

iPhone hardware

Hardware of the iPhone is designed by Apple Inc., who determines internal systems, designs, and prices. iPhones contain many hardware elements in its specifications. Apple directly sub-contracts hardware production to external OEM companies, maintaining a high degree of control over the end product.

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Screen and input

The touchscreen on the first five generations is a 3.5 inches (90 mm) liquid crystal display with scratch-resistant glass. The one on the iPhone 5, 5C, 5S, and first generation SE is 4 inches (100 mm). The size of the iPhone 6, 6S, 7, 8, second generation SE, and third generation SE is 4.7 inches (120 mm); the iPhone 6 Plus, 6S Plus, 7 Plus, and 8 Plus is 5.5 inches (140 mm); the iPhone X, XS, and 11 Pro with 5.8 inches (150 mm); the iPhone XR, and 11 with 6.1 inches (155 mm); and the iPhone XS Max and 11 Pro Max with 6.5 inches (170 mm). The capacitive touchscreen is designed for a bare finger, or multiple fingers for multi-touch sensing. The screens on the first three generations have a resolution of 320×480 (HVGA) at 163 ppi; those on the iPhone 4 and iPhone 4S have a resolution of 640×960 at 326 ppi; the 4 inches (100 mm) models, with 640×1136 at 326 ppi; the 4.7 inches (120 mm) models, with 750×1224 at 326 ppi; the 5 inches (140 mm) models, with 1080×1920 at 401 ppi; and the 5.8 inches (150 mm) model X, with 1125×2436 at 458 ppi. The initial models were using twisted-nematic (TN) LCDs. Starting with iPhone 4, the technology was changed to in-plane switching (IPS) LCDs. The iPhone 5 model's screen results in an aspect ratio of approximately 16:9. The iPhone X is the first iPhone to use an OLED display. It has a near bezel-less screen with a 19.5:9:5 aspect ratio.^[1]

The touch and gesture features of the iPhone are based on technology originally developed by FingerWorks.^[43] Most gloves and stylt prevent the necessary electrical conductivity of the screen, although capacitive stylt can be used with iPhone's finger-touch screen. The iPhone 3GS and later also feature a fingerprint-resistant oleophobic coating.^[6]

The iPhone has a minimal hardware user interface, with most models featuring five buttons. The only physical menu button is situated directly below the display and is called the "Home button" because its primary function is to close the active app and navigate to the home screen of the iPhone. The Home button is a circular button, reminiscent of the shape of icons on the home screen. However, new models which include Apple's fingerprint recognition feature Touch ID (which use the Home button as the fingerprint sensor) have no symbol. The iPhone X and later, with the exception of the iPhone SE (2nd generation), don't have a Home button but instead Face ID, a facial recognition authentication method.^[8]

A multi-function sleep/wake button is located on top of the device on earlier models. In the newer models starting with the iPhone 6, it is on right of the device. It serves as the unit's power button, and also controls phone calls. When a call is received, pressing the sleep/wake button once silences the ringtone, and when pressed twice transfers the call to voicemail. Situated on the left side, the left volume is the volume adjustment controls. The iPhone 4 has two separate circular buttons to increase and decrease the volume; all earlier models house two switches under a single plastic panel, known as a toggle switch, which could reasonably be counted as either one or two buttons.

Directly above the volume controls is a ring/silent switch that when engaged mutes telephone ringing, alert sounds from new & sent emails, text messages, and other push notifications, camera shutter sounds, Voice Memo sound effects, phone lock/unlock sounds, keyboard clicks, and (on earlier models, such as the iPhone 4S, and later) the sound of the iPhone's ringer. The silent switch can be used to control third-party apps, notably games. It is also used for fitness tracking purposes, primarily as a pedometer. Starting with the iPhone 5S, this functionality was included in the *My Motion* appressor and subsequent revisions of the embedded chip.

