

Test Instructions

- mechanical -



Xperia XA1 Plus

G3412, G3416, G3221, G3223, G3226

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For general information about test procedures, refer to 1220-1333: Generic Repair Manual - mechanical - (under the RE4250: Repair - Mechanical - Repair instructions).

Pre-Test Preparation

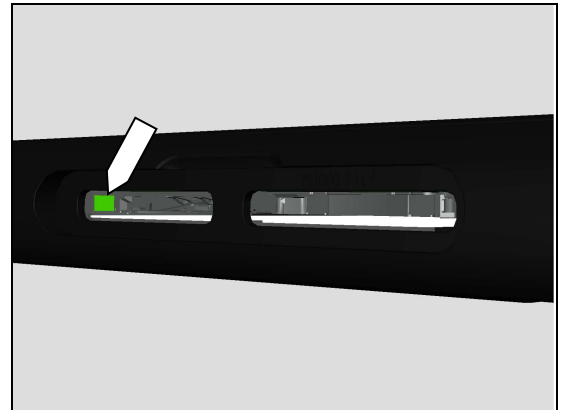
1.1 Hardware

1.1.1 Water indicator inspection

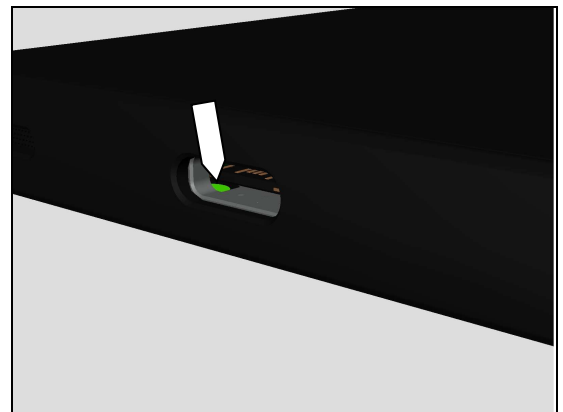
Before starting any test the Water indicators have to be checked.

There are total four water indicators as shown:

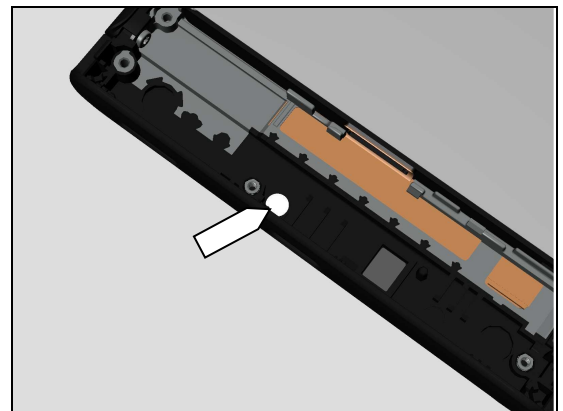
This water indicator is located as shown in picture after Cap Tray is removed(following Working Instruction).



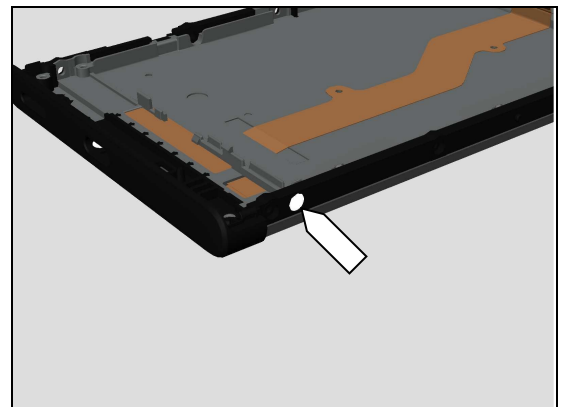
This water indicator is located near USB connector, and can be seen from USB hole as shown in picture.



Also this water indicator near USB connector can be checked after Sub PBA Assy is disassembled (following Working Instruction).



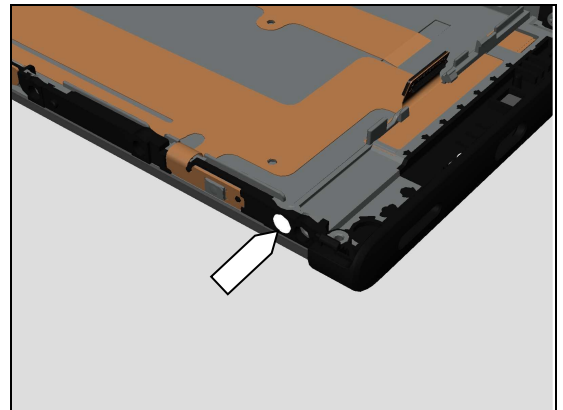
This water indicator is located as shown in picture after Side Panel SIM/SD is removed(following Working Instruction).



Pre-Test Preparation

This water indicator is located as shown in picture after Side Panel Keys is removed(following Working Instruction).

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



Pre-Test Preparations

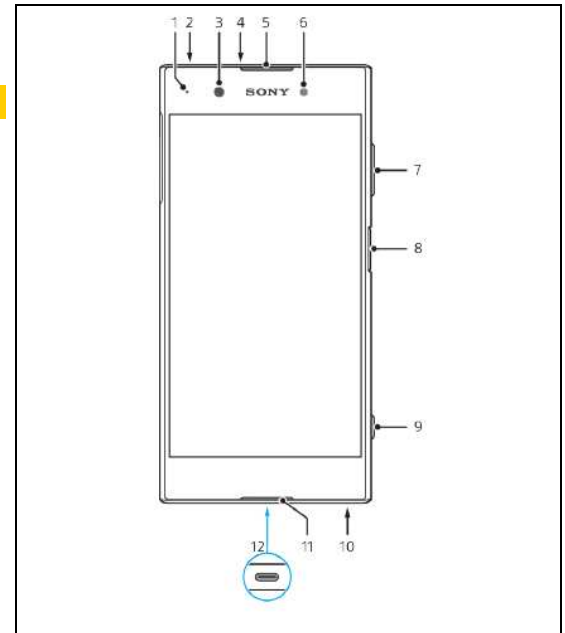
1.2 Test Enablers

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

Note! The product supports only Nano SIM!

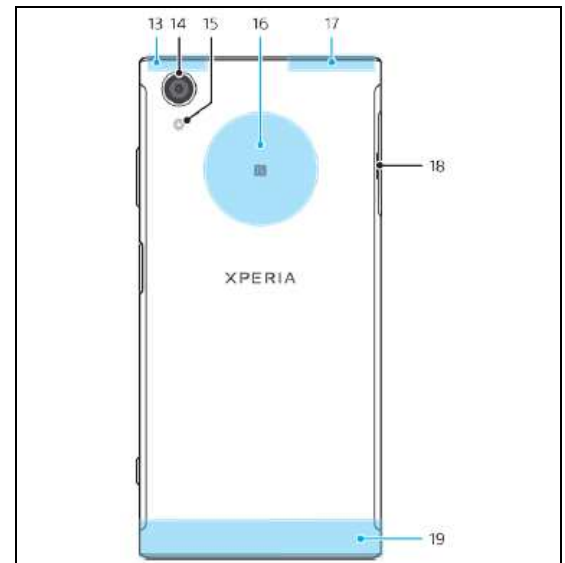
Front:

1. Charging/Notification light
2. Headset jack
3. Front camera lens
4. Secondary microphone
5. Ear speaker
6. Proximity/Light sensor
7. Volume key/Camera zoom key
8. Power key/Fingerprint sensor
9. Camera key
10. Main loudspeaker
11. Main microphone
12. Charger/USB Type-C cable port

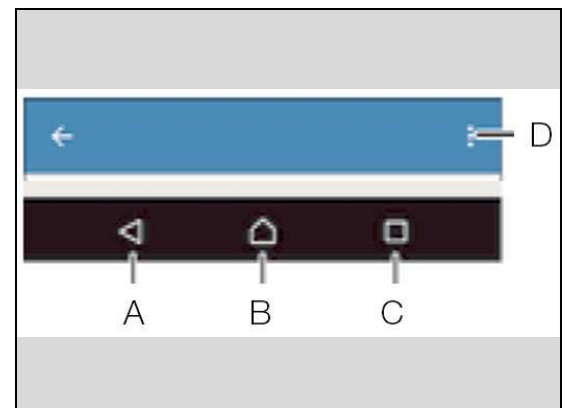


Back:

13. Wi-Fi/GPS/Bluetooth antenna area
14. Main camera lens
15. Flashlight
16. NFC detection area
17. Diversity antenna area
18. Nano SIM/Memory card cover
19. Main antenna area



- A. Back key
- B. Home key
- C. Task navigation key
- D. Menu key



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
- Make sure the phone is in call setup.
- Press the following keypad combination: ***##7378423##*** (i.e. ***##service##***)
- 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!

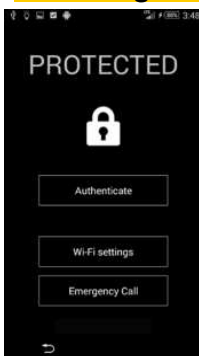
Use the USB cable to connect with the Micro USB connector of the phone for this purpose!

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: If a unit is locked by "theft protection", run the online Service in emma "theft protection unlock" for the model, before the customization script. USB DONGLE is required. (same as for "activation")

Service center must verify the customer's proof of purchase (with IMEI) to verify ownership before agreeing to unlock the unit!



Run Unlock script in emma, verify fault and then Customization script in emma.

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://software.sonymobile.com/emma/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.

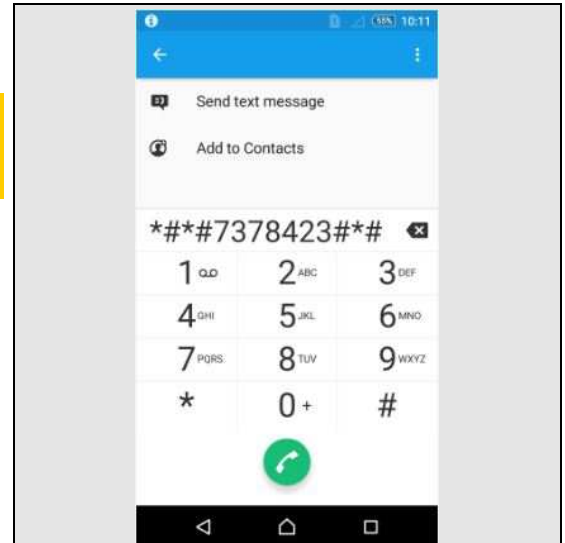
2 Tests

2.1 Service Test Mode

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

Settings -> Power management -> STAMINA mode

- Start up the phone, go to call setup.
- Press the following keypad combination: ***##7378423##** (i.e. ***##service##**)



Service info: Information about Model, Software, SIM lock, Configuration (IMEI, bands, codec's), Factory charging, DTCP-IP, Firmware, WLAN Mac address etc.

