

Test Instructions

- mechanical -



Xperia C5 Ultra
E5506, E5533, E5553, E5563

CONTENTS

1.1	Hardware.....	4
1.1.1	Water indicator inspection.....	4
Pre-Test Preparations		5
1.1.2	Test Enablers	5
1.2	Software.....	6
1.2.1	Software update.....	6
2	Tests	7
2.1	Service Test Mode.....	7
2.2	Service Tests	8
2.2.1	Keyboard & Switch	8
2.2.2	Touch Screen.....	8
2.2.3	Display.....	8
2.2.1	LED/Illumination	9
2.2.2	Proximity Switch.....	9
2.2.3	Speaker.....	9
2.2.4	Earphone	10
2.2.5	Microphone	10
2.2.6	Vibrator.....	11
2.2.7	Camera	11
2.2.1	Front Camera	11
2.2.2	FlashLED Test.....	12
2.2.3	Bluetooth.....	12
2.2.4	WLAN.....	13
2.2.5	GPS	13
2.2.6	Compass	13
2.2.7	Accelerometer.....	14
2.2.8	Ambient Light Sensor	14
2.2.9	Real time clock (RTC).....	15
2.2.10	Total call time.....	15
2.2.11	External Memory.....	16
2.2.1	Security	16
2.2.2	FM radio.....	16
2.2.3	Battery Test.....	17
2.2.4	Verify Certificates	17
2.2.5	SIM Card Test.....	17
2.2.6	USB Test.....	18
2.2.7	Firmware Version	18
2.2.8	Hall Sensor.....	19
2.2.9	NFC Card Mode.....	19
2.2.10	NFC Reader Mode.....	19
2.3	Manual Tests	20
2.3.1	On/Off Key test	20
2.3.2	Home/Multitask keys test.....	20
2.3.3	Charging via USB (Charger or Computer).....	21
2.3.4	Internal Memory Test.....	23
2.3.5	Audio Jack test	23
2.3.6	Data Communication test	24

2.3.7 Battery Test..... 25

2.3.8 Network Test..... 26

3 Calibrations..... 27

4 Revision History 28

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

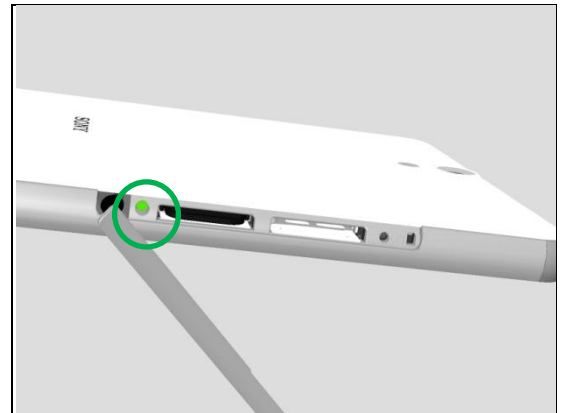
Pre-Test Preparations

1.1 Hardware

1.1.1 Water indicator inspection

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

The indicator is located as shown in this picture after the SIM SD Cover is removed.



There are total two pieces of liquid intrusion inside phone as shown.



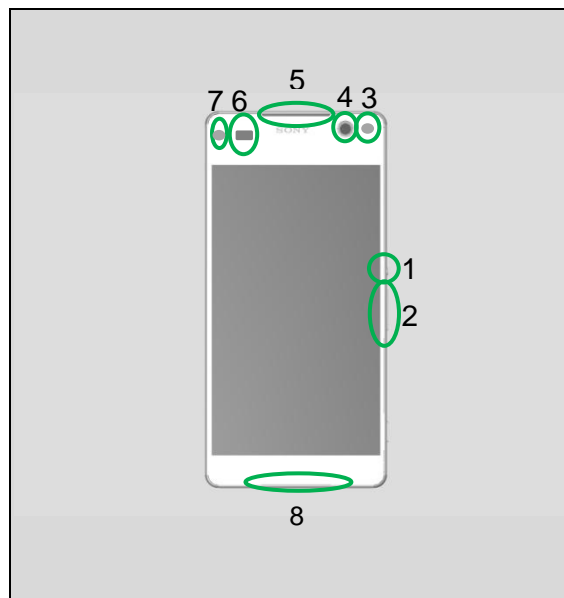
Pre-Test Preparations

1.1.2 Test Enablers

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

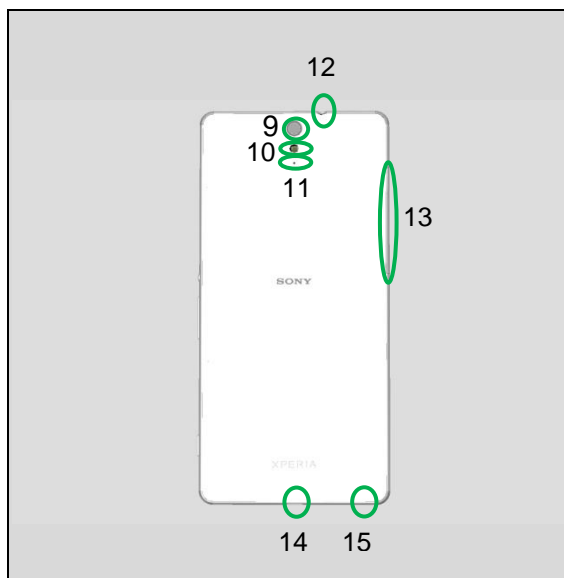
Front:

1. On/Off Key
2. Volume up/down Key
3. Front Flash LED
4. Front Camera
5. Earphone
6. Ambient Light Sensor& Proximity Switch
7. Notification LED
8. Loud Speaker



Back:

9. Main Camera
10. Flash LED
11. Secondary MIC hole
12. Audio Jack
13. SIM SD Cover
14. USB hole
15. Primary MIC hole



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

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:

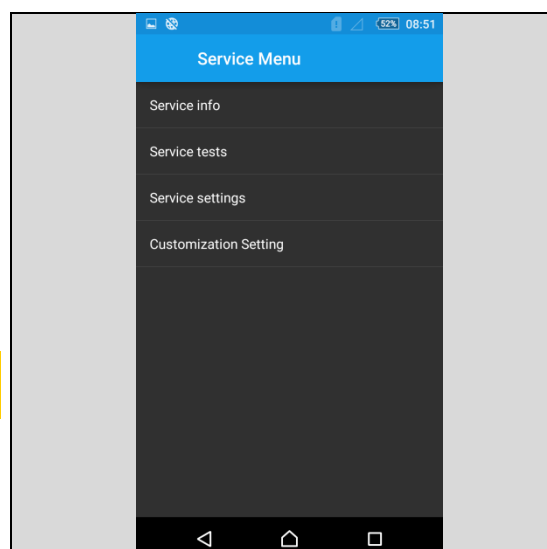
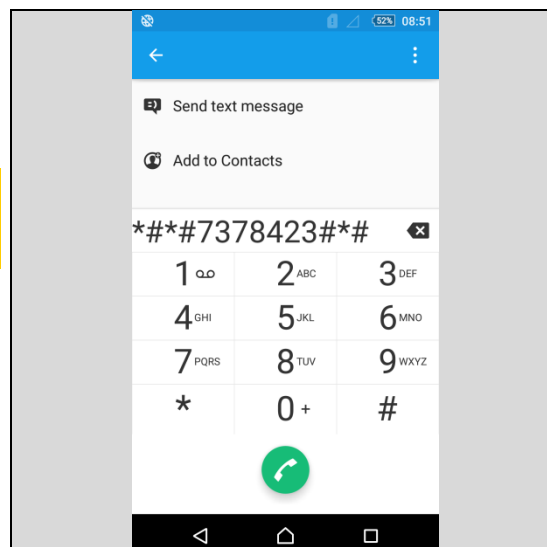
*****#7378423***;**

