GSMNC Primary School

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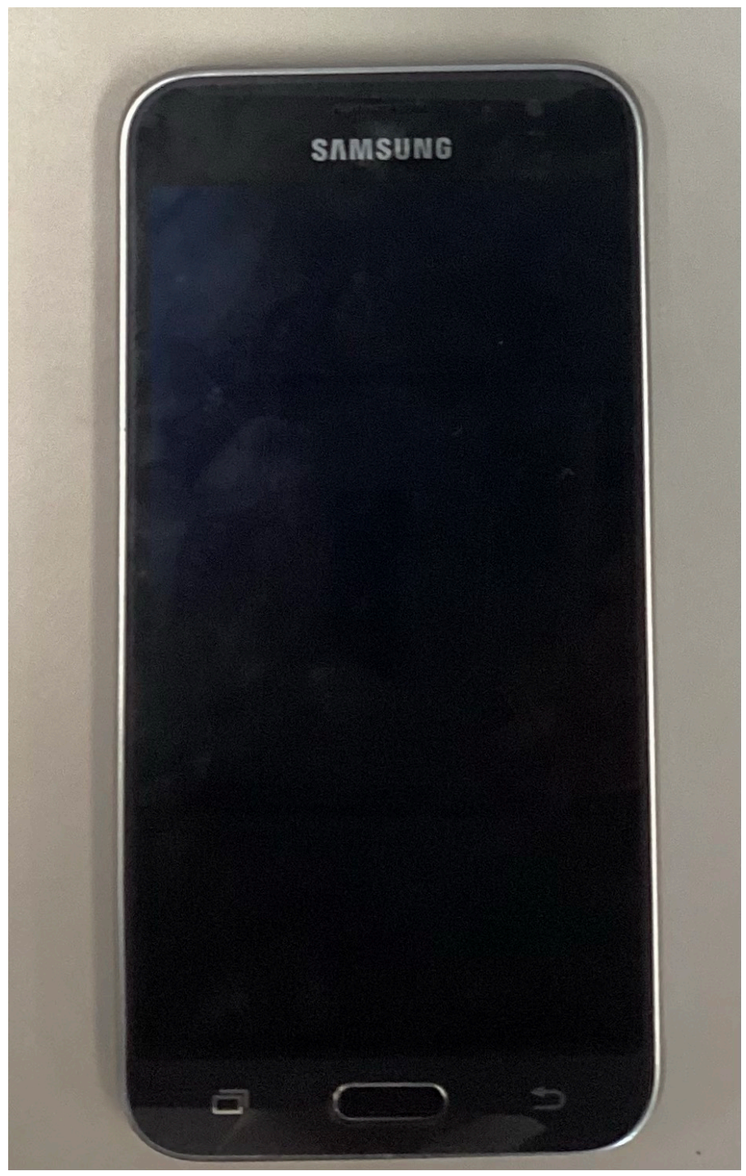
Middleton, Co. Cork Ireland

Reverse Engineering online challenge



Reverse engineering a Samsung galaxy j5

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Summary Report

We decided to use one of the high tech devices we use daily now, that people take for granted. We wanted to see exactly how much work is put into every device, so when our teacher said that he had an old Samsung galaxy j5 that he never used we jumped at the opportunity.

We took a lot of time to research before we actually disassembled the phone, and through research we learned a lot about the many parts in a Samsung Galaxy J5 and studied them. We discovered that the main components of the Samsung galaxy j5 are the screen, battery, camera, and processor chip, and we decided that the battery is like the heart, and the rest of the pieces like the organs but without the battery, none of them would work.

Our favourite part by far was taking off the screen, it was like unwrapping a present and seeing what's inside and we were all exited to start the real work as up until then all we had done was research, which some people found a little bit boring but we all knew that without the research we wouldn't have a clue what we were doing.