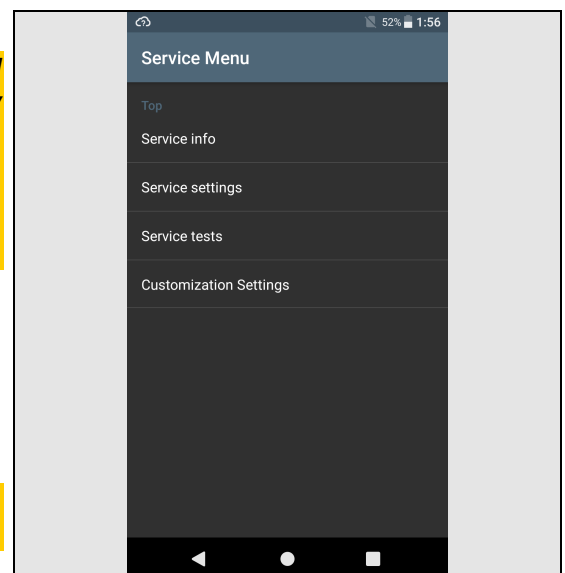
Service settings: Do not use

Service test: Follow instruction below

Customization Settings: Do not use.

- 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

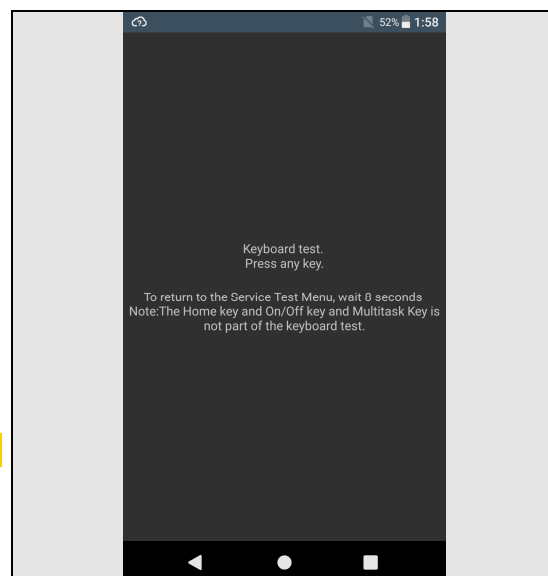
2.2 Service Tests

2.2.1 Keyboard & Switch

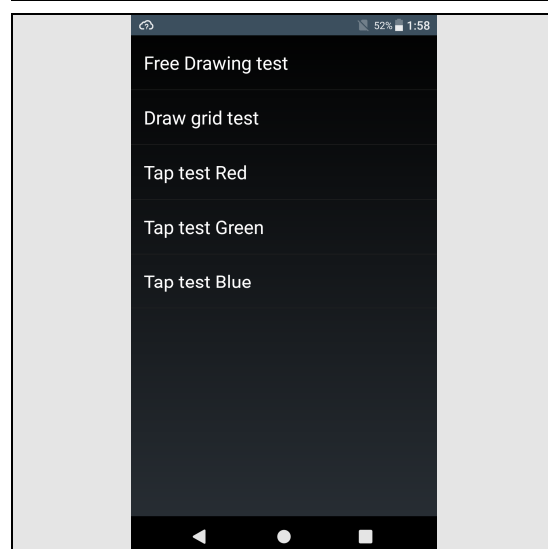
Press below keys:

- **Back key**: notification on screen.
- **Volume up key**: notification on screen.
- **Volume down key**: notification on screen.
- **Auto Focus key (short press) / Camera key (long press)**: notification on screen.

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



2.2.2 Touch Screen

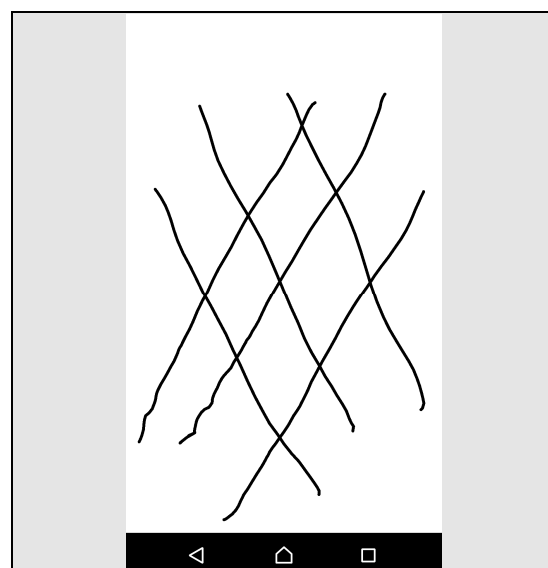


Free Drawing Test

Move fingers across the touch screen at the same time, lines will be drawn as it touches.

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

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

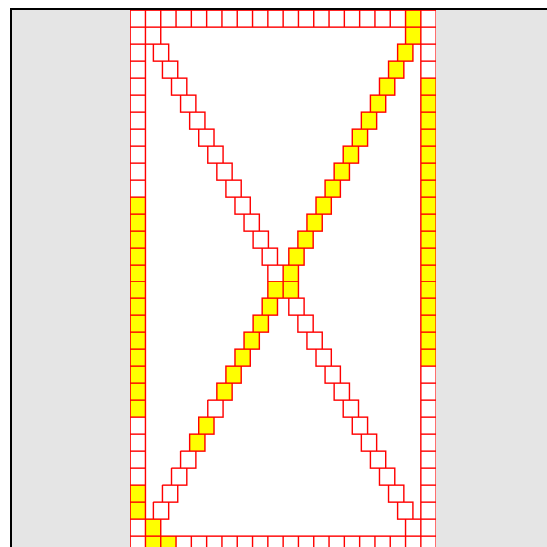


Tests: Service Tests

Draw Grid test

Move a finger across the boxes and they should switch colour.
Check all boxes as indicated, if you can't fill a box yellow colour it indicate a problem with the lines in TP sensor.

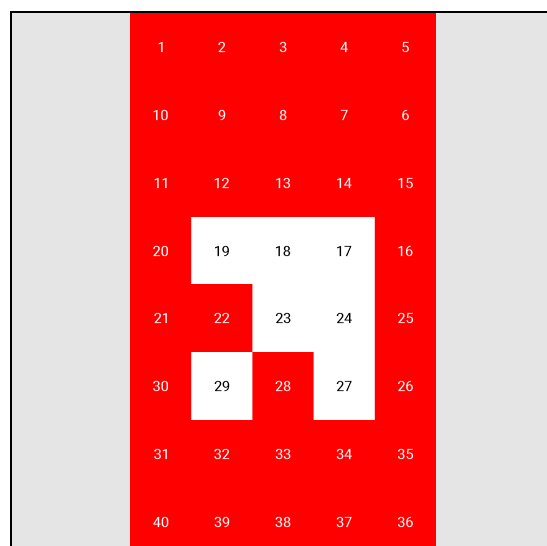
The test cannot exit unless finish it.



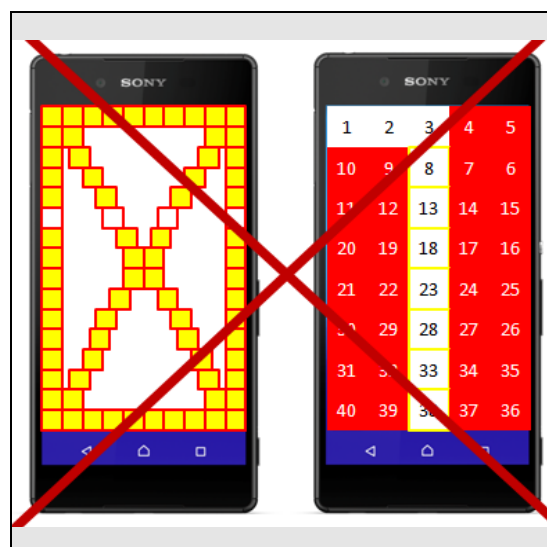
Tap Test Red, Green, Blue

For the Red, Green and Blue test, move a finger across the boxes (numbers) and they should switch colour to white.
Check all boxes / numbers, if there is any other color except the original color and white after touching, there is a problem with shadows.

Swipe from bottom of screen to get the Press the Back key to return to the Service Test Menu.



Incorrect examples from Draw grid and Tap test.



Tests: Service Tests

2.2.3 Display

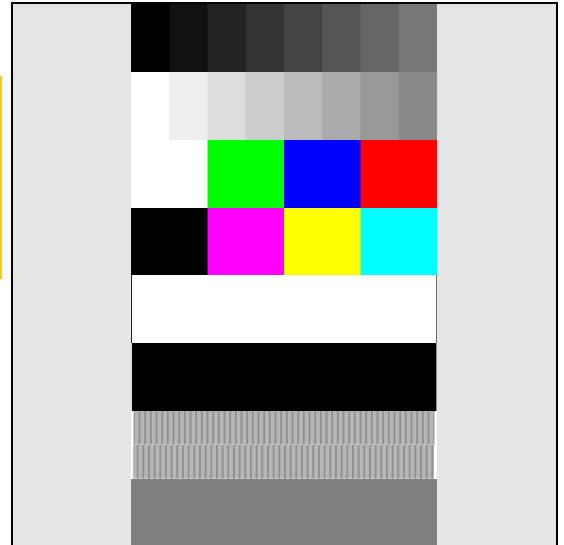
Minor variations in the display's brightness and color may occur between phones.

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 nine test patterns of White, Gray, Black, Red, Green, Blue, Rainbow Colors, Cross-Line, TV Pattern and in sequence 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.



2.2.4 LED/Illumination

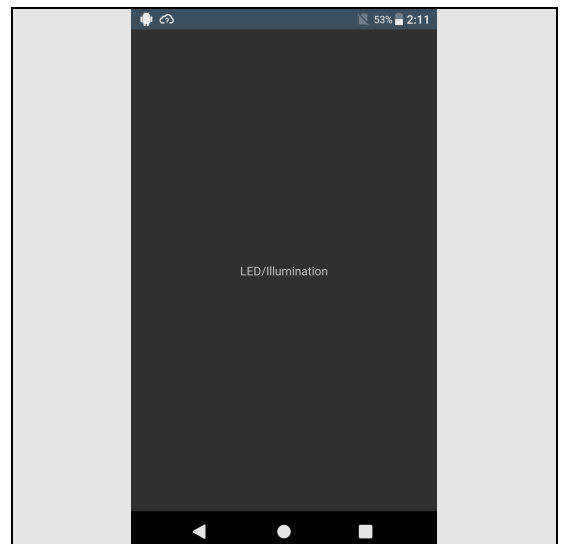
Check that the:

- Notification LED changes, showing four colors in the following sequence: red, green, blue and off.

Check that the:

- Display Backlight illumination goes from low to high strength back to low again.

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



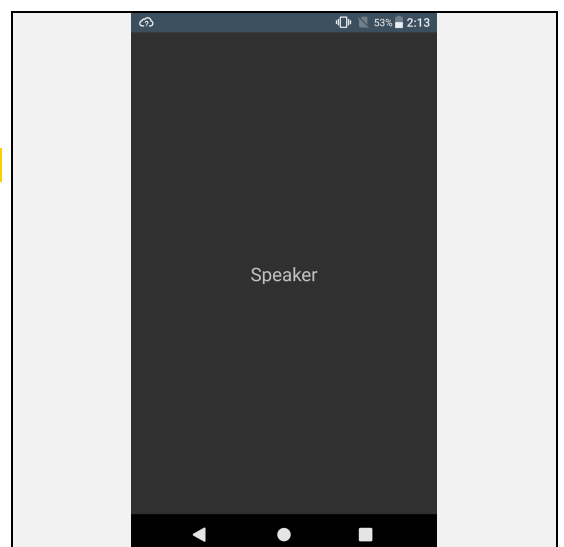
2.2.5 Speaker

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

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

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

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



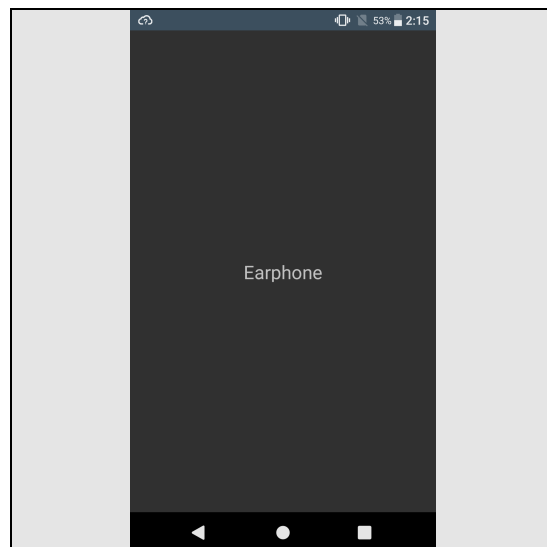
Tests: Service Tests

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 Top speaker volume.