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

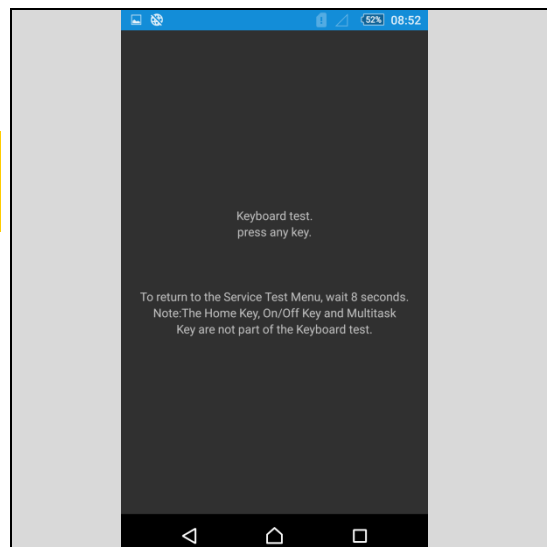
2.2.1 Keyboard & Switch

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
- Volume Up Key
- Volume Down Key
- Camera/Focus Key

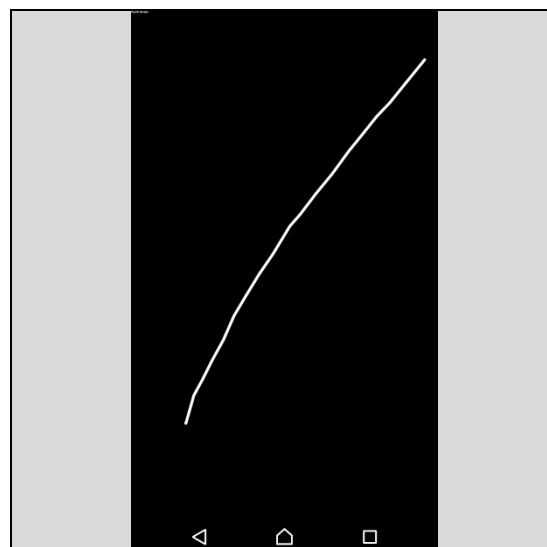
Wait 8 seconds to return to the Service Test Menu.



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.

Touch the display using a finger. With every touch, the display will show test patterns of White, Black, Red, Green, Blue, Rainbow etc 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.



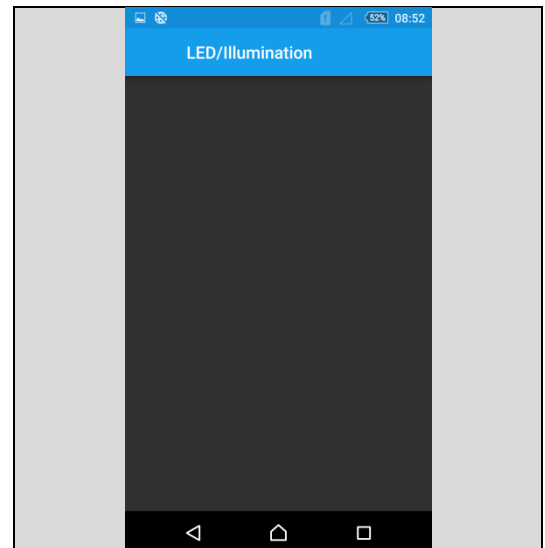
Tests: Service Tests

2.2.1 LED/Illumination

Check that the:

- Display Backlight illumination goes from low to high strength back to low again.
- Notification LED located on top left corner of the phone changes, showing colors in the following sequence: red, blue, green.

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

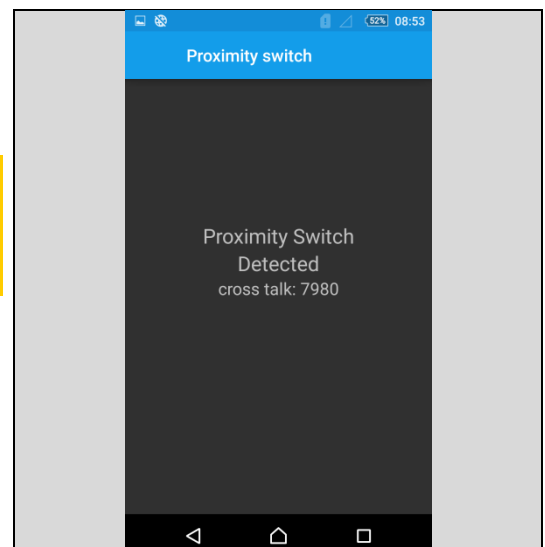


2.2.2 Proximity Switch

***The Chapter 'Speaker' test 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 Not detected' and the value of cross talk is low.

When covering the proximity switch area (on the top left side of the phone), the screen will show 'Proximity Switch Detected' with a tone, and the value of cross talk changes to high.



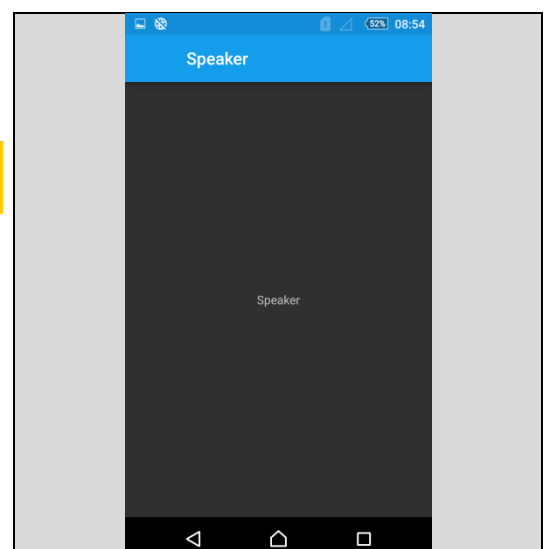
2.2.3 Speaker

***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 phone 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.



Tests: Service Tests

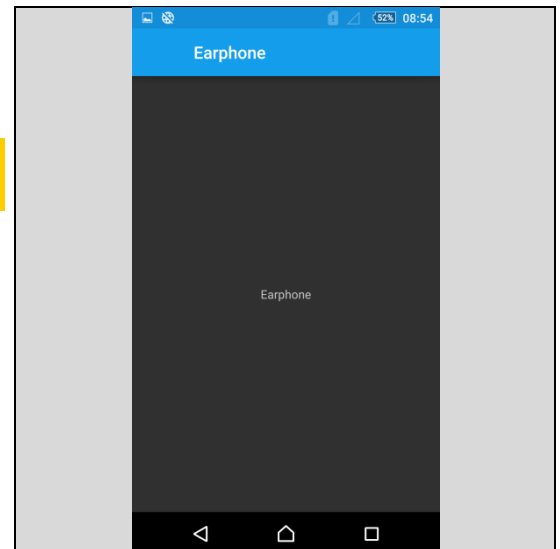
2.2.4 Earphone

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 earphone port on the top of the phone 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.

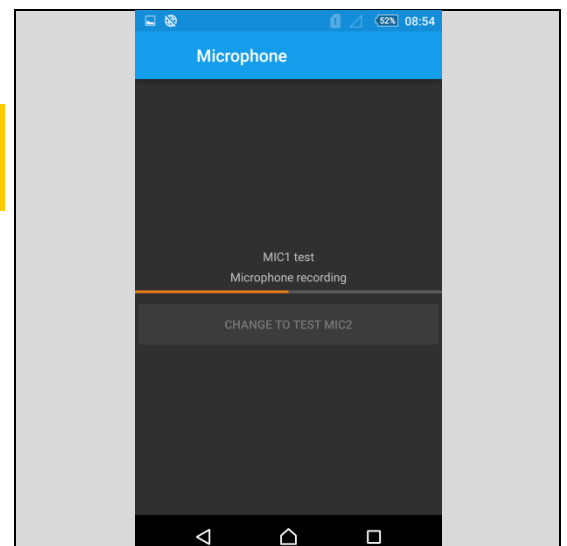


2.2.5 Microphone

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.



