MS653 4G Smartphone

Service and Repair Manual



Manufacturer	MAXCOM S.A., ul. Towarowa 23a, 43-100 Tychy, Poland
Brand / Model	MAXCOM / MS653
Product type	4G smartphone
Hardware version	L6213-MB-V1.0
Document revision	Rev. 1.1, 2026-11-04

1. Important Information

This manual describes disassembly, part replacement and reassembly of the MS653. It is intended for professional repairers, end-users carrying out simple repairs, and recycling operators.

Work described in sections 6.1 and 6.2 (battery cover and battery) can be carried out by the end-user without tools or with a plastic pry tool. Work that requires opening the housing, soldering or handling the main board should be carried out by a qualified technician.

MAXCOM S.A. is not liable for damage, injury or loss of function caused by repairs that do not follow the instructions in this manual. Use only original or equivalent spare parts.

2. About This Document

2.1 Scope

Covered:

- Safe disassembly and reassembly procedures
- Replacement of the battery, battery cover and internal modules
- Basic functional test and visual inspection
- Software (factory) reset and hardware test mode
- List of spare parts

Not covered:

- Advanced electrical diagnostics (component-level measurements)
- Firmware flashing and software-level repair

2.2 Target Audience

- Professional repairers: qualified technicians in the repair industry.
- End-users: battery and battery cover replacement (sections 6.1, 6.2 and 7.3).
- Recycling operators: staff who need to safely remove the battery and separate components.

2.3 Document Structure

- 3. General Precautions
- 4. Required Tools and Materials
- 5. Power On / Power Off
- 6. Disassembly
- 7. Reassembly
- 8. Software Reset
- 9. Hardware Test Mode
- 10. Spare Parts List
- Appendix A: Block Diagram

3. General Precautions

Read all precautions in this section before starting any repair work.

3.1 Safety Precautions Before Repair

CAUTION

Opening or repairing the device may lead to electric shock, device damage, fire or personal injury.

- Power off the device and disconnect the charger, USB cable and charging dock before disassembly.
- Keep the work surface clean and free of debris to avoid contamination of internal components.
- Wear an anti-static wrist strap connected to a grounded ESD-safe mat.
- Wear safety goggles and gloves. Use a face shield when using a hot air gun or soldering station.
- Work in a dry, well-ventilated area free of flammable materials.
- Do not damage cables or components during disassembly. Replace any damaged part with a new one.
- After reassembly, make sure no screws or foreign objects remain inside the device.

3.2 Glass Handling

CAUTION

Broken display glass may cause cuts and may damage internal parts.

- Wear safety gloves and goggles when handling broken glass.
- Place the damaged glass part into the spare part packaging immediately after replacement.

3.3 Battery Safety

The MS653 uses a removable Li-ion battery, 3.85 V, 4000 mAh (part LZT-T605-4000).

CAUTION

- Discharge the battery before starting repair work.
- Do not touch the battery contacts with metal tools. Do not short-circuit the battery.
- Do not bend, dent or puncture the battery and do not pry open the battery casing.
- Place a removed battery into insulating packaging immediately.
- Stop work if the battery is swollen, cracked, hot or smells unusual. Do not force removal; contact the service centre.
- If the battery vents (leakage, smoke), cover it with sand or move it to a fire-resistant container using insulated gloves and pliers.
- Do not dispose of batteries with household waste. Hand them over to a battery collection point in line with local regulations.

3.4 Tools

CAUTION

Use the specified tools for all repair work. Wrong tools can cause personal injury, tool damage or damage to the device and spare parts.

4. Required Tools and Materials

Tool	Picture	Description	Purpose
Safety goggles		Eye protection	Protect eyes during repair
Safety gloves		Cut-resistant / insulating gloves	Protect hands during repair
Safety face shield		Face protection	Protect face during hot air and soldering work
Tweezers		ESD-safe, fine tip	Handle connectors, cables and small components
Anti-static wrist strap		With grounding cable	Prevent electrostatic discharge damage
ESD-safe mat		Grounded work mat	Prevent electrostatic discharge damage
Hot air gun		Adjustable temperature	Soften adhesive layers of modules
Cross-head screwdriver		Cross-head bit for M1.4 screws	Remove and fit housing and board screws
Pry pick		Plastic, triangular	Open battery cover and housing clips
Soldering station		Temperature-controlled, 320–350 °C	Solder / desolder earpiece and SOS key
Pry bar		Plastic spudger	Open connector latches, separate main board

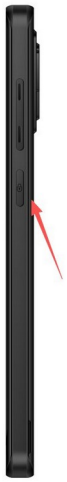
Materials: anhydrous ethanol (≥ 99 %), lint-free cloth, replacement adhesive tapes and foams (see section 10).