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

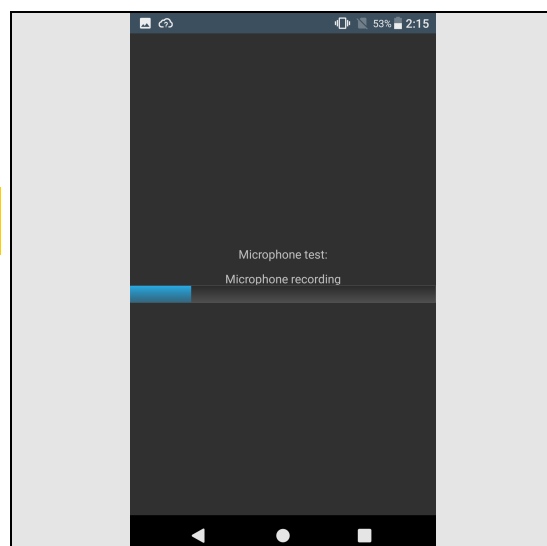


2.2.7 Microphone

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

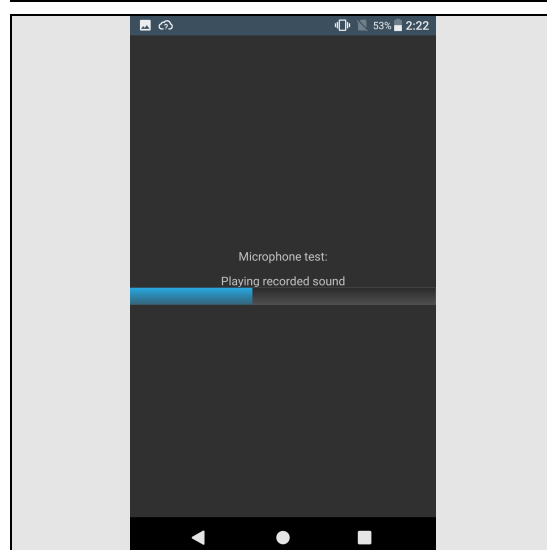
The phone will start to record and after approximately ten seconds the sound is played back through the loudspeaker.

Step 1: Speak into the microphone during the 'Microphone Recording' phase;



Step 2: Check the quality by listening to the recording from the loudspeaker during the 'Playing recorded sound' phase at maximum volume.

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



Tests: Service Tests

2.2.8 Secondary Microphone

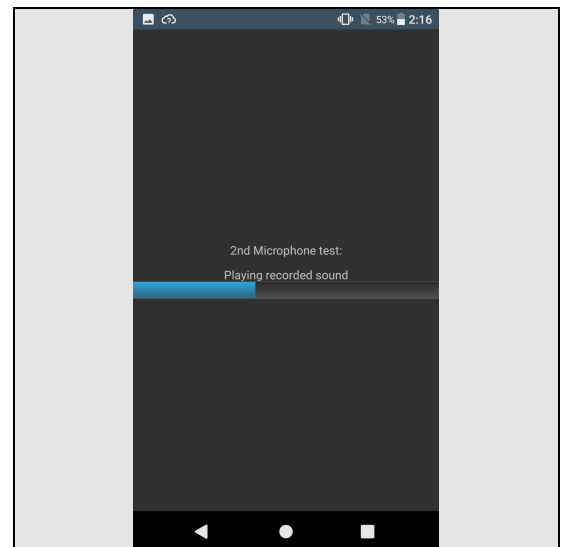
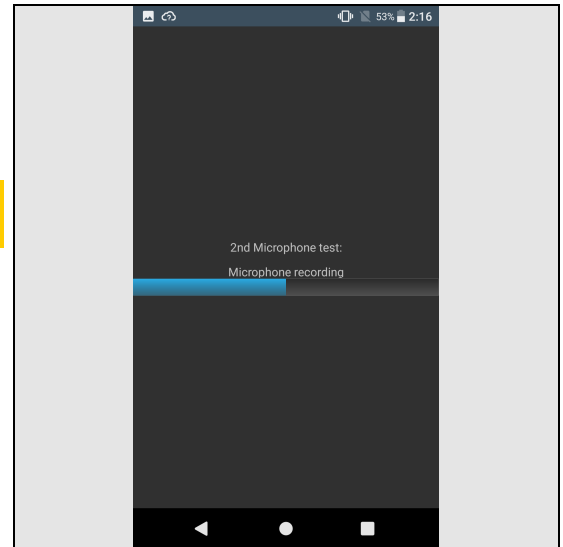
The previous 'Speaker' test must have been successfully carried out before doing this test!

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

Step 1: Speak into the secondary microphone during the 'Microphone Recording' phase;

Step 2: Check the quality by listening to the recording from the loudspeaker during the 'Playing recorded sound' phase at maximum volume.

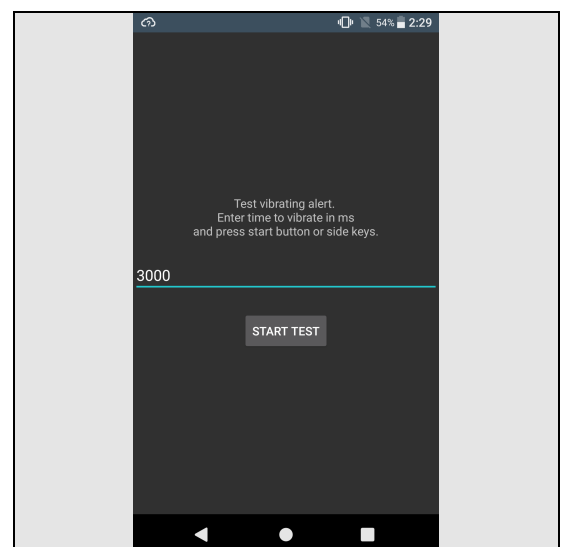
Press the Back key to return to the Service Test Menu.



2.2.9 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.



Tests: Service Tests

2.2.10 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.



2.2.11 Secondary Camera

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

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

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



2.2.12 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.



Tests: Service Tests

2.2.13 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;

There is a permission request, select 'Allow'.

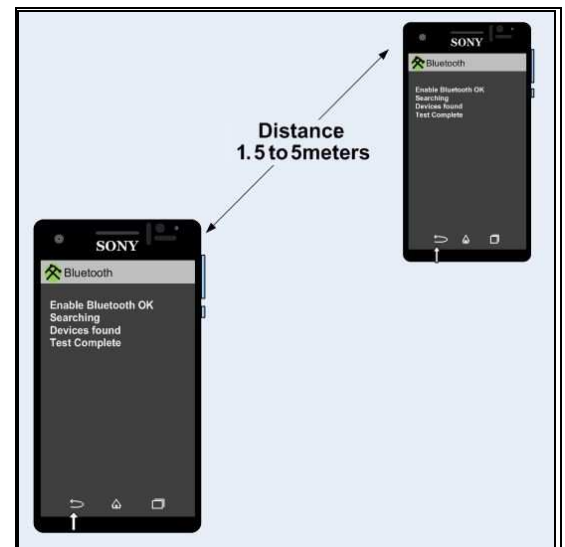
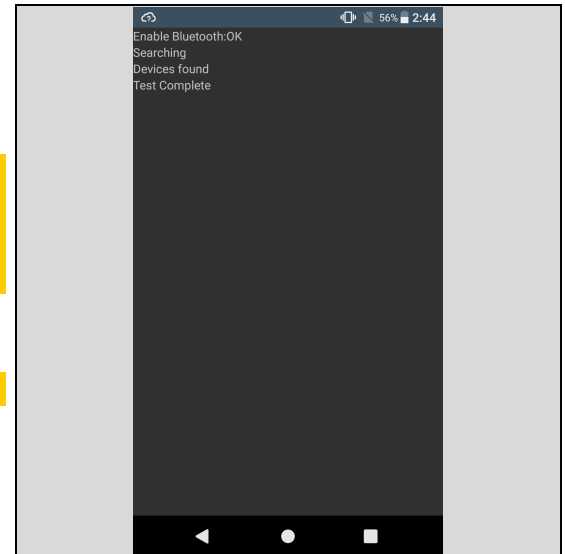
Step 2: Searching;

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.



Only symbolic view

2.2.14 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;

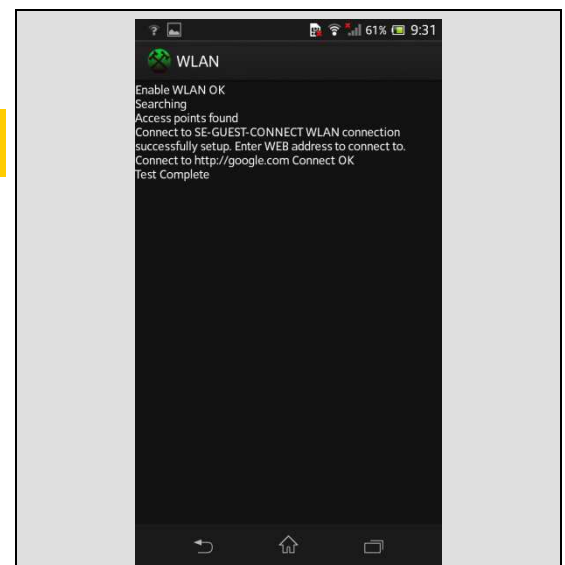
Step 3: Access points found list;

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

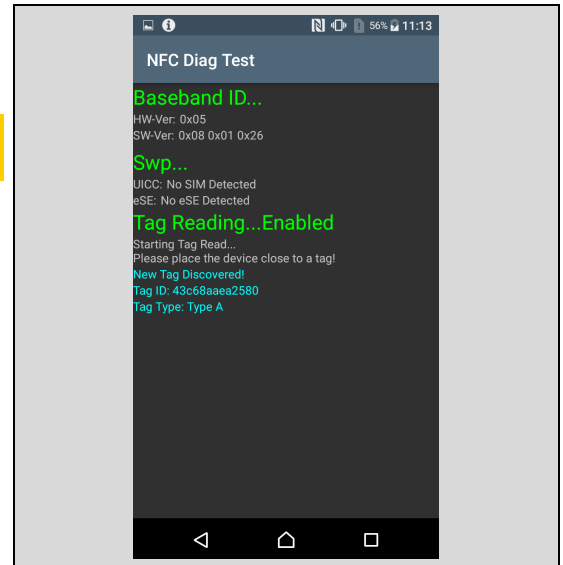
2.2.15 NFC

A NFC SIM card 4FF 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: Select 'NFC Diag Test';
- Step 3: After 'Tag Reading...Enabled' can be seen on the display, bring a NFC Tag close to NFC icon on the Battery Cover Assy.
- Step 4: When Tag is identified, a sound will be made and an OK message will be displayed.