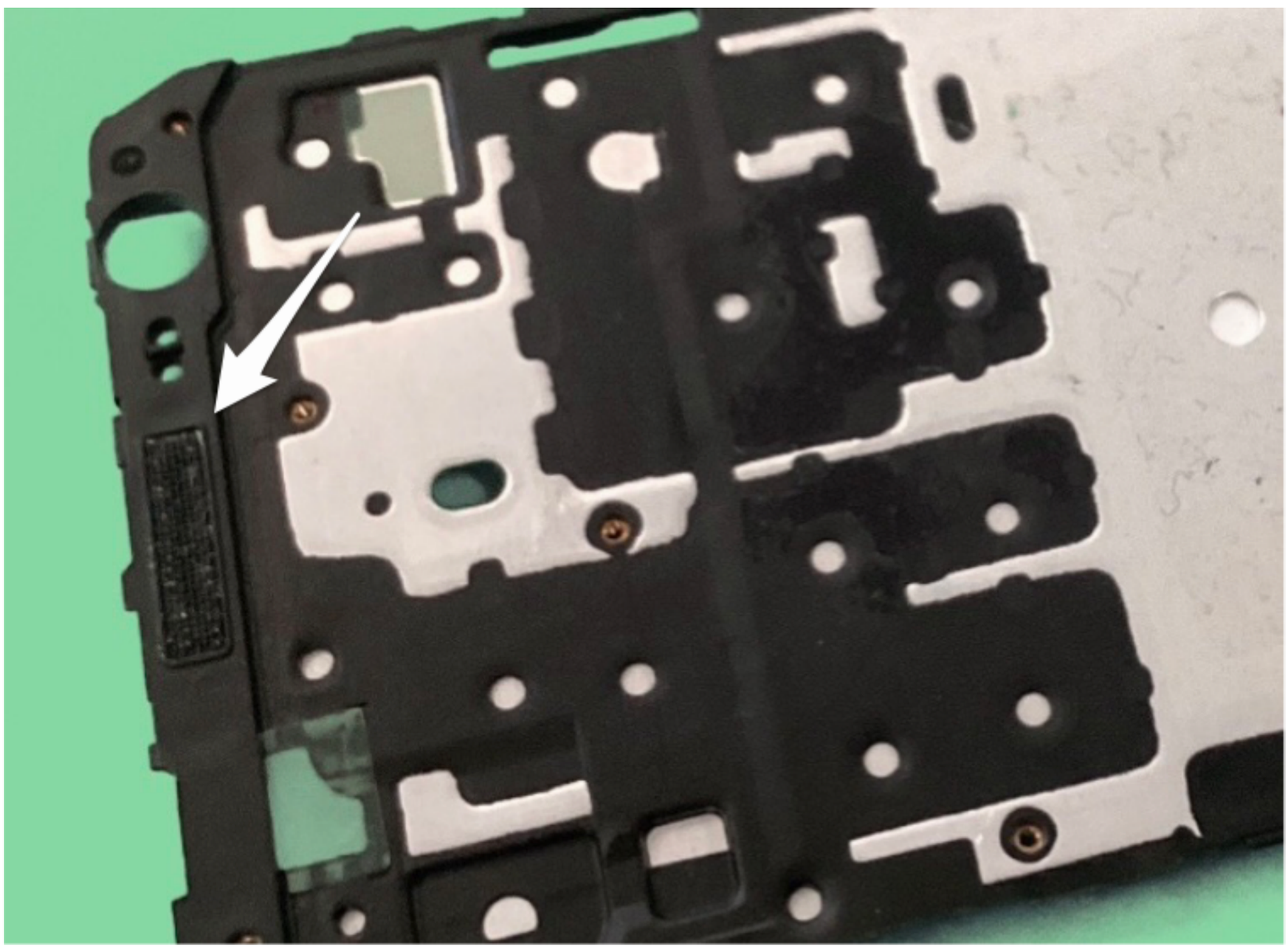
Parts List

- Speaker
- Camera
- Volume Button
- Touchscreen
- Home Button (fingerprint sensor)
- Microphone
- Power Button
- SIM card

Speaker

A speaker produces sound waves by rapidly vibrating the diaphragm. This is done by electrical current flowing through the voice coil, which is an electromagnet. Changing the flow of the current changes the magnetic forces between the voice coil and the permanent magnet.