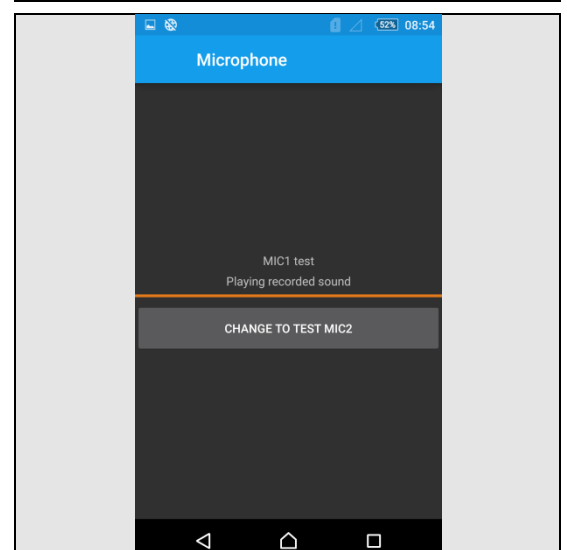
Secondary Microphone:

After MIC1 test is finished, press "CHANGE TO TEST MIC2" button to test secondary Microphone.

Step 1: Speak into the secondary microphone;

Step 2: Check the quality by listening to the sound from the speaker at maximum volume at the same time.

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

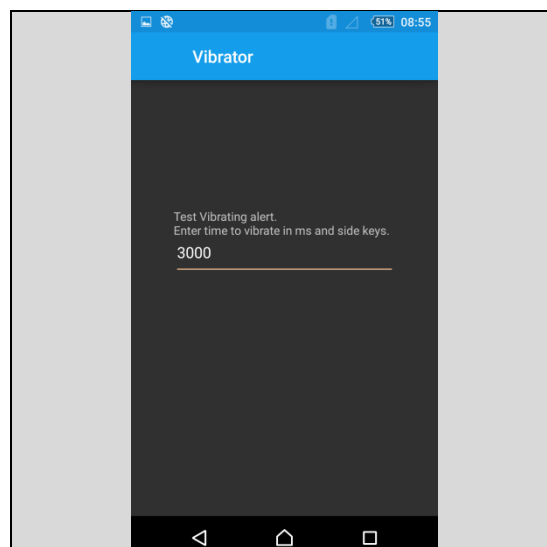


Tests: Service Tests

2.2.6 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.



2.2.7 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 and check the quality of the image shown in the display.

Touch the screen to take picture and preview the photo's auto focus quality.

Photos are taken but not saved during this test!

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

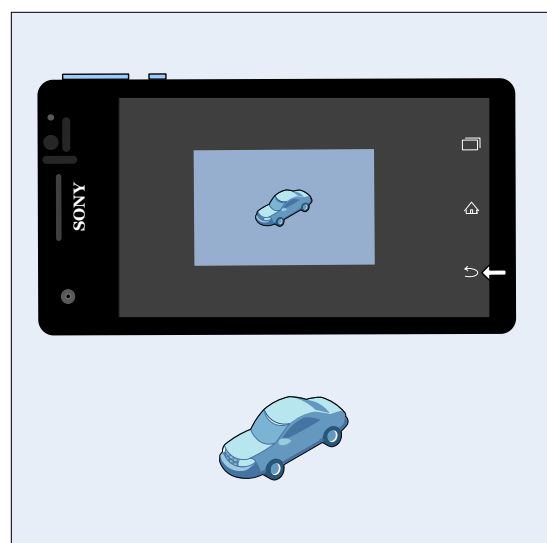


2.2.1 Front Camera

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

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



Tests: Service Tests

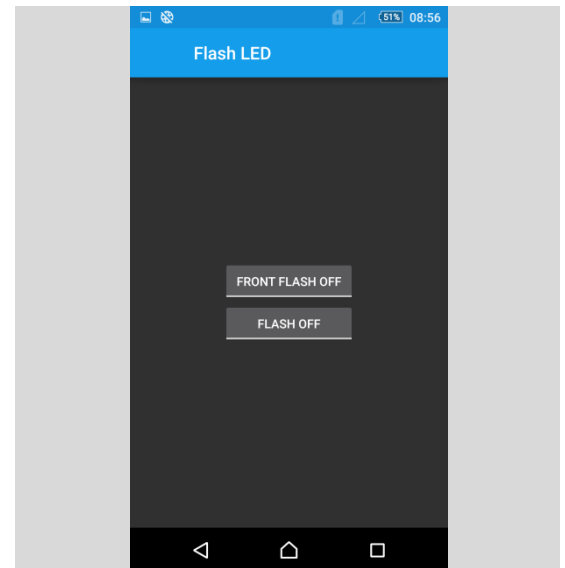
2.2.2 FlashLED Test

Check Front Flash LED and Rear Flash LED whether it's turned on.

Step 1: Press "FRONT FLASH OFF" button to test front Flash LED light to "FRONT FLASH ON" status, Press it again to turn it off.

Step 2: Press "FLASH OFF" button to test rear Flash LED light to "FLASH ON" status, Press it again to turn it off.

Press Back key to return to Service Test Menu.



2.2.3 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!

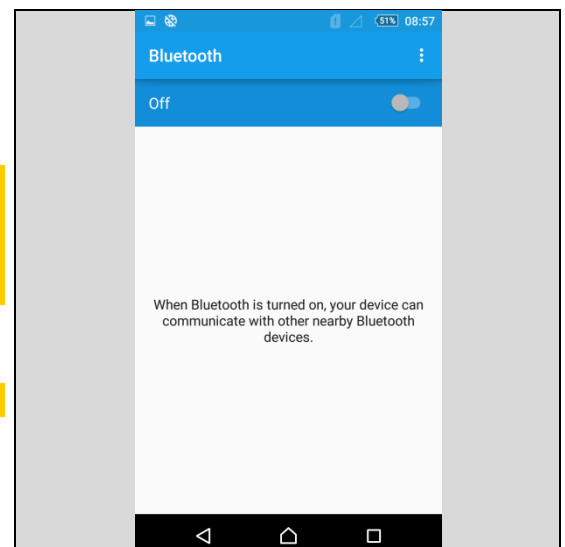
The Bluetooth test will be done in following sequences:

Step 1: Enable Bluetooth on; wait 4-5 seconds, shows OK;

There is a permission request, select 'Allow'.

Step 2: Searching;

Step 3: Show the Device Found list;



Step 4: Select the Target Bluetooth Device,

Step 5: Check the Pairing PIN code on both Target Bluetooth Device and unit, press Pair on both, when succeeded, it shows "Test Complete".

Press Back key to return to Service Test Menu..



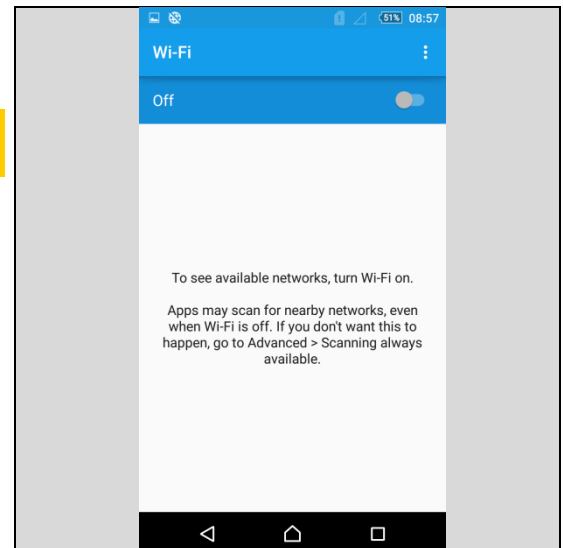
Tests: Service Tests

2.2.4 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 on; 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 succeed, it shows 'Test Complete'. Press the Back key to return to the Service Test Menu.



