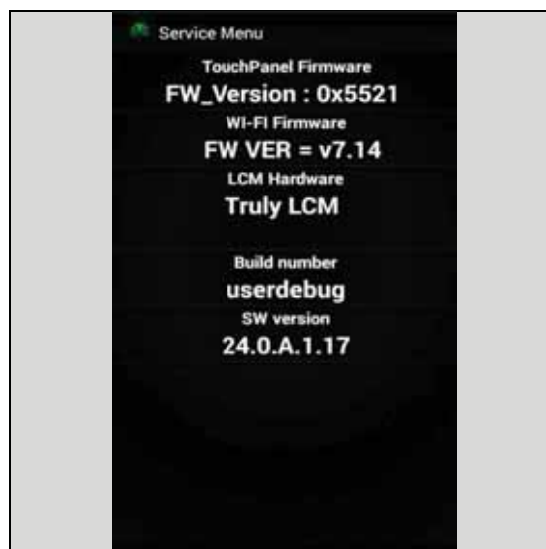
Press the Back key to return to the Service Test Menu.



2.2.25 Firmware Version

When entering the test, four information categories will be shown: TouchPanel Firmware, Wi-Fi Fireware, LCM Firmware, Build Firmware and SW Version.

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



Tests: Manual Tests

2.3 Manual Tests

2.3.1 SIM Card test

Verify that the phone can detect a SIM card:

Step 1: Insert a 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.

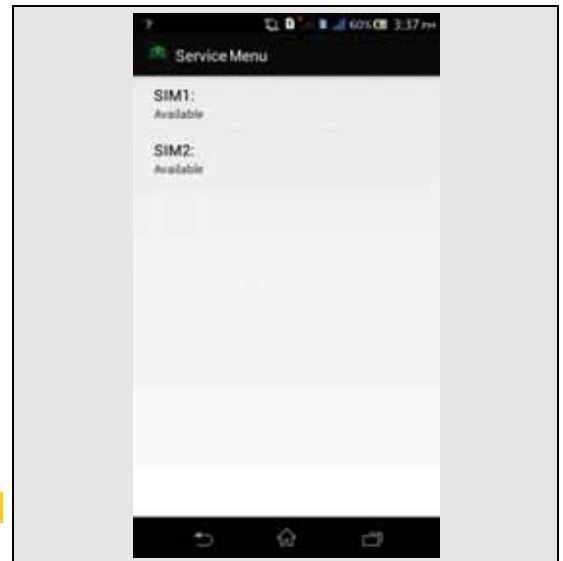
The SIM card operator name will be displayed above the Time Clock when phone is in Lock status.

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

SIM1 should shows "Available"; SIM2 should shows "Available";

Note: SIM1 is for WCDMA/GSM; SIM2 is for GSM only!

Press the Back key to return to Service Test Menu.



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.

Only symbolic view

2.3.3 Home key test

Whatever the phone shows now during operation, press the Home key for the phone go directly back to the Standby screen.

Only symbolic view

Tests: Manual Tests

2.3.4 Multitask key test

Whatever the phone shows now during operation, press the Multitask key to show the programs used recently.

Only symbolic view

2.3.5 Audio Jack test

Connect a Sony CTIA headset.

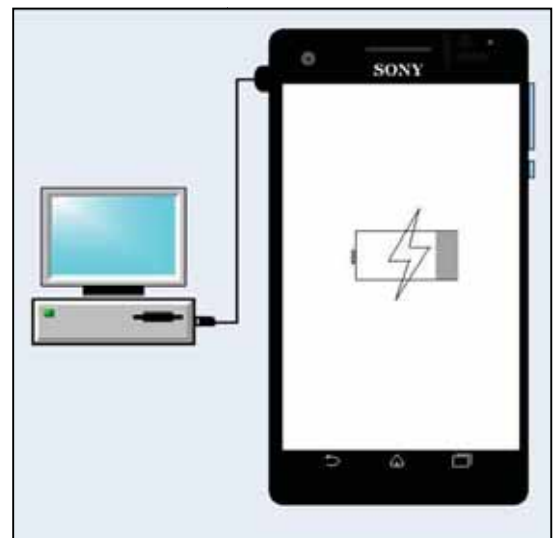
Repeat the test of “2.2.6 Speaker”, “2.2.7 Earphone” and “2.2.8 Microphone”.