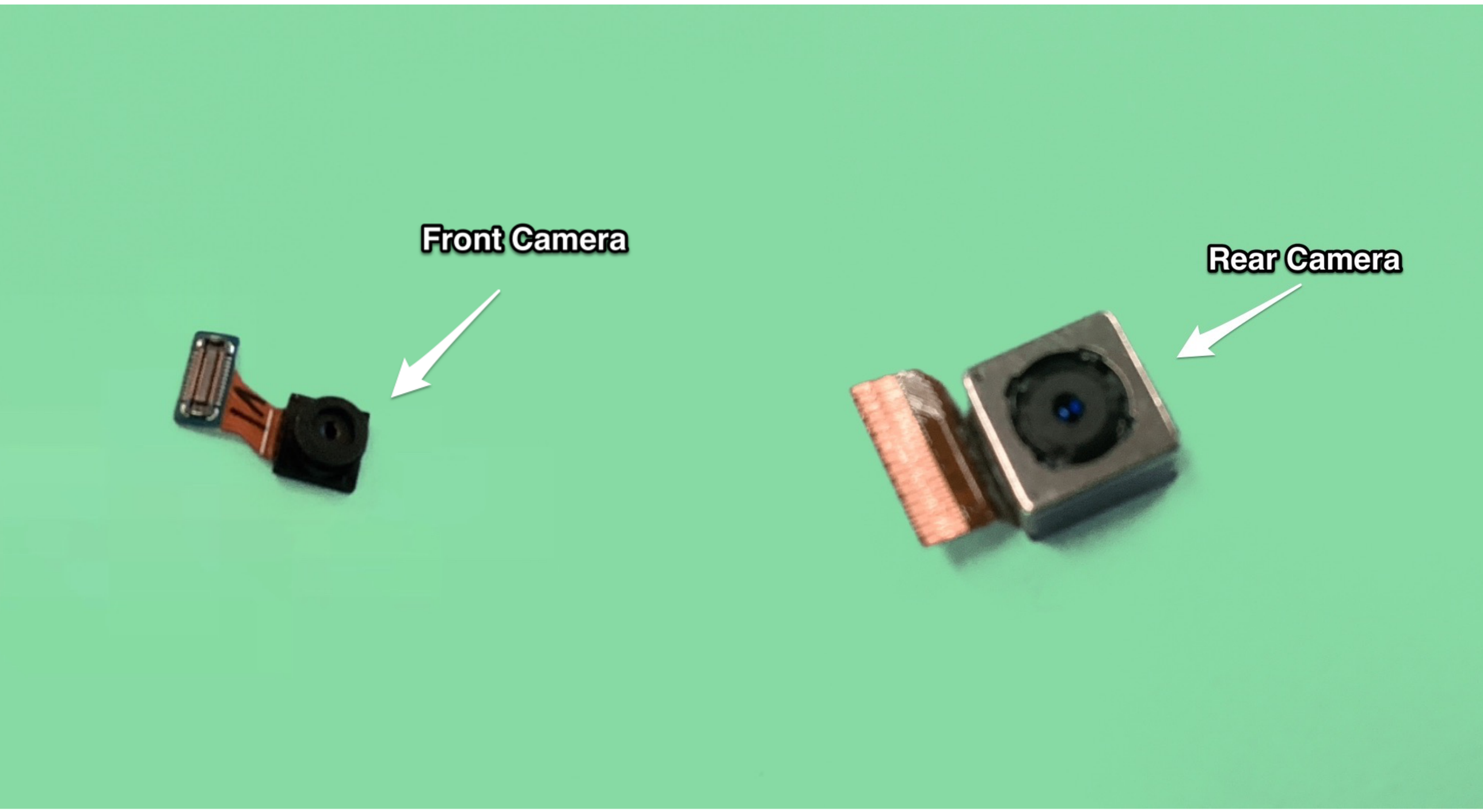
The sound waves are carried to a thin metal disk inside the phone, called a diaphragm, and are converted into electrical energy. The electrical energy travels over wires to another phone and is converted from electrical energy to sound waves again which can be heard by someone on the other end of the phone!



Camera

In the Samsung Galaxy J5, both the front and rear cameras are 13 MP and produce detailed, high-resolution images. Thanks to the low-aperture lenses, you can capture bright photos in low lighting.

Flagship cameras of Samsung Galaxy smartphones are very good with low light performance, excellent dynamic range and colours are bright, it’s all because of the software that this phone is better than most Android Phones.