Press the Back key to return to Service Test Menu.

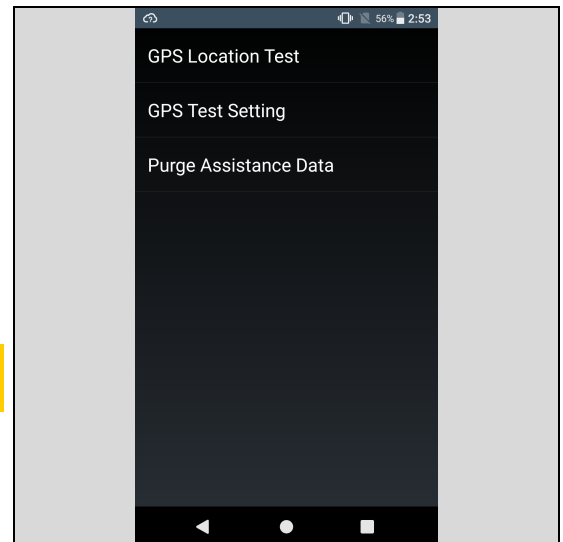


2.2.16 GPS

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

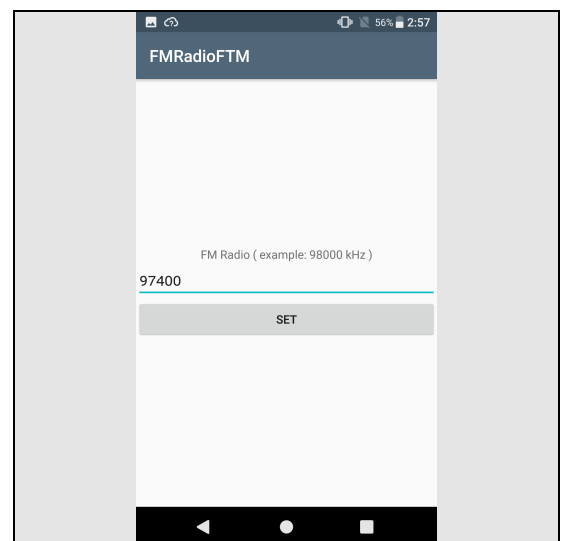


2.2.17 FM Radio

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.



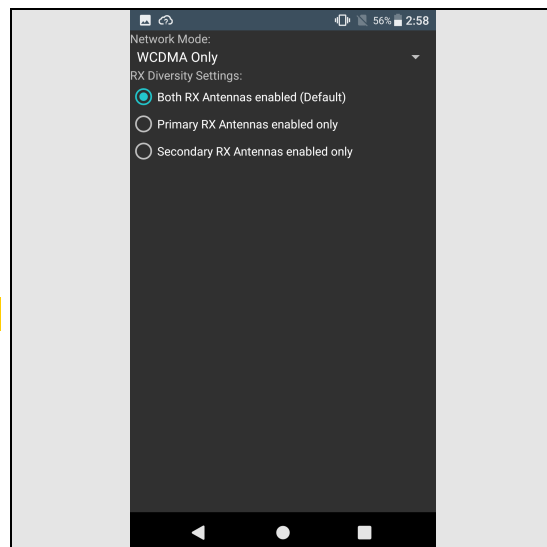
Tests: Service Tests

2.2.18 Antenna RX Diversity

N/A.

Do not use this test!

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

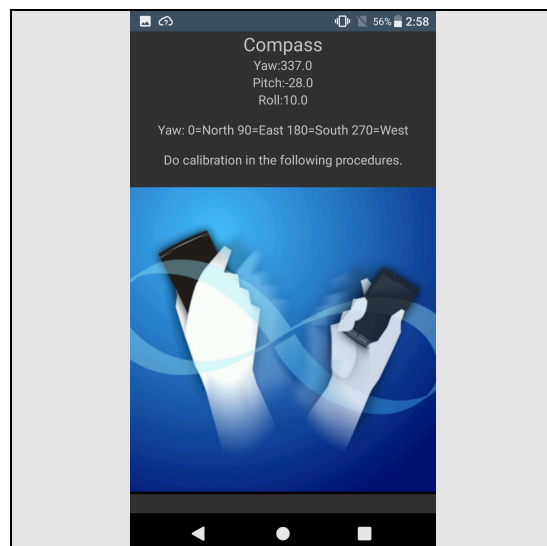


2.2.19 Compass

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)

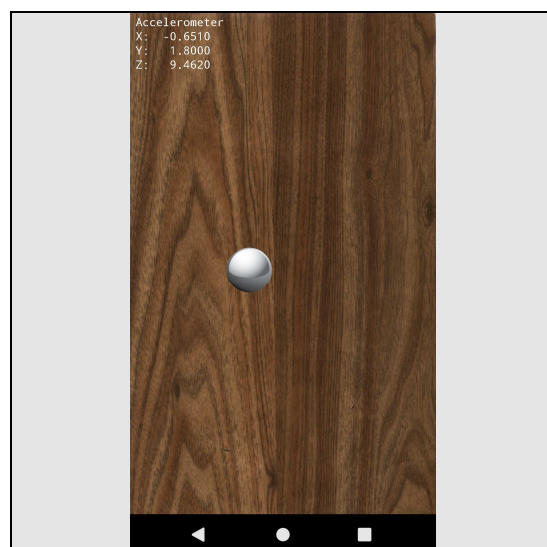
Press the Back key to return to the Service Test Menu.



2.2.20 Accelerometer

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

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

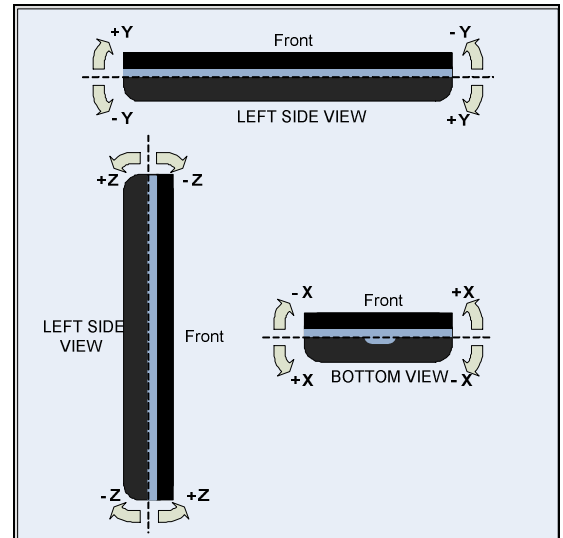


Tests: Service Tests

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

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

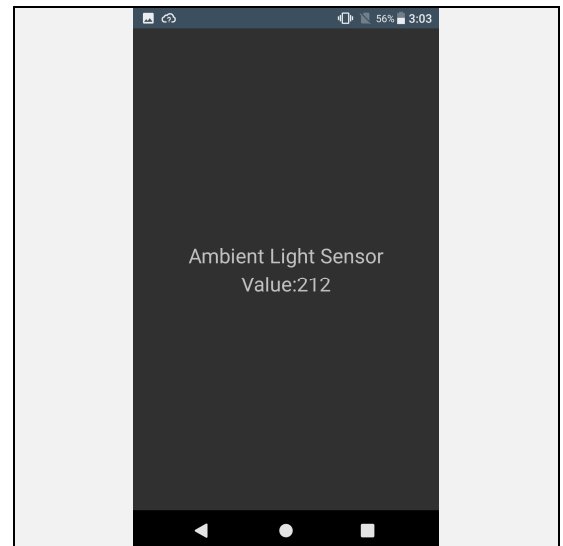
Press the Back key to return to the Service Test Menu.



2.2.21 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.



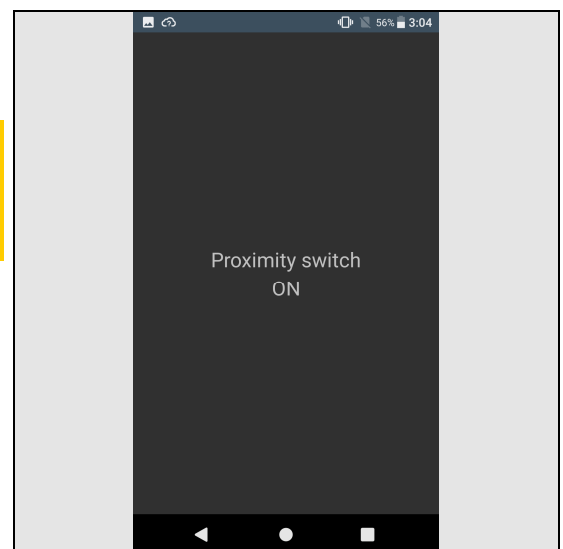
2.2.22 Proximity switch

The previous '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 OFF' and a tone is emitted.

When covering the proximity switch area, the screen will show 'Proximity switch ON' with a different type of tone.

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



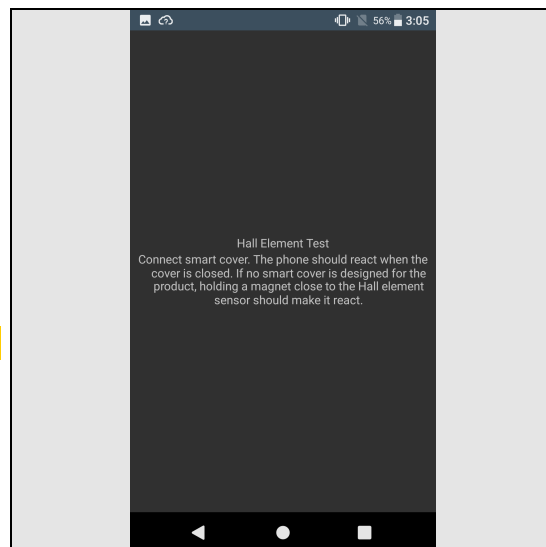
Tests: Service Tests

2.2.23 Hall Element Test

Enter this test and press power key to enter sleep mode!
Put the magnet above the Hall sensor area and then remove the magnet, the phone will wake up.

Refer to Test Enablers for the Hall sensor area location.

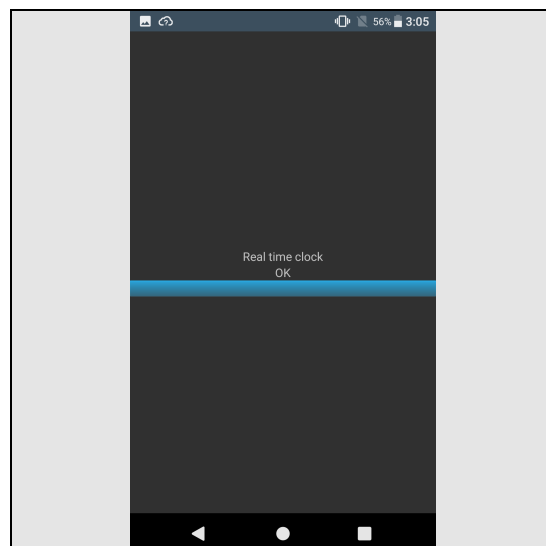
Press the Back key to return to the Service Test Menu.