5. Power On / Power Off

Power off the device before any repair work. After reassembly, power the device on and check that it works correctly.

5.1 Power On

Press and hold the power key until the display lights up.



5.2 Screen On / Off

When the device is on, short-press the power key to turn the screen on or off.

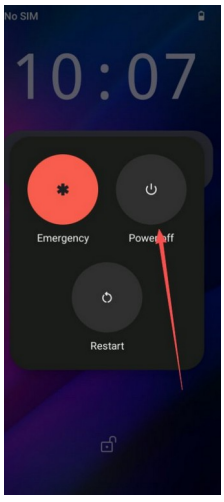
5.3 Unlock the Device

After waking the screen, swipe up on the touchscreen to unlock.



5.4 Power Off

Unlock the device, press and hold the power key, then tap Power off.



6. Disassembly

Preparation

- Back up all user data before disassembly.
- Power off the device and disconnect all power sources (charger, USB cable, charging dock).
- Wear safety goggles and gloves; use a face shield for hot air and soldering work.
- Wear an anti-static wrist strap connected to a grounded ESD mat.

Disassembly order: battery cover (6.1) → battery (6.2) → rear housing (6.3) → front housing / main board (6.4, 6.5) → USB sub-board (6.6).

6.1 Remove Battery Cover

6.1.1 Purpose

The battery cover protects the battery, SIM / memory card slots and internal modules. Remove it to access the battery and all internal parts.

6.1.2 Required Tools

Tool	Function
Pry pick	Insert into the gap between battery cover and chassis to release the snap fits

6.1.3 Safety Precautions

Wear an anti-static wrist strap, safety gloves and goggles, and work in an ESD-protected area free of flammable materials.

6.1.4 Pre-Removal Check

Confirm the device is powered off.

6.1.5 Procedure

1. Locate the opening notch at the bottom-right corner where the battery cover meets the chassis.



2. Insert the tip of the pry pick approx. 2 mm into the notch. Slide the tool slowly along the edge to release all snap fits around the cover.



Note: Do not force the cover open; this may crack or deform it.

6.1.6 Post-Removal Inspection

- Check the inside of the device for damage.
- Check the battery cover for cracks, deformation or broken snap fits.

Reassembly: see section 7.3.

6.2 Remove Battery

6.2.1 Purpose

Remove the battery to disconnect power before servicing internal parts, or to replace the battery.

6.2.2 Safety Precautions

- Do not touch the battery contacts with metal tools.
- Do not puncture, compress or bend the battery. A damaged battery may leak, catch fire or explode.
- Do not dispose of used batteries with household waste. Use a battery collection point.
- Wear an anti-static wrist strap, safety gloves and goggles, and work in an ESD-protected area free of flammable materials.

6.2.3 Pre-Removal Check

- Battery cover is removed.
- Device is disconnected from all power sources.

6.2.4 Procedure

1. Locate the battery removal cutout.
2. Lift the battery out using the cutout / grip tab. If needed, use a plastic pry pick as a lever. Do not use metal tools.





6.2.5 Post-Removal Inspection

Check the battery for cuts, dents, bending, swelling or electrolyte leakage. Replace a damaged battery.

Reassembly: see section 7.3.

6.3 Remove Rear Housing Assembly

6.3.1 Purpose

Remove the rear housing to access the main board, speaker, USB sub-board and charging port.

6.3.2 Required Tools

Tool	Function
Pry pick	Release snap fits
Cross-head screwdriver	Remove rear housing screws

6.3.3 Safety Precautions

Wear an anti-static wrist strap, safety gloves and goggles, and work in an ESD-protected area free of flammable materials.

6.3.4 Pre-Removal Check

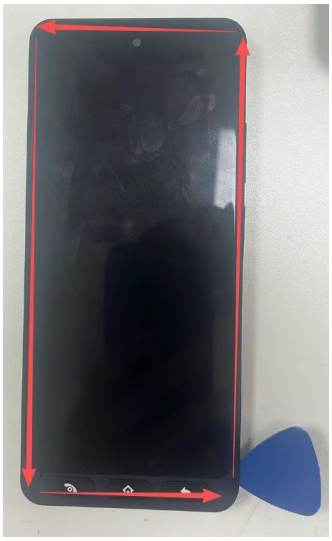
- Battery cover and battery are removed.
- ESD protection is in place.