Volume Button

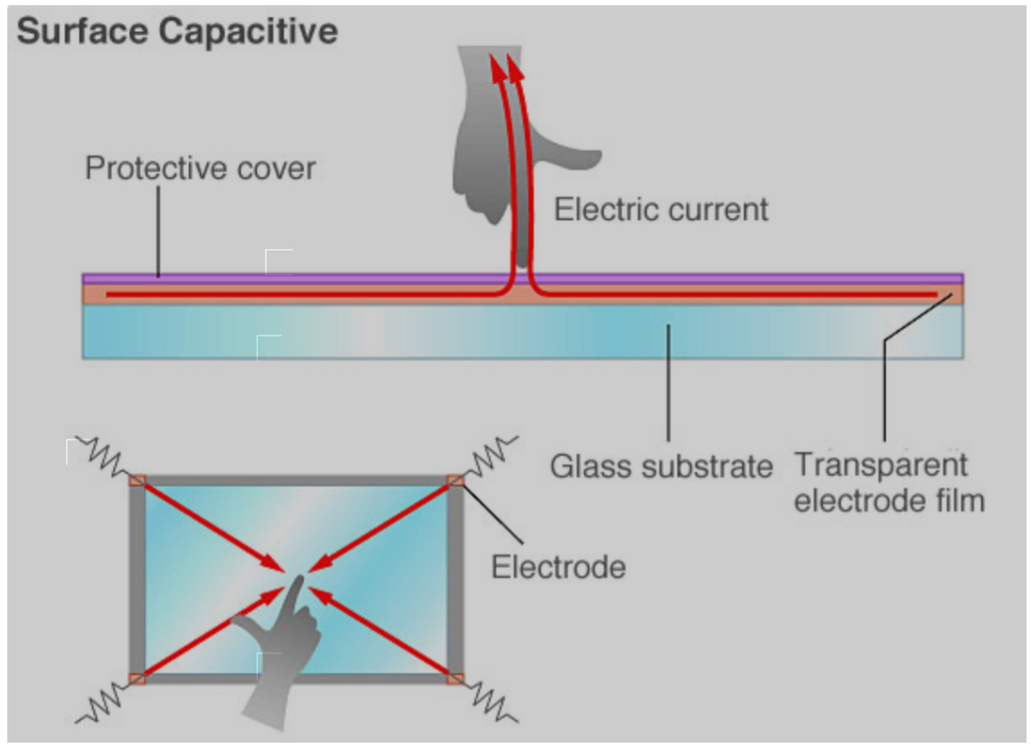
The volume button raises or lowers the volume of the ringtone or the general volume of your phone. It is located at the side of the phone and is the longer button, as the other one is the power button.

The volume button works by adjusting the amplitude of the electrical signal that drives the speakers or headphones, thereby making the sound waves larger or smaller and amplifying or diminishing the sound.

Touchscreen

Touchscreens work using electricity. The screen is made of glass, an insulating material - it cannot carry an electric current. Due to that, the surface of the screen is coated with a thin layer of an electrically conducting material such as indium tin oxide which is used due to the fact that it is transparent (clear).

Pressing the surface of the screen presses the electrodes in the film and the glass to come into contact, resulting in the flow of an electrical current.