A software update in January 2008 allowed the first-generation iPhone to use cell tower and Wi-Fi network locations trilateration,^[49] despite lacking GPS receiver capability. Since the iPhone 3GS generation, the iPhone employs a GPS operated by the United States. Since the iPhone 4S generation the device also supports the GLONASS global positioning system, which is operated by Russia. Since the iPhone 8 it supports Galileo.^[51]

3D Touch and Haptic Touch

The iPhone 6S and 6S Plus, introduced in 2015, feature 3D Touch displays which allow the screen to recognize how hard it is being pressed using pressure-sensitive multi-touch technology, and a new Taptic Engine to provide haptic feedback.^[52] In addition to visual cues, 3D Touch uses the Taptic Engine to provide a tactile sensation relative to the force being applied to the display to indicate to the user that a light or deep press action has been completed. An example of how this technology was used is lightly pressing the screen to preview a photograph and deeply pressing to open it, a feature dubbed "Peek and Pop" by Apple.^[53]

All iPhones starting with the iPhone 6s (with the exception of the first-generation iPhone SE and iPhone XR^[54]) had this feature. Starting in 2019 however, 3D Touch was omitted on all iPhones starting with the iPhone 11/iPhone 11 Pro, and its software features were removed from iOS 13 and later in favour of Haptic Touch. Haptic Touch retains much of the functionality of 3D Touch but cannot detect pressure, as the display lacks integrated capacitive sensors. Actions that previously required a deep press now only require a light press. The Haptic feedback is no longer associated with the applied pressure but rather the touch duration. Due to the migration from 3D Touch to Haptic Touch, all iPad models that can update to iPadOS 13, along with the first-generation iPhone SE and seventh-generation iPod touch, which previously did not support 3D Touch, gained similar Haptic Touch functionality with the iOS 13 and iPadOS 13 updates, although without any haptic feedback.

Sensors

iPhones feature a number of sensors, which are used to adjust the screen based on operating conditions, enable motion-controlled games, location-based services, unlock the phone, and authenticate purchases with Apple Pay, among many other things.

Proximity sensor

A proximity sensor deactivates the display and touchscreen when the device is brought near the face during a call. This is done to save battery power and to prevent inadvertent inputs from the user's face and ears.^[55] The iPhone's proximity sensors detect the ear and switches off the light, saving power and stopping the face from unintentionally pressing buttons. A phone case, dirt or grime, or a software problem may cause the proximity sensor to malfunction.^[45]

Ambient light sensor

An ambient light sensor adjusts the display brightness which saves battery power and prevents the screen from being too bright or too dark.^[57] True Tone, which is activated by default, uses advanced sensors to change the color and intensity of the iPhone screen to match the ambient light, resulting in more natural-looking images. The ambient light sensor is also used to help determine the iPhone's location and other apple products, such as the iPod and iPad. The device changes the screen brightness automatically based on this knowledge to save battery life and minimize eye strain.^[58]

Accelerometer

A 3-axis accelerometer senses the orientation of the phone and changes the screen accordingly, allowing the user to easily switch between portrait and landscape mode.^[59] Photo browsing, web browsing, and music playing support both upright and left or right wilderness orientations.^[60] Unlike the iPad, the iPhone does not rotate the screen when turned upside-down, with the Home button above the screen, unless the running program has been specifically designed to do so. The 3.0 update added landscape support for still other applications, such as *Angry Birds*, and introduced the ability to rotate the unit for input (generally for user functionality). The accelerometer can also be used to control third-party apps, notably games. It is also used for fitness tracking purposes, primarily as a pedometer. Starting with the iPhone 5S, this functionality was included in the *My Motion* appressor and subsequent revisions of the embedded chip.

Magnetometer

A magnetometer is built-in since the iPhone 3GS, which is used to measure the strength and direction of the magnetic field in the vicinity of the device. Sometimes certain devices or radio signals can interfere with the magnetometer requiring users to either move away from the interference or re-calibrate by moving the device in a figure-eight pattern. Since the iPhone 3GS, the iPhone also has a Compass app, which was unique at time of release, showing a compass that points in the direction of the magnetic field.