6.3.5 Procedure

1. Remove the 20 screws securing the rear housing with a cross-head screwdriver.



2. Insert a triangular pry pick into the bottom gap of the rear housing and slide it slowly along the full perimeter to release all snap fits.



3. When all snap fits are released, lift the rear housing carefully.

Note: Count the removed screws and keep them separately so that no screw is left inside the device.

6.3.6 Post-Removal Inspection

- Check that the main board, speaker and charging port are not displaced or damaged.
- Check the rear housing for cracks, broken snap fits or bent edges.

Reassembly: see section 7.1, steps 4–5.

6.4 Front Housing Assembly – Preparation

6.4.1 Purpose

The front housing assembly (with the LCD module) is the base of the device. The main board is removed from it in section 6.5. This gives access to the camera, earpiece, side key FPC, SOS key and sensors.

6.4.2 Required Tools

Tool	Function
Pry bar	Open connector latches, release main board
Tweezers	Handle small components and FPC cables
Soldering station	Desolder earpiece wires and SOS key
Cross-head screwdriver	Remove main board screws

6.4.3 Safety Precautions

- Wear an anti-static wrist strap, safety gloves and goggles, and work in an ESD-protected area free of flammable materials.
- Do not touch main board solder pads, chip pins or FPC contacts with metal tools.
- Set the soldering station to 320–350 °C. Heat a single solder joint for max. 4 s; wait 10 s between heating cycles to avoid lifting copper pads from the main board.
- Place the soldering iron in an insulated stand after use, away from flammable materials.

6.4.4 Pre-Removal Check

- Battery cover, battery and rear housing are removed.
- ESD protection is in place.
- Check the front housing and display for cracks and check the display-to-housing fit.

6.5 Remove Main Board and Front Housing Modules

6.5.1 Purpose

Remove the main board to access or replace the rear camera, front camera, display, microphone, flash LED, light / proximity sensor, earpiece, SOS key and side key FPC.

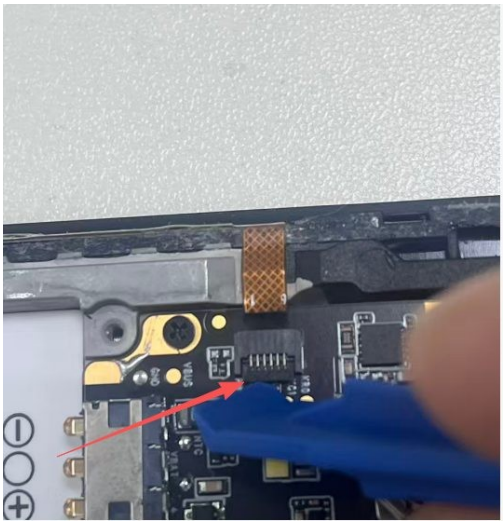
6.5.2 Procedure

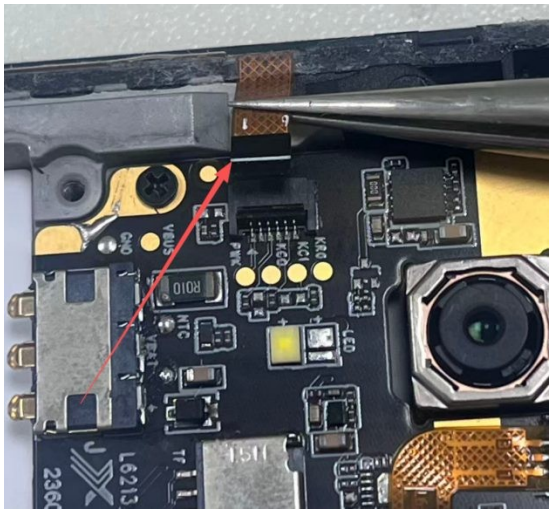
⚠ CAUTION
Steps that involve soldering (earpiece, SOS key) are intended for professional repairers only.

1. Remove the main board screws with a cross-head screwdriver. Screws have different lengths – store them by position.

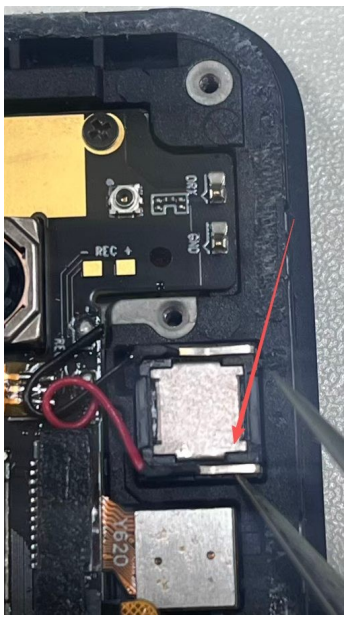


2. Disconnect the side key (volume +/- and power) FPC: open the connector latch with the pry bar, then pull out the FPC with tweezers.



