



## iPad Wi-Fi Teardown



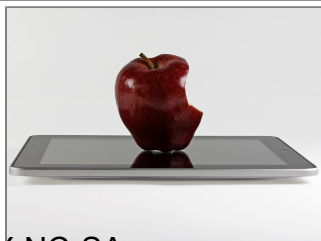
### Step 1 -

- It's here! We got our hands on Apple's newest toy, the iPad, and we can't wait to see what's in it. So we won't— let's do this!



### Step 2

- Contents of the box:
  - iPad
  - Dock Connector to USB Cable
  - 10W USB Power Adapter
  - Documentation





### Step 3

- Before we proceed with our iPad teardown, a quick announcement: On April 22, 2010, [iFixit will change repair forever](#).



### Step 4

- The iPad measures in at 242.8 x 189.7 x 13.4 mm and weighs in at 1.5 lbs.
- The significantly improved 9.7 inch LED-backlit glossy widescreen with Multi-touch is perfect for all your movie watching, e-book reading needs.
- The iPad's model number is A1219, which doesn't mean much. But the 3G iPad is [A1337](#), which is rather geeky, even for Apple.
- Yes, we did turn it on—how could we not? But then we turned it right back off and started figuring out how to pry this beautiful machine apart.





### Step 5

- iPad, meet iPod original.
  - More like: Flying saucer, meet horse & buggy.
- The iPad stacked upon a MacBook Pro, stacked upon a Dell laptop.



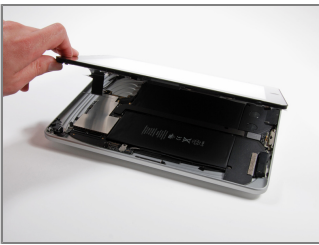
### Step 6

- Insert a [metal spudger](#) between the display and the rear case to pry the iPad open.
- What an environmentally friendly device!
  - Arsenic-free display glass
  - BFR-free
  - Mercury-free LCD display
  - PVC-free
  - Recyclable aluminum and glass enclosure
- Environment WIN!



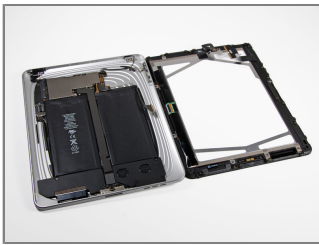
### Step 7

- Lift the display assembly away from the rear case.
- A first peek under the hood reveals two huge Li-ion Polymer batteries taking up most of the space in this device.



### Step 8

- Aaaaand it's off. You have no idea how glad we are that this [didn't require a heat gun](#).
- Words from the wise: You might break some tabs getting the display assembly off.



### Step 9

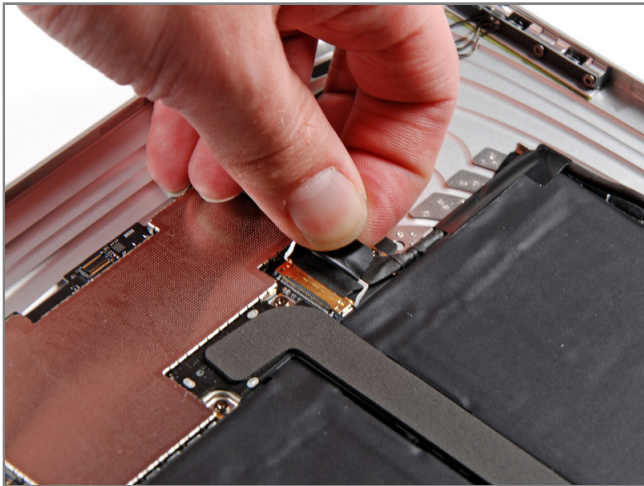
- Wow, what gorgeous symmetry.
- The display assembly and rear case assembly are each 350g. Talk about 50/50 weight distribution.
- The empty void in the upper right corner is where the cellular communications board will go in the [3G iPad](#).



### Step 10

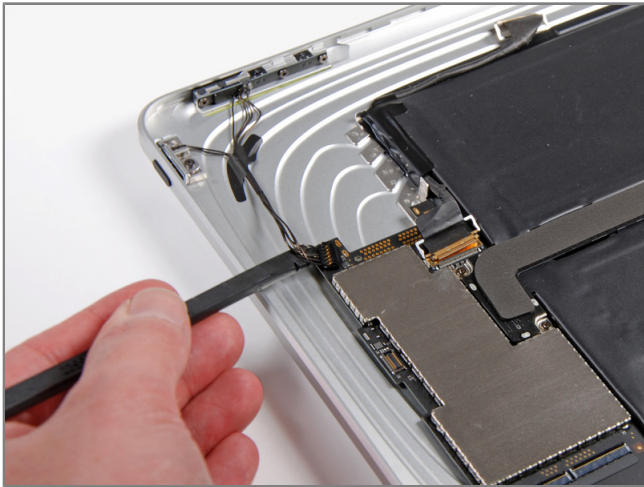
- The display has a marking referencing [Honeywell patent #5280371](#).
- It looks pretty barren, mostly because all the 3G equipment is missing.
- The 3.75V, 24.8 watt-hour battery provides the juice for an advertised 10 hours of use. In contrast, the iPhone 3GS has a 4.51 watt-hour battery and the MacBook Air has a 40 watt-hour battery.
- The USB power supply had to be enhanced specifically for the iPad. It's a 10W unit manufactured by Foxlink Technology, Ltd., part #[A1357 W010A051](#).