2.2.24 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.

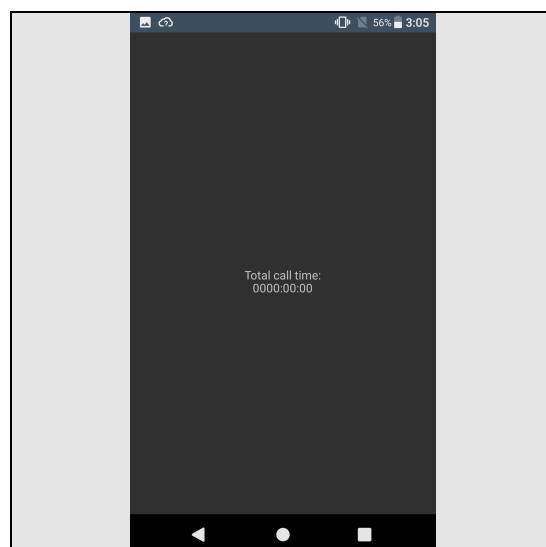
Press the Back key to return to the Service Test Menu.



2.2.25 Total call time (G3421,G3423)

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

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

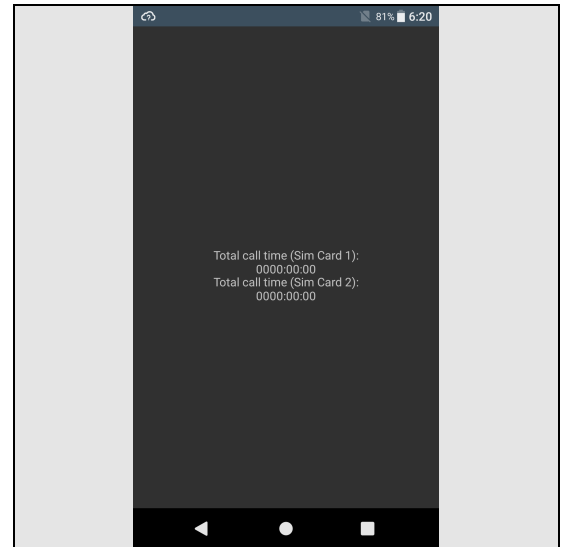


Tests: Service Tests

2.2.26 Total call time (G3412,G3416,G3426)

The total call time of SIM Card 1 and SIM Card 2 are displayed in the format HHHH:MM:SS (hours: minutes: seconds).

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



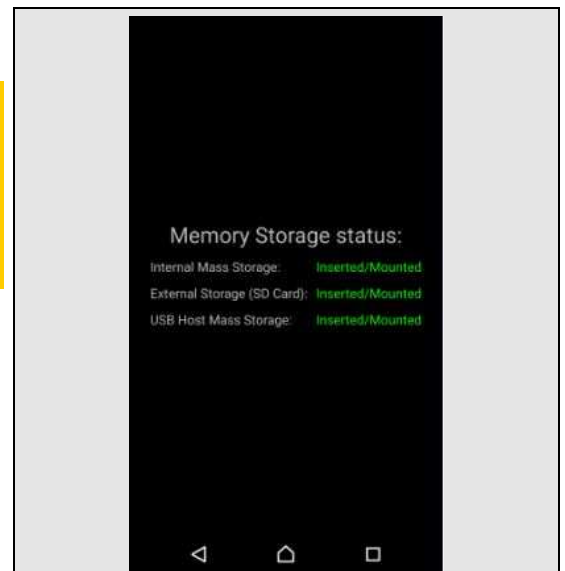
2.2.27 Storage

A memory card should be inserted in the phone and attach OTG device between phone and a USB disk before starting this test.

After you inserted USB disk go to Settings/Device Connection/USB Connectivity/Detect USB device/USB connected

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

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

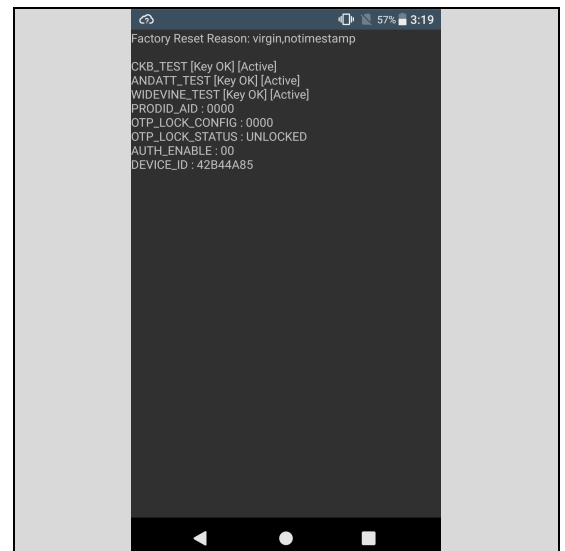


2.2.28 Security

The DRM keys are shown in the display.

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

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

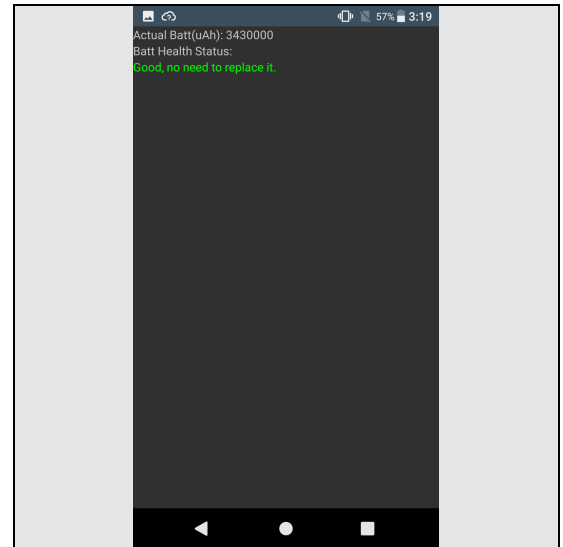


Tests: Service Tests

2.2.29 Battery Health Test

The Battery Health Status is shown in the display.

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



2.2.30 Verify certificates

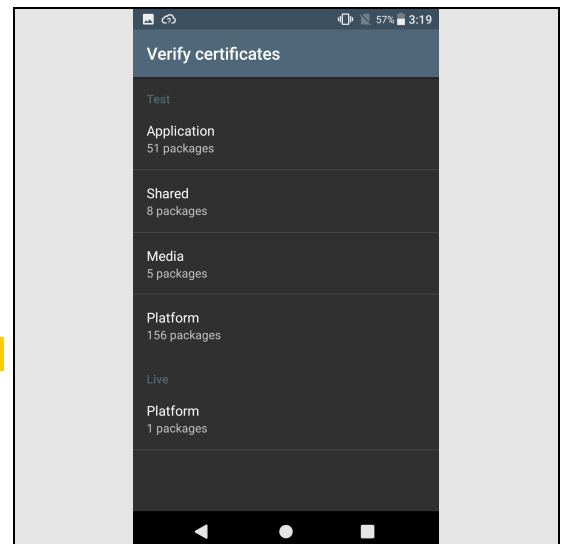
When entering the test, five information categories will be shown:

Test: Media, Application, Shared, Platform

Live: Application.

Do not use this test!

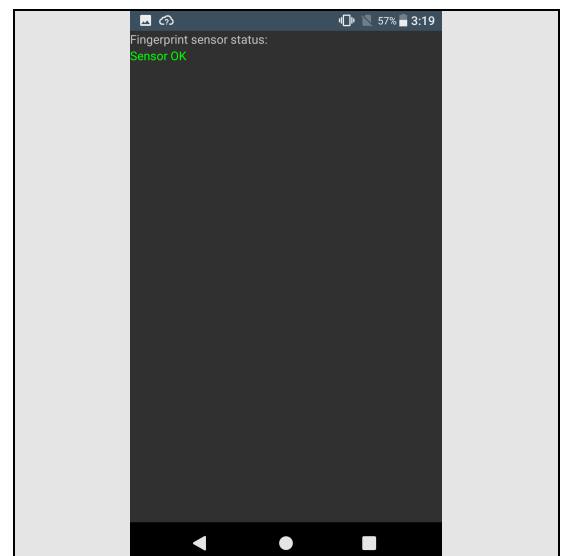
Press the Back key to return to the Service Test Menu.



2.2.31 Fingerprint Test

During the actual test the text 'Sensor' 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.



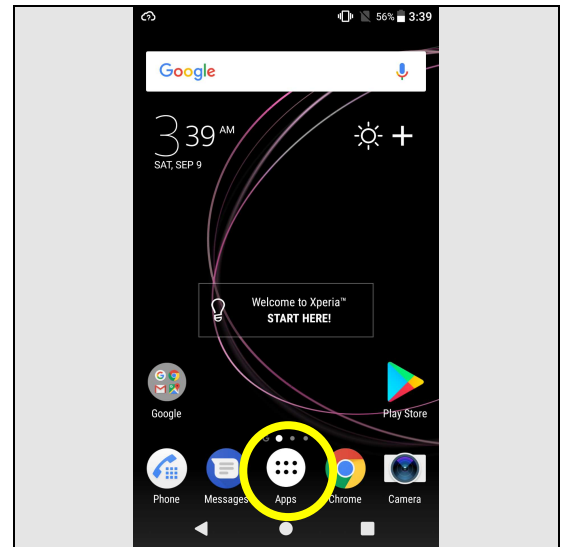
Tests: Android Setting Tests

2.3 Android Setting Tests

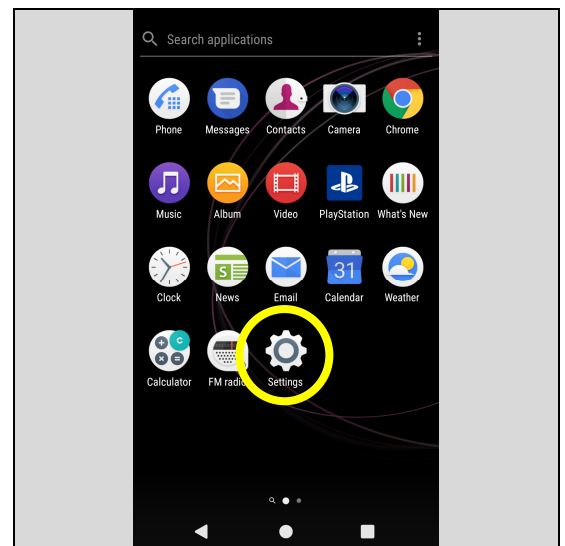
2.3.1 Fingerprint Sensor function test

Step 1: Go to Fingerprint Manager.

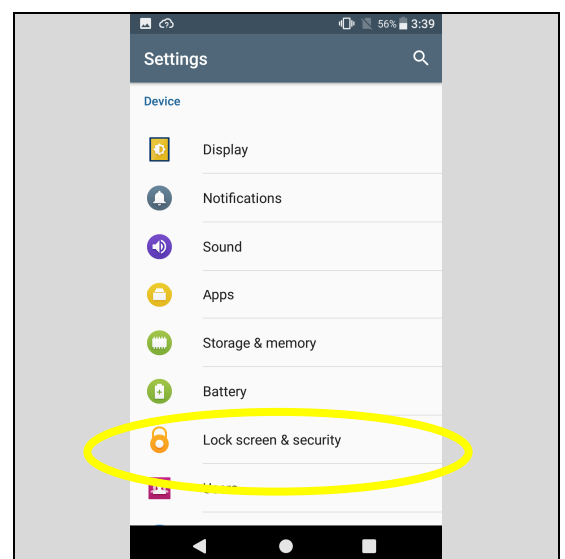
Tap "Apps".