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

Only symbolic view

2.3.6 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

2.3.7 Charging (Charger or Computer)

2.3.7.1 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.

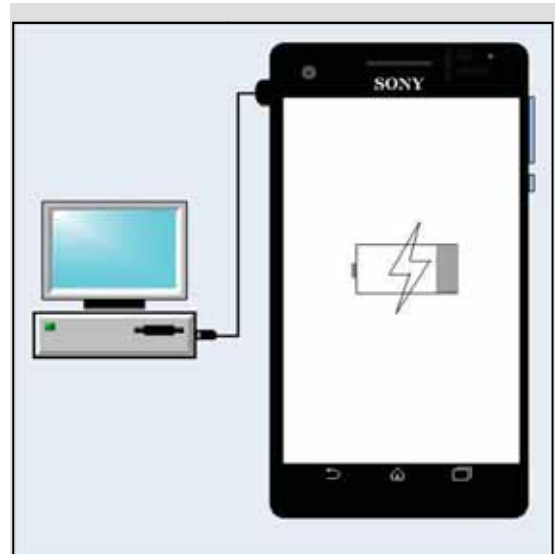
Connect a USB cable from a computer or charger to the phone.

Verify that the phone is being charged by the notification LED and Battery icon in the display.

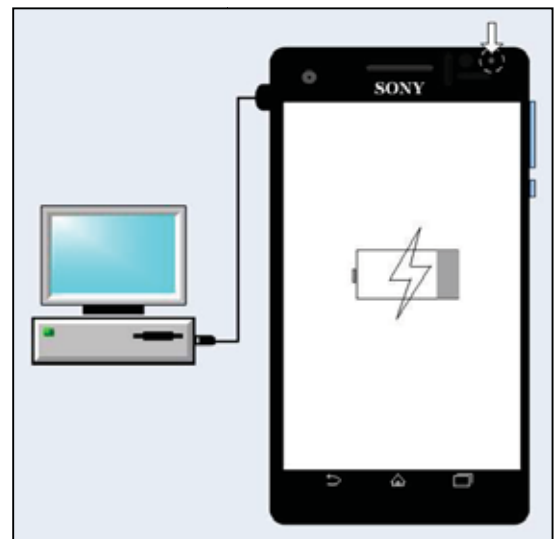
Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.

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

- Red: Battery level is between 1% and 15%;
- Orange: Battery level is between 16% and 90%;
- Green: Battery is between 91% and 100%;



