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MagSafe: Everything About Apple's New iPhone 12 Charging Technology

Friday March 12, 2021 2:59 PM PST by Juli Clover

With the [iPhone 12](#) and 12 Pro models introduced in October 2020, Apple reinvented "MagSafe," a name once used for the breakaway magnetic charging cables designed for the MacBook. The repurposed MagSafe name still pertains to magnet-based accessories, but this time, designed for iPhones rather than Macs.



All of the iPhone 12 models have a ring of magnets built into the back around the wireless charging coil that allows for MagSafe-based accessories like cases

the wireless charging coil that adhere to MagSafe based accessories like cases and chargers, and this guide outlines everything you need to know about MagSafe.

How MagSafe Works

MagSafe uses a ring of magnets in the iPhone 12 models to connect to accessories that also have magnets built inside. So, for example, Apple's MagSafe Charger snaps right on to the back of an [iPhone](#), much like a magnet snaps onto a refrigerator.



Cases are the same way, snapping onto the magnet ring built into the iPhone. The design of the magnet ring allows the iPhone 12 models to be compatible with a whole range of accessories that rely on magnets, from chargers to mounts to cases.

The Magnet Ring Inside iPhones

iPhone 12 models have a ring of 18 rectangular magnets arranged in a circular shape located underneath the wireless charging coil in each device, which is what allows the MagSafe magic to happen.



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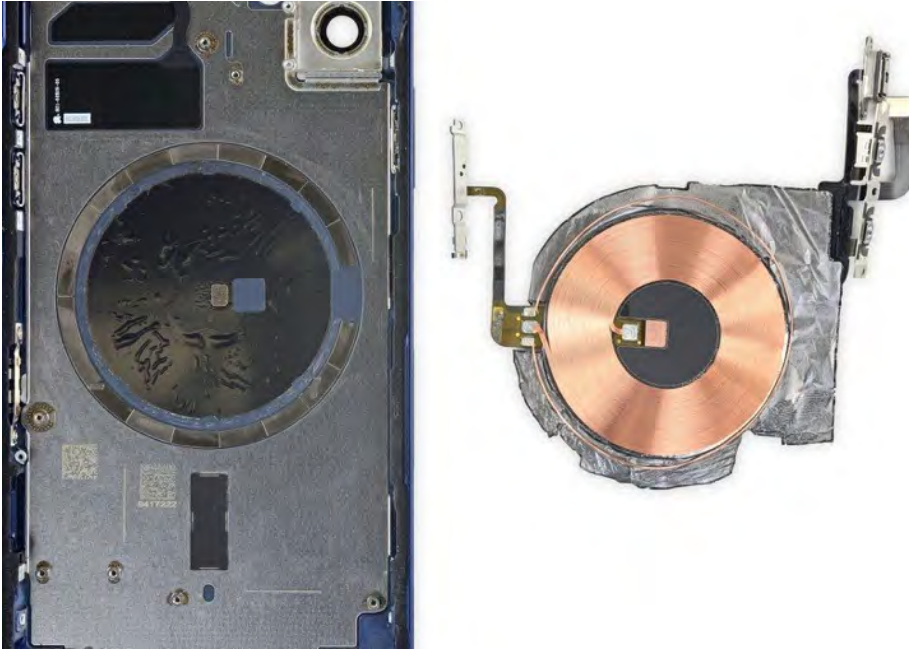
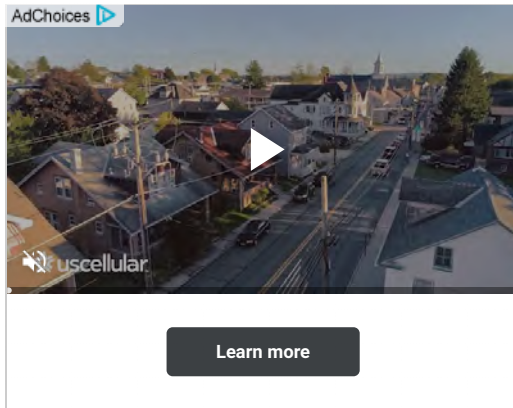


Image via iFixit

Older iPhones had the same wireless charging coil, but no magnets underneath to allow for magnetic connections.



MagSafe Charger

The MagSafe Charger looks something like a larger Apple Watch Charging Puck with an aluminum body and a soft white material at the top of the charger. The charger snaps onto an iPhone 12 with magnets inside, perfectly aligning the charging coil in the MagSafe Charger with the charging coil in the iPhone.





Image via iFixit

Repair site iFixit took apart a MagSafe Charger and did an x-ray to show us the charger's internal design. As with the iPhone, there are a series of magnets inside that are compatible with the magnets in the iPhone that surround an internal charging coil and a circuit board that manages the charging process.

Apple has also designed the [MagSafe Duo Charger](#), which combines a MagSafe charger with an Apple Watch charging puck. The charger is foldable, making it ideal for travel, and costs \$129.



The MagSafe Duo Charger is not able to charge an iPhone 12 at the full 15W. With Apple's 20W charger, the MagSafe Duo charges at a maximum of 11W, and with a 27W or higher USB-C power adapter, it charges at up to 14W. The MagSafe Duo does not come with a power adapter and a charger must be purchased separately. Note that the 29W charger from Apple is not compatible, but the 30W charger is.

but the 5W version is.

12W Charging for iPhone 12 mini

For most of the iPhone 12 models, the MagSafe charger is able to charge at a maximum of 15W, but for the smallest iPhone, the [iPhone 12 mini](#), charging [maxes out at 12W](#). The same goes for the MagSafe Duo. Charging speeds can also be affected by the temperature of the iPhone.

Getting 15W Charging Speeds

Achieving 15W (or 12W on iPhone 12 mini) charging speeds [requires Apple's 20W power adapter](#) or another appropriate 20W+ PD 3.0 charger. Testing with Apple's prior-generation 18W [iPad](#) charger and a 96W MacBook Pro charger proved that those power adapters do not allow the MagSafe Charger to reach the full 15 watts.



The same goes for many existing third-party power adapters, which also do not have the proper charging profile. New chargers from third-party companies may, however, include support for the MagSafe Charger, and [testing indicates](#) that to provide the 15W charging speed, a MagSafe Charger needs to support Power Delivery 3.0 at 9V/2.22A or 9V/2.56A, according to Apple. The iPhone 12 mini can hit maximum charging speeds with a 9V/2.03A power adapter.

You're guaranteed to get 15W with Apple's [\\$19 20W power adapter](#) (this power adapter also comes with the 2020 [iPad Air](#) models), but you may also be able to use a third-party charger as long as it meets those specifications.



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