Gyroscope señsor

Since the iPhone 4, the 4th Generation iPod touch, and the iPad 2, a three-axis gyroscope was included. This sensor will run on six axes due to the combination of a gyroscope and an accelerometer. One of the main reasons of the implementation was to enhance gaming mechanics such as the sensitivity and responsiveness aspects. It is compatible with iPhone, iPad, and iPod touch.^[61]

Radio

Some previous iPhone models contained a chip capable of receiving radio signals,^[43] however, Apple has the FM radio feature switched off because there was no antenna connected to the chip. Later models of the iPhone (starting with the iPhone 7), however, do not contain radio chips at all.^[62] A campaign called "Free Radio On My Phone" was started to encourage iPhone manufacturers to use the chip to enable the radio on the phones they manufacture, reasons cited were that radio drains less power and is useful in an emergency such as the 2016 Fort McMurray Wildfire.^[63]

Fingerprint sensor

Until 2017, iPhone models starting from iPhone 5S (excluding the iPhone 5C) featured Apple's fingerprint recognition sensor. It is used for unlocking the device and authenticating Apple Pay purchases (since the iPhone 6) using Touch ID. It is located in the home button. Touch ID has been replaced by Face ID (excluding the iPhone SE (2nd generation)), starting with the iPhone X. The fingerprint sensor uses the user's biometric information to give the user quick access to the device. It can also be used to open applications and approve transactions. It's compatible with iPhone, iPad, and iPod touch.

Barometer

Included on the iPhone 6 and later (excluding the iPhone SE (1st generation)), a barometer is used to determine air pressure and elevation.^[64] This sensor is used to provide position and navigational features by determining the altitude through evaluating air pressure. The barometers will allow the device to be pinpointed.

Facial recognition sensor

Starting with the iPhone X, a facial recognition sensor, named the TrueDepth camera system, is featured. It is used for unlocking the device and for authenticating purchases using Face ID. It can also be used for *ARKit* and *AR*.

Audio and output

On the bottom of the iPhone, there is a speaker to the left of the dock connector and a microphone to the right. There is an additional loudspeaker above the screen that serves as an earpiece during phone calls. The iPhone 4 includes an additional microphone at the top of the unit for noise cancellation, and switches the placement of the microphone and speaker on the base on the unit—the speaker is on the right.^[65] Volume controls are located on the left side of all iPhone models and as a slider in the iPod application.

The 3.5 mm TRRS connector for the headphones is located on the top left corner of the device for the first five generations (original through 4S), after which time it was moved to the bottom left corner.^[66] The headphone socket on the first-generation iPhone is recessed into the casing, making it incompatible with most headsets without the use of an adapter.^[67] Subsequent generations eliminated the problem by using a flush-mounted headphone socket. Cars equipped with an auxiliary jack allow free use of the iPhone while driving as a substitute for Bluetooth. The iPhone 7 and later have 3.5 mm headphone jack^[68] and instead headsets must connect to the iPhone by Bluetooth, use Apple's Lightning port (which has replaced the 3.5 mm headphone jack), or (for traditional headsets) use the Lightning to 3.5 mm headphone jack adapter, which is included with iPhone 7 up until iPhone X and plugs into the Lightning port. This adapter is available for purchase at several leading retailers.^[69]

Apple's own headset has a multi-purpose button near the microphone that can play or pause music, skip tracks, and answer or end phone calls without touching the iPhone. Some third-party headsets designed for the iPhone also include the microphone and control button.^[80] The current headsets also provide volume controls, which are only compatible with more recent models.^[61] A fourth ring in the audio jack carries this extra information.

The built-in Bluetooth 2.x+EDR supports wireless earpieces and headphones, which requires the HSEF profile. Transfer of audio was added in the 3.0 update for hardware that supports A2DP. Built-in non-socketed third-party wireless exist, the iPhone does not officially support the OBEX file transfer protocol.^[62] The lack of these profiles prevents iPhone users from exchanging multimedia files, such as pictures, music and videos, with other Bluetooth-enabled cell phones.

Composited^[81] or componen^[84] video at up to 576i and stereo audio can be output from the dock connector using an adapter sold by Apple. iPhone 4 also supports 1024x768 VGA output^[83] without audio, and HDMI output,^[86] with stereo audio, via dock adapters.