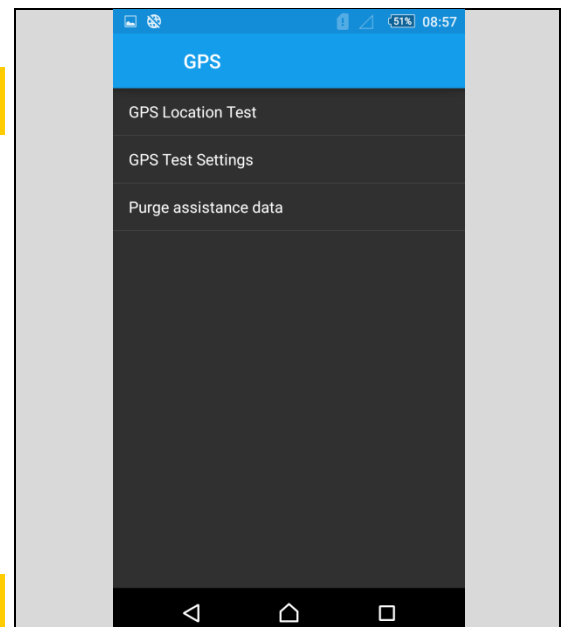
2.2.5 GPS

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

Verify that the GPS function properly:

- Step 1: Go to *GPS Location test to turn on GPS first*;
 - Step 2: Go to *GPS Location test* again to search 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.

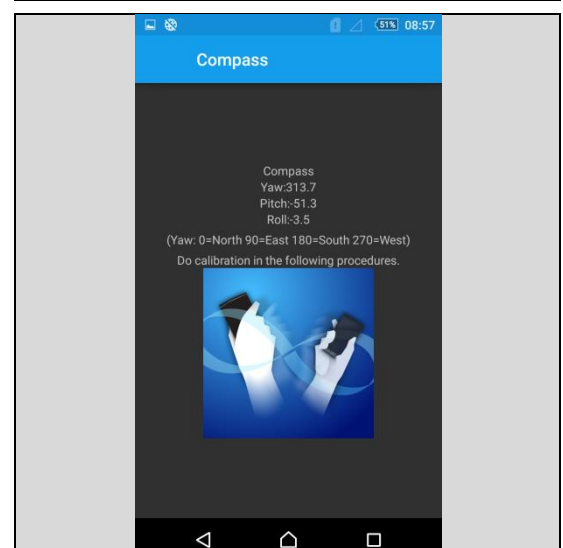


2.2.6 Compass

Do the test with hand movements as shown in the phone, and then check the actual direction with measured Yaw value.

(Yaw:0=North, 90=East, 180=South, 270=West)

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

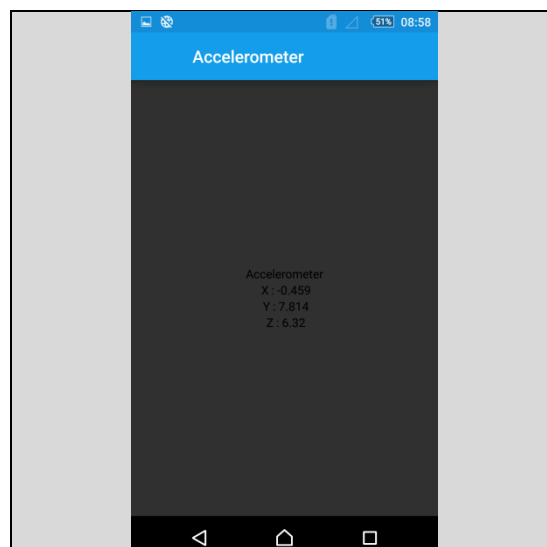


Tests: Service Tests

2.2.7 Accelerometer

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

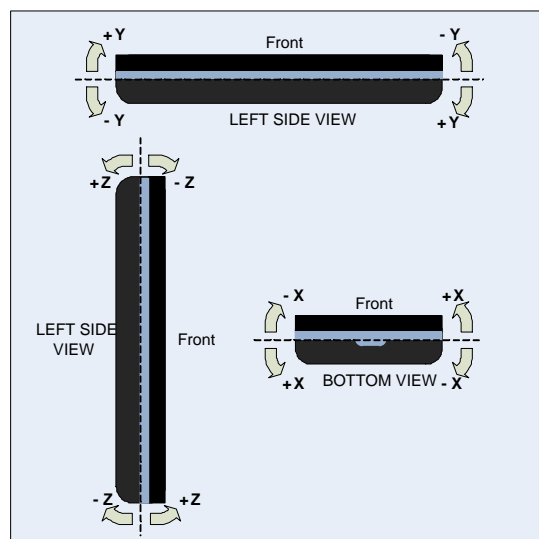
Press the Back key to return to the Service Test Menu.



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.

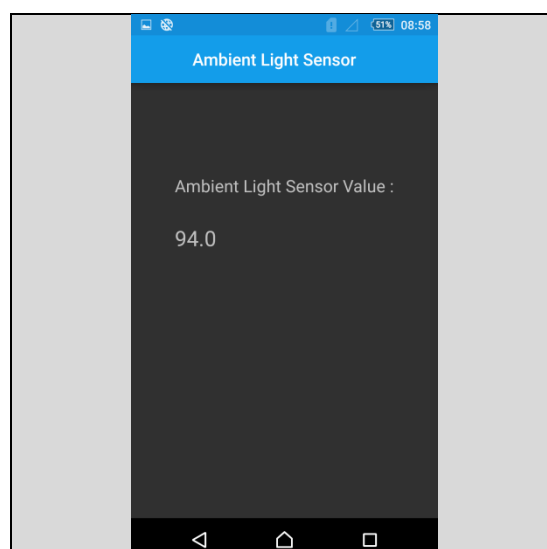
Press the Back key to return to the Service Test Menu.



2.2.8 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.

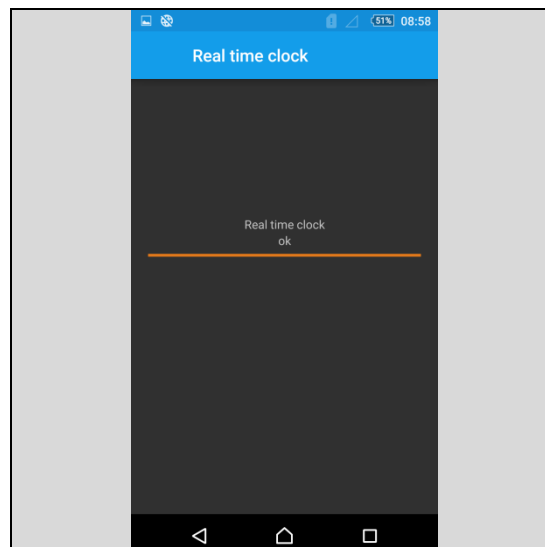


Tests: Service Tests

2.2.9 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.

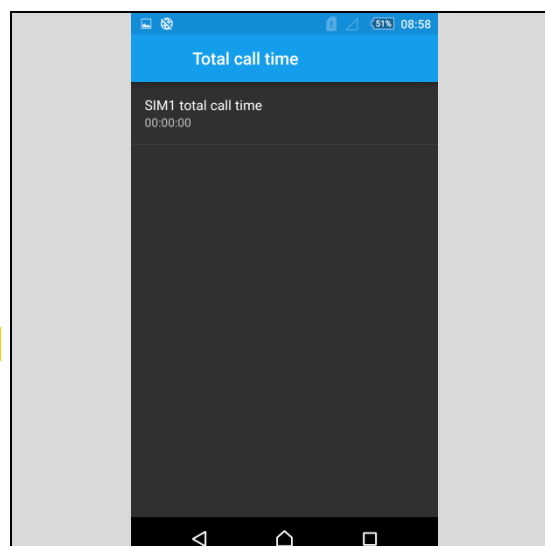


2.2.10 Total call time

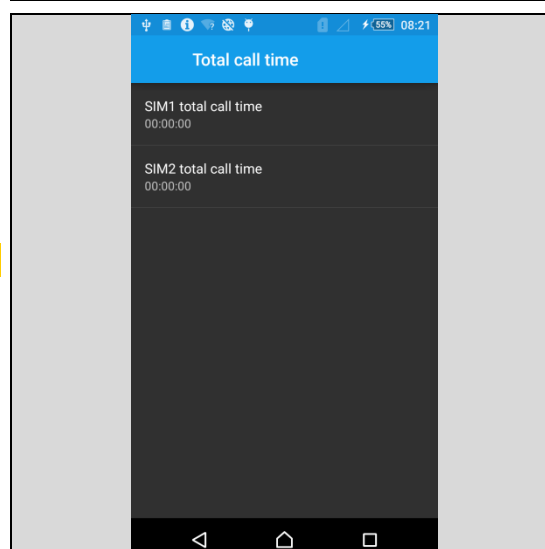
The total call time for SIM displayed in the format HH:MM:SS (hours: minutes: seconds).

