# XP Pro Thermal
# SERVICE MANUAL


6.5" Smartphone
Dimension:171.5x79.8x11.5mm

# Sonim Technologies


SON-20250424 Ver. No 1.0

| | | | |
|---|---|---|---|
| | **XP Pro SERVICE MANUAL** | | **Classification: External** |
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| | | | **Version: 1.0** |
| **Effective date:**<br><br>**24 - 04 - 2025** | **Prepared By:**<br><br>**Yafeng Wu**<br>**Berg Zhu**<br>**Midas Xiao** | **Reviewed By:**<br><br>**Jerry Zhang** | **Approved By:**<br><br>**Zhenpeng Liu** |

| Updated Ver. | Effective date | Prepared by | Brief of Amendments |
|---|---|---|---|
| 1.0 | 24 - 04 - 2025 | Yafeng Wu<br>Berg Zhu<br>Midas Xiao | Initial version |
| | | | |
| | | | |
| | | | |

# Pre-Cautions

1. Only trained professionals should perform upgrades or repairs.
2. Use an anti-static workstation and wear an anti-static wrist strap.
3. Use only approved tools and parts listed in the manual.
4. Reinstall all parts—like components, screws, and insulators—correctly.
5. Make sure all cables and wires are put back in the right place.
6. Handle all parts with care—static electricity can easily damage them

# TABLE OF CONTENTS

# 1.0 INTRODUCTION

## 1. PURPOSE

This manual provides the standardized operating instructions for L2 repairs.

## 2. REGULATORY INFORMATION

### A. SECURITY

This wireless device, (the "Device") contains software owned by Sonim Technologies, Inc. ("Sonim") and its third party suppliers and licensors (collectively, the "Software"). As user of this Device, Sonim grants you a non-exclusive, non-transferable, non-assignable license to use the software & hardware solely in conjunction with the Device on which it is installed and/or delivered with. Nothing herein shall be construed as a sale of the Software & hardware to any third party.

You shall not reproduce, modify, distribute, reverse engineer, decompile, otherwise alter or use any other means to discover the source code of the Software, hardware or any component of the Software/hardware. For avoidance of doubt, you are at all times entitled to transfer all rights and obligations to the Software to a third party, solely together with the Device with which you received the Software, provided always that such third party agrees in writing to be bound by these rules. The validity, construction and performance of the license shall be governed by the laws of Delaware, United States & the manufacturer will not be responsible for any charges that result from unauthorized use.

### B. PHONE CARE

Each Sonim phone has a designated IP class for dust and water protection, according to the IEC Ingress Protection (IP) Standard. This means that the phone is dust protected and can be submerged into 2 m deep water for up to 60 minutes. Immersion in deeper water can damage it and must be avoided.

Sonim phones are solid and built for heavy duty use. Its design protects against disassembly or mechanical damage when subjected to forces equal to free fall from the height of 2 meters. Subjecting the phone to stronger impact and forces can damage it and must be avoided.

### C. MAINTAINENCE LIMITATIONS

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that authorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

### D. ELECTROSTATIC SENSITIVE DEVICES

**ATTENTION**
Boards which contain Electrostatic Sensitive Devices (ESD) are indicated by the sign.

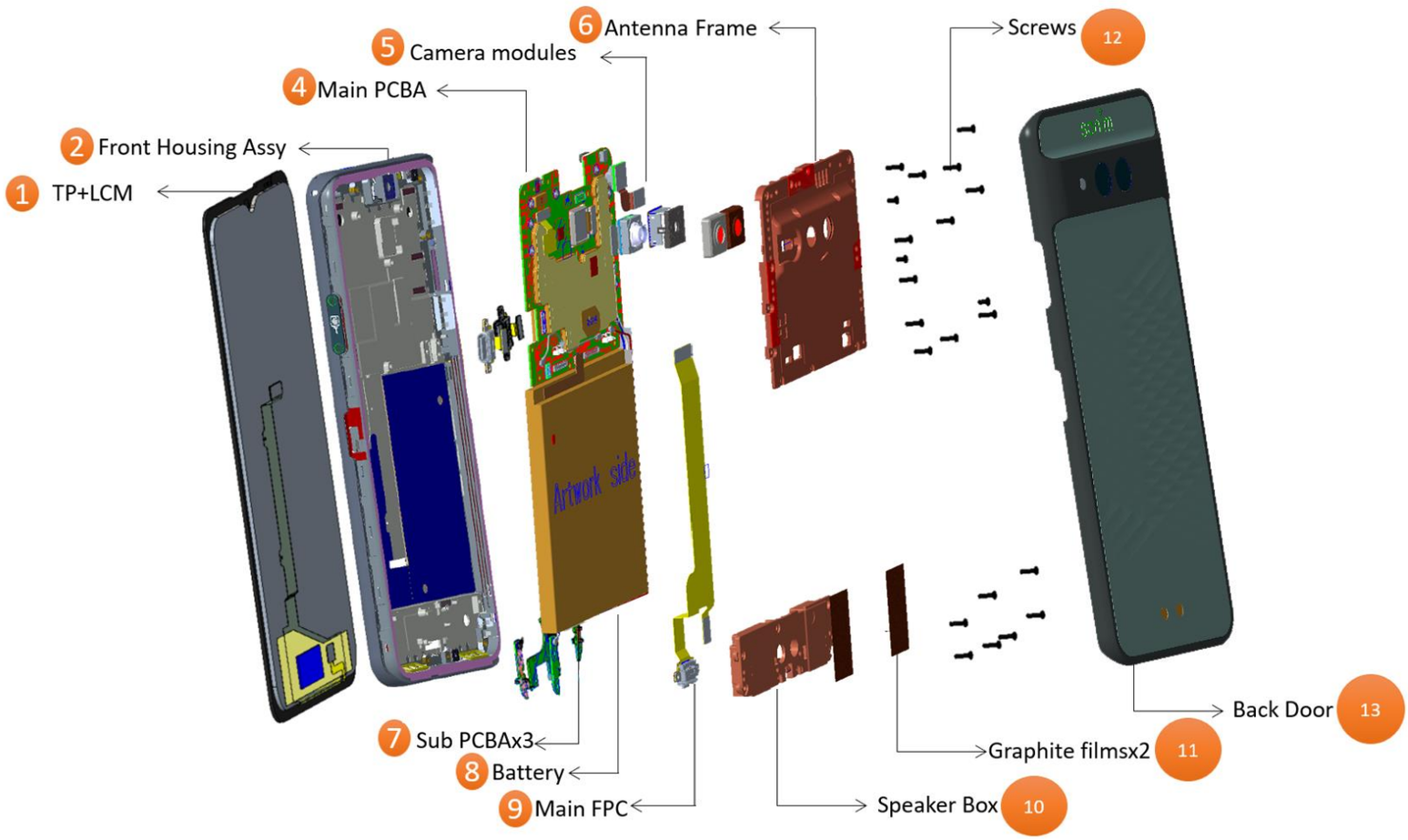
**Following has to be taken while handling the ESD boards**

1. Service personnel should ground themselves by using a wrist strap while working on the boards
2. When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
3. Use a suitable, grounded soldering iron.
4. Keep sensitive parts in protective packages until these are used.

# 2.0 REQUIREMENTS

| REQUIREMENTS TO PERFORM THE ASSEMBLY & DISASSEMBLY OF HANDSETS | |
|---|---|
| Spare parts | |
| Tools | Tweezers, Screw driver, Anti-static rod, SIM Ejector |
| ESD Gloves, shoes, Aprons, Anti-static wrist band | |
| Clean sol or Isopropyl Alcohol [IPA] | |
| Hot air blower | |
| Soldering Iron | |
| Jig & Fixture | Heating plate, Battery cover disassembly Jig, Air tightness test fixture, Freezer or Icebox |

# 3.0 EXPLODED VIEW OF X802



# 4.0 HANDSET DISASSEMBLY

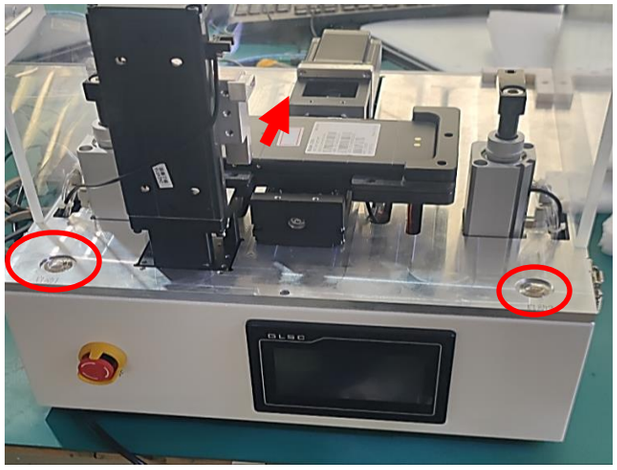
1. Remove SIM tray

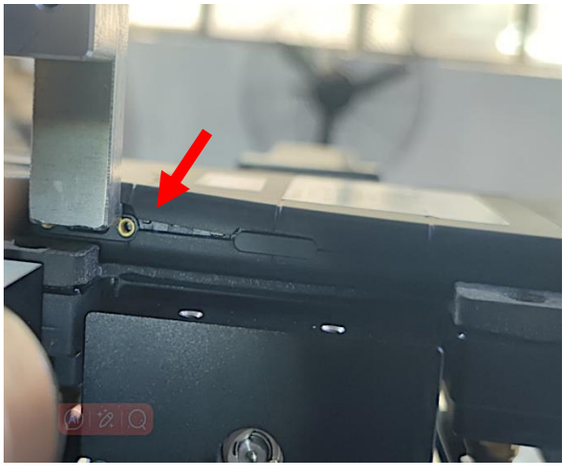
2. Remove two screws to disassemble Sub-USB cover

3. Put the device on the heating plate to heat Battery cover

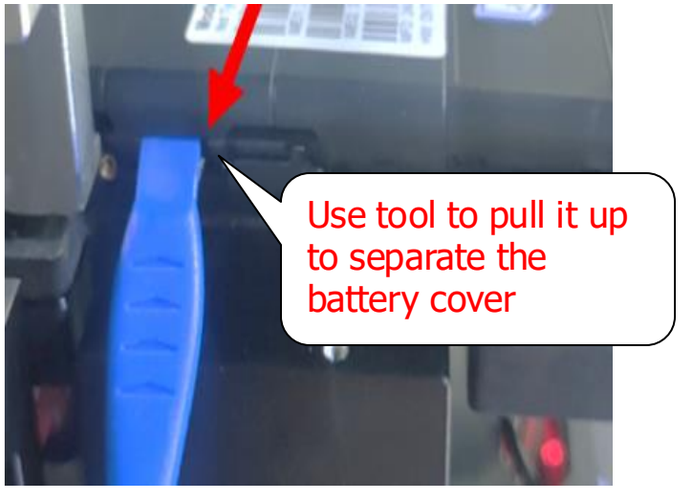
Temperature: 75°C
Period time: 25~30 min

4. After heating Battery cover about 25~30℃, put the device into the disassembly Jig to separate Battery cover from Front casing.

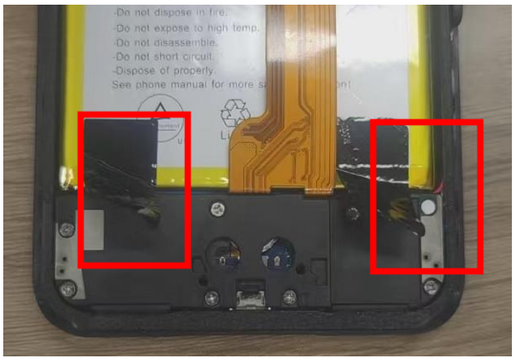


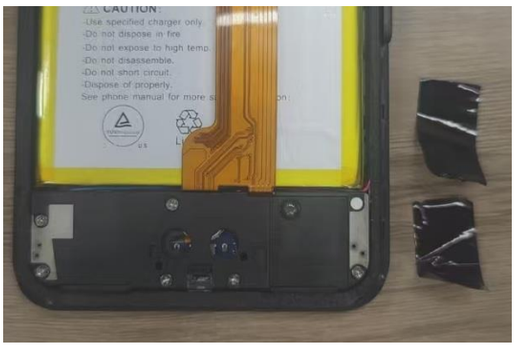


Remove Battery cover with tool.