Battery

The iPhone features an internal rechargeable lithium-ion battery. Like an iPad, but unlike most other mobile phones at the time of its launch, the battery is not user-replaceable.^[72]^[73] The iPhone can be charged when connected to a computer for syncing across the included USB to dock connector, similar to charging an iPod. Alternatively, a USB to AC adapter (or "wall charger", also included) can be connected to the cable to charge directly from an AC outlet. Some models of the iPhone support wireless charging.^[82] A distinction to Android devices is that connecting an iPhone to a charger while powered off causes it to power on rather than showing a battery indicator without booting.^[84]^[49]

Apple runs tests on reproduction units to determine battery life. Apple's website says that the battery life "is designed to retain up to 80% of its original capacity after 300 complete charge cycles".^[41]

The battery life of early models of the iPhone has been criticized by several technology journalists as insufficient and less than Apple's claims.^[43]^[44]^[44]^[45] The iPhone 4 is also reflected by a J. D. Power and Associates customer satisfaction survey, which gave the "battery aspects" of the iPhone 3G its lowest rating of two out of five stars.^[45]^[47]

If by the battery malfunctions or dies prematurely, the phone can be returned to Apple and the battery replaced for free while still under warranty.^[48] The warranty lasts one year from purchase and can be extended to two years with AppleCare. The battery replacement service and its pricing was not available until January 2012, when Apple released the "Battery Health and Service Guide".^[49] It is similar to how Apple (and third parties) replace batteries for iPods. The Foundation for Taxpayer and Consumer Rights, a consumer advocate group, has sent a complaint to Apple and AT&T over the fee that consumers have to pay to have the battery replaced.^[49]

Since iOS 10.2.1, Apple has instituted a policy of employing "performance management" techniques (including CPU throttling) on iPhone devices whose batteries degraded. In order to maintain device stability and prolong their lifespan. These changes came in the wake of reported issues with unexpected shutdowns on certain iPhone models following the release of iOS 10.1.1. In response to criticism over the practice, including concerns over this being a form of planned obsolescence, Apple announced that it would offer discounted battery replacements for iPhone 6 and newer in 2018, and that it would add additional battery health information on a future version of iOS (iOS 11.3, which also allows users to disable this throttling).^[50]^[51]^[52]^[53]

Since July 2007, third-party battery replacement kits have been available^[54] at a much lower price than Apple's own battery replacement program. These kits often include a small screwdriver and an instruction leaflet, but as with many newer iPod models the battery in the first generation iPhone has been soldered in. Therefore, a soldering iron is required to install the new battery. The iPhone 3G uses a different battery fitted with a connector that is easier to replace.^[55] The iPhone X features a different battery, with two battery cells, and the adhesive pull tabs are adhered to the sides instead of folded over the top, therefore making repairs a little more difficult than before.^[56]

A patent filed by the corporation, published in late July 2013, revealed the development of a new iPhone battery system that uses location data in combination with data on the user's habits to moderate the handset's power settings accordingly. Apple is working towards a power management system that will provide features such as the ability to estimate the length of time a user will be away from a power source to modify energy usage and a detection function that adjusts the charging rate to best suit the type of power source that is being used.^[57]

Camera

The first-generation iPhone (2007) and iPhone 3G (2008) have a fixed-focus 2.0-megapixel camera on the back for digital photos. It has no optical zoom, flash or autofocus, and does not natively support video recording. Video recording is possible on the first-generation iPhone and iPhone 3G via a third-party app available on the App Store or through jailbreaking. iPhone OS 2.0 introduced geotagging for photos.

The 2009 iPhone 3GS has a 3.2-megapixel camera with autofocus, auto white balance, and auto macro (up to 10 cm). Manufactured by Omnivision, the camera can also capture 640×480 (VGA) resolution video at 30 frames per second.^[58] The video can be cropped on the iPhone and directly uploaded to YouTube or other services.

The 2010 iPhone 4 introduced a 5.0-megapixel camera (2992×1996 pixels) that can record video at 720p resolution, considered high-definition. It also has a backside-illuminated sensor that can capture pictures in low light and an LED flash that can stay lit while recording video.^[59] It is the first iPhone that can natively do high dynamic range photography.^[60] The iPhone 4 also has a second camera on the front that can take VGA photos and record SD video. Saved recordings may be synced to the host computer, attached to email, or (where supported) sent by MMS.

