



iPad Mini 5 Teardown

iPad Mini 5 teardown, performed by iFixit on March 28, 2019.

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INTRODUCTION

What's that on our teardown table? It's a big phone! A small tablet! [AirPower!?](#) No, it's the iPad Mini! This year Apple revisited their smallest tablet, bucking industry trends by keeping the Mini's screen small and bezels big. Did Apple stick to tradition all around, or will we be treated to an interior redesign? Looks like we'll have to tear this tablet down to find out!

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TOOLS:

- [iOpener](#) (1)
 - [Suction Handle](#) (1)
 - [iFixit Opening Picks set of 6](#) (1)
 - [Phillips #00 Screwdriver](#) (1)
 - [Tweezers](#) (1)
 - [Spudger](#) (1)
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Step 1 — iPad Mini 5 Teardown



- This tablet may be mini, but it has some big specs:
 - 7.9-inch (diagonal), LED-backlit Retina True Tone display with 2048 × 1536 resolution (326 ppi)
 - A12 Bionic SoC with 64-bit architecture and embedded M12 coprocessor
 - 8 MP rear camera + 7 MP FaceTime HD camera
 - Wi-Fi (802.11a/b/g/n/ac) with dual channel (2.4 GHz and 5 GHz) and MIMO support + Bluetooth 5.0
 - 19.1 Wh rechargeable lithium-polymer battery
 - Three-axis gyro + accelerometer + barometer + ambient light sensor
- ⓘ Let's kick things off with an airport security view of the box, charger, and Lightning cable (hat tip to the gang at [Creative Electron](#)).

Step 2



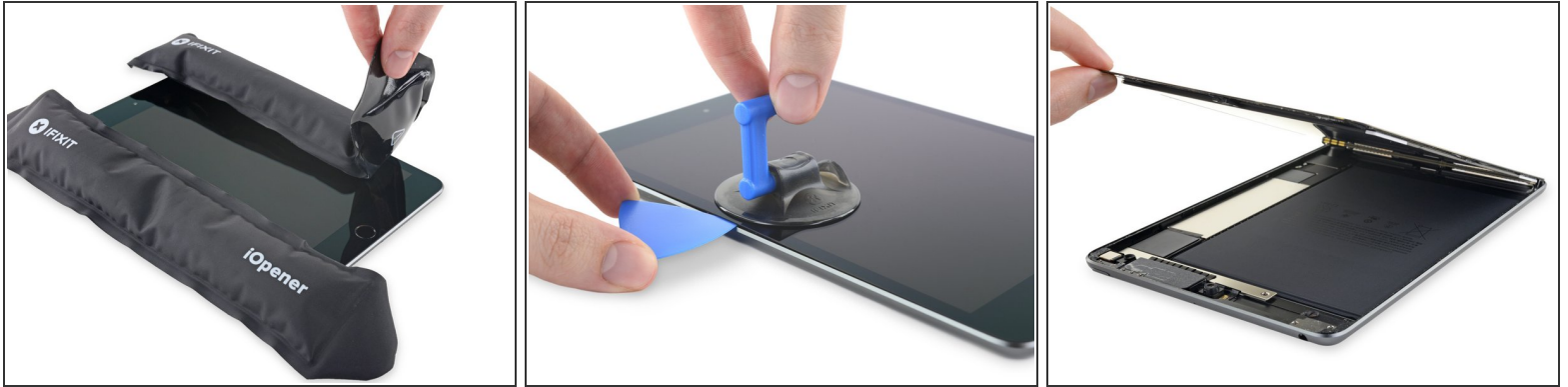
i From the outside, this new Mini looks *exactly* like a downsized version of the equally-new iPad Air.

- *Spoiler alert:* [judging by the X-rays](#), it's *not* a downsized new iPad Air. It looks exactly like an upgraded iPad Mini 4.
- The new Air, meanwhile, is based on the last-generation [iPad Pro 10.5"](#). (Stay tuned for our Air teardown, coming in about a day.)
- Meanwhile, Apple also sells the [iPad 6](#) (or just "iPad"), which itself is a reworked version of the [original iPad Air](#).

★ Did you get all that? Because we haven't even mentioned the latest iPad Pros yet. In fact, let's go ahead and not mention those.

- We pull a cellular-capable iPad Mini 4 from the lab to confirm our suspicions. Headphone jack: check. Big bezels: check. Home button: check.
- About the only exterior clue that gives away the new model is its model number, **A2133**—oh, and the loss of those regulatory markings on the back, which all live in software now.