Note: E5506, E5553 have one nano SIM card only.

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



Note: E5533, E5563 have two nano SIM cards;



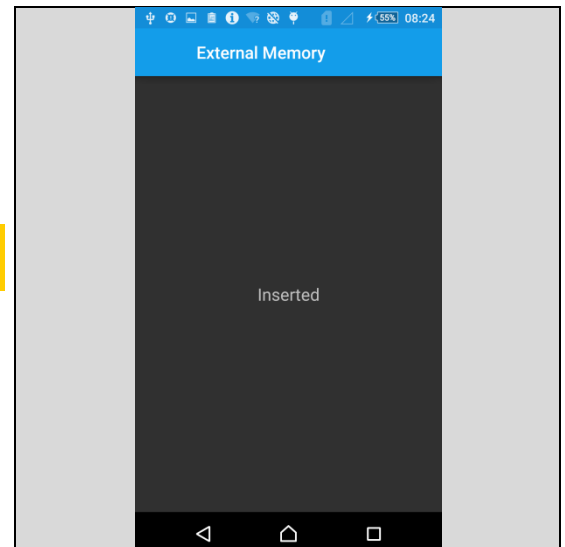
Tests: Service Tests

2.2.11 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.



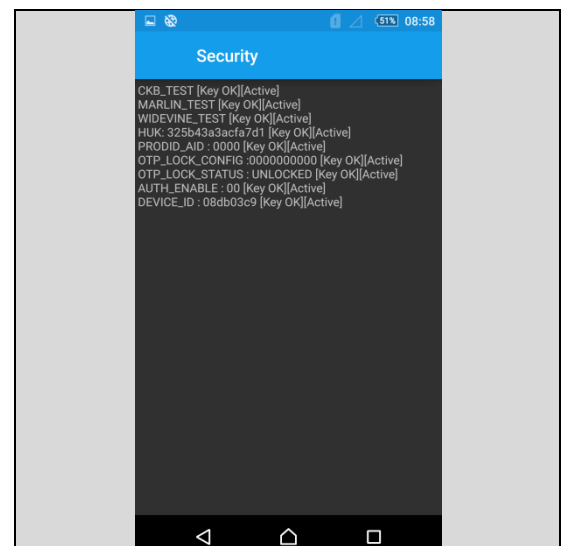
2.2.1 Security

Not Applicable, do not use.

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.



2.2.2 FM radio

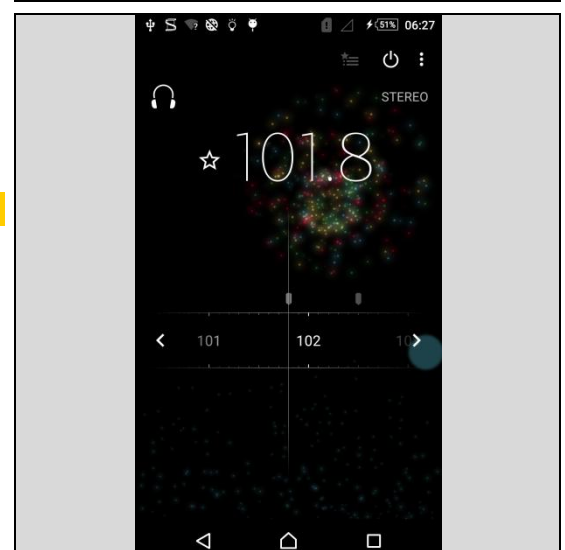
Use a CTIA type headset to do this test!

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.



Tests: Service Tests

2.2.3 Battery Test

Verify that charging of the battery functions properly:

Step 1: Go to *Battery Status check*;

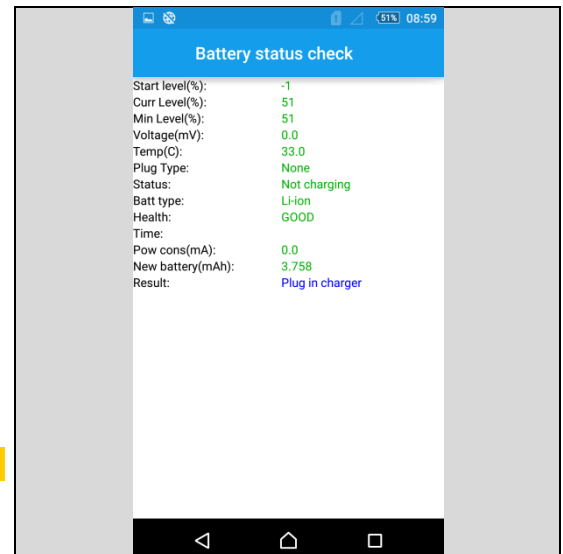
Step 2: Connect a wall charger or via USB to the system connector;

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.

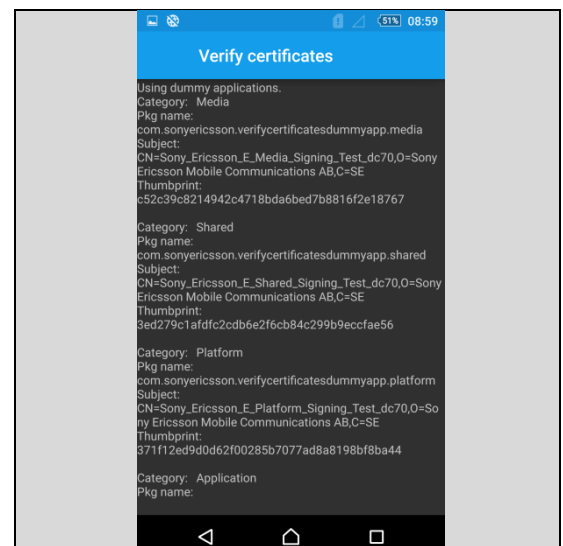


2.2.4 Verify Certificates

Not Applicable, do not use.

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.



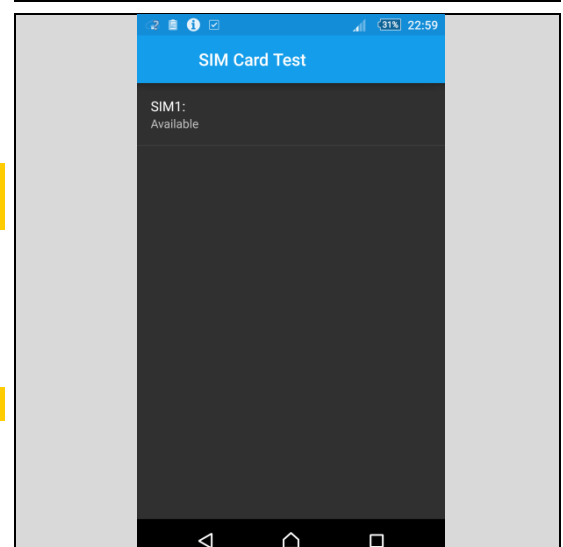
2.2.5 SIM Card Test

Nano SIM card should be inserted in the phone before the start of this test!

The phone should detect that the Nano SIM card is inserted and shows "Available".