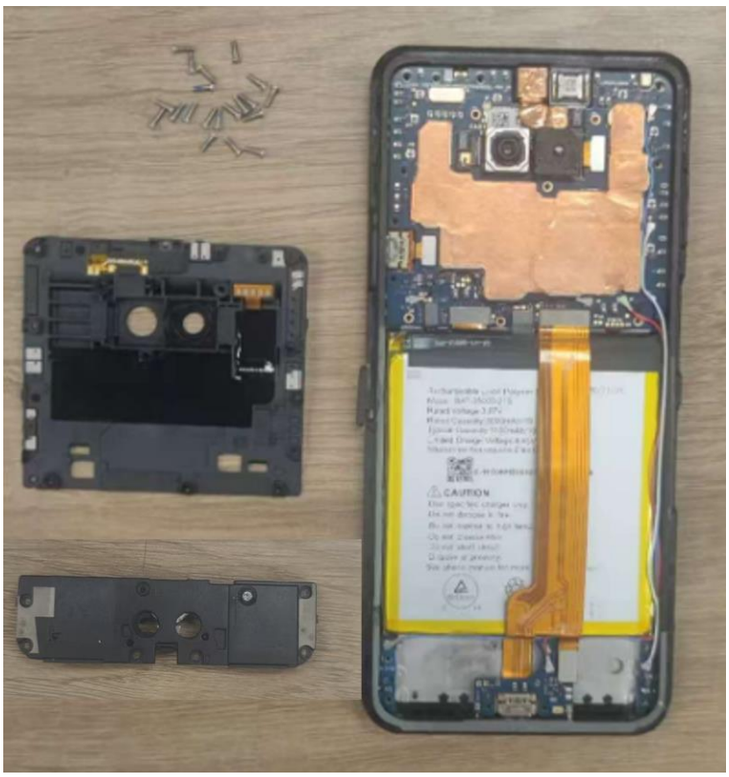



5. Disassemble 20 screws (M1.4*5.0mm) and remove Volume key and PTT key
Remove the heat dissipation film of the speaker

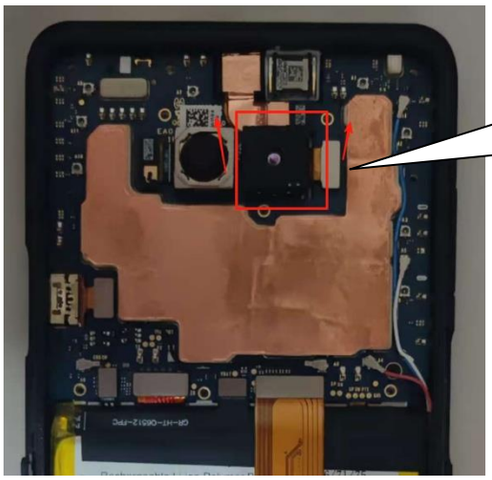




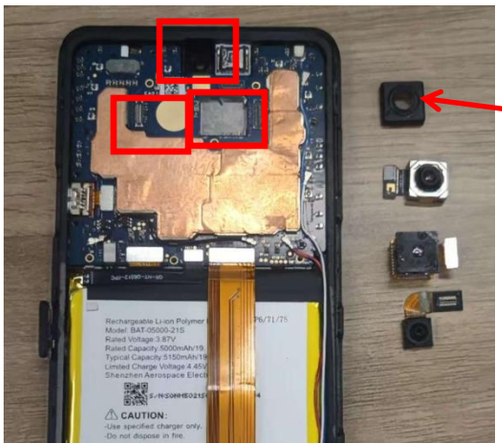
6. Remove antenna frame and speaker box frame,



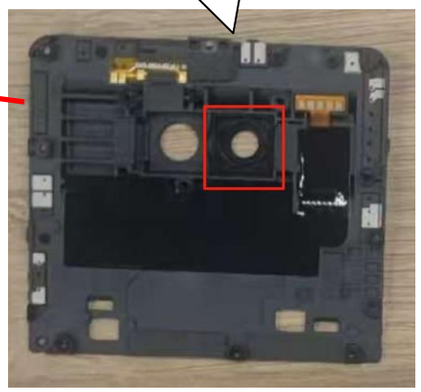
7. Disassemble camera rubber to remove all cameras



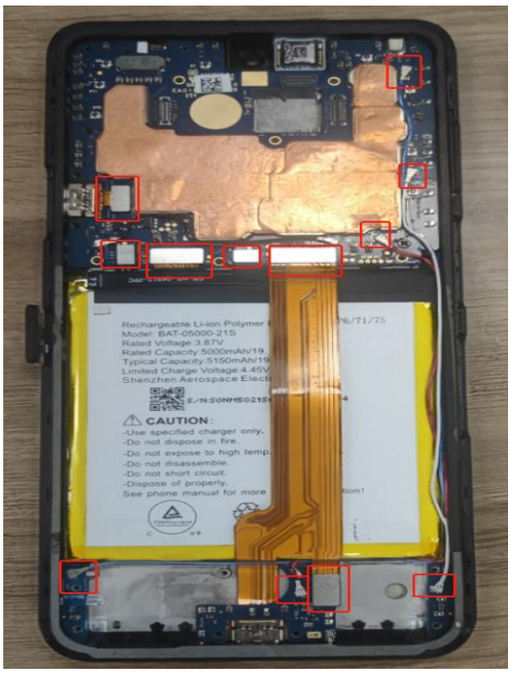
First, remove the infrared camera by lifting it vertically.Then, remove the camera base.



Remove the camera rubber cover

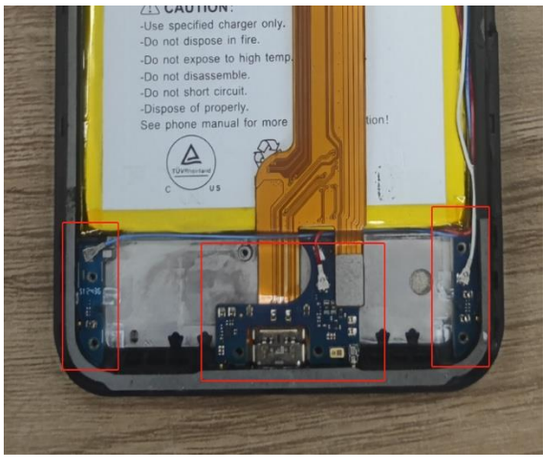


8. Unlock the connectors of FPC



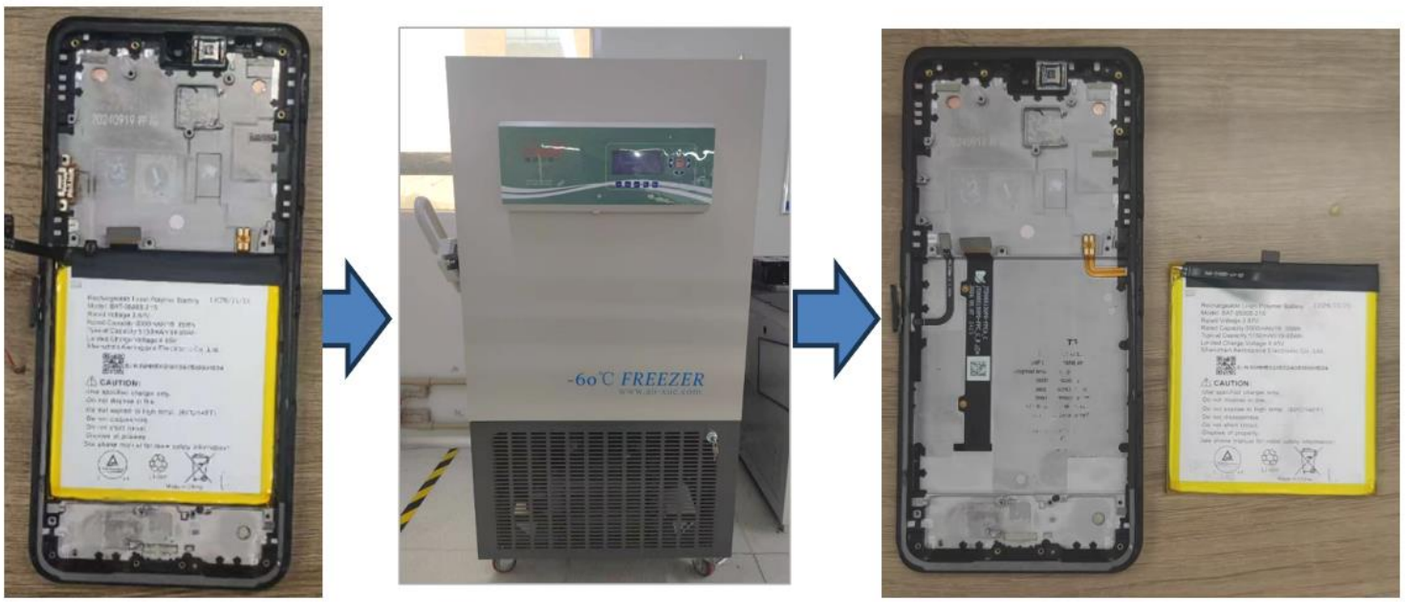
9. Unscrew 2 screw (M1.4*2.8mm) and connectors, and then remove main PCBA board


10. Remove Sub-PCBA board, Antenna PCBA and FPC



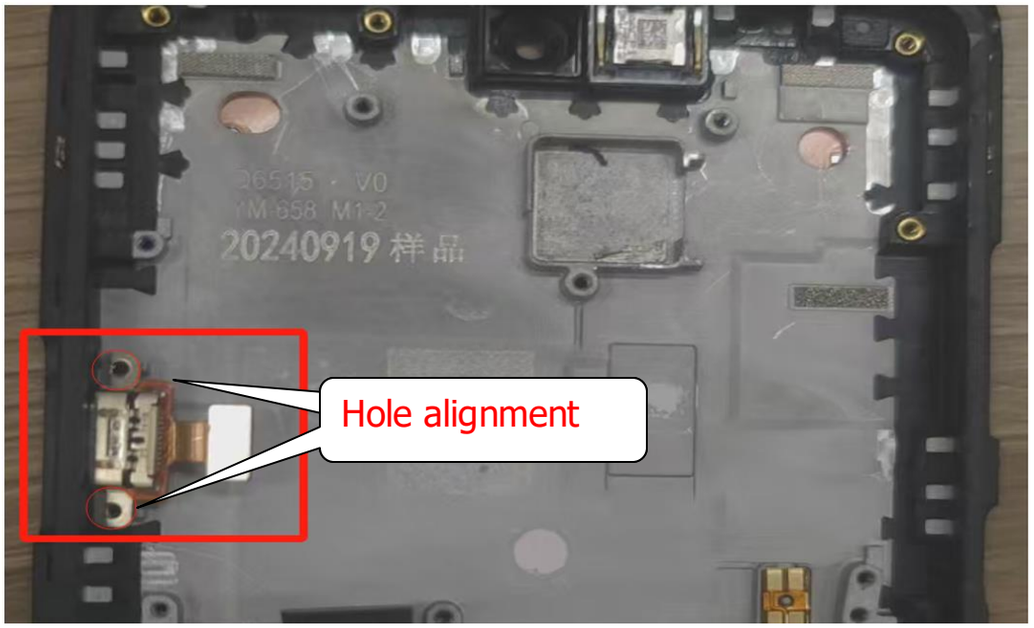

## 11. Remove Battery

Place the front casing module (with the battery attached) in a freezer at -10°C ±2°C for at least 10 minutes.
After freezing, gently knock the front casing module on a padded table mat to loosen and remove the battery.
Do not reuse the removed battery.