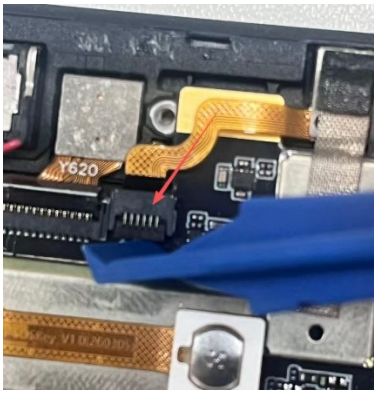


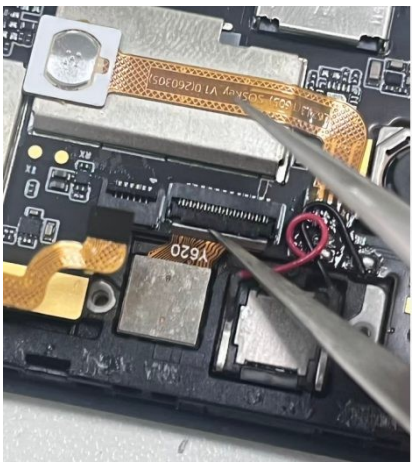
3. Earpiece (wired, soldered to the main board): lift the earpiece out of its seat with tweezers so that the main board can be removed. To replace the earpiece, desolder its two wires.

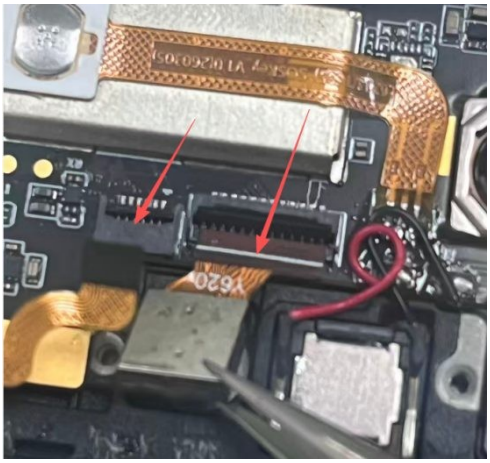


4. Front camera and light sensor: remove the foam tape over the camera connector, disconnect the front camera and light sensor FPC, then remove both modules with tweezers.

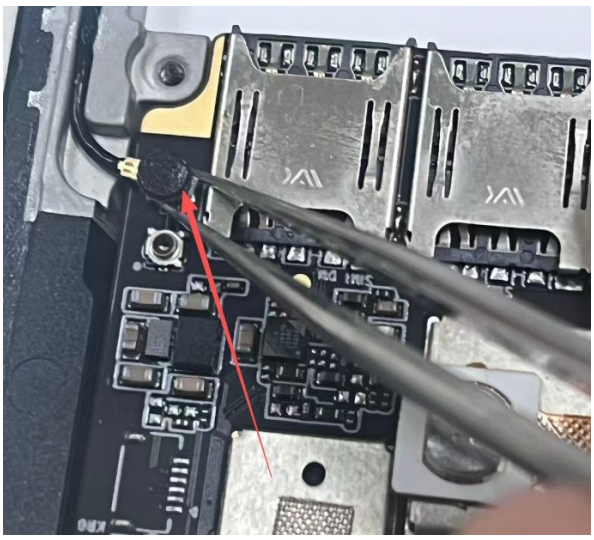






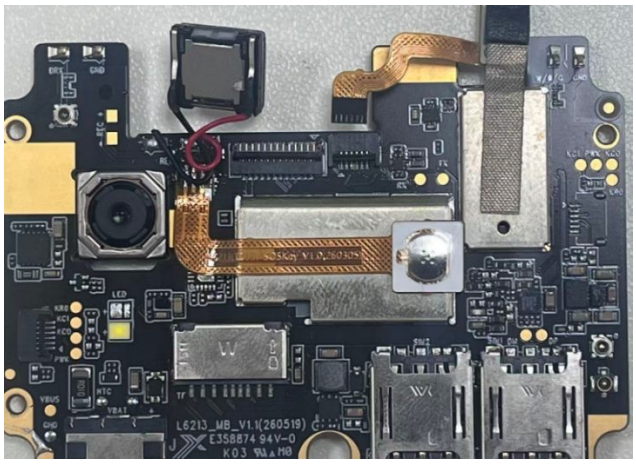


5. Coaxial antenna cable: lift the coaxial connector off its socket with tweezers.



6. Main board: open the latches of the main FPC and LCD FPC connectors with tweezers and disconnect both cables. Lift the main board out.