Tap "Settings".

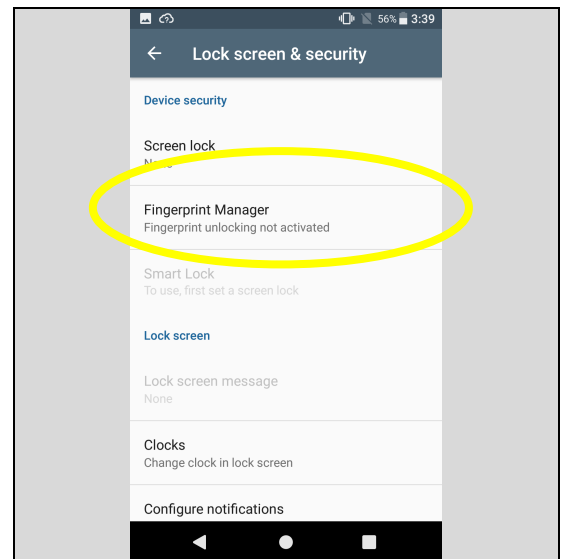


Tap "Lock screen & security".



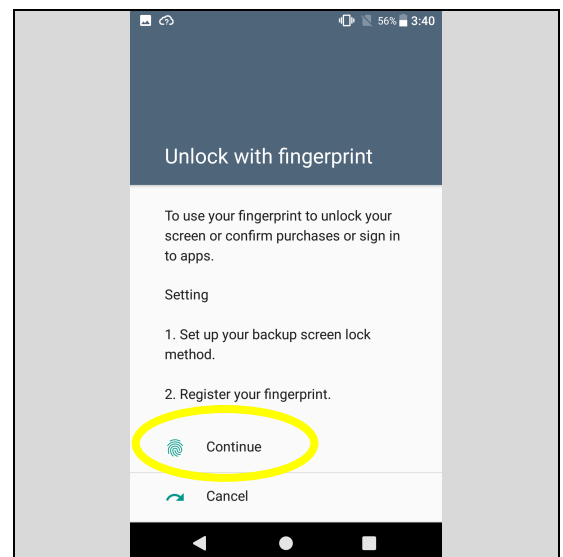
Tests: Android Setting Tests

Tap "Fingerprint Manager".

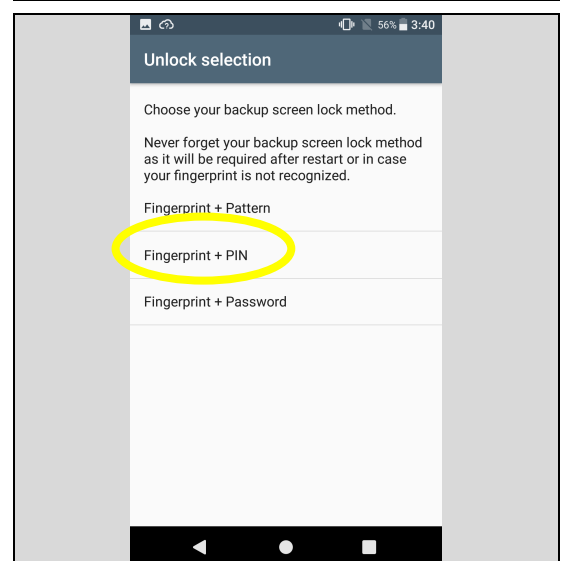


Step 2: Set PIN code

Tap "Continue".

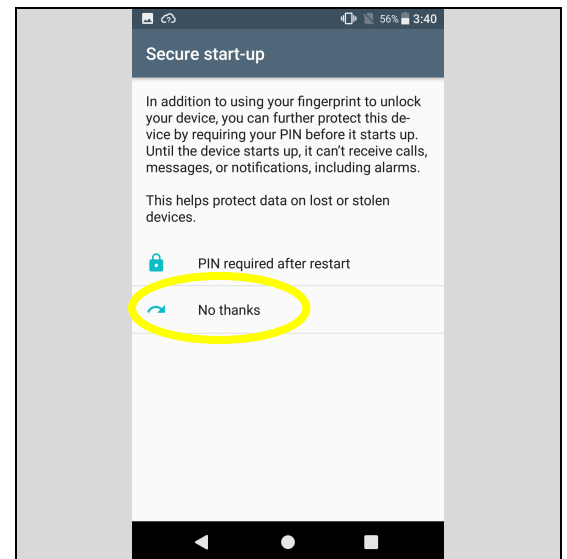


Tap "Fingerprint + PIN".

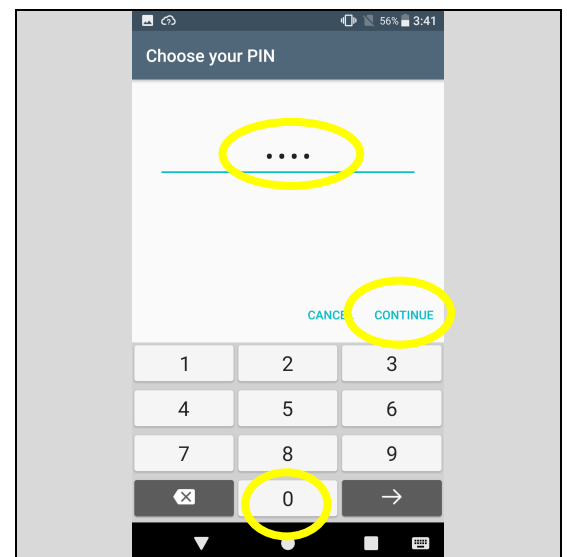


Tests: Android Setting Tests

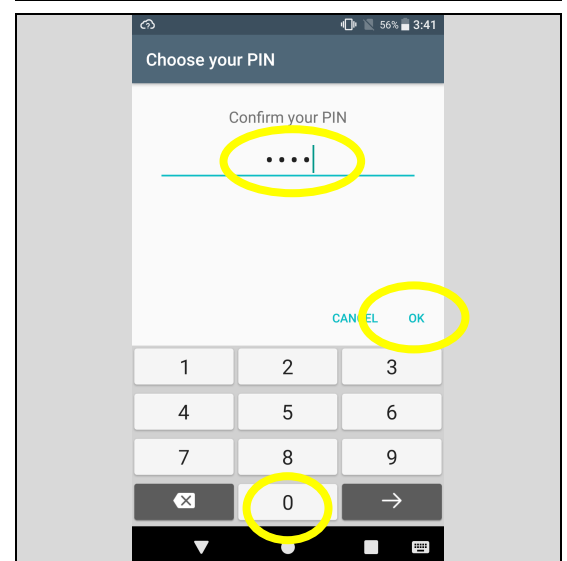
Tap "No thanks".



Enter 0000 as PIN to avoid mistake.
Tap "CONTINUE".



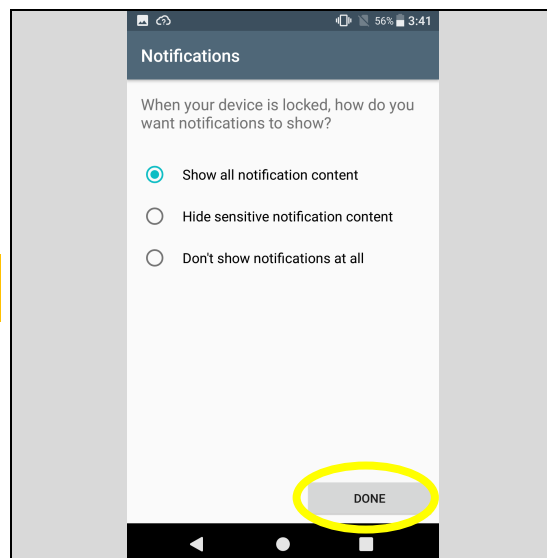
Enter 0000 one more time, and tap "OK".



Tests: Android Setting Tests

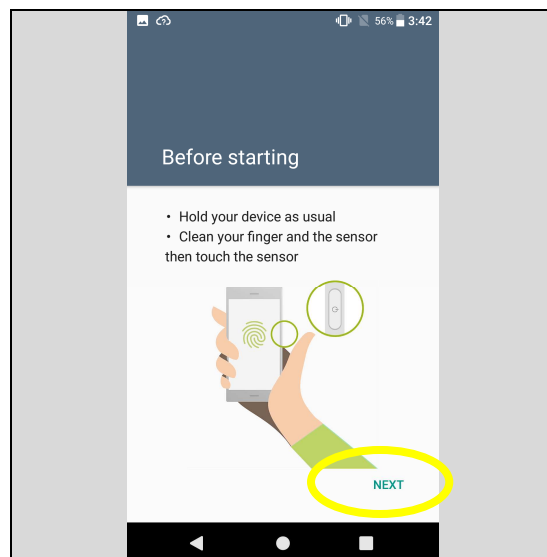
Tap "DONE".

After finish test, PIN code must be reset.
Make sure to follow **Step 4: Reset PIN**.

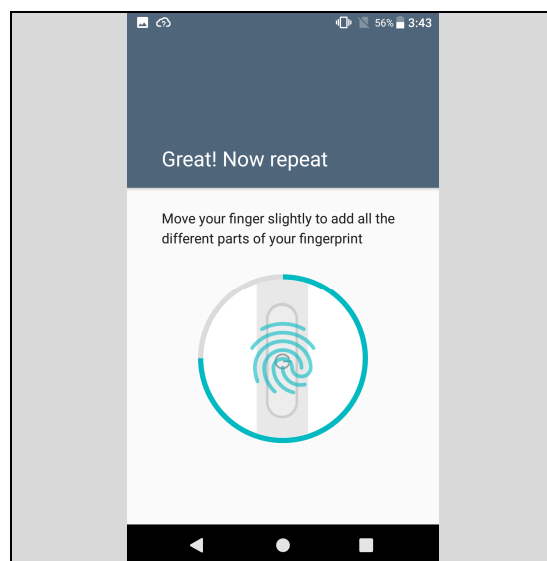


Step 3: Fingerprint function test

Tap "NEXT".

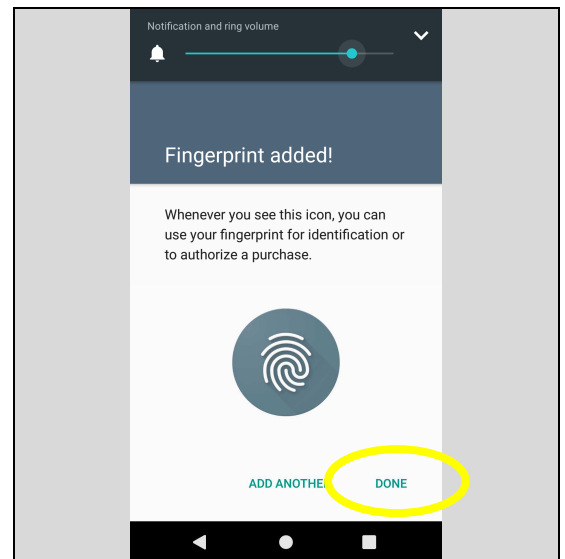


Touch the sensor lightly with your finger and lift it after you feel a vibration.
Move your finger slight to add all the different parts of your fingerprint.