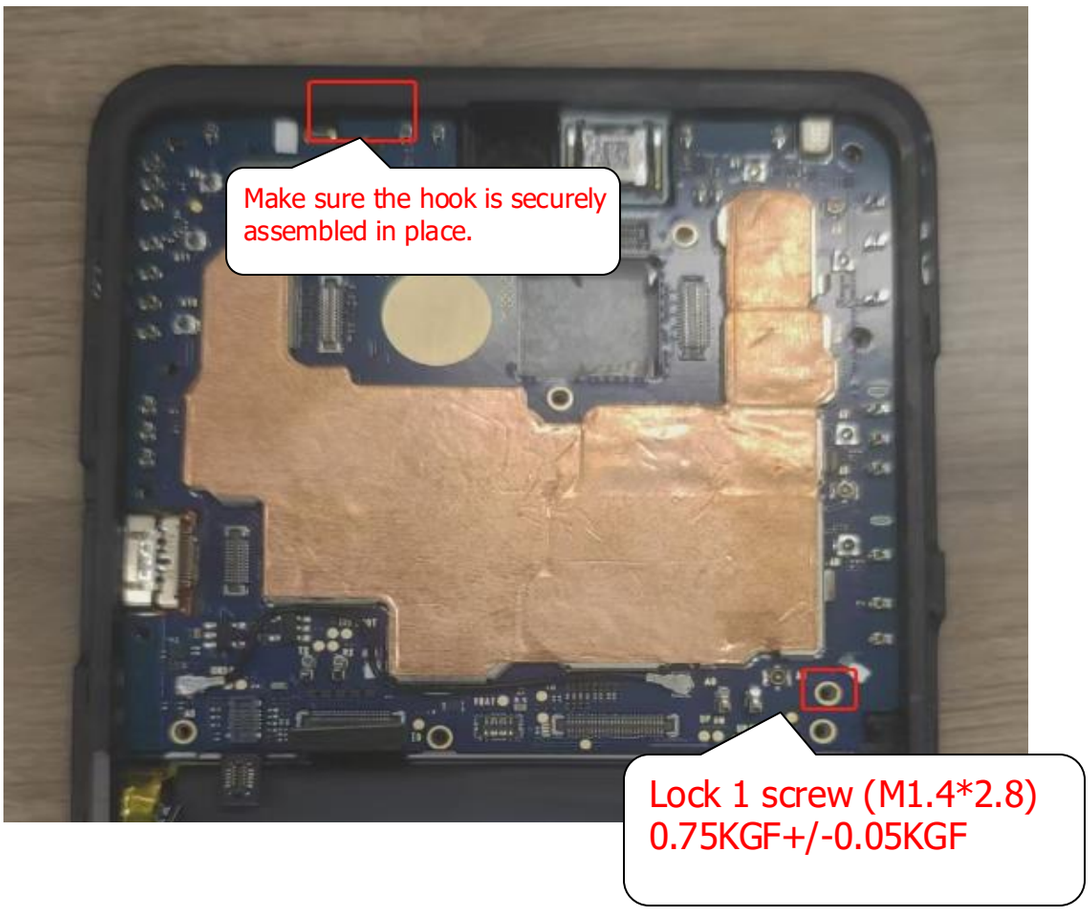


# 5.0 HANDSET ASSEMBLY

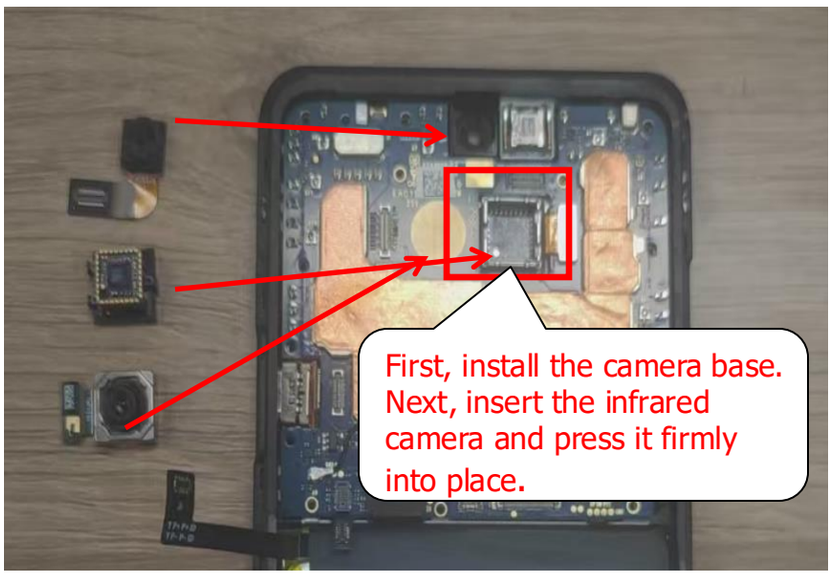
1. Install Sub-USB connector

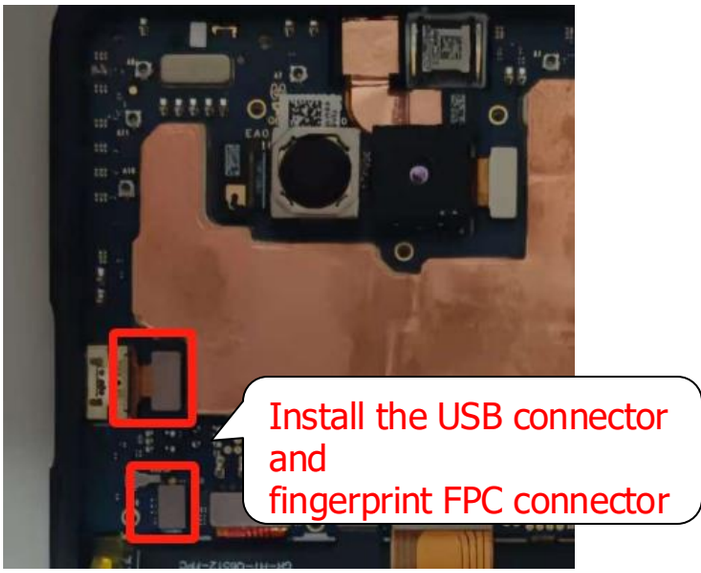



2. Install main PCBA board

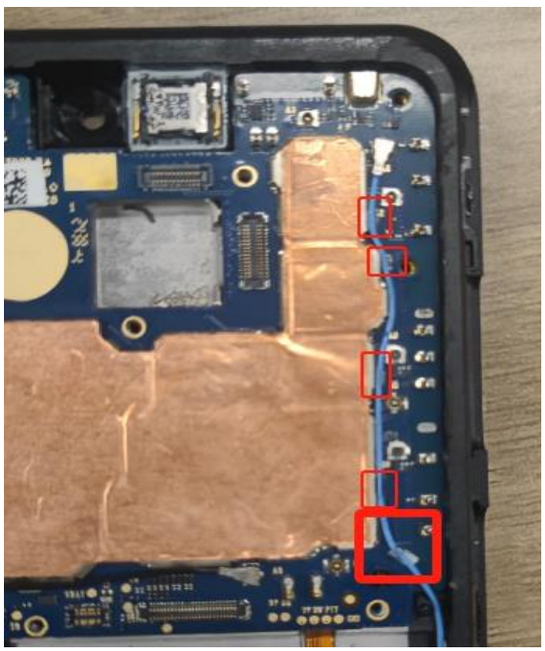


3. Install Camera base and  camera *3, install connectors

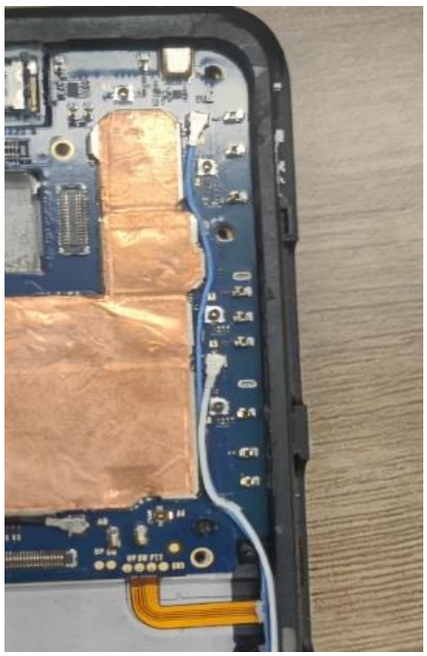


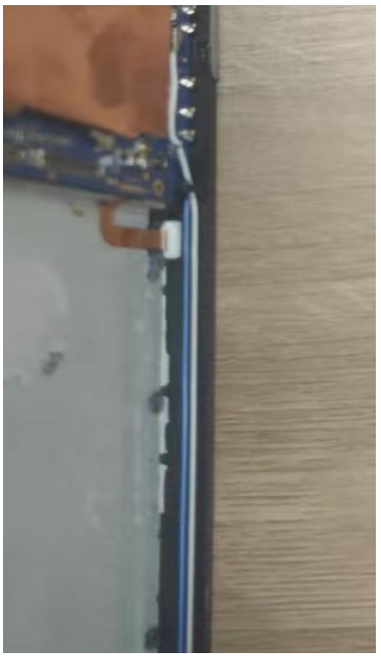




4. Install Ant-6 RF cable (White color) and Ant-6 PCBA board

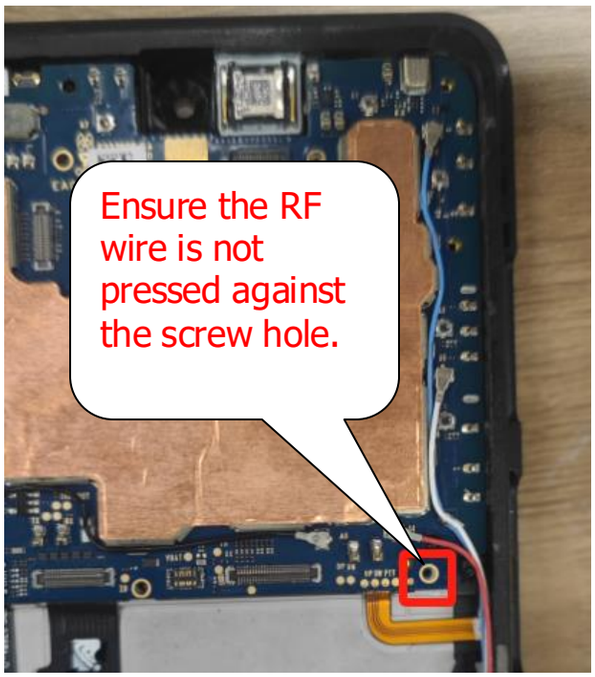


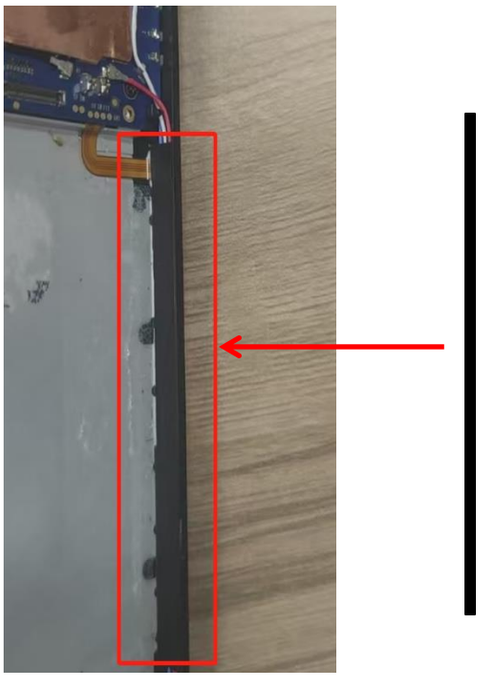
5. Install Ant-5 RF cable (Blue color) and Ant-5 PCBA board