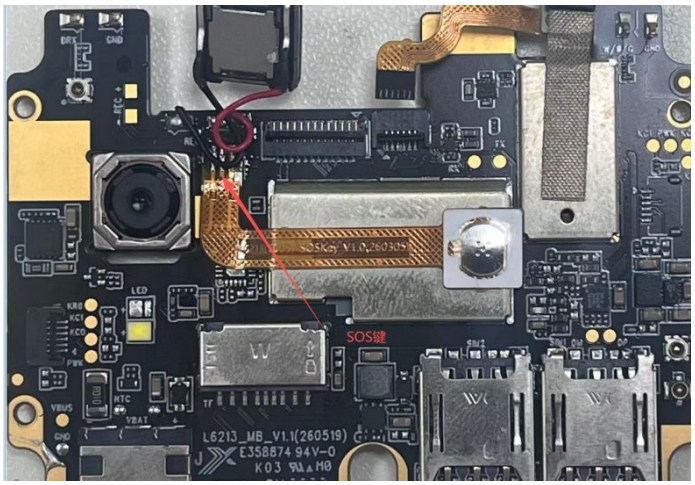




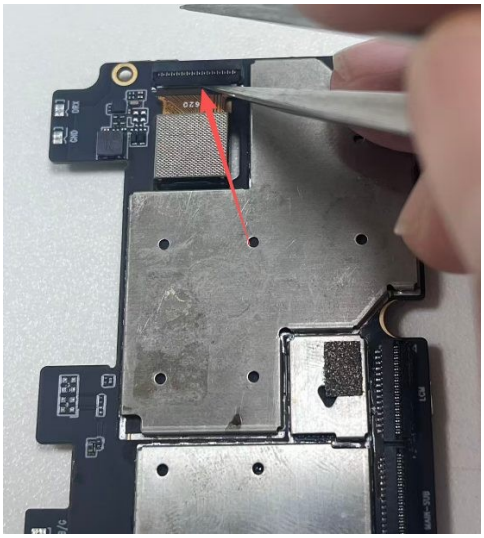
7. Side keys (volume +/- and power): position of the side key FPC.



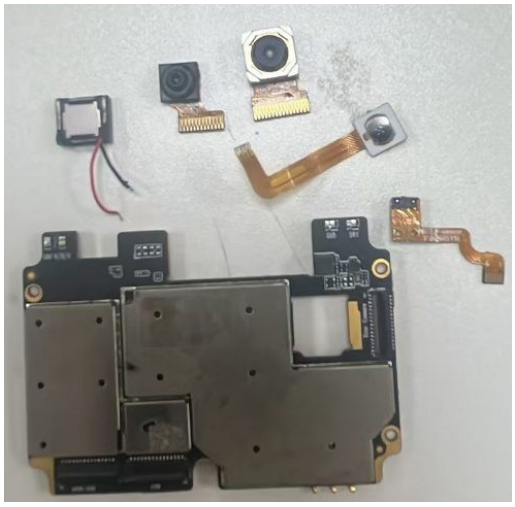
8. SOS key (soldered): desolder with a soldering iron and remove.



9. Rear camera: open the rear camera connector latch with tweezers and remove the camera module.



10. Overview of the removed main board and modules.



11. Remove the light sensor and the light guide.





Important: After repair, make sure the light guide and the light sensor are fully seated. Otherwise the light and proximity sensors will not work.

6.6 Remove USB Sub-Board

6.6.1 Purpose

Remove the USB sub-board to replace the USB Type-C port, vibration motor, main key FPC, speaker module or microphone.

6.6.2 Required Tools

Tool	Function
Tweezers	Separate adhesive layers and handle small components
Cross-head screwdriver	Remove USB sub-board screws

6.6.3 Safety Precautions

- Wear an anti-static wrist strap, safety gloves and goggles, and work in an ESD-protected area free of flammable materials.
- Do not touch solder pads, chip pins or FPC contacts with metal tools.