Step 3



- As much as we wish Apple would come up with a better approach to tablet construction (like they've done for [phones](#), or like others have done for [tablets](#)), we're pretty sure we know how opening this one is going to go:
 - [Heat](#).
 - [Slash](#).
 - [Repeat](#).
- Once the Mini is shucked, we get our first peek at the tasty internals.

Step 4



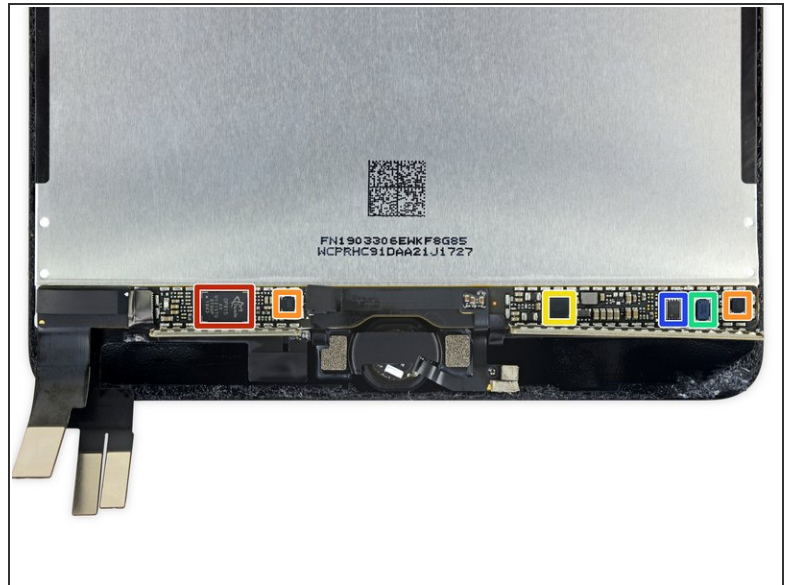
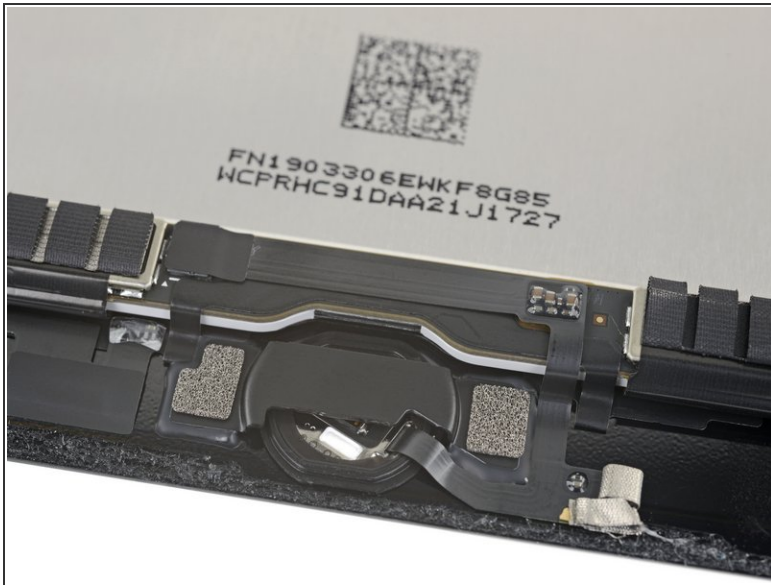
- After all that glue, we're treated to some less frustrating fasteners.
 - Knowing Apple's penchant for goofy screw heads, we brought our whole set of drivers. Thankfully this part of the Mini hasn't changed—we're just dealing with standard Phillips heads here.
- Our drivers make short work of those screws and we remove the bracket covering the display and battery connectors ...
- ... and it brings along a friend! Turns out the battery flex connector is now adhered to that cover bracket, automatically disconnecting the battery when the bracket is removed. Nifty!
- ❗ Hopefully this will help fixers to not [accidentally kill the backlight](#) on their displays.

Step 5



- Notice the clean lines and muted colors in Apple's foray into [abstract art](#). The second image is *extra* abstract thanks to X-rays.
- Let's channel our inner art critic and try to spot some differences between the newest Mini and its predecessor:
 - Different battery model, with updated (i.e. incompatible) connectors
 - Rated for 19.32 Wh, it matches [the last Mini's](#), has less than the [standard iPad's](#) 32.9 Wh, and comes in a little over the [Galaxy Note9's](#) 15.4 Wh.
 - Upgraded front-facing camera module
 - Updated ambient light (True Tone) sensors
 - A migrated set of microphones
- [Here's a clean view with no markings](#), in case you want to spot the differences yourself.