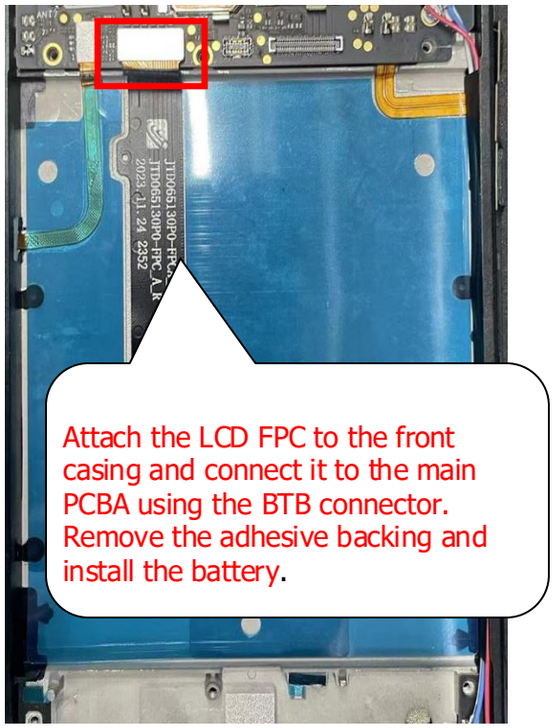


6. Install Ant-4 RF cable (Red color) and fix RF cable by PET film



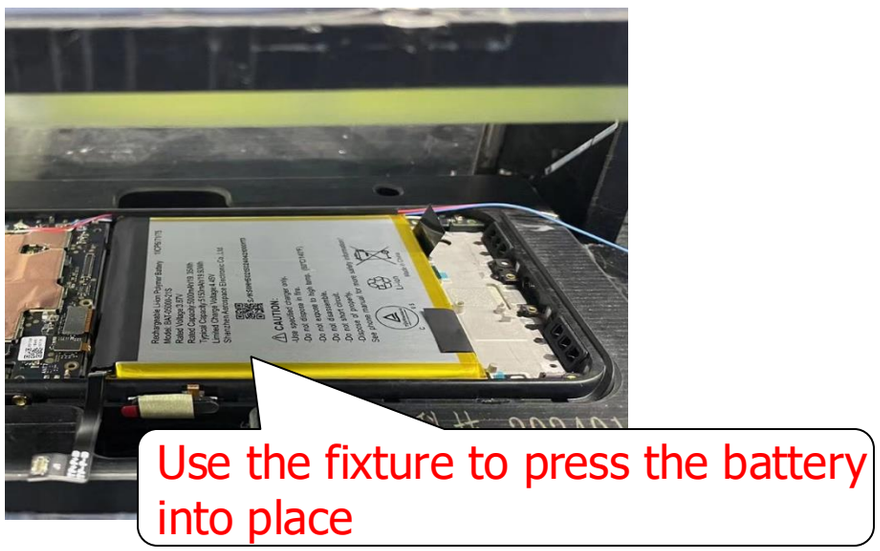



7. Connect LCD FPC and install the battery



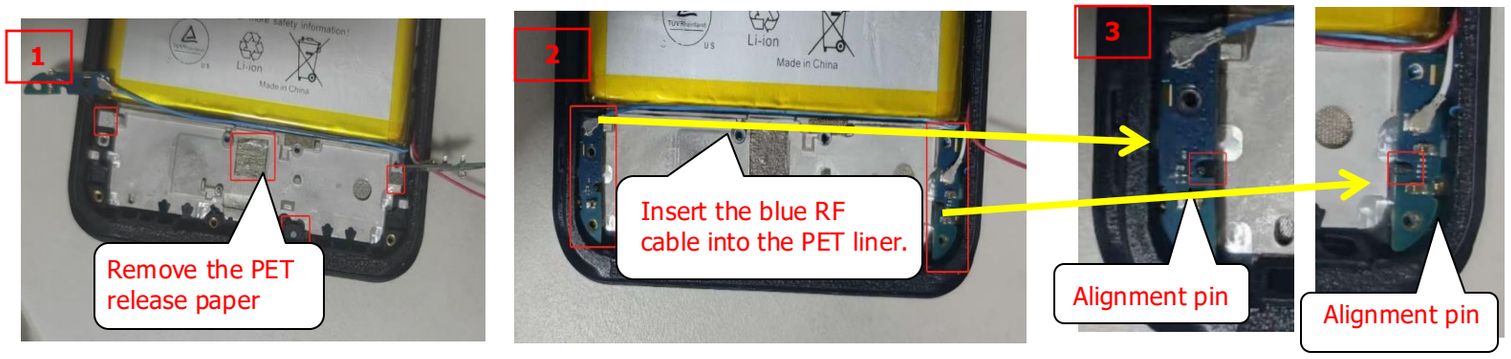


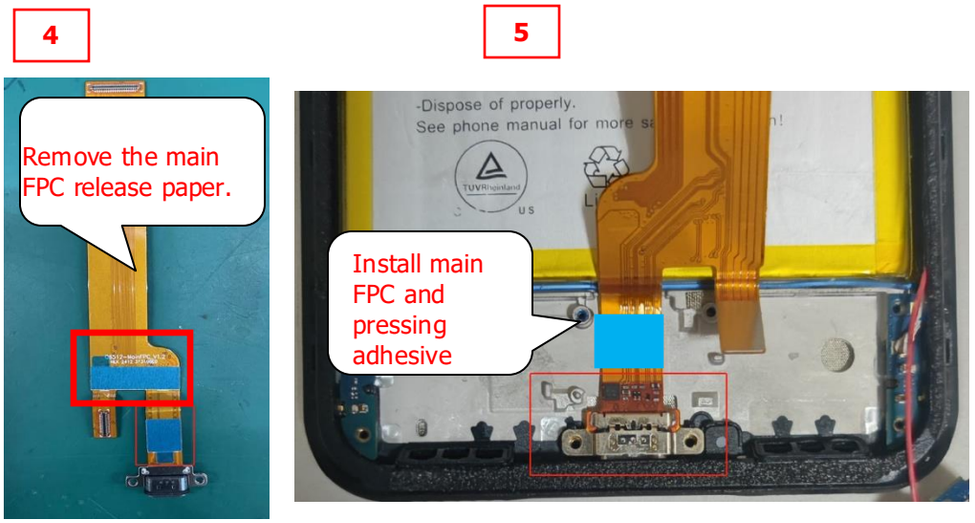
8. Press Battery with the fixture



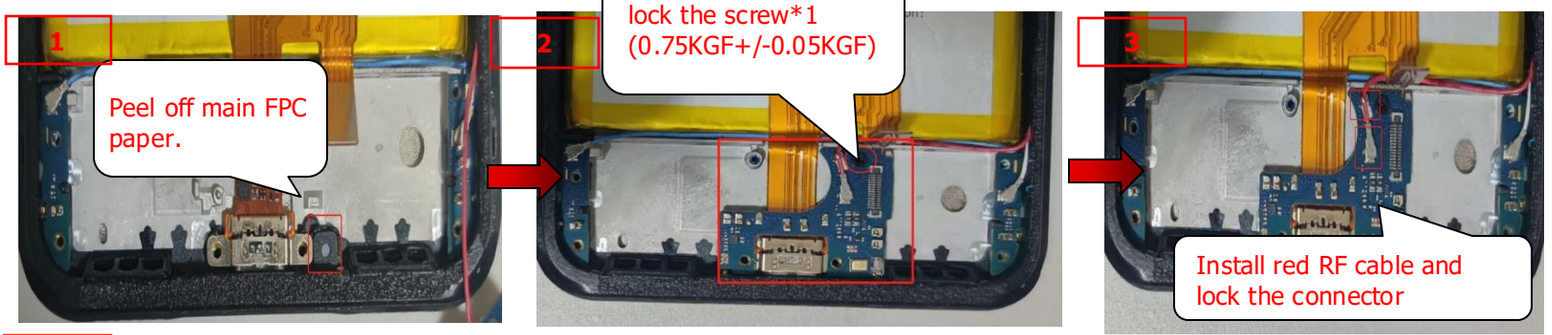

Apply 300N of pressure (±10N) for 12 seconds

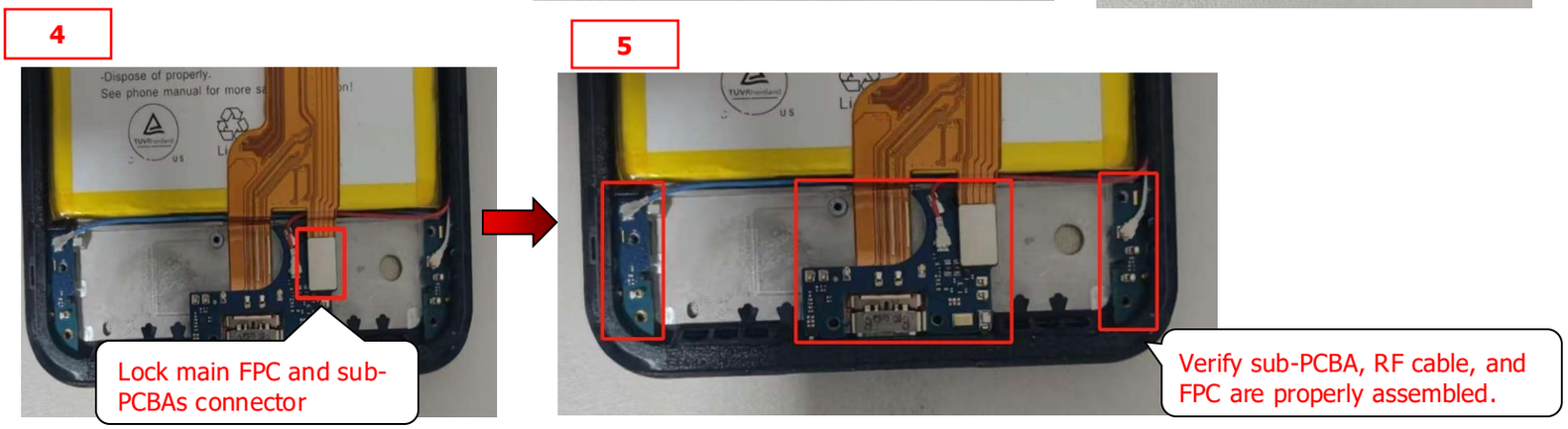
## 9. Secure RF cable with PET and attach main FPC



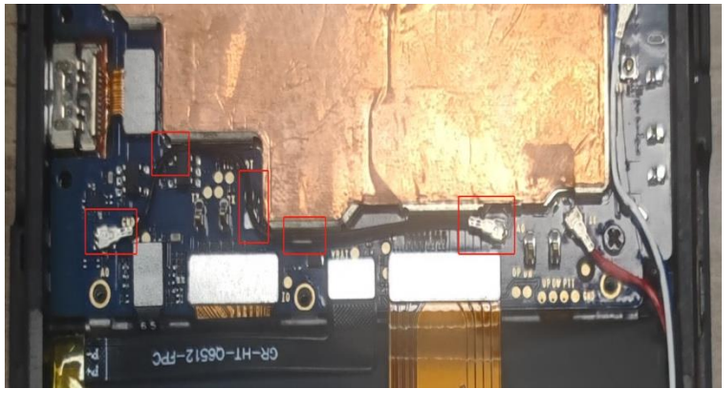

## 10. Install sub-PCBA



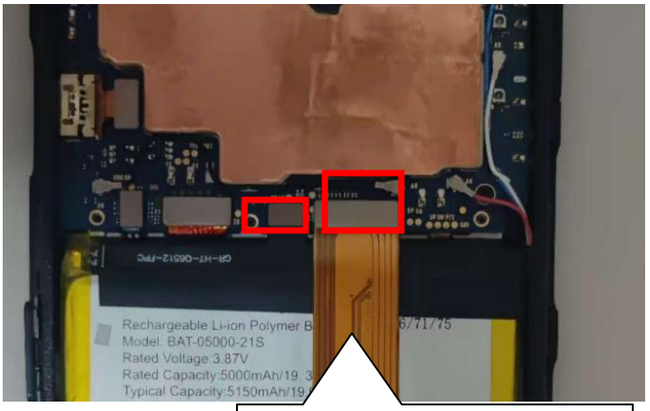



11. Install Speaker box and lock screw*7 (M1.4*5)  1.0KGF+/-0.05KGF


12. Install Ant-7 RF cable (Black) and install connectors

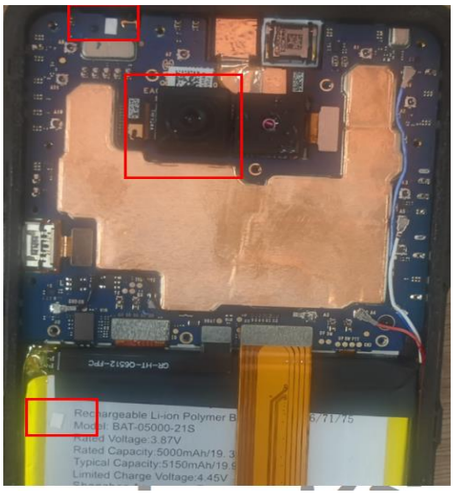



Connect Ant-7 RF and secure RF cable in wire clamp

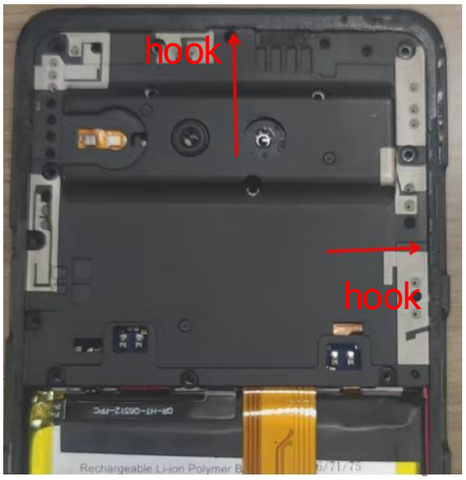



Install Battery connector and main FPC connector

13. Install rear camera rubber and place two LDIs as shown



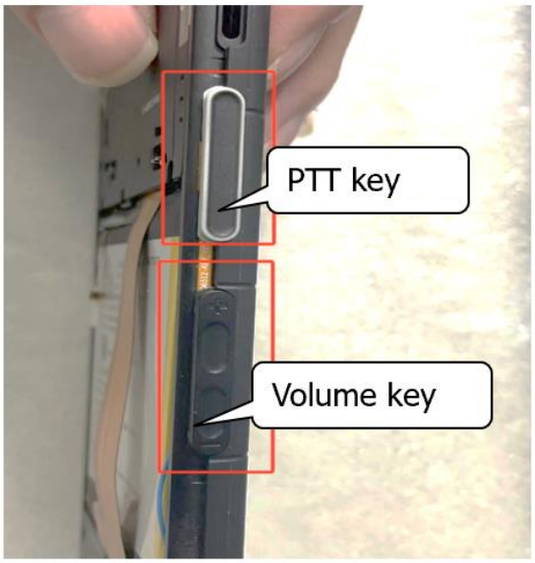
14. Install antenna frame and lock screws*13 (M1.4*5)




15. Apply heat-dissipation films to the speaker and attach the fragile sticker

16. Install PTT key and volume key

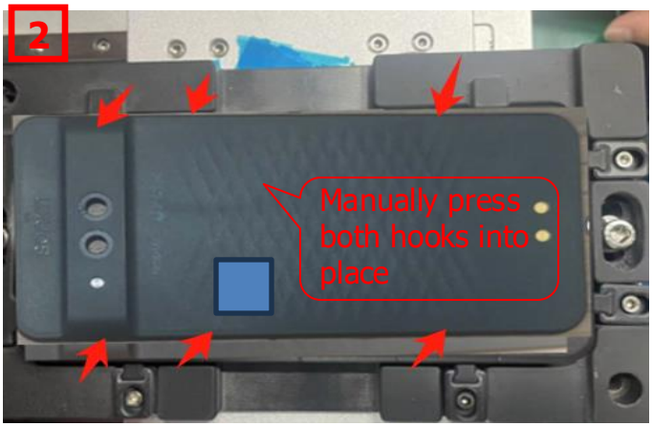
1




17. Install and press down the battery cover.

1

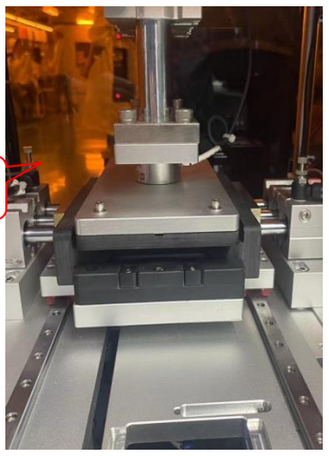

2




3


4

Pressing



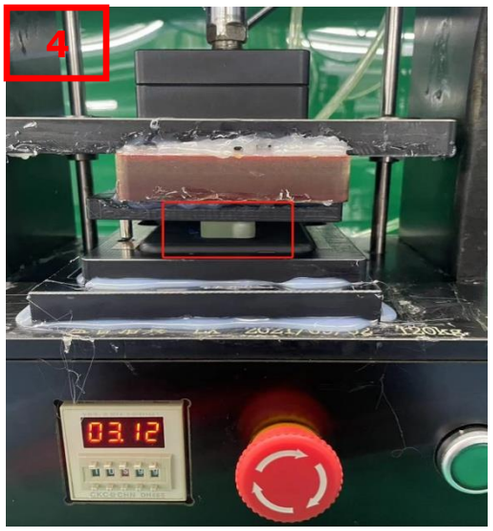
Apply 500N of pressure (±10N) for 40 seconds

## 18. Install camera lens


Remove adhesive release papers and clean the cameras.

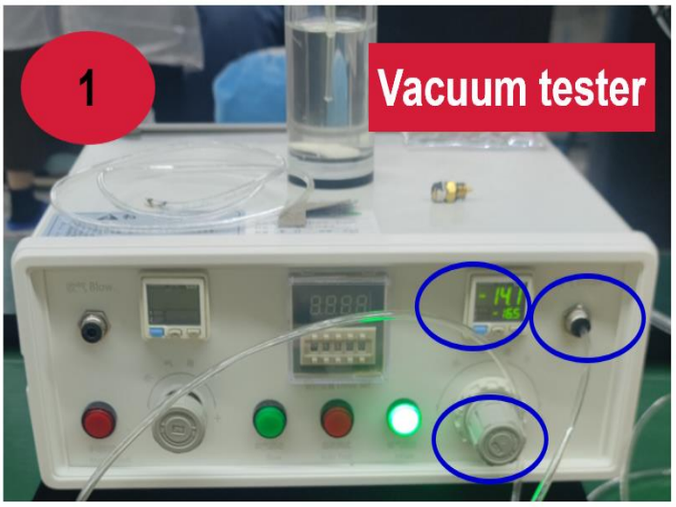

The green side of the infrared camera lens is on the outside


Ensure the camera lens is free of lint or white spots




Apply 10 ± 0.1 kgf of pressure for 12 seconds

19. Perform air leakage test on the finished phone.





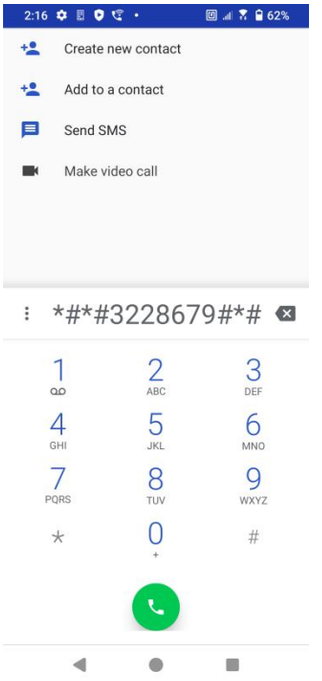


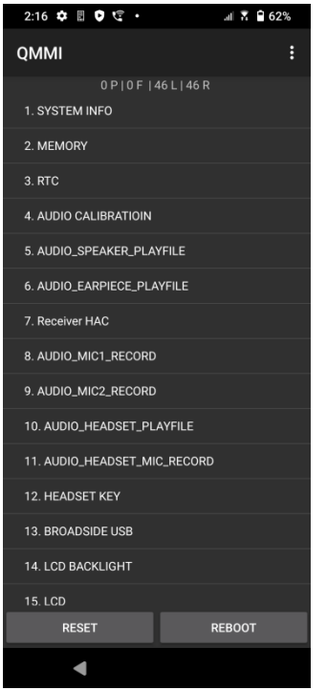
1. Set vacuum tester to: –14 kPa to –16 kPa
2. Seal mic1 & mic2 using masking Selecte (see pic 2 & 3)
3. Block flashlight lens with plasticine and connect air tube (see pic 4)
4. Start vacuum test:

# 6.0 X800 QMMI Testing Guide

## 1. Enter QMMI Test Mode

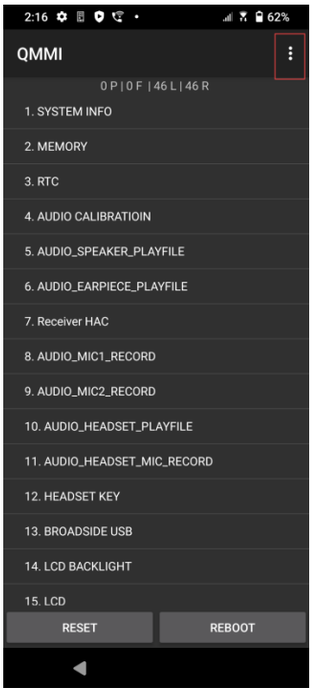
"Power on the device, Select the phone icon, and dial ##3228679## to enter MMI test mode. The screen will show the single test list, 'RESET' button, and 'REBOOT' button."