The 2011 iPhone 4S camera can shoot 8-MP stills and 1080p video can be accessed directly from the lock screen and can be triggered using the volume-up button as a shutter trigger. The software makes use of the built-in gyroscope to artificially stabilize the image while recording video.

The iPhone 5 (2012) and iPhone 5S, running iOS 6 or later, can take panoramas using the built-in camera app.^[61] and the iPhone 5 can also take still photos while recording video, though only at 0.9 megapixels (1280×720), as with the later iPhone 5S.^[62]^[63]

The camera on the iPhone 5 is protected by a sapphire lens cover, as are all subsequent models.^[64] In 2014 Apple consumed "one-fourth of the world's supply of sapphire to cover the iPhone's camera lens and fingerprint reader".^[65]

The camera on the iPhone 5 reportedly shows purple haze when the light source is just out of frame,^[66] although Consumer Reports said it "is no more prone to purple hazing on photos shot into a bright light source than its predecessor or than several Android phones with fine cameras".^[67]

On all five model generations, the phone can be configured to bring up the camera app by quickly pressing the home key twice.^[68] On all iPhones running iOS 5, it can also be accessed from the lock screen directly.

The 2013 iPhone 5S widens the aperture to *f*/2.2 and features *True Tone Flash*, which has two LED lights, white and amber, that will improve white balance in low light by separately adjusting in 1,000 combinations of brightness level. Its image sensor is now 15 percent larger (1/3") than its previous model (1/3.2") at the same resolution to increase the surface size of individual pixels, allowing them to capture more light in the same time. The iPhone 5C, however, has the same camera hardware and features as the iPhone 5.

The 2014 iPhone 6 and 6 Plus include phase detection autofocus, while only the 6 Plus has Optical Image Stabilization. Both models can shoot 1080p videos at 60 frames per second, though optical image stabilization of the latter is unfunctional during video recording, making the iPhone 6S Plus the first with optical video stabilization.^[69]

With the release of iOS 8, the iPhone 4S and later models can now shoot time-lapse videos, with its capability to switch frame rates automatically as the recording increases its time.^[70]

The 2015 iPhone 6S and 6S Plus are outfitted with a 12-megapixel camera, with 4K video capability at 30fps, both for the first time on iPhone. The front-facing camera is upgraded from 1.3 to 5 megapixels, though video resolution remains less than 720p. Other features added are *Live Photos*, which captures a short video along a photo, and *Retina Flash*, which utilizes the screen's backlight as front camera flash, though less powerful than the rear LED lamp.^[71]

The user may change the resolution down to 1080p or 720p in the system settings outside of the camera application, where lower resolutions extend the recording duration until exhaustion of internal storage capacity, and reduces power consumption.^[72]

The first-generation iPhone SE (2016) features the same 12 MP camera found on the iPhone 6S, with the same 4K and high frame rate video capability, but its front camera only has 1.2 megapixels, like the iPhone 5S and 5c.

The 2016 iPhone 7 features optical image stabilization on its rear camera, a feature that was previously exclusive to the Plus models, and the 7 Plus is the first iPhone to feature dual-lens cameras (both 12 MP). Both models have a 7 MP front-facing camera, with 7 MP image resolution, compared to 2520×1080p for the second camera on the iPhone 7 Plus is a telephoto lens, which enables 2× optical zoom, allowing for the level of detail that the center crop of a 48-megapixel photo with the non-te camera's field of view would have. The camera software allows up to 10x digital zoom. The rear cameras on the 7 and 7 Plus both have an *f*/1.8 aperture, as compared to *f*/2.2 on the iPhone 6 and 6 Plus, though the 7 Plus' tele camera has *f*/2.8 and is not optically stabilized.^[80]^[78] It also has a new quad-LED True Tone flash, which is brighter compared to its predecessors.