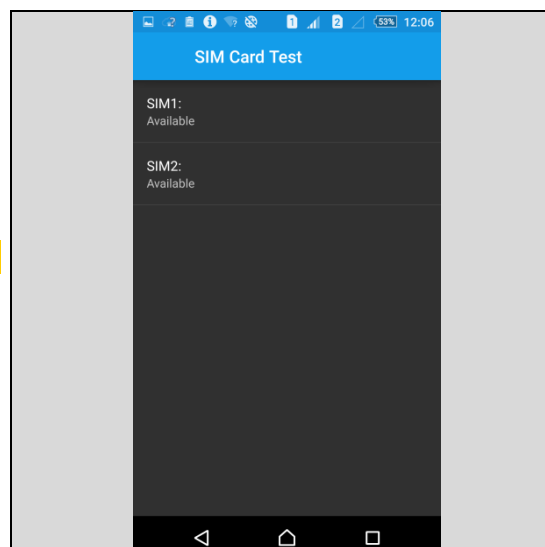
Note: E5506, E5553 have one nano SIM card only.

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



Tests: Service Tests

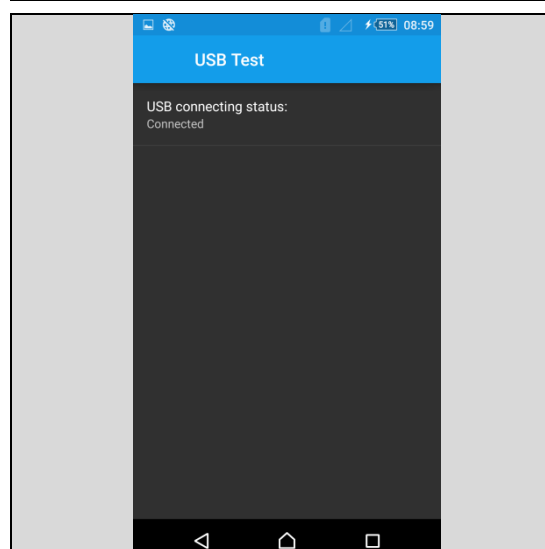
Note: E5533, E5563 have two Nano SIM cards;



2.2.6 USB Test

Insert USB Cable into USB connector, it will shows "Connected".

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

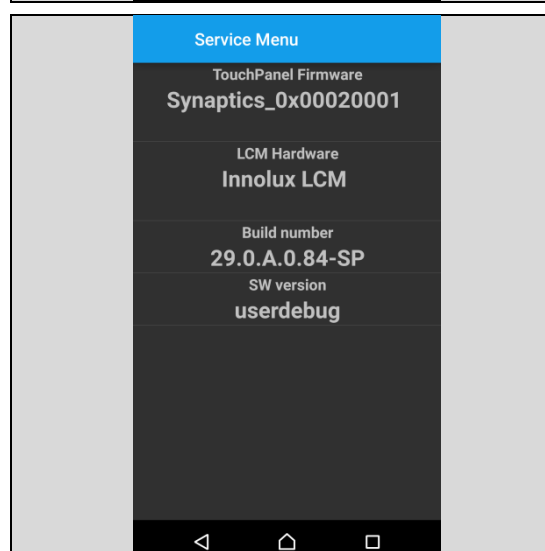


2.2.7 Firmware Version

Not Applicable, do not use.

When entering the test, four information will be shown: TouchPanel Firmware, LCM Hardware, Build Number, SW Version.

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



Tests: Service Tests

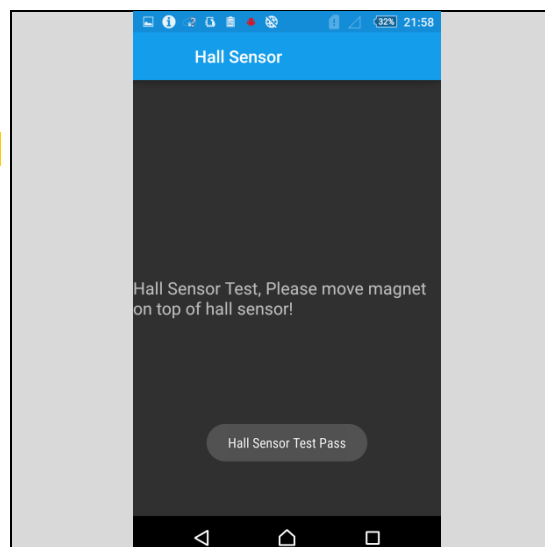
2.2.8 Hall Sensor

Use E55 Smart Cover to test Hall Sensor function.

When entering the test, it shows "Hall Sensor Test, Please move magnet on top of hall sensor!"

Close the E55 Smart Cover (magnet inside), then it shows "Hall Sensor Test Pass".

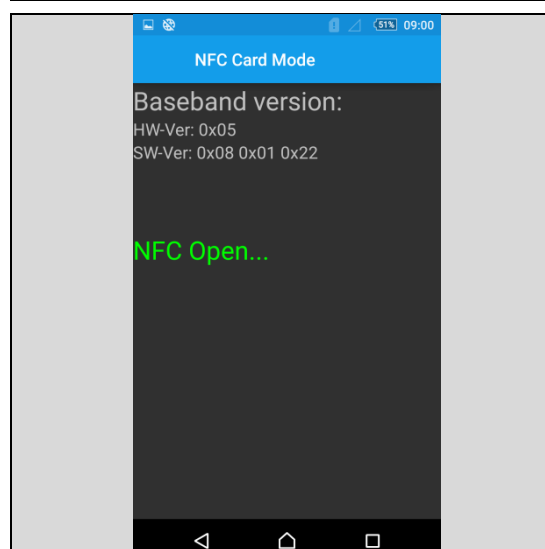
Press the Back key to return to the Service Test Menu.



2.2.9 NFC Card Mode

Not Applicable, do not use.

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



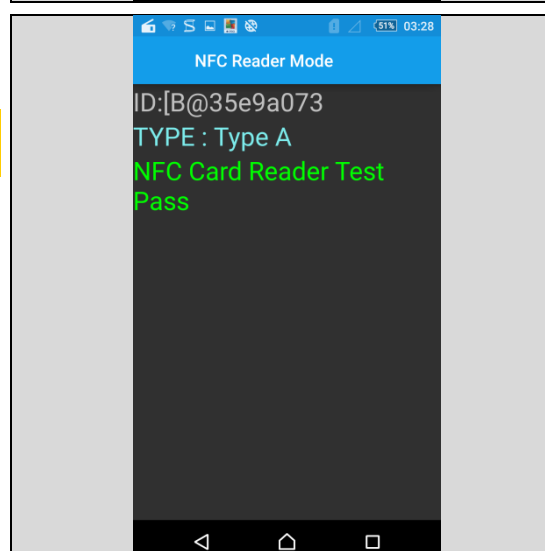
2.2.10 NFC Reader Mode

A NFC SIM card 4FF should be inserted in the phone before the start of this test!

When entering the test, it shows "Please detect card to NFC".

Bring a NFC Tag close to NFC icon in the middle of the Battery Cover Assy.

When Tag is identified, a sound will be made and an "NFC Card Reader Test Pass" message will be displayed.