Step 6



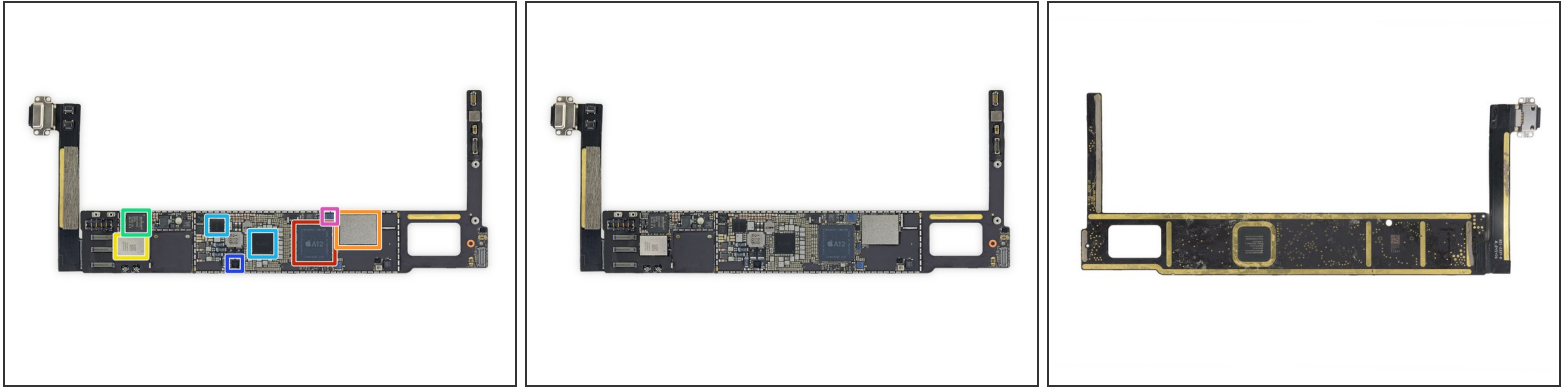
- Despite their similar hardware, iPads continue to lag way, way behind iPhones in their construction —this home button being a perfect example. On iPhones this is [an easy, elegant swap](#), but here it's still a mess of glue, [even after all this time](#).
- Elsewhere on this display, we blast the shields off and smoke out the chips underneath:
 - Parade Technologies DP815 Display Port timing controller (likely)
 - Texas Instruments [TPS65195](#) clock level shifter
 - Texas Instruments TPS65144 LCD Bias w/ integrated gamma reference
 - Intersil ISL24879 precision programmable LCD reference voltage generator
 - STMicroelectronics [M24C64-F](#) 64 Kb Serial EEPROM memory

Step 7



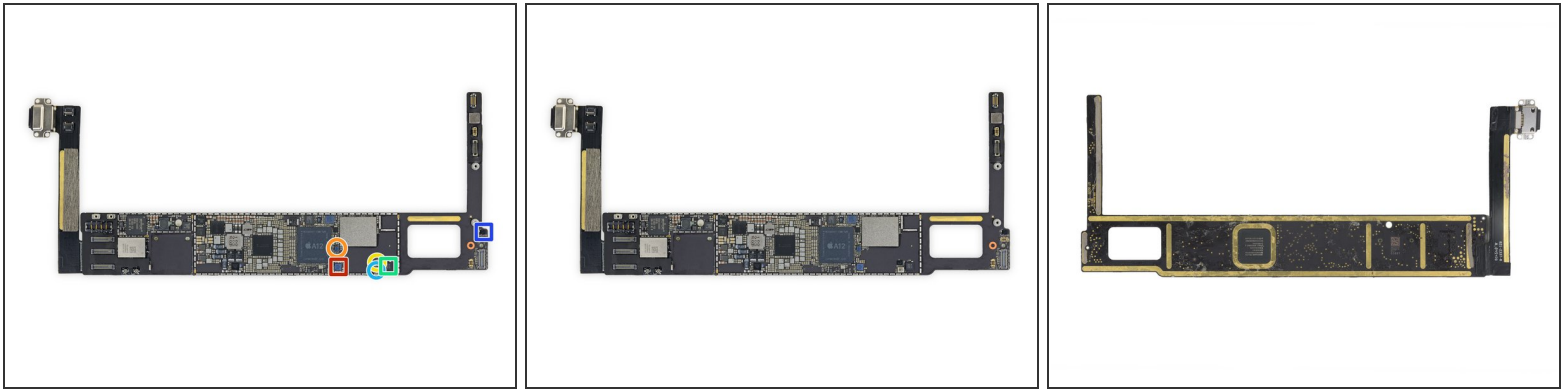
- This Mini inherits the 7 MP $f/2.2$ front-facing camera setup we first saw in the [10.5-inch iPad Pro](#).
 - ❗ That's a pretty significant upgrade from the 1.2 MP sensor in the [Mini 4](#), though the housing looks mostly the same.
- With the cameras out of the way, we get a close look at the new upper microphone array, now centered near the selfie cam.
- Next, the logic board comes free after a good struggle against the [kragle](#) underneath. (Why do iPads always feel like they're assembled by Lord Business?)