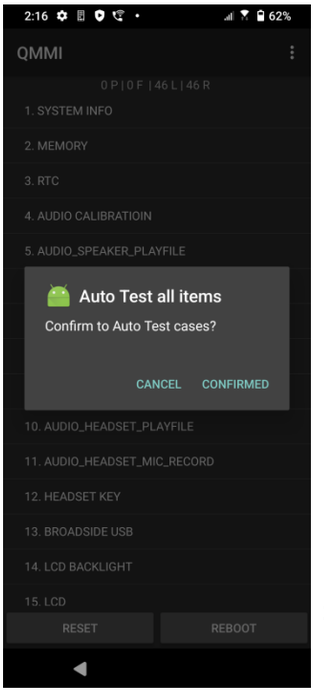




## 2. Auto Test

"Select the three-dot icon (top right), then select 'Auto Test all test'. In the pop-up, Select 'CONFIRMED' to view the auto test list, or 'CANCEL' to close it."

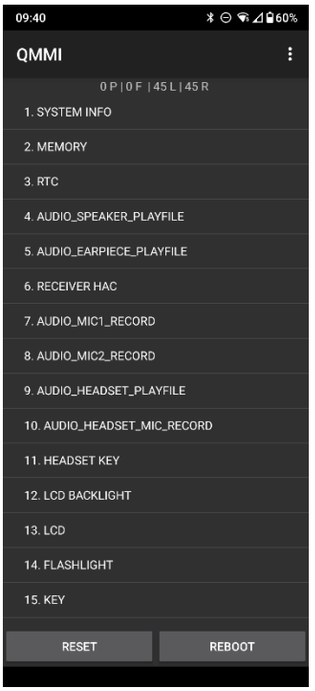


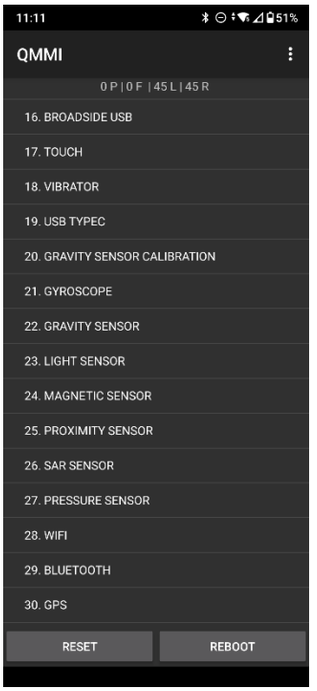



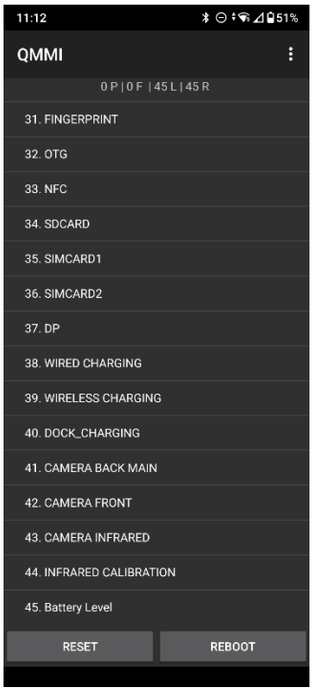
•EFUSE Status: Enabled

## 3. Single test

The single test includes 45 items.



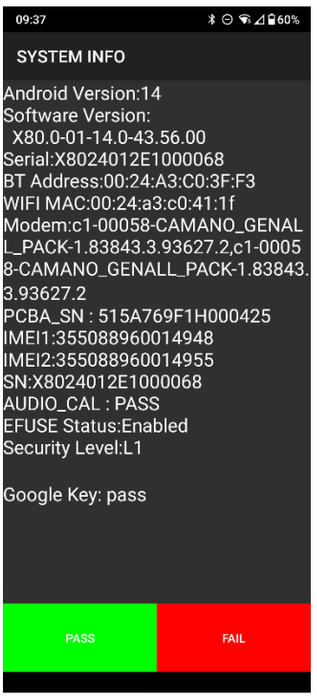




## •3.1 SYSTEM INFO

Select 'SYSTEM INFO' and verify that all displayed information matches the phone. If the following three items are in their correct states, the test is PASS; otherwise, it is FAIL.“

EFUSE Status: Enabled
Security Level: L1
Google Key: Pass

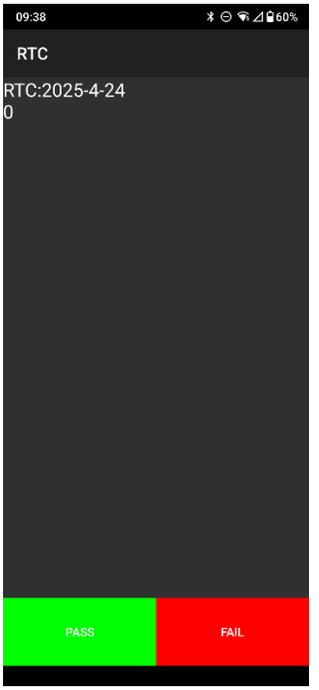


## 3.2MEMORY

Select 'MEMORY' to view device memory info. If displayed correctly, the test is “PASS”; otherwise, it’s “FAIL.”


## 3.3 RTC

Select “RTC” to enter the test interface, it displays the current date and automatically count down by 3 seconds, the test is PASS, otherwise it is FAIL.

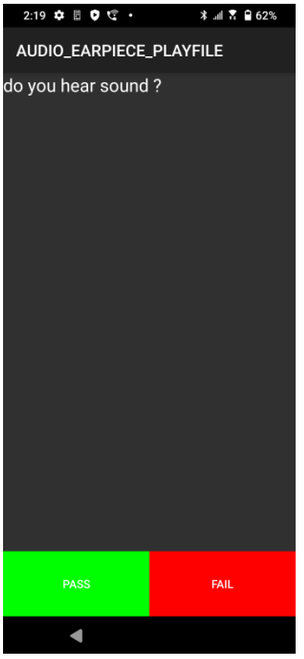


## 3.4 AUDIO_SPEAKER_PLAYFILE

Select 'AUDIO_PEAKDER_PLAYFILE'. Without a headset, if the speaker plays clear ringtones, the test is “PASS”; otherwise, it’s “FAIL”

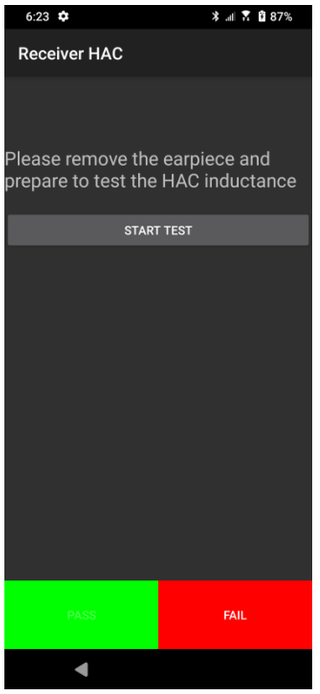

## 3.5 AUDIO_EARPIECE_PLAYFILE

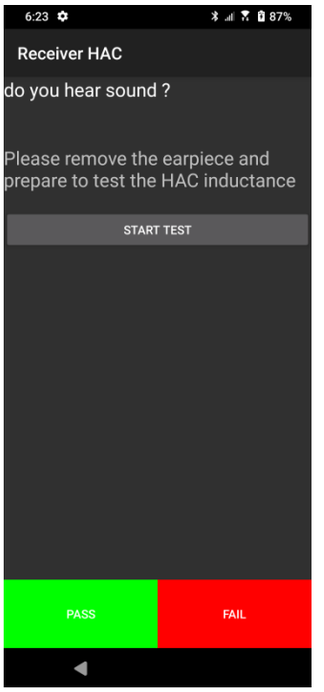
Select 'AUDIO_EARPIECE_PLAYFILE'. Without a headset, if the earpiece plays clear ringtones, the test is “PASS”; otherwise, it’s “FAIL”



## 3.6 Receiver HAC

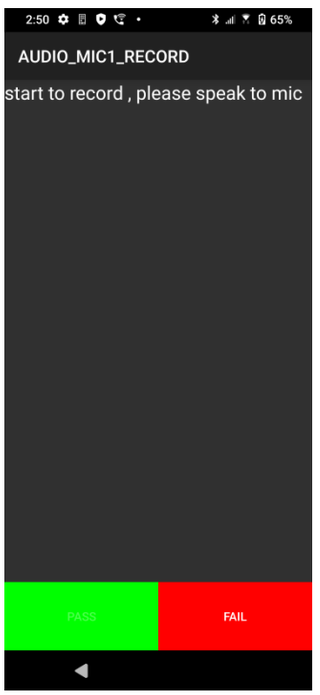
Select “Receiver HAC” to enter the test interface, Select START, place the receiving device with HAC function near the earpiece, and if the device can hear the music played by the earpiece, the test is PASS, otherwise it is FAIL.

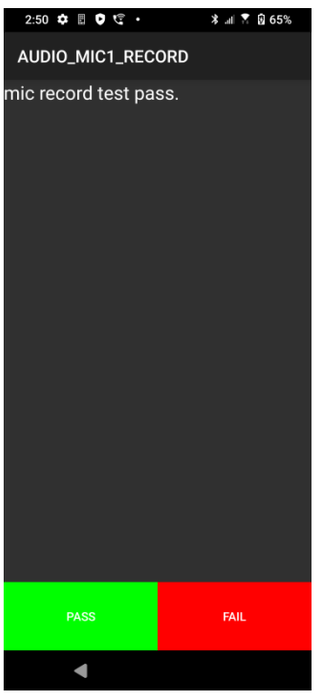



## 3.7 AUDIO_MIC1_RECORD

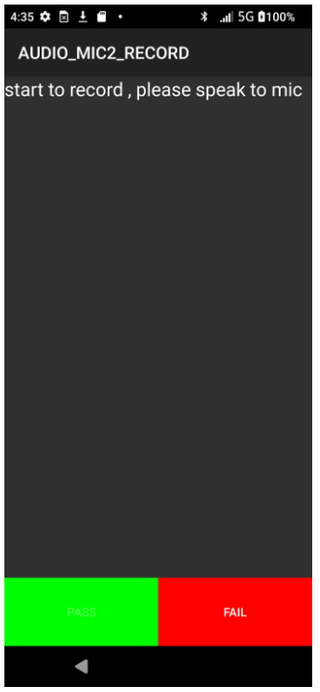
Select “AUDIO_MIC1_RECORD” to enter the test interface, speak into the mic1 at the bottom of the phone, if you hear the recording, the test is PASS, otherwise it is FAIL.



## 3.8 AUDIO_MIC2_RECORD

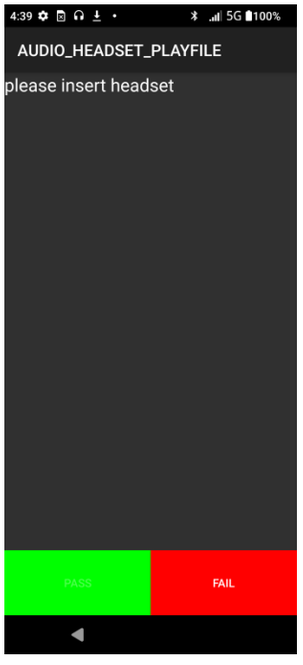
Select 'AUDIO_MIC2_RECORD' and speak into the top mic (Mic2). If playback is audible, the test is “PASS”; otherwise, it’s “FAIL”

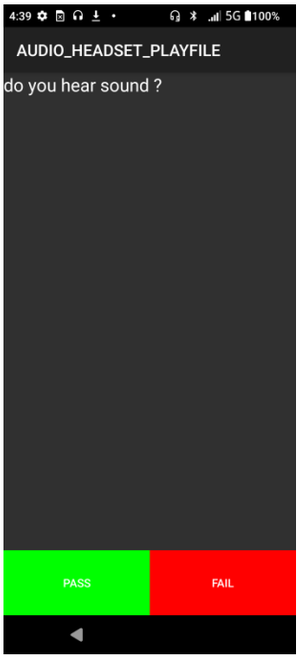




## 3.9 AUDIO_HEADSET_PLAYFILE

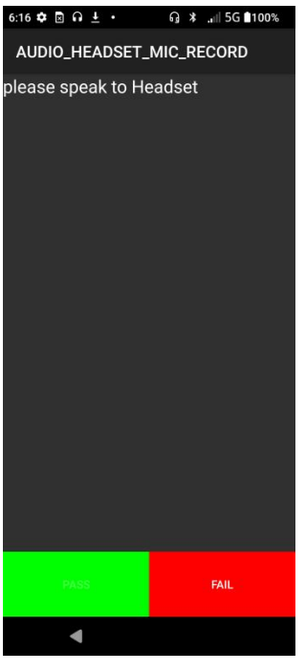
Select 'AUDIO_HEADSET_PLAYFILE'. Plug the headset into the USB port. If sound plays through the headphones, the test is “PASS”; otherwise, it’s “FAIL”.



## 3.10 AUDIO_HEADSET_MIC_RECORD

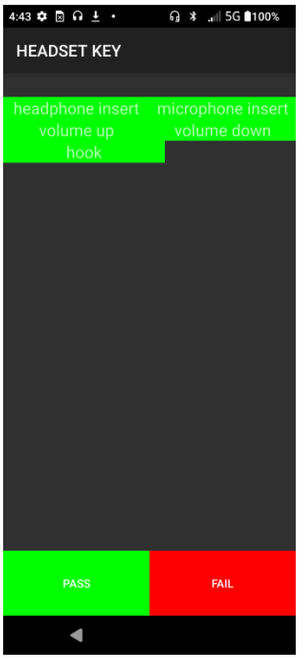
Select 'AUDIO_HEADSET_MIC_RECORD'. Insert the headset and speak into its mic. If playback is heard through the headphones, the test is “PASS”; otherwise, it’s “FAIL."



## 3.11 HEADSET KEY

Select “HEADSET KEY” to enter the test interface, insert the headset, then press the volume and hook key on the headphones, the corresponding button item background turn green. If all test items turn green, the test is "PASS", otherwise it is "FAIL. "
Note: Please do not Select the volume button and power button of the phone during the test, because the phone button will also turn the test item green.