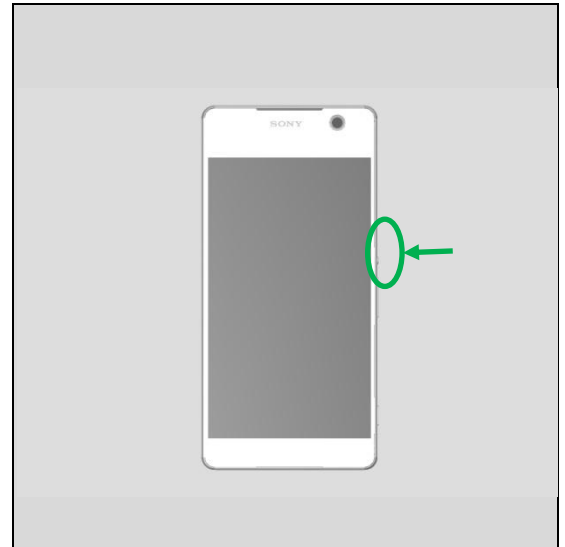


Tests

2.3 Manual Tests

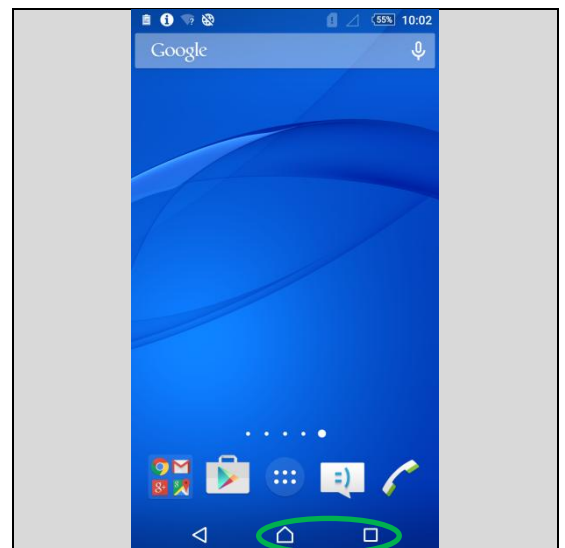
2.3.1 On/Off Key test

- 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.



2.3.2 Home/Multitask keys test

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



Tests: Manual Tests

2.3.3 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!

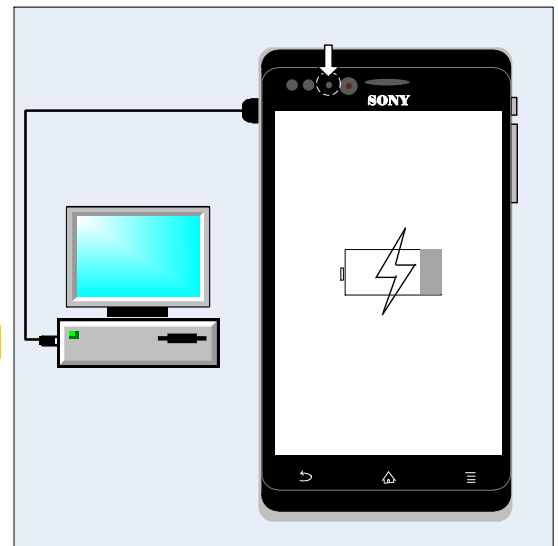
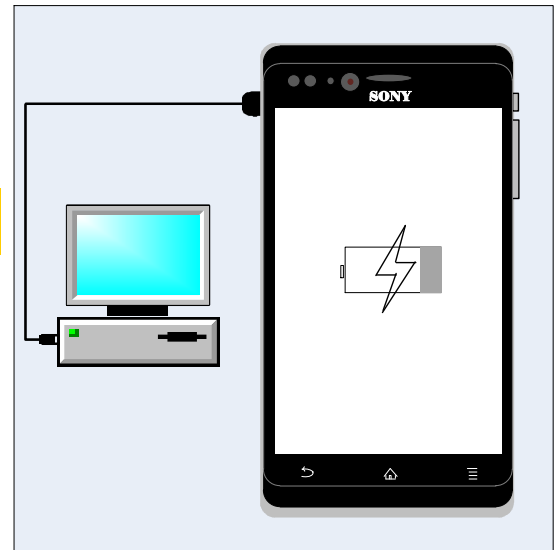
- Step 1: Insert a battery, but do not start the phone;
- Step 2: Connect a USB cable from a computer or charger to the phone;
- Step 3: Verify that the phone is being charged by the notification LED and the Battery icon in the display;
- Step 4: Remove the USB cable from the connector and verify that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

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

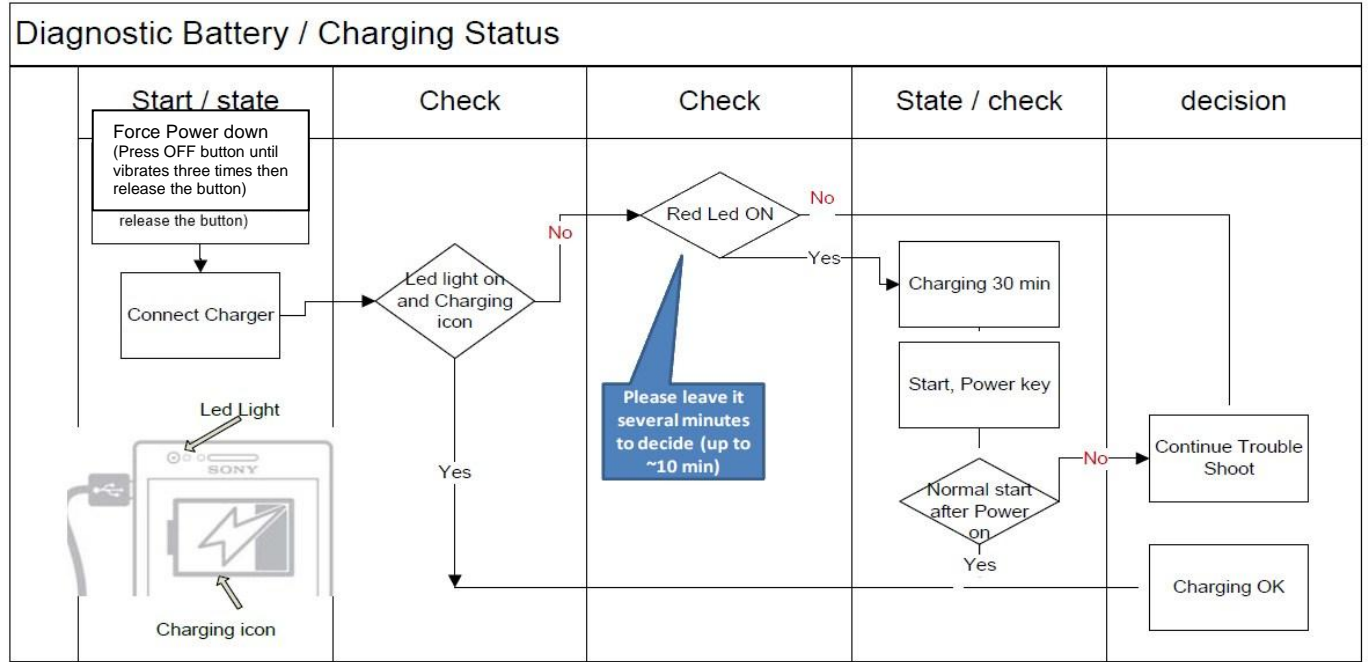
- Red: Battery level is between 1% and 14%;
- Orange: Battery level is between 15% and 89%;
- Green: Battery level is between 90% and 100%.

Sample phone are used in picture as reference only.

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



Tests: Manual Tests



The picture in above flow chart is only symbolic view.