Home Button

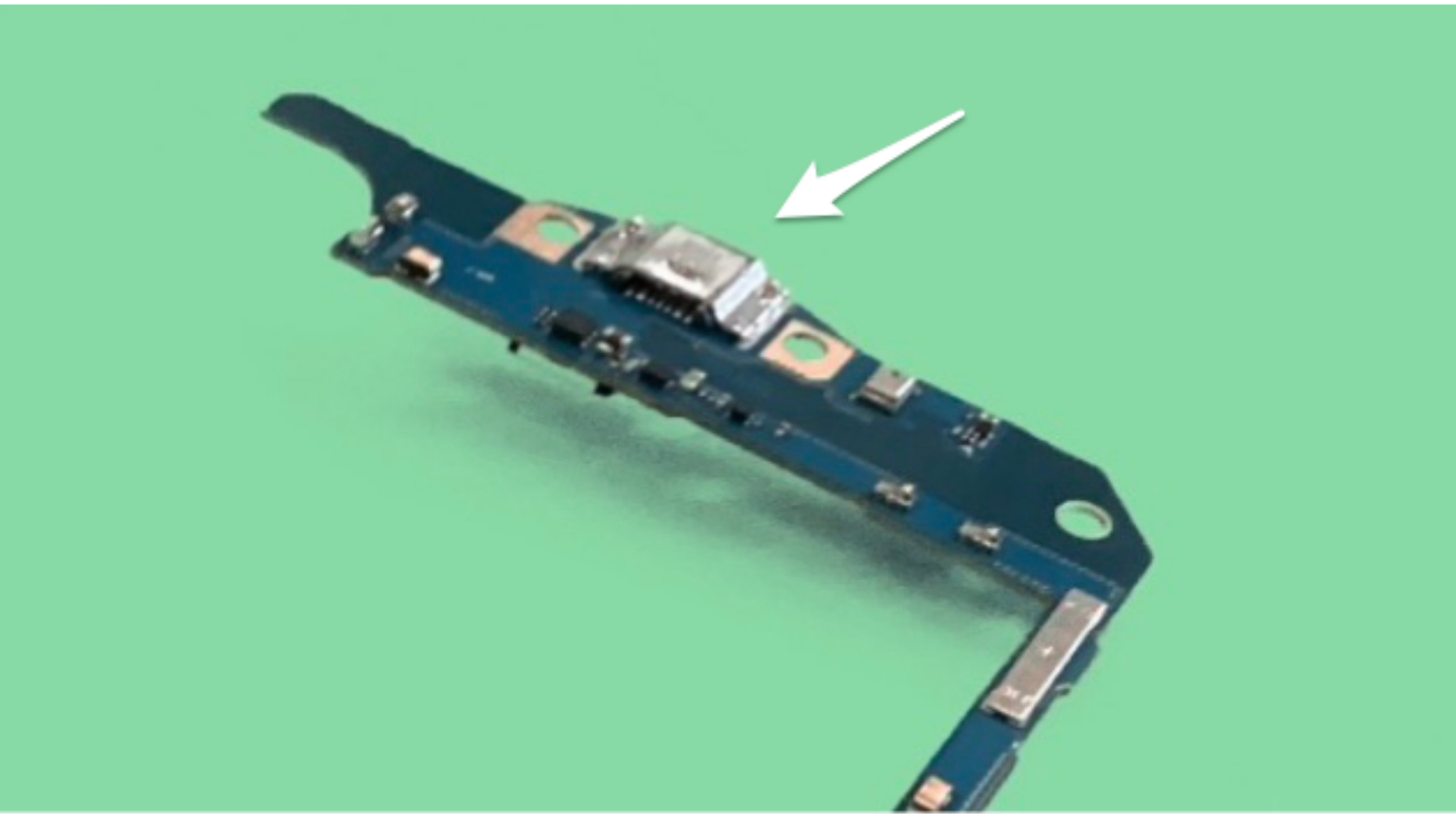
The home button doesn’t move but the electrode detects a finger is pressing down on it, it signals the Haptic Engine to produce a vibration which feels and sounds like a click, thus fooling you into fling like you’ve physically pressed it.

The home button was introduced by Apple CEO Steve Jobs in 2007 to make navigation easier and to serve as a way to reach the phones Home Screen more easily.

Microphone

The microphone capsule contains a small diaphragm connected to a moving coil when sound waves hit the diaphragm and vibrates dot this causes the coil to move back and forth in the magnets field, generating an electrical current.