The 2017 iPhone 8 camera remains largely the same as its predecessor, but it features a larger sensor and a newer color filter. The camera can also now record 4K at 60 and 24 frames per second, slow-mo at 1080p at 240 frames per sec. The new camera system also enables Portrait Lighting, which defines the light in a scene. It also features a quad-LED True Tone flash with 2× better light uniformity and Slow Sync.^[79]

The iPhone X (2017) camera is almost the same as the iPhone 8's camera, but the telephoto lens has an aperture of *f*/2.4 and optical image stabilization.^[77] The front camera also has Portrait Mode and Portrait Lighting, due to the new TrueDepth camera system.^[78]

The iPhone XS, XS Max, and XR have an updated 12MP (1/2.5") sensor size with a 1.4 µm pixel size. The XS series has a telephoto lens, while the lower end XR has only one lens. It also features Smart HDR, using the power of A12 Bionic chip, along with the Neural Engine, machine learning, artificial intelligence, and some advancements to provide better photos through improved dynamic range. The devices film with stereo audio instead of mono audio for the first time on iPhone, even though two opposite-side microphones had been built in since iPhone X.^[80]^[81]^[82]

The iPhone 11, 11 Pro and 11 Pro Max introduced an ultrawide lens; the latter two became the first triple-camera iPhones. The 11 has a dual-lens setup, lacking the telephoto lens of the 11 Pro and 11 Pro Max. The front camera is now capable of recording video at 4K as a result of a new 12 MP sensor, and can also capture slow-motion footage.

The second-generation iPhone SE's camera hardware is the same as the iPhone 8, but adds Portrait mode, Portrait lighting, Smart HDR, extended dynamic range for video up to 30 fps, stereo recording and cinematic video stabilization.

The iPhone 12 series brought Night Mode to all camera lenses, including the TrueDepth camera. It also uses Deep Fusion in more situations, and uses Smart HDR 3. Dolby Vision HDR video recording up to 30 FPS is available for the iPhone 12 and 12 mini, and up to 60 FPS for the 12 Pro and 12 Pro Max. The 12 Pro Max also has a 47% larger sensor and sensor-shift stabilization for better low-light photos and more details. The telephoto camera can now zoom up to 2.5x on the Pro Max, albeit with a *f*/2.4 aperture instead of the 12 Pro's *f*/2.0 aperture.

A "Keep Normal Photo" option accessible through the system settings allows saving HDR photos in both the high dynamic range and normal variants.^[83]

Storage

	iPhone storage (iPhone 8 – iPhone 12 Pro / Pro Max)				
iPhone 8 / 8 Plus, iPhone X	iPhone XR, iPhone 11	iPhone XS / XS Max, iPhone 11 Pro / Pro Max	iPhone SE (2nd Gen.)	iPhone 12 / 12 Mini	iPhone 12 Pro / Pro Max
64 GB	64 GB	64 GB	64 GB	64 GB	128 GB

	iPhone storage (1st Gen iPhone – iPhone 7 / 7 Plus, 6S / 6S Plus (September 2016))			
iPhone (1st Gen.) iPhone 3G	iPhone 3GS, iPhone 4, 5C	iPhone 4S, 5, 5S	iPhone 6, 6S	iPhone SE (1st Gen.) ^[84]
4 GB	8 GB	16 GB	16 GB	32 GB

	iPhone storage (1st Gen iPhone – iPhone 7 / 7 Plus, 6S / 6S Plus (September 2016))			
iPhone (1st Gen.) iPhone 3G	iPhone 3GS, iPhone 4, 5C	iPhone 4S, 5, 5S	iPhone 6, 6S	iPhone SE (1st Gen.) ^[84]
4 GB	8 GB	16 GB	16 GB	32 GB

	iPhone storage (1st Gen iPhone – iPhone 7 / 7 Plus, 6S / 6S Plus (September 2016))			
iPhone (1st Gen.) iPhone 3G	iPhone 3GS, iPhone 4, 5C	iPhone 4S, 5, 5S	iPhone 6, 6S	iPhone SE (1st Gen.) ^[84]
4 GB	8 GB	16 GB	16 GB	32 GB

	iPhone storage (1st Gen iPhone – iPhone 7 / 7 Plus, 6S / 6S Plus (September 2016))			
iPhone (1st Gen.) iPhone 3G	iPhone 3GS, iPhone 4, 5C	iPhone 4S, 5, 5S	iPhone 6, 6S	iPhone SE (1st Gen.) ^[84]
4 GB	8 GB	16 GB	16 GB	32 GB