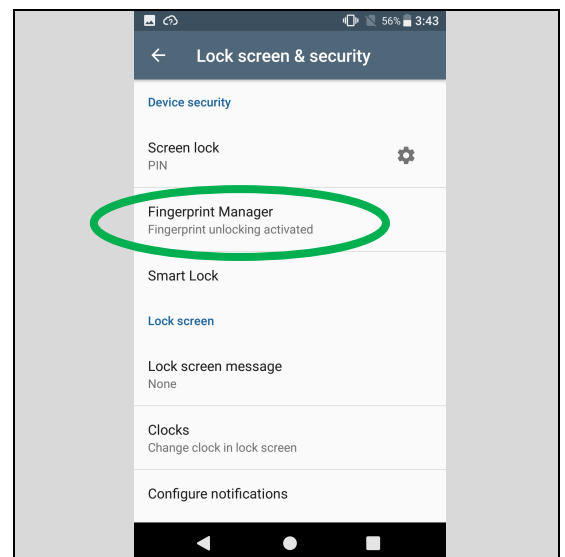


Tests: Android Setting Tests

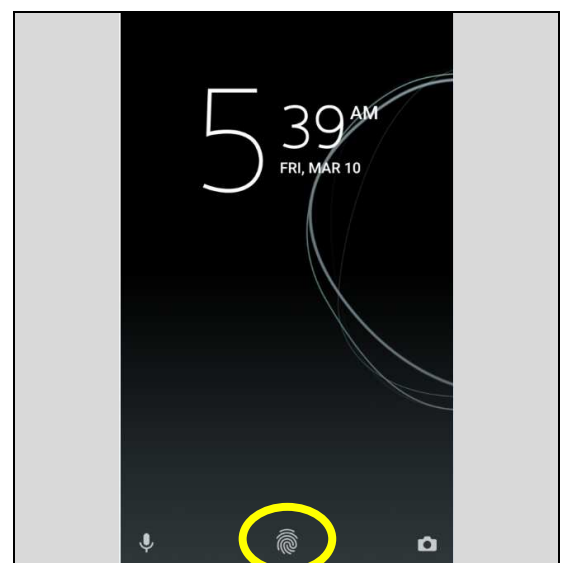
Tap "DONE".



Check if Fingerprint unlocking is activated,

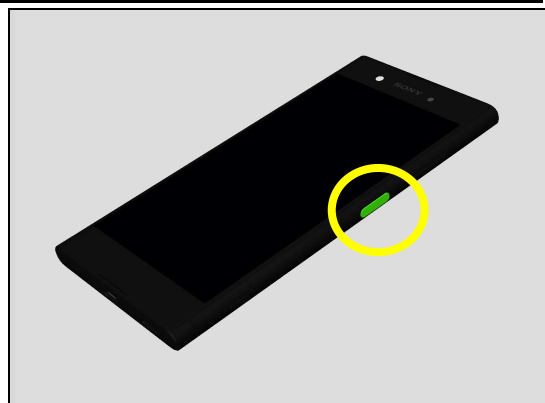


Lock the phone and press power key.
Check if fingerprint icon is appeared.



Tests: Android Setting Tests

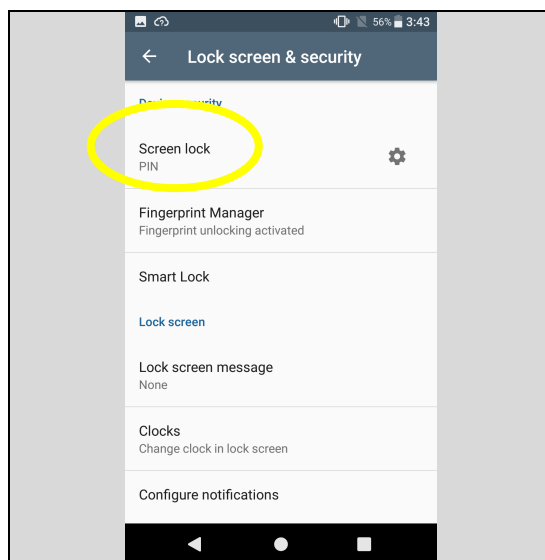
Touch your fingerprint on the sensor to unlock.
If unlock, fingerprint security function is working.



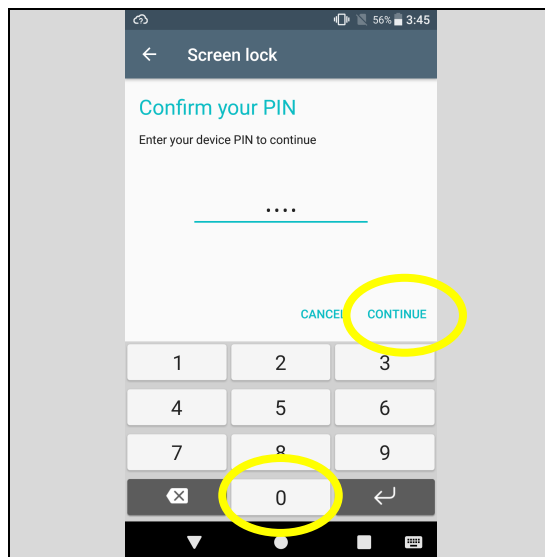
Step 4: Reset PIN

Perform Factory data reset or follow the following instructions.

Go to Apps → Setting → Lock screen & security.
Tap "Screen lock".

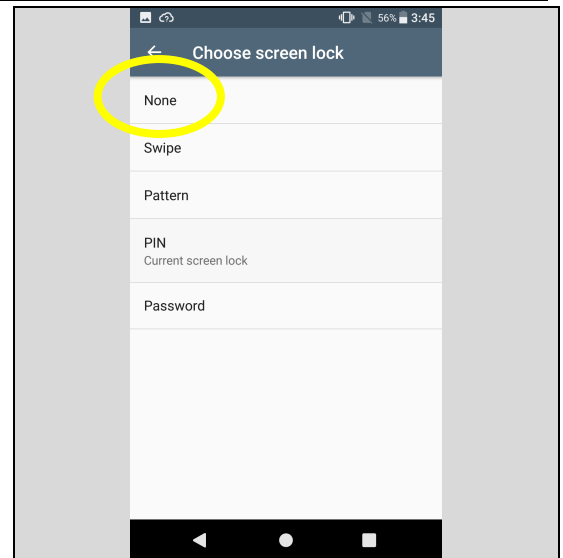


Enter 0000, and tap "CONTINUE".

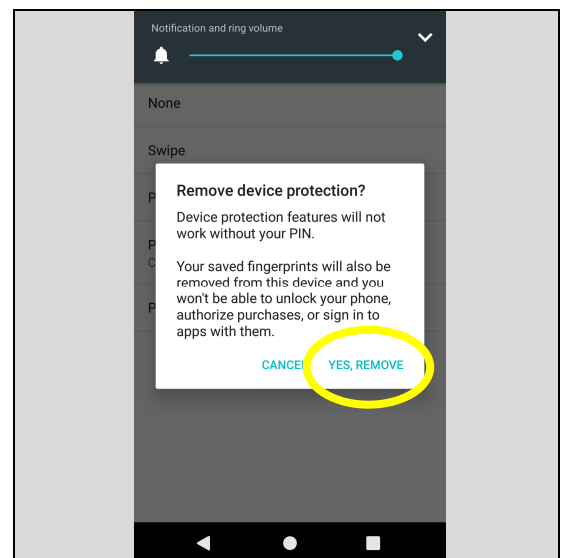


Tests: Android Setting Tests

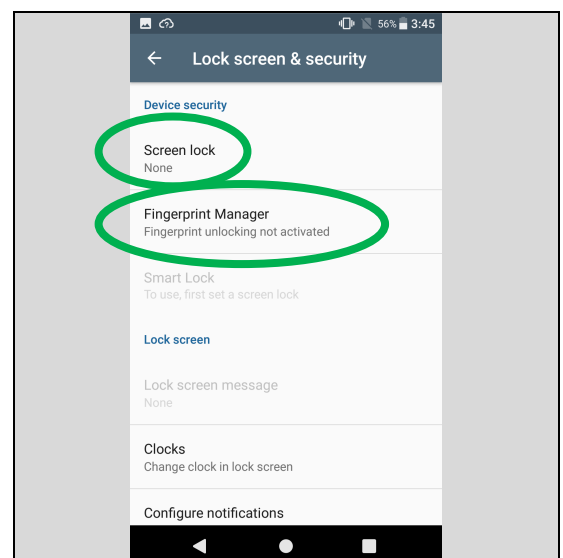
Tap "None".



Tap "YES, REMOVE".



Make sure that Screen lock is "None", and Fingerprint Manager is "Fingerprint unlocking not activated".



Tests: Manual Tests

2.4 Manual Tests

2.4.1 SIM test (G3421,G3423)

Verify that the phone can detect a SIM card:

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

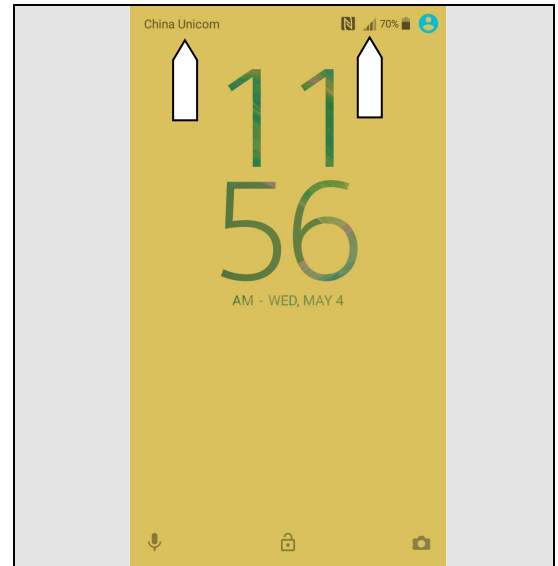
If the SIM card is detected by the phone, the start-up procedure will continue.

Step 2: The operator's name is displayed at the top left corner of the locked screen.

If not detected, the message 'No SIM card-Emergency call only' will be displayed instead.

If operator is not detected, the message 'No service' will be displayed instead.

Press Back key to return to Standby Menu.



2.4.2 SIM test (G3412,G3416,G3426)

Verify the phone can detect a SIM 1 and a SIM 2:

Step 1: Insert a SIM 1 and a SIM 2, and start the phone; If the SIM 1 and SIM 2 is detected by the phone, the start-up procedure will continue.

Step 2: The SIM 1 and SIM 2 operator names will be displayed at the top left corner of the locked screen by turns.

If SIM card is not detected, the message 'No SIM card-Emergency call only' will be displayed instead. If operator is not detected, the message 'No service' will be displayed instead.

Press Back key to return to Standby Menu.



2.4.3 Power key test

Press the Power key for a long time to turn the phone on or off.

Press the Power key for a short time to enter Sleep mode or to wake it up from Sleep mode.