6.6.4 Pre-Removal Check

- Battery cover, battery and rear housing are removed.
- ESD protection is in place.

6.6.5 Procedure

1. Remove the 2 screws securing the USB sub-board.

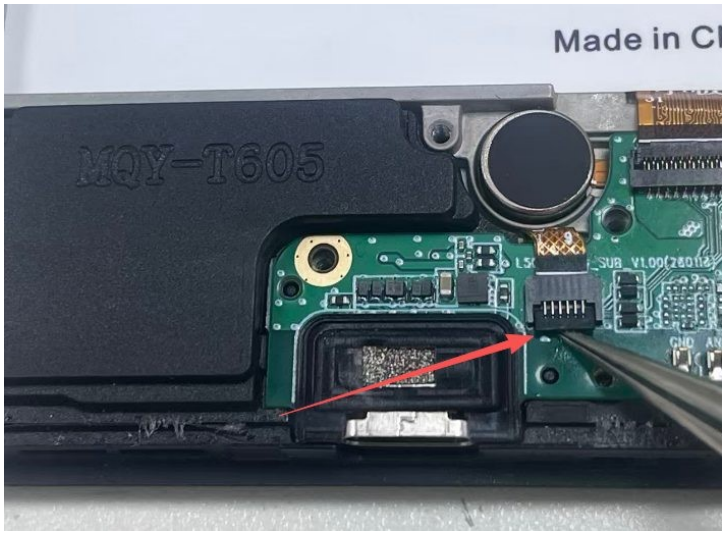


2. Remove the foam tape over the main FPC connector, open the connector latch with tweezers and disconnect the main FPC.



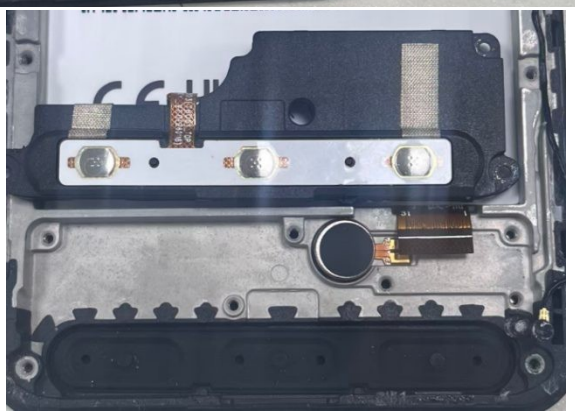


3. Disconnect the main key FPC: open the connector latch with tweezers and pull out the FPC.



4. Remove the USB sub-board together with the speaker module.





Important: When replacing the USB sub-board, make sure the USB Type-C silicone gasket is fitted correctly.

Note: Remove adhesive residue with a lint-free cloth and anhydrous ethanol (≥ 99 %). Do not pull FPC cables vertically – they may tear.

6.6.6 Post-Removal Inspection

- Check the main board for deformation, swollen capacitors, lifted pads, burn marks, cracked chips or bent pins.
- Check camera lenses for scratches, dust or fingerprints and check that the lenses sit firmly.
- Check the display for cracks or leakage.
- Check FPC cables for damage or oxidised contacts.
- Confirm that all adhesive residue is removed.

7. Reassembly

Before Reassembly

- Check the battery compartment and main board area for loose screws, solder debris, adhesive residue or other foreign objects.
- Wear safety goggles and gloves; use a face shield for soldering work.
- Wear an anti-static wrist strap connected to a grounded ESD mat.

After Reassembly

Run the hardware test mode (section 9) and check all components and sensors.

7.1 Reassemble Main Board and Housing

> ⚠ **CAUTION**
>
> This section includes soldering and is intended for professional repairers only.

7.1.1 Purpose

Install the main board into the front housing, connect and fix the camera, display, earpiece, microphone and other modules, and close the housing.