SIM card

GSM models of the iPhone use a SIM card to identify themselves to the GSM network. The SIM sits in a tray, which is inserted into a slot at the top of the device. The SIM tray can be ejected with a paper clip or the "SIM ejector tool" (a simple piece of cut-out sheet metal) included with the iPhone 3G and 3GS in the United States and with all models elsewhere in the world.^[85]^[87] Some iPhone models shipped with a SIM ejector tool which was fabricated from an alloy dubbed "Liquidmetal".^[88] In most countries, the iPhone is usually sold with a SIM lock, which prevents the iPhone from being used on a different mobile network.^[89]

The GSM iPhone 4 features a MicroSIM card that is located in a slot on the right side of the device.^[90]

The CDMA model of the iPhone 4, just the same as any other CDMA-only cell phone, does not use a SIM card or have a SIM card slot.

An iPhone 4S activated on a CDMA carrier, however, does have a SIM card slot but does not rely on a SIM card for activation on that CDMA network. A CDMA-activated iPhone 4S usually has a carrier-approved roaming SIM preloaded in its SIM slot at the time of purchase that is used for roaming on certain carrier-approved international GSM networks only. The SIM slot is locked to only use the roaming SIM card provided by the CDMA carrier.^[91]

In the case of Verizon, for example, one can request that the SIM slot be unlocked for international use by calling their support number and requesting an international unlock if their account has been in good standing for the past 60 days.^[92] This method only unlocks the iPhone 4S for use on international carriers. An iPhone 4S that has been unlocked in this way will reject any non-international SIM cards (AT&T Mobility or T-Mobile USA, for example).

The iPhone 5 and later iPhones use nano-SIM cards in order to save space internally. The iPhone X and later iPhones added eSIM support in addition to nano-SIM, therefore they support Dual SIM functionality.

Liquid contact indicators

All iPhones (as well as many other devices by Apple) have a small disc at the bottom of the headphone jack that changes from white to red on contact with water; the iPhone 3G and later models also have a similar indicator at the bottom of the dock connector.^[93] Because Apple warranties do not cover water damage, employees examine the indicators before approving warranty repair or replacement. However, with the adoption of water resistance as a feature of the iPhone, this practice is no longer in use by Apple.

The iPhone's indicators are more exposed than those in some mobile phones from other manufacturers, which carry them in a more protected location, such as beneath the battery behind a battery cover. These indicators can be triggered during routine use, by an owner's sweat,^[94] steam in a bathroom, and other light environmental moisture.^[95] Criticism led Apple to change its water damage policy for iPhones and similar products, allowing customers to request further internal inspection of the phone to verify if internal liquid damage sensors were triggered.^[96]

Included items

All iPhone models include written documentation, and a dock connector to USB cable. The first generation and 3G iPhones also came with a standard composite AV Cable (HDMI-to-Apple Lightning cable), which allows the iPhone to charge from an AC outlet. The iPhone 3G and iPhone 3GS sold in North America, Japan, Colombia, Ecuador, and Peru^[90] include an ultracompact USB power adapter.

In October 2020, at the iPhone 12 virtual event, Apple announced that they will be removing the power adapter and EarPods from iPhone packaging.^[99]

Payments

In September 2014, with the launch of the iPhone 6, Apple announced Apple Pay, a mobile payment system. The feature, aimed to "revolutionize" the way users pay, uses an NFC chip, Touch ID fingerprint scanner (Face ID on iPhone X and later), Apple's Wallet app, and a dedicated "Secure Element" chip for encrypted payment information to make purchases at participating stores, both physical and online.^[98]

Taptic Engine

All iPhone models have a haptic engine to vibrate when a notification or alert, incoming call, etc. iPhone

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