Only symbolic view



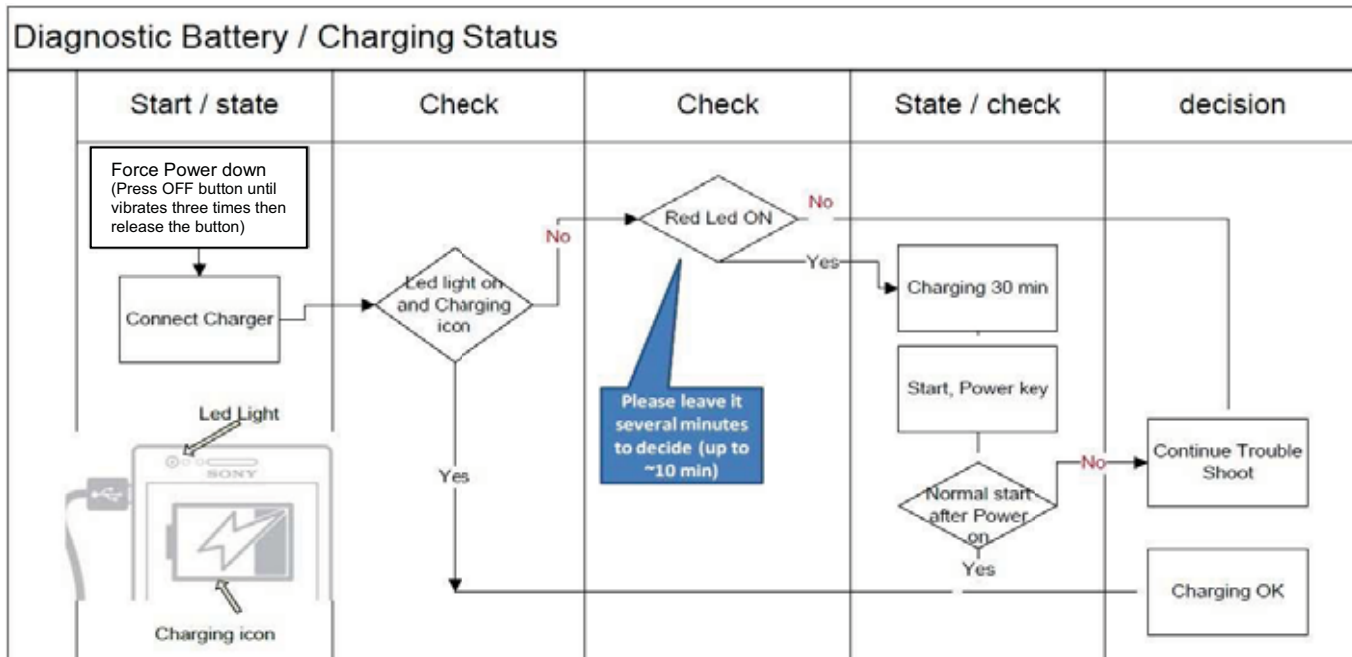
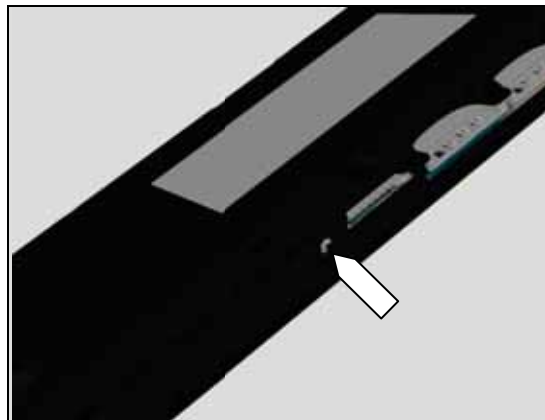
Only symbolic view

Tests: Manual Tests

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

Perform a force shut down by pressing the OFF button as shown in picture, until the unit vibrates three times then release the button. Then the phone will shut down.

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



The picture in above flow chart is only symbolic view.

Tests: Manual Tests

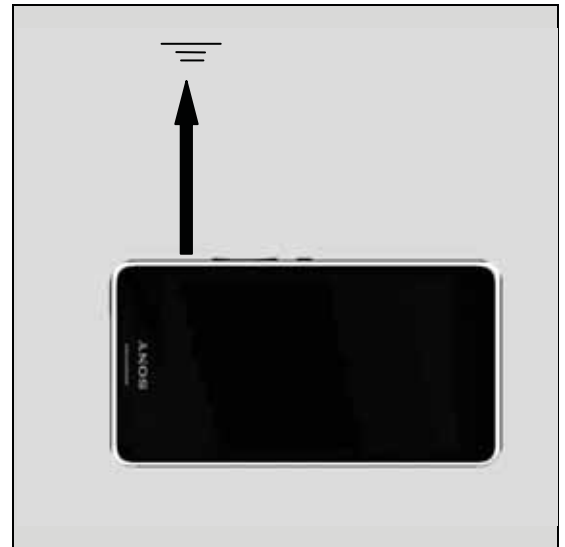
2.3.8 Mobile TV test (E2124 only)

This function test can only be used for E2124.

Start the phone.

Verify that the phone can detect Mobile TV channels:
Pull out the Mobile TV antenna.

From the Home screen, tap , and then tap [Mobile TV].