7.1.2 Required Tools

Tool	Function
Tweezers	Handle and position small components
Soldering station	Solder SOS key FPC and earpiece wires
Cross-head screwdriver	Fit main board and housing screws

7.1.3 Safety Precautions

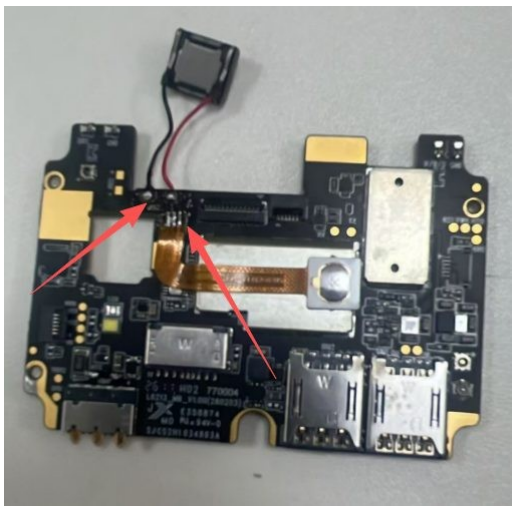
- Wear an anti-static wrist strap, safety gloves and goggles, and work in an ESD-protected area free of flammable materials.
- Do not touch solder pads, chip pins or FPC contacts with metal tools.
- Set the soldering station to 320–350 °C. Heat a single solder joint for max. 4 s; wait 10 s between heating cycles to avoid lifting copper pads from the main board.
- Place the soldering iron in an insulated stand after use.

7.1.4 Pre-Assembly Inspection

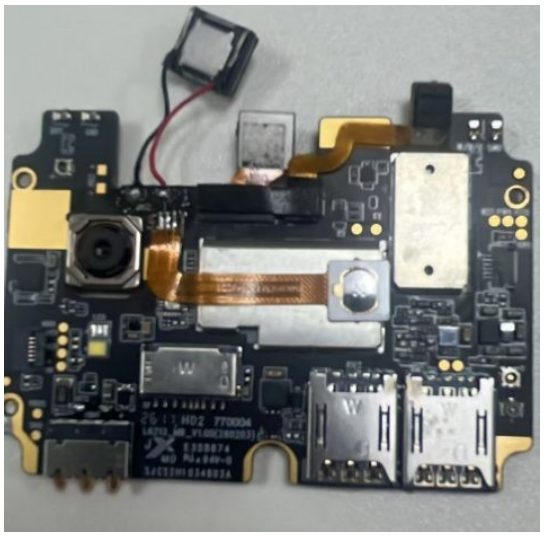
- Main board: no deformation, lifted pads, swollen capacitors or bent pins.
- Camera, display, earpiece and other modules: no damage; FPC cables intact and not oxidised.
- ESD protection is in place.

7.1.5 Procedure

1. SOS key and earpiece: align the SOS key FPC contacts with the main board pads and solder them. Let the joint cool, then press the FPC lightly. Check for cold joints or bridges. Apply the dome protection sheet to its area on the main board, pressing from one corner to avoid bubbles. Solder the earpiece wires – observe polarity (+/–).



2. Cameras and light sensor: install the rear camera, then the front camera, then the light sensor FPC. Cover the camera connector with foam tape.



3. Main board: connect the main FPC and LCD FPC. Make sure the front camera and its opening are clean. Seat the main board fully and fit the main board screws. Fit the side keys FPC and the coaxial antenna cable. Insert the battery, power on and run the test code ##8888## to check all functions.





4. Rear housing: when the functional test passes and there is no visible damage, fit the rear housing. Start at the side key edge, then press the housing along the edges until all snap fits engage.





5. Fit all rear housing screws. Run the test mode again and check the appearance of the device.

Note: Remove flux residue with a lint-free cloth and anhydrous ethanol (≥ 99 %).

7.2 Reassemble USB Sub-Board

1. Place the speaker module and USB sub-board in position. Check that the USB Type-C silicone gasket is fitted correctly.
2. Connect the main key FPC and the main FPC; close the connector latches.
3. Apply new foam tape over the main FPC connector.
4. Fit the 2 USB sub-board screws.
5. Continue with section 7.1, steps 4–5.

7.3 Install Battery and Battery Cover

1. Check the battery for damage or swelling. Use only the specified battery (LZT-T605-4000, 3.85 V, 4000 mAh).
2. Insert the battery so that its contacts align with the device contacts, then press it into the compartment.
3. Place the battery cover on the device, starting at the top edge, and press along the edges until all snap fits engage.
4. Power on the device and check that it starts and charges correctly.

8. Software Reset

8.1 Purpose

A factory reset restores the original software settings. Use it to fix slow operation, errors or crashes caused by corrupted settings or app conflicts.

8.2 Prerequisites

- Battery level above 50 %.
- All user data is backed up.
- Headset, USB cable and other accessories are disconnected.