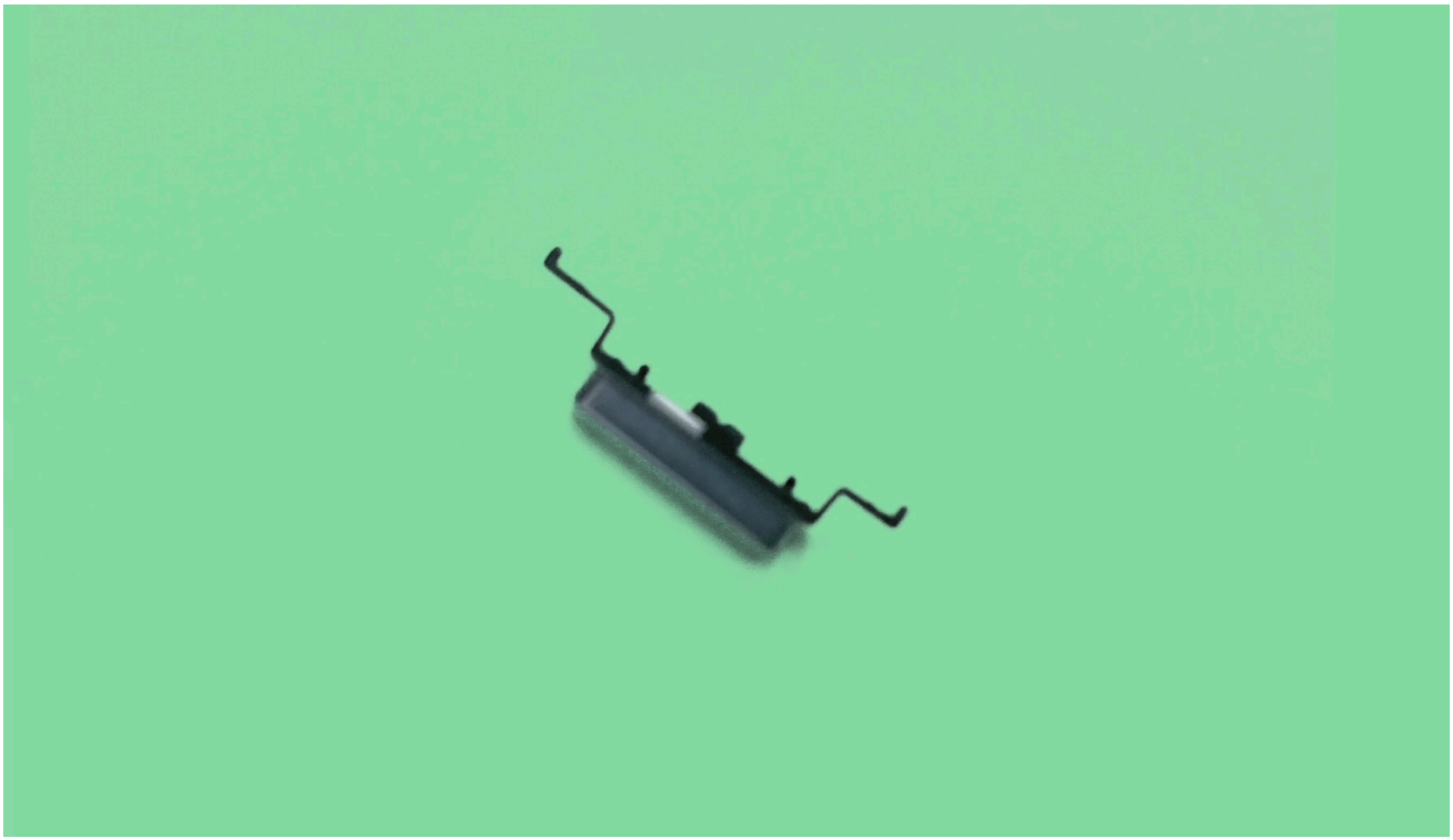
The microphones audio signal is transformed int a radio signal via transmitters. These are transmitted to a receiver, which transforms them once more into a; audio signal before being transmitted to the audio system.