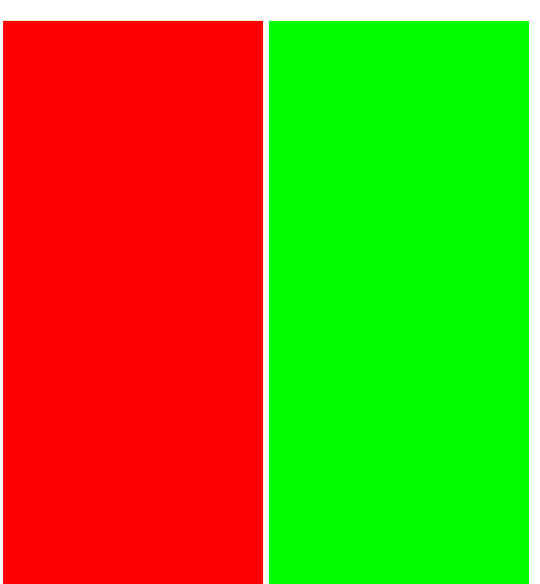



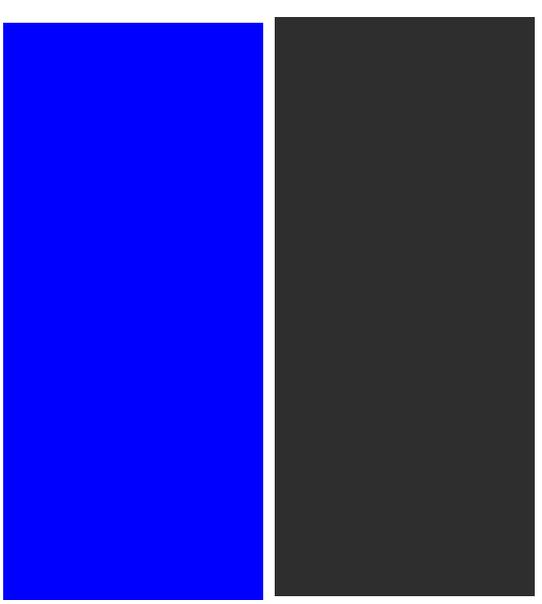
## 3.12 LCD BACKLIGHT

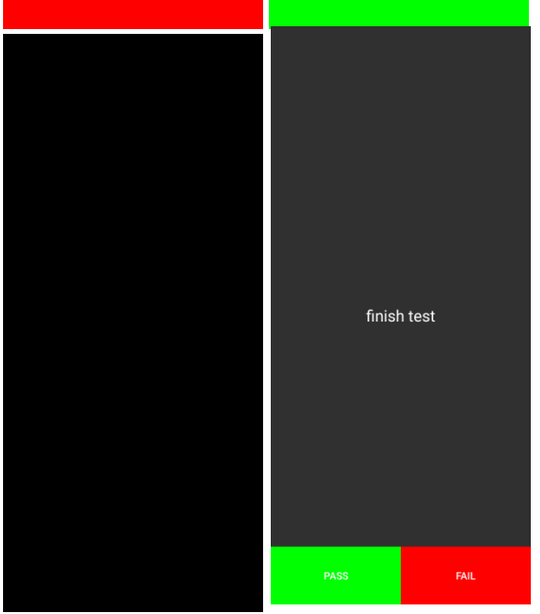
Select 'LCD BACKLIGHT'. If the screen backlight shifts from bright to dim, the test is “PASS”; otherwise, it’s “FAIL”.


## 3.13 LCD

Select “LCD” to enter the test interface, the screen will display red, green, white, blue, gray and black images, if all colors appear normal and there are no watermarks, light spots, the test is "PASS", otherwise it is "FAIL"

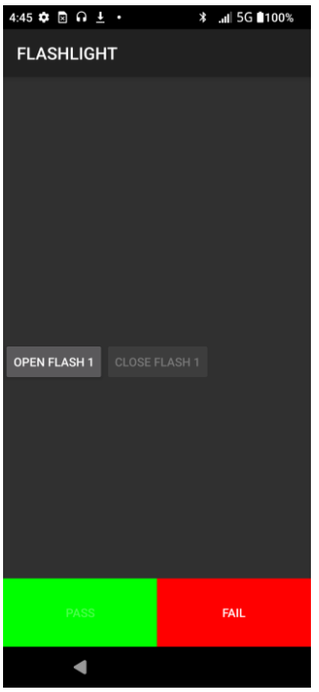






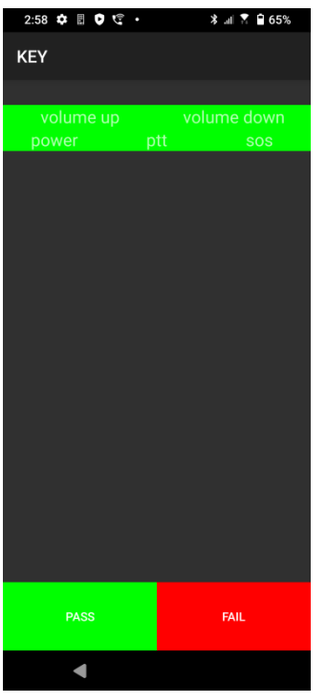
## 3.14 FLASHLIGHT

Select 'FLASHLIGHT'. Toggle the buttons—if the flash turns on and off normally, the test is “PASS”; otherwise, it’s “FAIL”



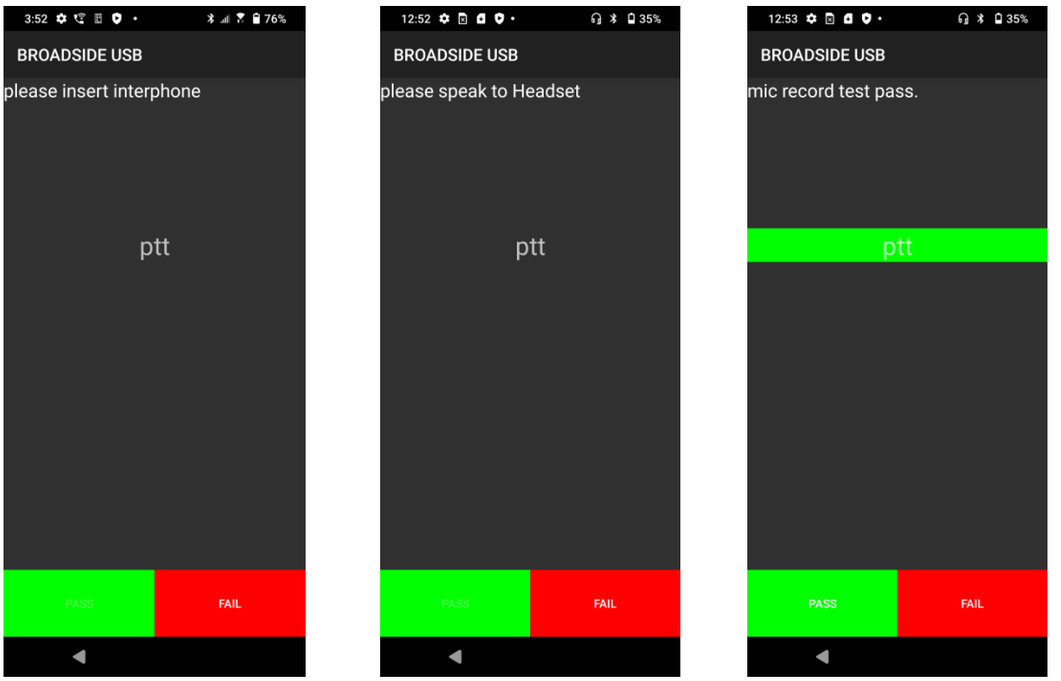

## 3.15 KEY

Select 'KEY'. Press the volume up, volume down, power, PTT, and SOS keys. If all respond normally, the test is “PASS”; otherwise, it’s “FAIL”

## 3.16 BROADSIDE USB

Select 'BROADSIDE USB'. Connect the interphone and speak into its mic. If sound is heard and the mic test passes, then press the PTT button—if the button background turns green, the test is “PASS”; otherwise, it’s “FAIL”

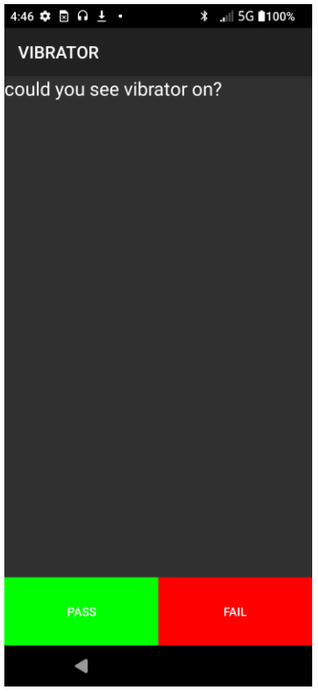



## 3.17 TOUCH

Select 'TOUCH'. Follow the on-screen pattern. If sliding works normally, the test is “PASS”; otherwise, it’s “FAIL”.

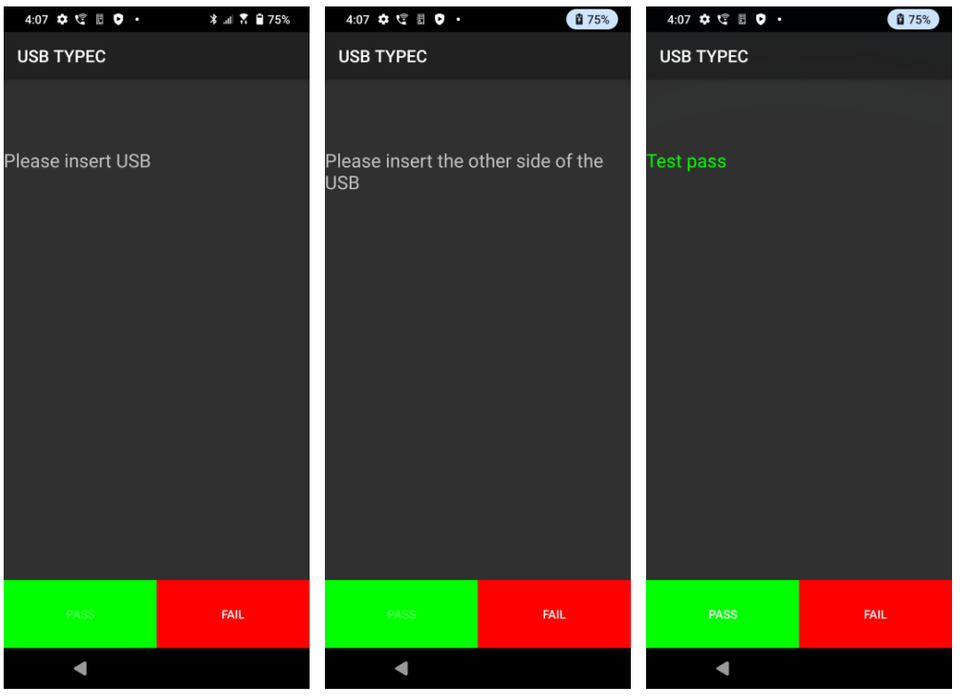
## 3.18 VIBRATOR

Select 'VIBRATOR'. If the phone vibrates, the test is “PASS”; otherwise, it’s “FAIL”



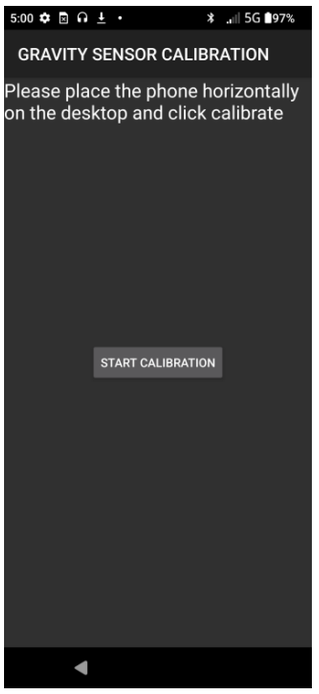

## 3.19 USB TYPEC

Select 'USB TYPEC'. Insert the USB and check both A and B sides. If both are recognized, the test is “PASS”; otherwise, it’s “FAIL”



## 3.20 GRAVITY SENSOR CALIBRATION

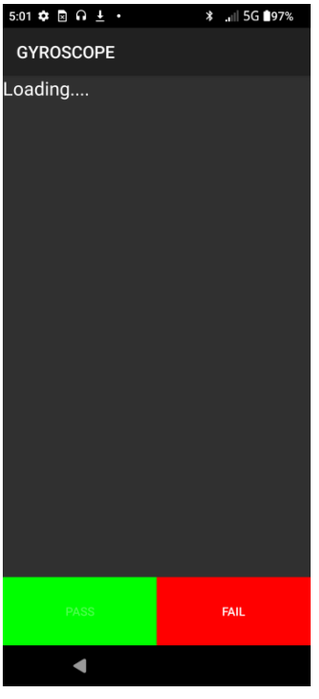
Select 'GRAVITY SENSOR CALIBRATION'. Place the phone flat on a table and Select 'START CALIBRATION'. If the result shows 'PASS'", the test is "PASS"; otherwise, it's "FAIL".

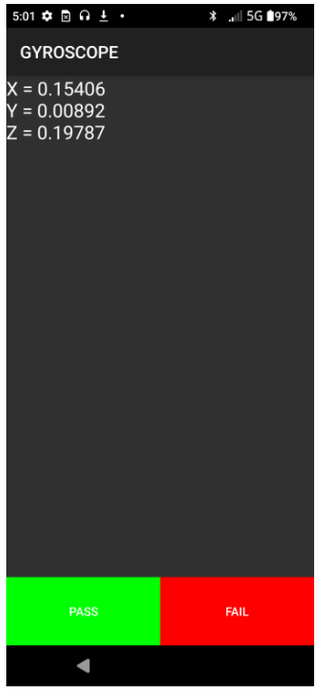




## 3.21 GYROSCOPE

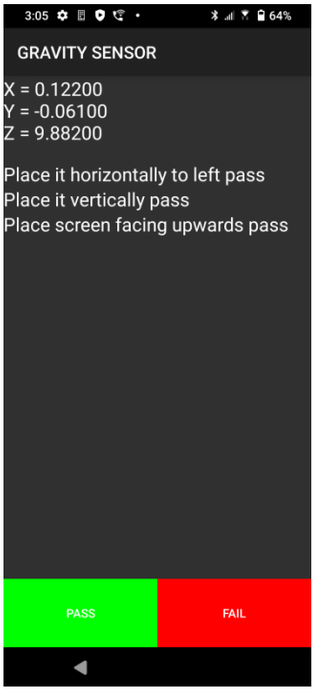
Select 'GYROSCOPE'. Rotate the phone—if the on-screen data responds correctly, the test is "PASS"; otherwise, it's "FAIL"



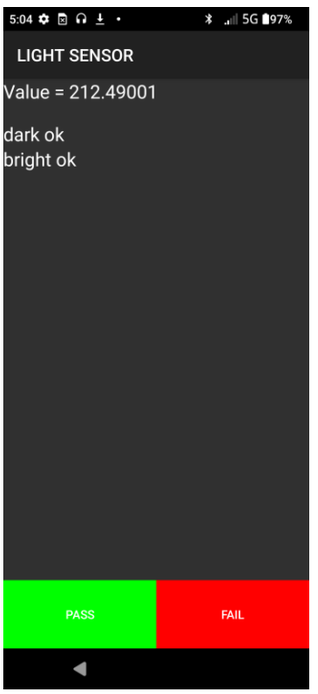
## 3.22 GRAVITY SENSOR

Select 'GRAVITY SENSOR'. Rotate the phone vertically, horizontally, and to the left side. If the on-screen data updates correctly, the test is “PASS”; otherwise, it’s “FAIL”.