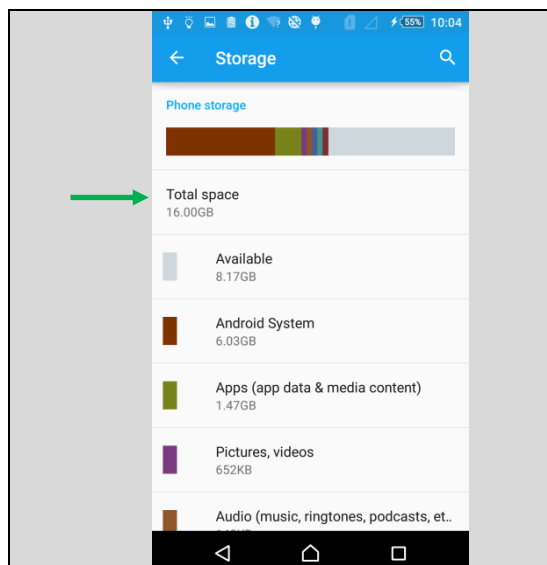
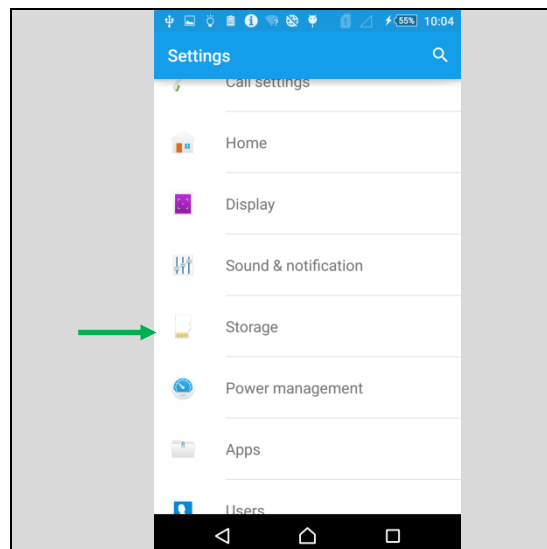
Tests: Manual Tests

2.3.4 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;



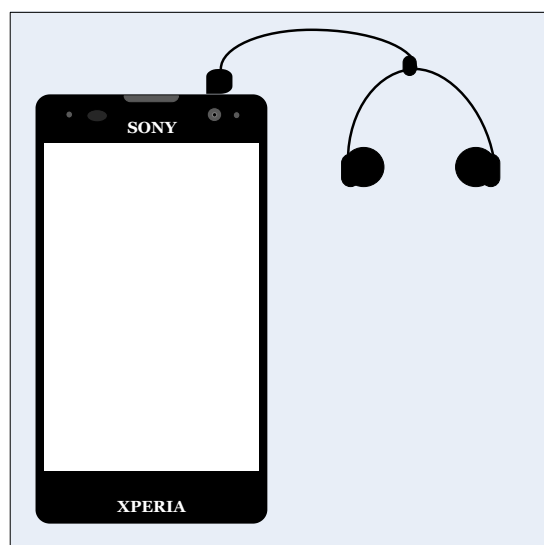
Verify that the display shows the total Space is about 16GB.

2.3.5 Audio Jack test

Connect a Sony CTIA headset.

Repeat the test of "Speaker", "Earphone" and "Microphone".

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

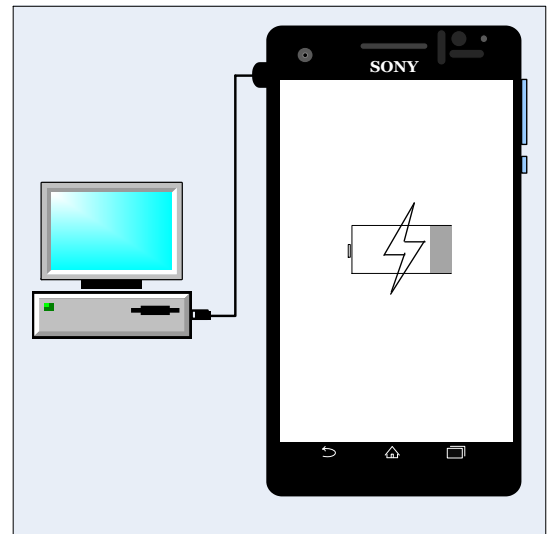


Only symbolic view

Tests: Manual Tests

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

2.3.7 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.

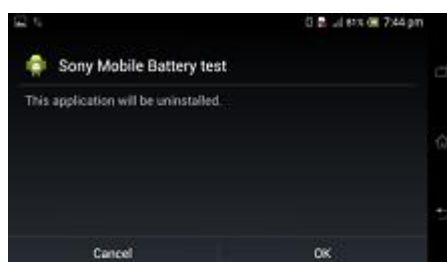
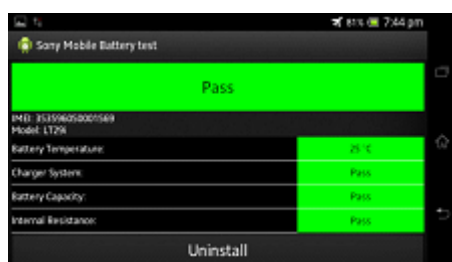
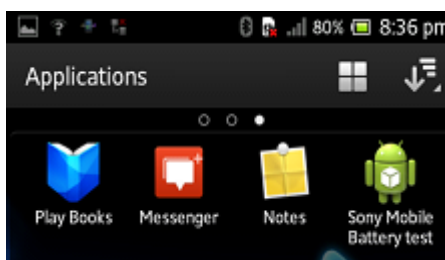
The test is available in CSPN at Level: Mechanical,

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: Network Test

2.3.8 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!**

2.3.8.1 On-the-air call to mobile

GSM

Go to the Setting app:

Settings ⇒ *More..* ⇒ *Cellular networks* ⇒ *Preferred network type* ⇒ *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 '2.5.1.2 Procedure (GSM & UMTS)' below.

UMTS (if available)

Go to the Setting app:

Settings ⇒ *More..* ⇒ *Cellular networks* ⇒ *Preferred network type* ⇒ *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 '2.5.1.2 Procedure (GSM & UMTS)'.

LTE (if available)

Go to the Setting app:

Settings ⇒ *More..* ⇒ *Cellular networks* ⇒ *Preferred network type* ⇒ *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* ⇒ *Cellular network type*

2.3.8.2 Procedure (GSM & UMTS)

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

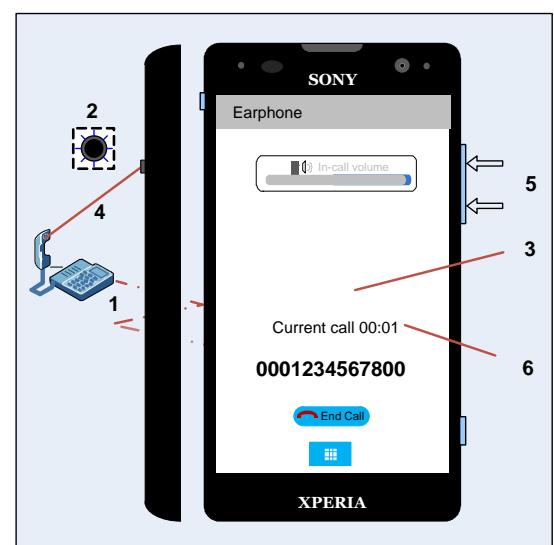
Step 2: Check that there is a ring signal.

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.

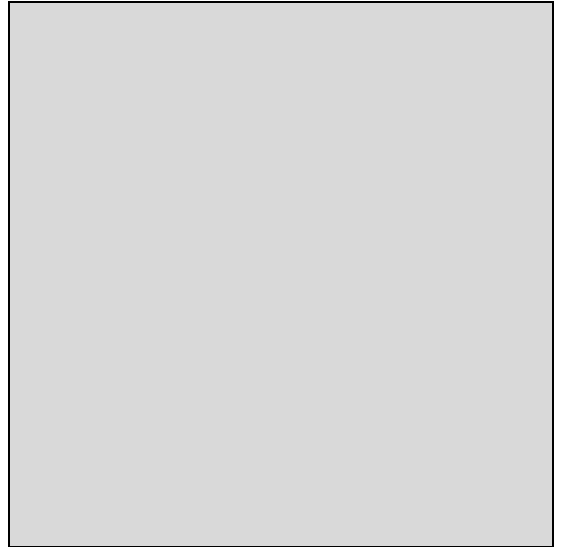


Only symbolic view

3 Calibrations

Calibrations have to be done if Exchange Board or Front Cover Assy is replaced.

When replacing Front Cover Assy or board swap, must do the Calibration for Proximity Sensor, Ambient Light Sensor, and Accelerometer: 1289-2983 Trouble Shooting Application – mechanical.



4 Revision History

Rev.	Date	Changes / Comments
1	2015-07-22	Initial release