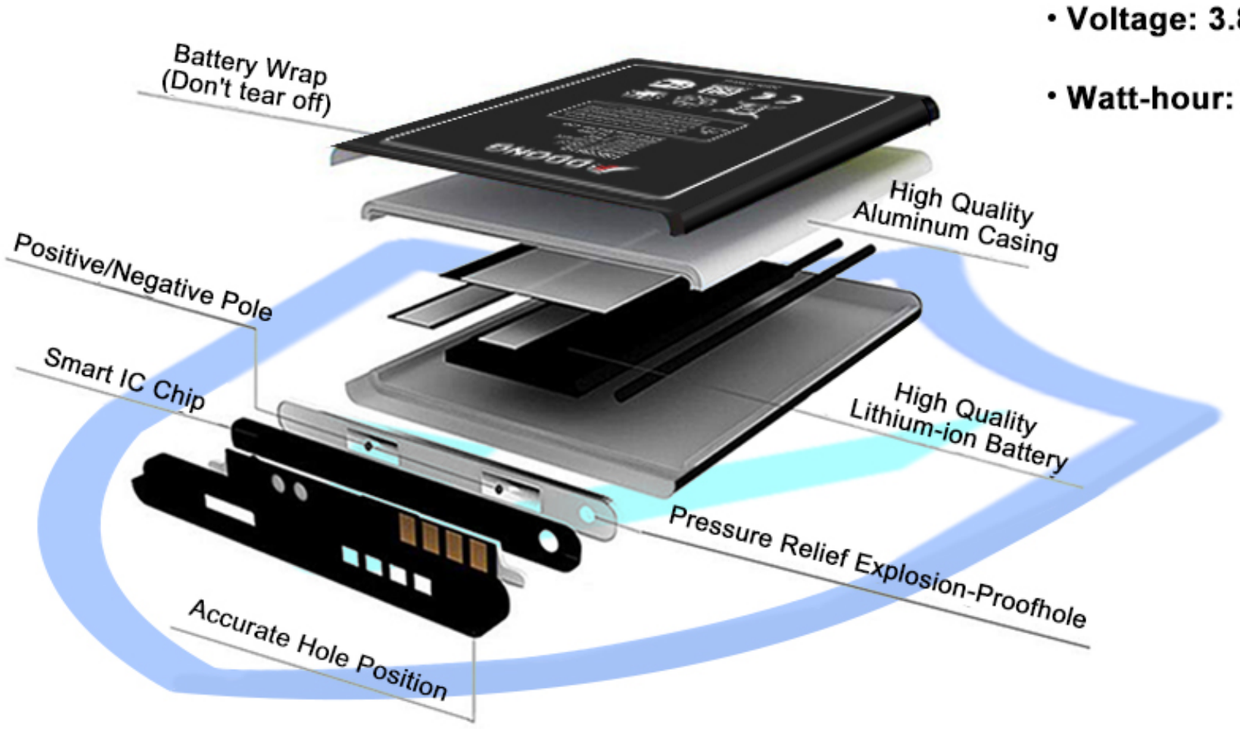
Power Button

The power button turns on or off the screen of your phone and is located at the side of the phone.

A single input is directly coupled to a single output in this case. The switches primary function is to control the circuit by turning it on/off. When the switch in the circuit is closed, the circuit is switched on. When the switch in the circuit is open, the switch is turned off.



Battery



- **Battery Type: Lithium Ion**
- **Battery Capacity: 2600mAh**
- **Voltage: 3.8V**
- **Watt-hour: 9.88Wh**

The movement of the lithium ions creates free electrons in the anode which creates a charge at the positive current collector. The electrical current then flows from the current collector through a device being powered (in this case, a cell phone) to the negative current collector.

Charging a phone is the exact opposite of discharging a battery's energy. By supplying current (the manipulated variable), a charger transfers lithium ions from the positive electrode to the negative electrode, thus restoring energy.

SIM Card

Each SIM card holds a users IMSI (International Mobile Subscriber Identity) and ICCID (Integrated Circuit Card Identifier) information. Mobile network operators use a SIM card's IMSI and ICCID to verify the holding user and decide whether to grant network access to the associated device.

SIM cards are computer chips that hold information and allow you to connect with your network. This means you can make calls, send SMS messages and connect to mobile internet services like 3G, 4G, and 5G. They're also transferable and you can choose to save messages, contacts, and emails to them.

Fun Facts

- The Samsung Galaxy J5 was first released on the 26 June 2015 and it was discontinued in 2018.
- Samsung Galaxy J5 features a 5-inch super AMOLED touchscreen with 720 x 1280 pixel resolution.
- Samsung Galaxy J5 comes with 2GB RAM and 16GB storage, and is powered by 1.2 GHz quad-core Qualcomm Snapdragon 410 processor.
- It has an advanced 64-bit class system on a chip (SoC) backed by 2 GB or 3 GB Of LPDDR3 RAM. It packs a 3000 mAh battery.
- The Samsung company name comes from the the Korean word for three stars.

Thank you for reading our PDF

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