Only symbolic view

Tests: Manual Tests

2.4.4 Home key test

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



2.4.5 Task navigation key test

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

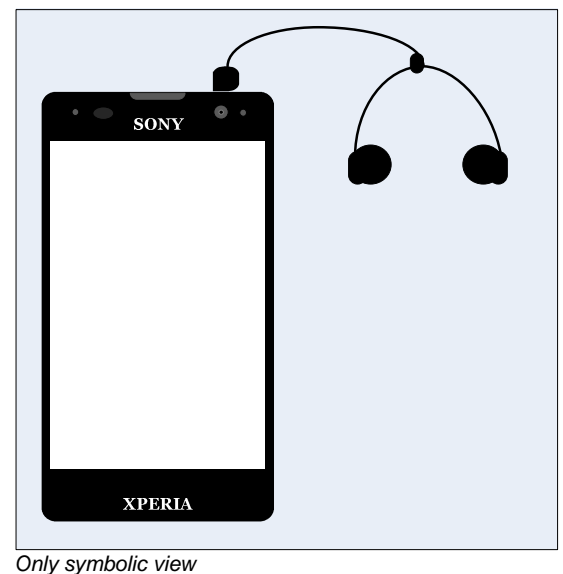


2.4.6 Audio Jack test

Connect a Sony CTIA headset (with microphone).
(see www.sonymobile.com go to the product and then Accessories)

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

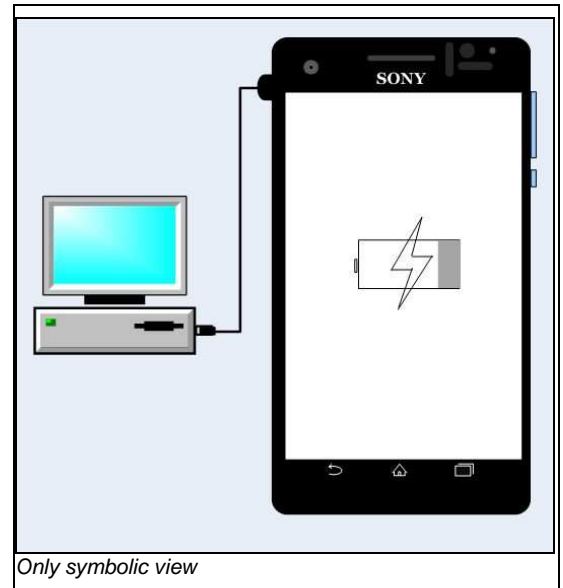
Make sure that the sound to and from Headset is emitted loud and clear.



Tests: Manual Tests

2.4.7 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



2.4.8 Charging via USB Type C (Charger or Computer)

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

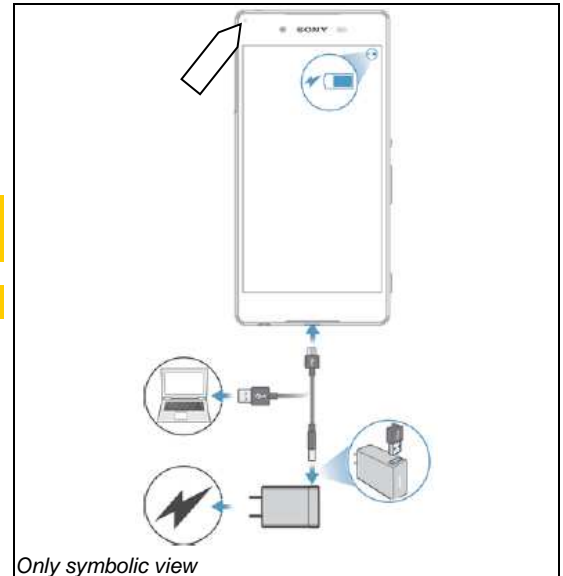
Ensure that no computer application, such as PC Suite or Emma, is active!

Do not start the phone.

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

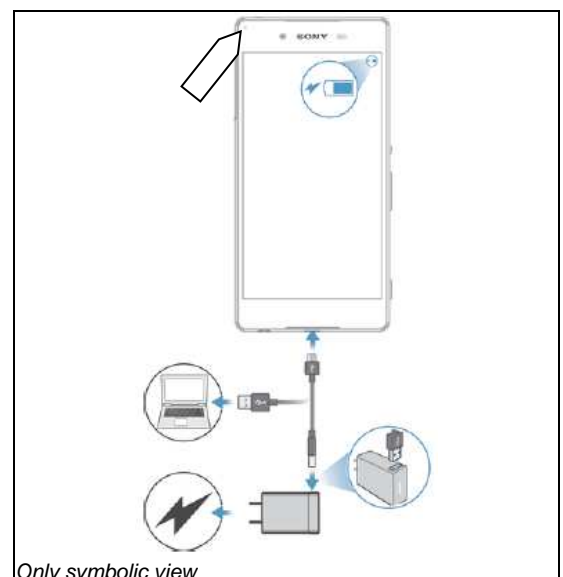
Verify that the phone is being charged by the notification LED and Battery icon in the display.

Remove the USB cable from the connector and verify that the Notification LED (see 1.2 Test Enablers) and Battery icon no longer indicates charging.



The Notification LED (see 1.2 Test Enablers) colour status is depended on battery remaining capacity:

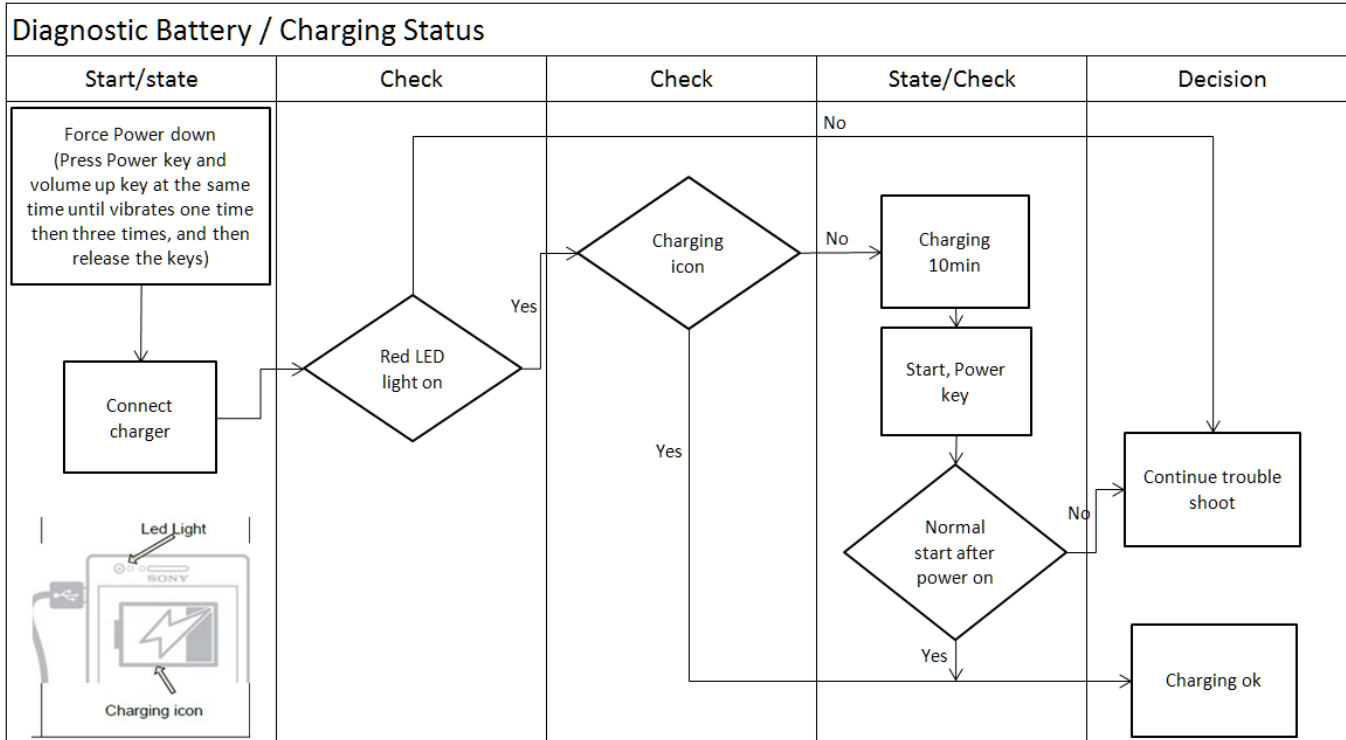
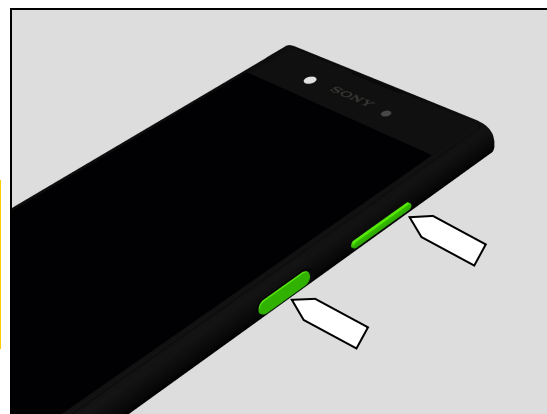
- Red: Battery level is between 1% and 10%;
- Orange: Battery level is between 11% and 89%;
- Green: Battery is between 90% and 100%;



Tests: Manual Tests

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

Perform a force shut down by pressing the Power key and volume up key at the same time (for 11 seconds), as shown in picture, until the unit vibrates one time then three times, and then release the button. Then the phone will shut down.



The picture in above flow chart is only symbolic view.

Tests

2.5 Network Test

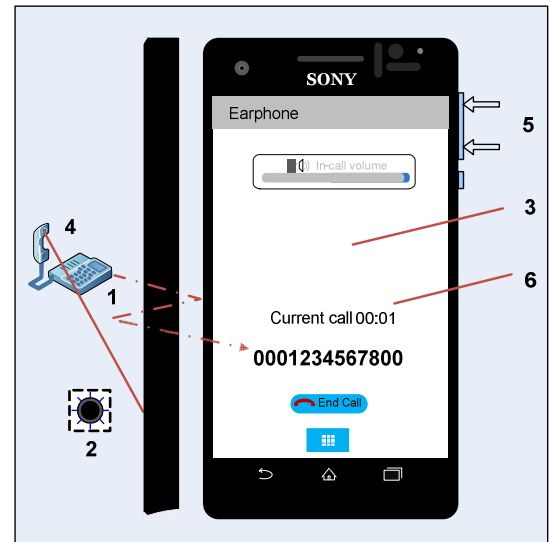
This test can only be performed if the phone has got an activated Nano SIM card (no Test Nano SIM) and an available network signal!

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

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

2.5.1 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

Tests: Network Test

2.5.2 On-the-air call to mobile (G3421,G3423)

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile 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 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile 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 Procedure (GSM & UMTS)' above.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile 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⇒ SIM status⇒ Mobile Network Type

Tests: Network Test

2.5.3 On-the-air call to mobile (G3412,G3416,G3426)

SIM 1 or SIM 2

GSM

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ 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 Procedure (GSM & UMTS)' above.

UMTS

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ 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 Procedure (GSM & UMTS)' above.

LTE (if available)

Go to the Setting app:

Settings ⇒ More ⇒ Mobile Networks ⇒ SIM 1 or SIM 2 ⇒ 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⇒ SIM status⇒ Mobile Network Type

If one of the SIM is selected to be LTE (preferred)/WCDMA/GSM, the other SIM only support WCDMA (preferred)/GSM.

3 Revision History

Rev.	Date	Changes / Comments
1	2017-Sept-22	Initial Release