8.3 Precautions

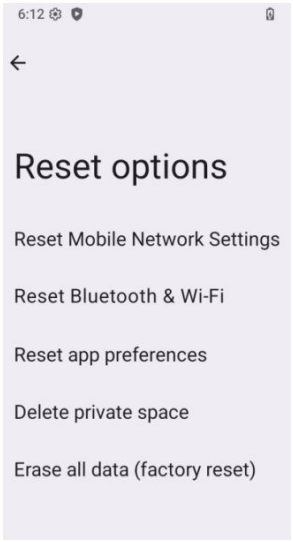
- A factory reset erases all user data on the device.
- Do not power off the device or interrupt the reset. The device may not start afterwards.

8.4 Factory Reset Procedure

1. Open Settings > System > Reset options.
2. Tap Erase all data (factory reset).

3. Confirm with Erase all data. The device restarts when the reset is complete.

Reset options also include resetting network, Bluetooth / Wi-Fi and app settings only. These do not erase user data.



8.5 After Reset

- Check that the device starts normally without black screen, distortion or boot loop.
- Test calls, mobile network, Wi-Fi and camera.

9. Boot Modes and Hardware Test

9.1 Normal Boot

Press and hold the power key until the screen and boot animation appear.

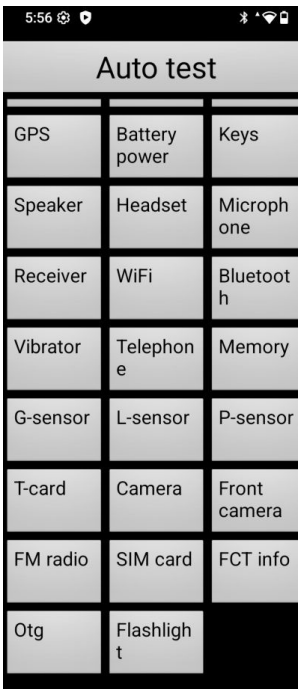
9.2 Hardware Test Mode

Entry:

1. Open the Phone (dialer) app.
2. Enter ##8888##. The hardware test menu opens.

Select a test item to check an individual module (display, touch, keys, speaker, receiver, microphone, cameras, sensors, Wi-Fi, Bluetooth, GPS, FM radio, SIM, memory card, battery, charging). Auto test runs all tests in sequence and shows a pass/fail report.





To exit, tap the Back key.

9.3 Precautions

- Follow the steps exactly when entering test modes.
- If the test mode does not open or an error is shown at start-up, do not repeat the procedure many times. Contact the MAXCOM service centre.

10. Spare Parts List

Spare parts can be ordered from MAXCOM S.A. (www.maxcom.pl). Quote the model (MS653) and the part code.

No.	Spare part	Part code
1	Main board	LZT-PCBA-T60-L6213
2	LCD module (6.5")	LZT-MLCD-T605-GC7272
3	Front camera 5 MP	LZT-CAM-T605-5E31
4	Rear camera 13 MP	LZT-CAM-T605-IMX135
5	Speaker	LZT-SPK-T605-MQY
6	Vibration motor	LZT-MOT-T605-0827
7	Main antenna	LZT-GSM-T605-001
8	GPS / Wi-Fi / BT antenna	LZT-GFB-T605-001
9	Diversity antenna	LZT-DIV-T605-001
10	Coaxial cable	LZT-TZX-T605-001
11	USB sub-board	LZT-SUB-PCBA-T605-L503
12	Main FPC	LZT-MFPC-T605
13	Side key FPC	LZT-PWR&VOLKE Y FPC-T605
14	SOS key FPC	LZT-SOSKEY FPC-T605
15	Light / proximity sensor FPC	LZT-P-sensor FPC-T605
16	Main key FPC	LZT-TOPKEY FPC-T605
17	Earpiece (receiver)	LZT-REC-T605-0809-15
18	Front housing	LZT-AH-T605-BK
19	Middle housing (rear housing)	LZT-BH-T605-BK
20	Battery cover	LZT-CH-T605-BK

No.	Spare part	Part code
21	Front keys	LZT-MK-T605-KEY-HEB
22	Side keys	LZT-SK-T605-KEY
23	SOS key cap	LZT-SOSK-T605-KEY
24	Rear camera lens	LZT-CL-T605
25	Main board screw M1.4 × 2.5	LZT-CM14-H25-BK-TTS
26	Housing screw M1.4 × 3.5	LZT-CM14-H35-BK-TTS
27	USB-A to USB-C cable	LZT-USB cable-A-C-5V/2A
28	Battery Li-ion 3.85 V 4000 mAh	LZT-T605-4000
29	Charging dock	LZT-ZC-MS653

Appendix A: Block Diagram