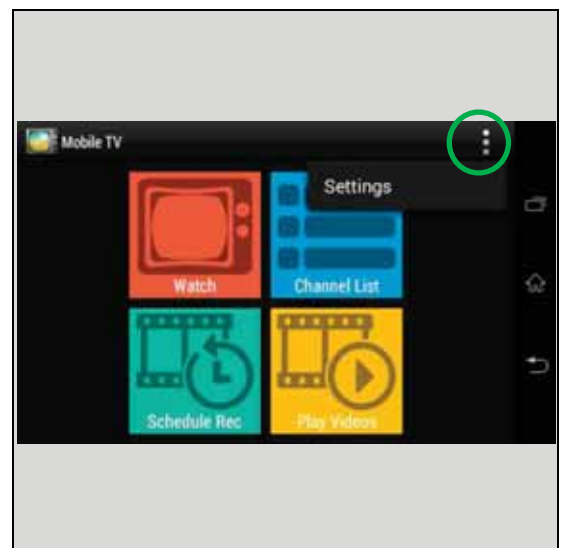


Mobile TV screen as shown in picture:

- Watch: it will search available channels first and then Play.
- Channel List: it will search available channels list;
- Schedule Rec: it will record Mobile TV program;
- Play Videos: it will play the recorded Mobile TV program.

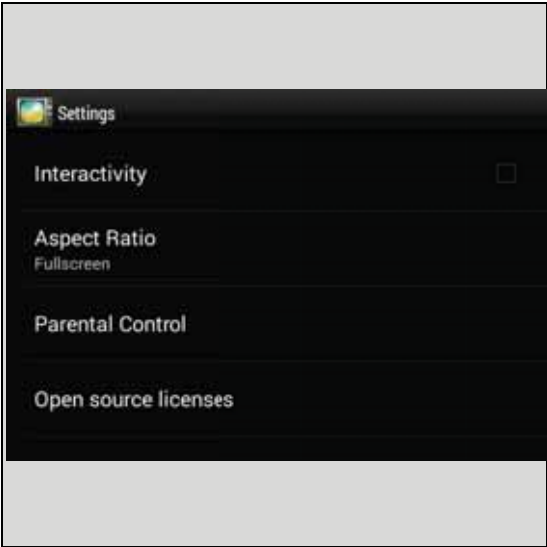


Select button at right-top corner, it will enter settings menu.



Tests: Manual Tests

Settings menu view.



Tests

2.4 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.

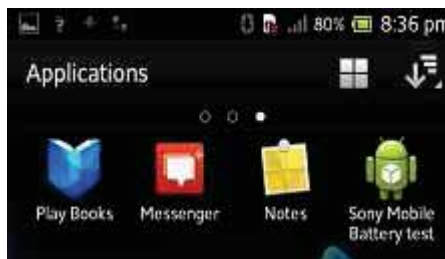
The test is available in CSPN at Level: Mechanical,

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

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

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

2.5 Network Test

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

There are different versions of the test depending on whether a GSM, UMTS or LTE network is available or not!

If a GSM, UMTS or LTE network is available, the network test has to be done separately for GSM, UMTS or LTE!

2.5.1 Procedure (GSM & UMTS & LTE)

- 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

Tests: Network Test

2.5.2 On-the-air call to mobile Dual SIM

2.5.2.1 SIM1 -WCDMA/GSM

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Dual SIM card ⇒ enable SIM1 GSM Only ⇒ 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 '2.5.1 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ Dual SIM card ⇒ enable SIM1 ⇒ 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 '2.5.1 Procedure (GSM & UMTS)' above.

2.5.2.2 SIM2 – GSM Only

GSM

Go to the Setting app:

Step1: Settings ⇒ More ⇒ Mobile Networks ⇒ Dual SIM card ⇒ disable SIM1 (WCDMA/GSM) and enable SIM2 (GSM)

Ensure that the Network Status icon show SIM2 signal strength and show no symbol for SIM1 at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.5.1 Procedure (GSM & UMTS)' above.

Tests: Network Test

2.5.3 On-the-air call to mobile Single SIM

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 '2.5.1 Procedure (GSM & UMTS)' above.

UMTS

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 '2.5.1 Procedure (GSM & UMTS)' above.

3 Revision History

Rev.	Date	Changes / Comments
1	2015-Feb-11	Released
2	2015-Feb-27	D2124 Model added Chapter 2.3.8 added for Mobile TV