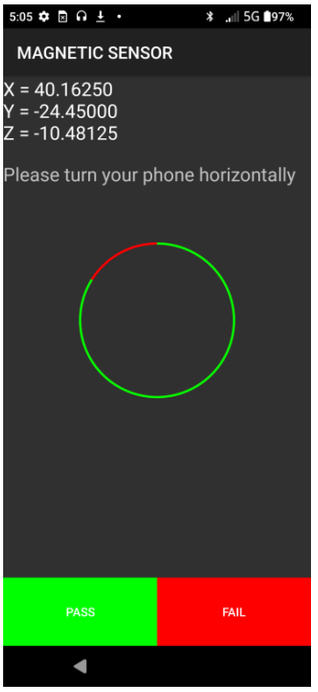

## 3.23 LIGHT SENSOR

Select 'LIGHT SENSOR'. Cover the top sensor with your hand—if 'dark' changes to 'ok', and shine a flashlight on it—if 'bright' changes to 'ok', the test is “PASS”; otherwise, it’s “FAIL”.

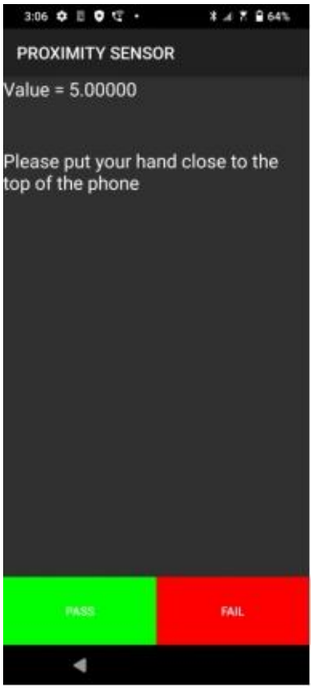
## 3.24 MAGNETIC SENSOR

Select 'MAGNETIC SENSOR'. Rotate the phone 360°. If the on-screen data updates correctly, the test is “PASS”; otherwise, it’s “FAIL”.



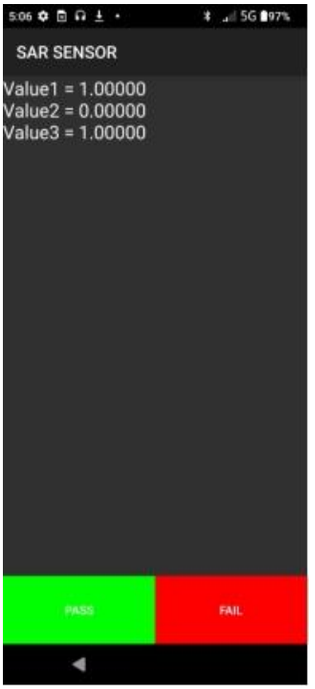

## 3.25 PROXIMITY SENSOR

Select 'PROXIMITY SENSOR'. Move your hand near and away from the top sensor. If the screen data updates correctly, the test is “PASS”; otherwise, it’s “FAIL”.



## 3.26 SAR SENSOR

Select 'SAR SENSOR'. Touch each test point (upper left, upper right, and lower right on the back). If values change on the screen, the test is “PASS”; otherwise, it’s “FAIL”.

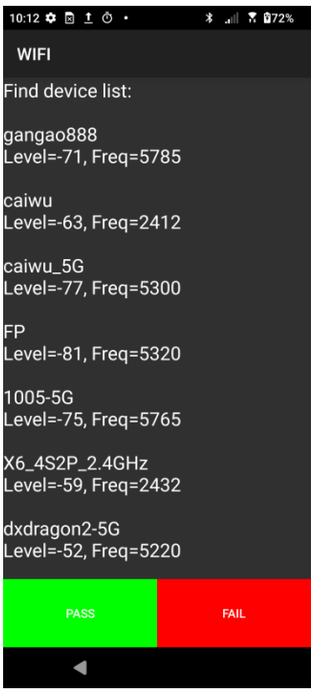



## 3.27 PERSSURE SENSOR

Select 'PRESSURE SENSOR'. If pressure data displays correctly, the test is “PASS”; otherwise, it’s “FAIL”.

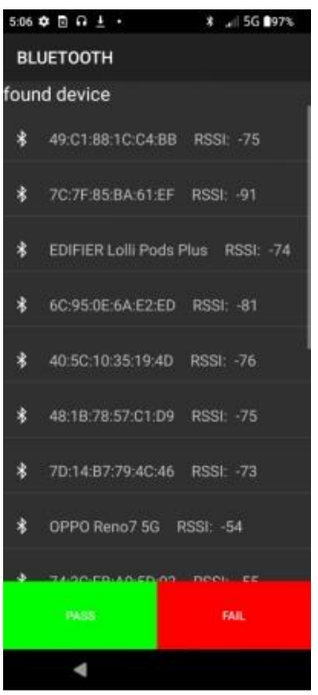
## 3.28 WIFI

Select 'WIFI'. If WiFi hotspot info appears and both 2.4GHz and 5GHz networks are detected, the test is “PASS”; otherwise, it’s “FAIL”



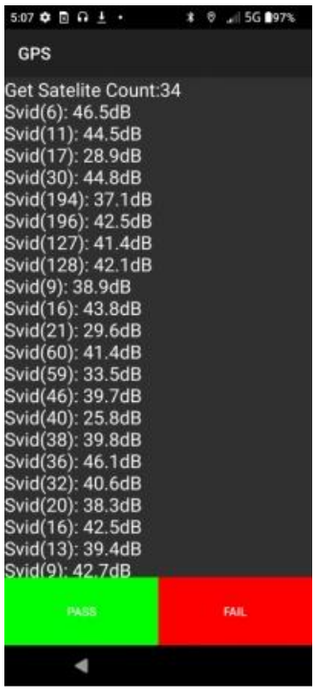

## 3.29 BLUETOOTH

Select “BLUETOOTH” to enter the test interface, if all available Bluetooth device information is displayed on the screen， the test is PASS, otherwise it is FAIL.



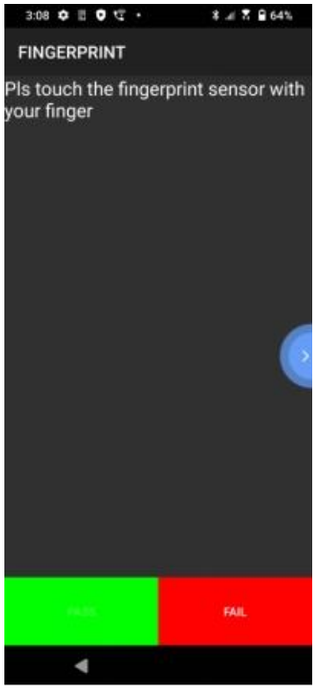
## 3.30 GPS

Select 'GPS'. In a location with strong signal, if satellite strength is above 36 and more than 3 satellites are found, the test is “PASS”; otherwise, it’s “FAIL”.



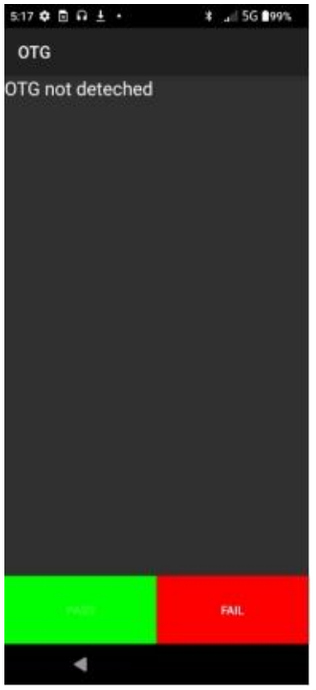

## 3.31 FINGERPRINT

Select ‘”FINGERPRINT”’. Touch the sensor—if fingerprint recognition is successful, the test is “PASS”; otherwise, it’s “FAIL”.




## 3.32 OTG

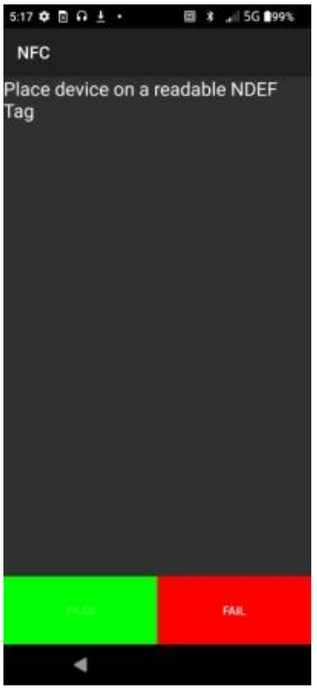
Select “OTG” to enter the test interface, connect OTG cable and external storage device (such as USB flash drive/card reader), use A-side and B-side of the OTG to connect the phone separately. If A and B sides can detect OTG, the screen displays “OTG deteched” and the “Cc status” displays “1” or “2”, The test is PASS. Otherwise, it is FAIL.

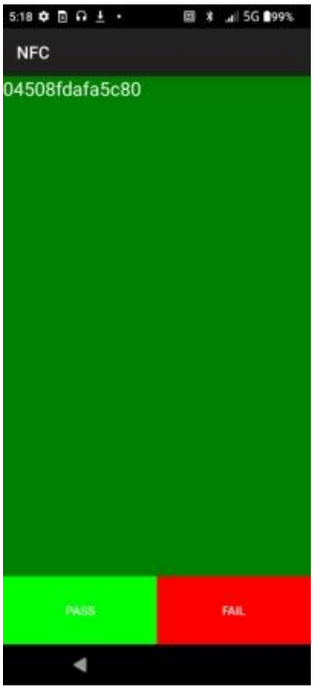





## 3.33 NFC

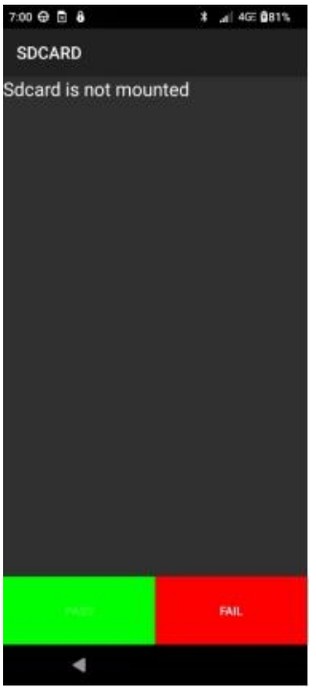
Select “NFC”. Place the test card on the back of the phone—if the card is detected and info appears on-screen, the test is “PASS”; otherwise, it’s “FAIL”.



## 3.34 SDCARD

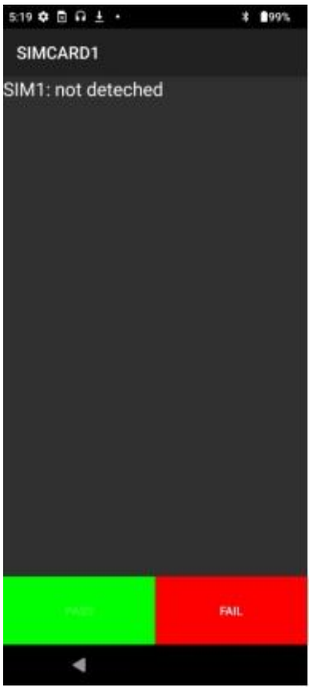
Select “SDCARD” to enter the test interface. Insert the SD card into the phone, if SD card is detected and the screen display the information of the SD card, the test is PASS. Otherwise, it is FAIL and the screen display “Sdcard is not mounted”.





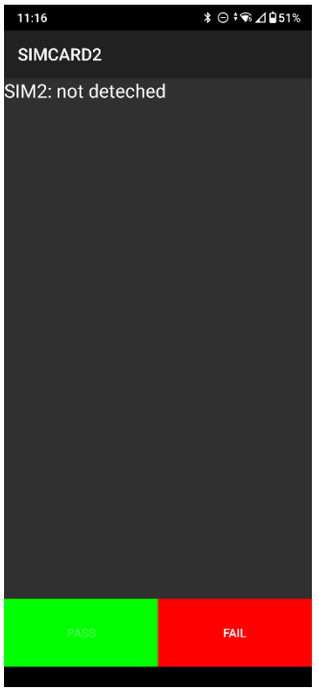
## 3.35 SIMCARD1

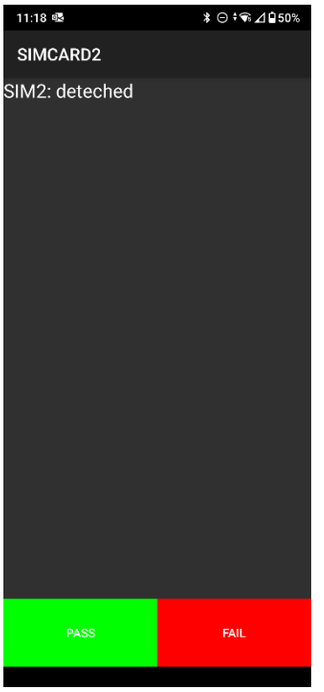
Select ”SIMCARD1” and insert a SIM card. If it's detected, the test is “PASS”; if not, “SIM1: not detected” appears and the test is “FAIL”




## 3.36 SIMCARD2

Select “SIMCARD2” to enter the test interface, insert the SIM card into the phone, if the SIM card is detected to be successful, the test is PASS. Otherwise, it is FAIL and the screen display “SIM2: not deteched”.