Step 8



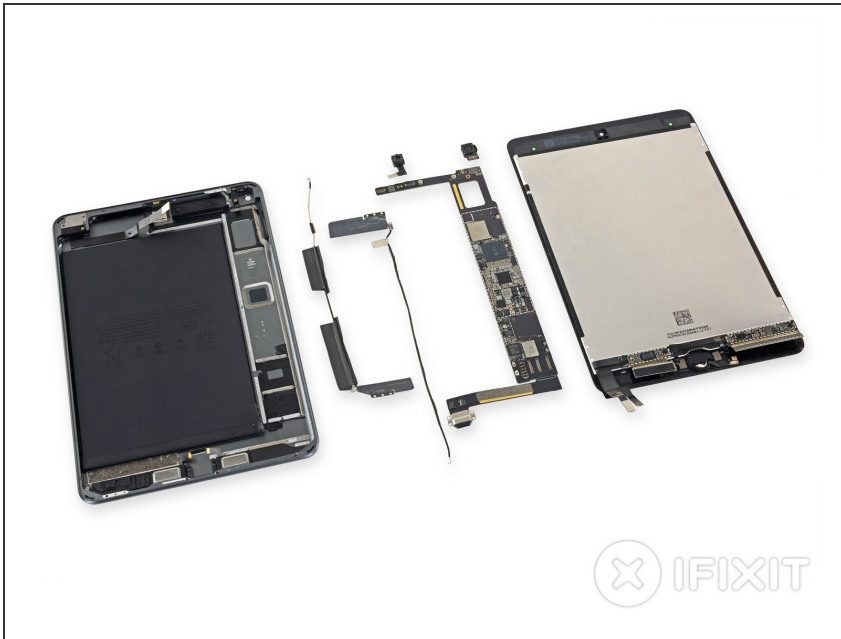
- Let's see what kind of silicon Apple managed to squeeze in here:
 - Apple [APL1W81](#) A12 Bionic SoC, layered over Samsung K3UH4H40AM-MGCL 3 GB LPDDR4X DRAM
 - Toshiba TSB3243VD1190CHNA1 64 GB flash memory
 - Apple/USI 339S00551 Bluetooth/WiFi module
 - Broadcom BCM15900 touchscreen controller
 - Apple 343S00286-A0 and 343S00282-A0 power management ICs (left to right)
 - NXP Semiconductor CBTL1612A1 display port multiplexer
 - NXP Semiconductor 100VB27 (SN100V) NFC controller

Step 9



- IC identification, continued:
 - Cirrus Logic CS42L83A audio codec
 - Cirrus Logic audio amplifier
 - Cypress Semiconductor [CYPD2104](#) USB-C port controller
 - Bosch Sensortec accelerometer/gyroscope
 - Bosch Sensortec pressure sensor
 - AKM Semiconductor [AK0991xx](#) digital compass

Step 10



- With this iPad Mini in pieces, we'll conclude our teardown! What did we learn?
- The iPad Mini continues to be (mostly) its own entity—not quite a shrunken down [iPad](#), nor a miniature [iPad Air](#).
- After a [number](#) of [conflicting experiences](#) ultimately leading up to this Mini's glued-in battery, we're officially *not optimistic anymore* about seeing adhesive pull tabs for iPad batteries.
- That said, it's time to give this iPad a repairability score!

Step 11 — Final Thoughts

REPAIRABILITY SCORE:



- iPad Mini 5 earns a **2 out of 10** on our repairability scale (10 is the easiest to repair):
 - A single Phillips driver takes care of all the screws.
 - Many components are modular and can be replaced independently, but the Lightning port is soldered to the logic board.
 - Battery replacement is possible, but still unnecessarily difficult.
 - Gobs of adhesive hold many parts and cables in place, complicating all repairs.
 - Removing the home button is tough, and will be required for display replacement if you want to keep Touch ID functionality.