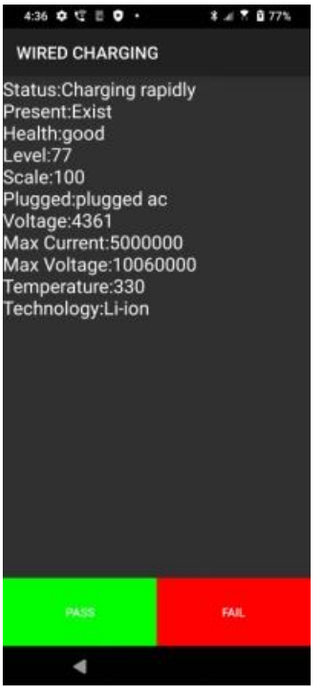




## 3.37 DP

Select “DP”. Connect the phone to an external device via HDMI cable. If the phone screen displays on the external device, the test is “PASS”; otherwise, it’s “FAIL”

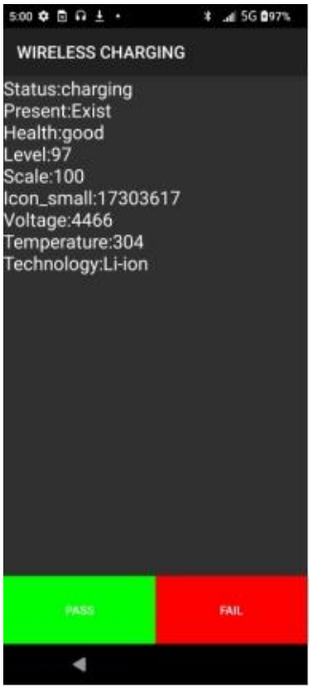

## 3.38 WIRED CHARGING

Select “WIRED CHARGING”. Connect a Type-C USB—if “Charging quickly” appears (power >15W), the test is “PASS”; otherwise, it’s “FAIL”.



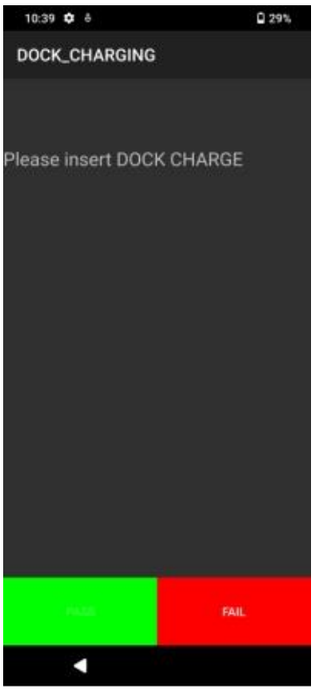

## 3.39 WIRELESS CHARGING

Select “WIRELESS CHARGING”. Place the phone on a wireless charger—if charging works and battery info displays correctly, the test is “PASS”; otherwise, it’s “FAIL”.

## 3.40 DOCK_CHARGING

Select “DOCK_CHARGING”. If the phone charges properly via the dock, the test is “PASS”; otherwise, it’s “FAIL”.

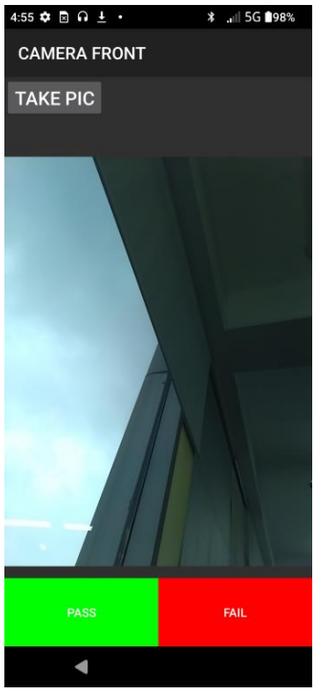




## 3.41 CAMERA BACK MAIN

Select “CAMERA BACK MAIN” and select “TAKE PIC”. If the main rear camera captures a photo, the test is “PASS”; otherwise, it’s “FAIL”.

## 3.42 CAMERA FRONT

Select “CAMERA FRONT” and select “TAKE PIC”. If the front camera takes a photo, the test is “PASS”; otherwise, it’s “FAIL”.

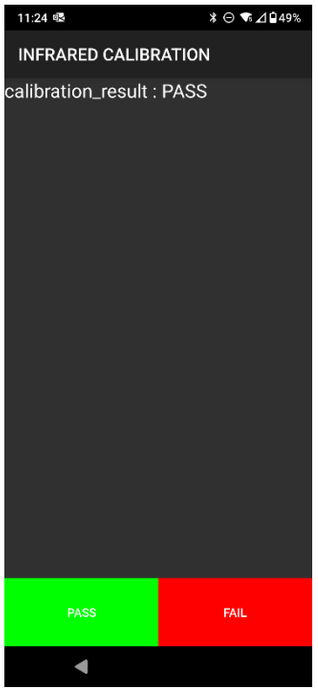



## 3.43 CAMERA INFRARED

Select “CAMERA INFRARED” to test the infrared camera. If it turns on and functions correctly, the test is “PASS”. Select the return icon to go back to the “PASS/FAIL” screen. Otherwise, it’s “FAIL”.

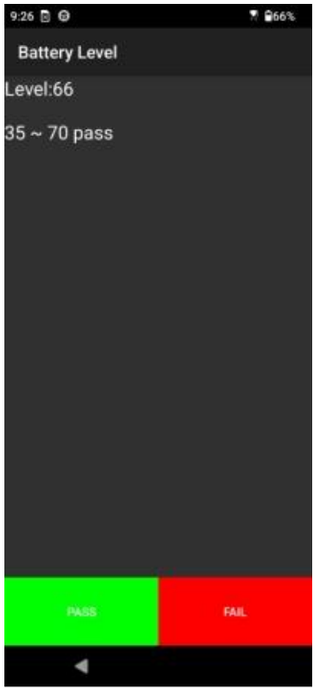

## 3.44 INFRARED CALIBRATION

Select "INFRARED CALIBRATION". If the phone completes the calibration automatically, the test is "PASS"; otherwise, it's "FAIL".



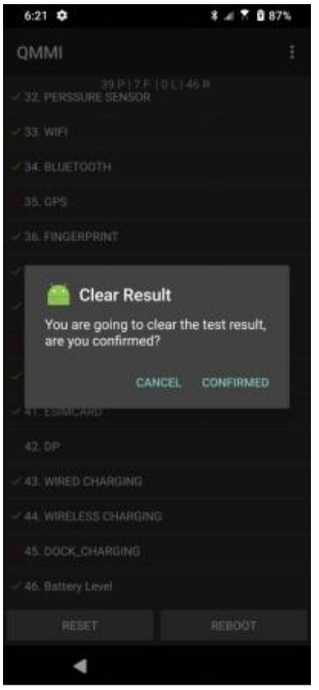

## 3.45 Battery Level

Select "Battery Level". If the battery is between 35% and 70%, the test is "PASS"; otherwise, it's "FAIL".



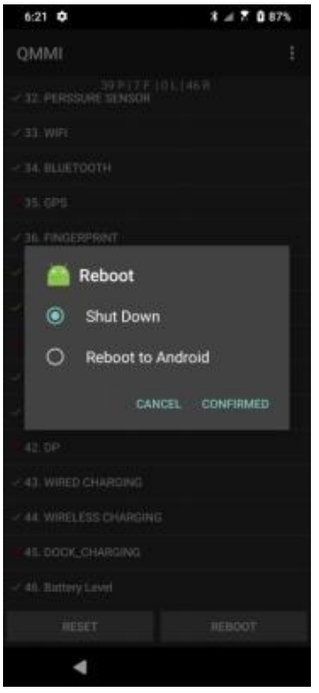
## 4.RESET

Select “RESET”. In the 'Clear Result' pop-up, select “CONFIRMED” to clear test results or “CANCEL” to close the box.




## 5.REBOOT

Select “REBOOT”. In the pop-up, select “Shut Down” or “Reboot to Android”, then select “CONFIRMED”. To exit without action, select ”CANCEL”.

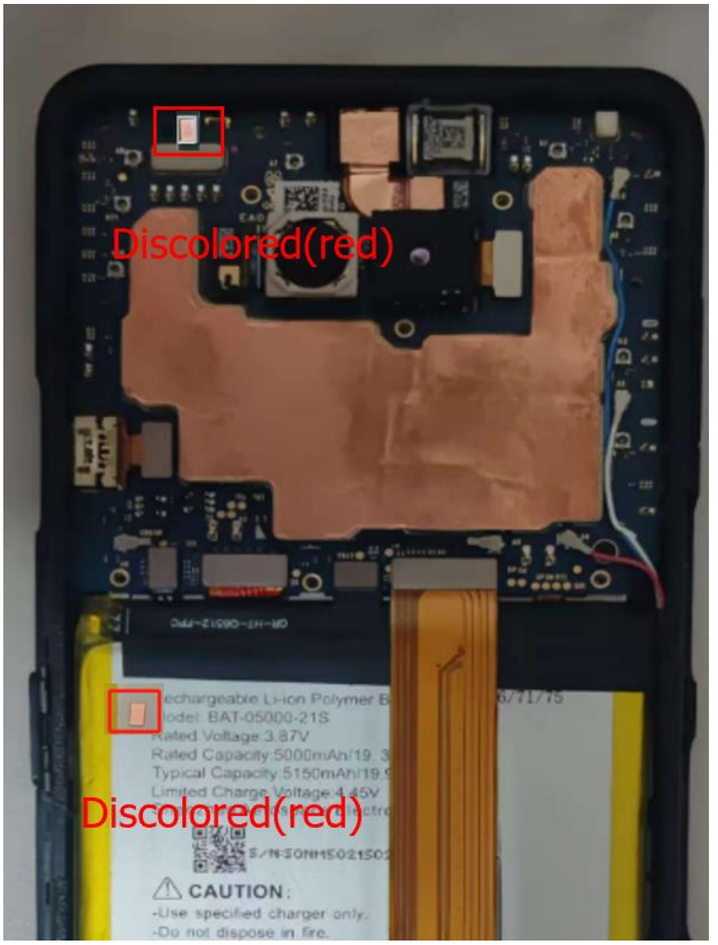


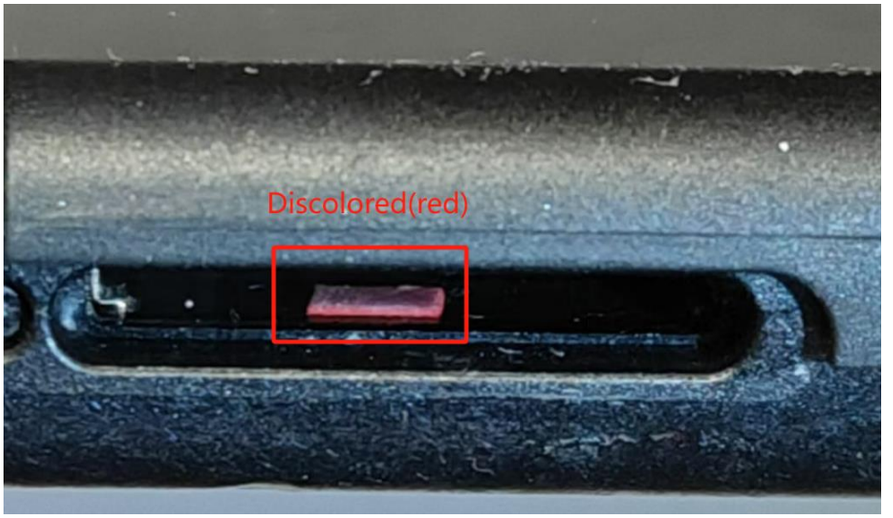
## 7.0 TROUBLE SHOOTING

Confirm white LDI is present :


## 7.0 TROUBLE SHOOTING

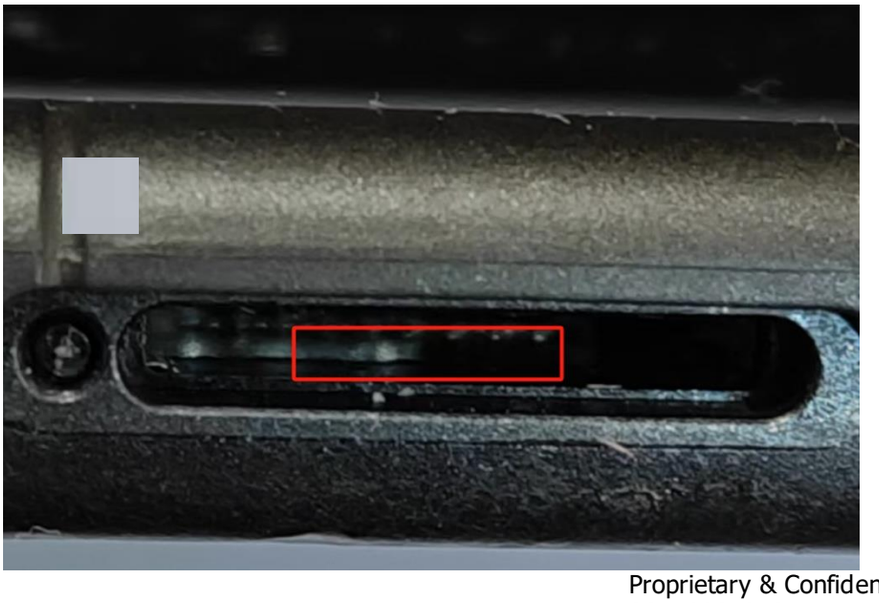
Fail – LDI tripped (red) due to water ingress



## 7.0 TROUBLE SHOOTING

Fail – LDI missing at Battery, SIM card cavity, or PCBA board.

# Noted

1.For liquid-damaged phones, disassemble and thoroughly dry the PCBA and casing before inspection to avoid further damage to the PCBA or screen.

2.Customers may not report water damage. If liquid residue, mold on the PCBA, or red water-proofing labels are found after disassembly, take photos immediately to avoid disputes.

3.Before disassembly, check whether the phone has been previously opened or repaired.

4.During maintenance, inspect all waterproof indicators to ensure they are intact and not discolored.

5.Normal waterproof labels are white. Red or severely discolored labels indicate significant or prolonged water exposure