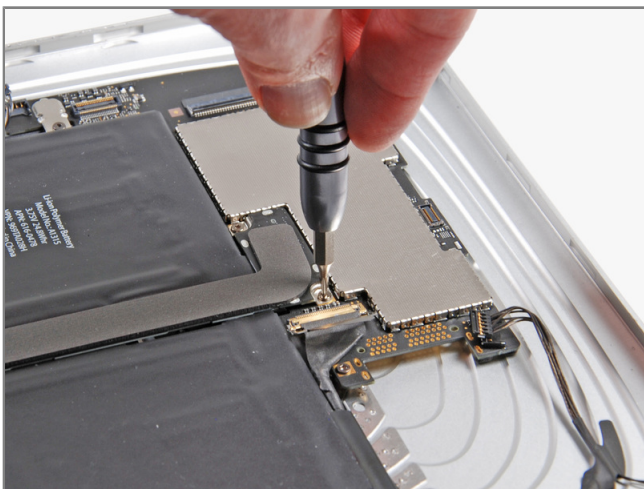
### Step 11

- Disconnecting the display data cable.
- Removing these connectors is a two step process. You first have to flip up the locking bar (pictured) and can then slide the cable out of the socket.
- The display data cable connector is the [same style](#) used in all of the new Unibody MacBooks.



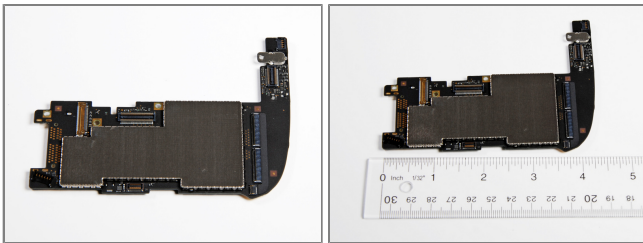
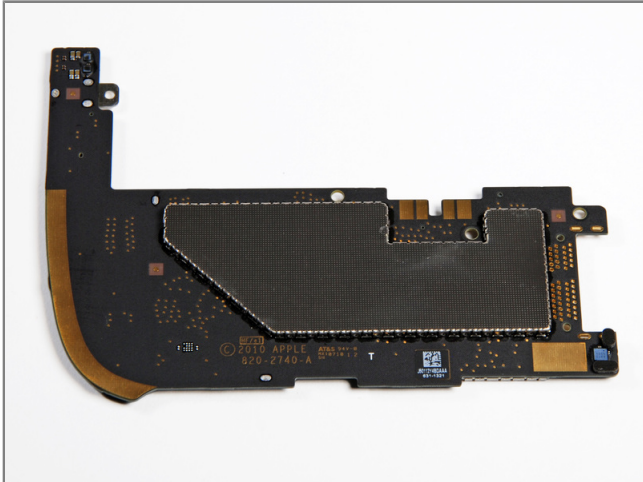
### Step 12

- Disconnecting the volume, power, and screen rotation lock buttons connector.



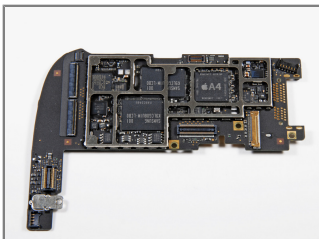
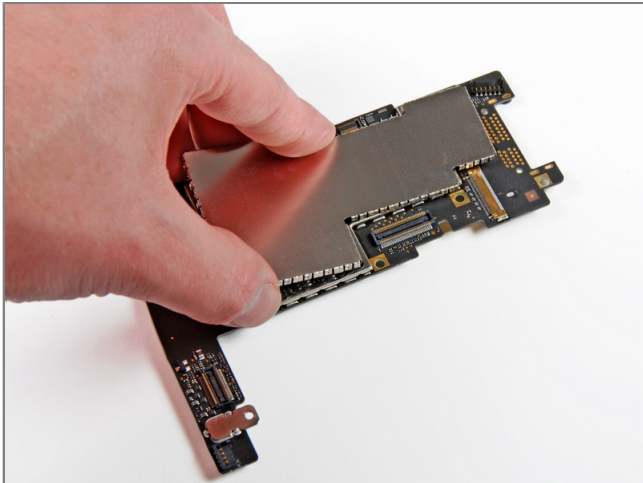
### Step 13

- The main board is secured to the back panel by [T4 Torx](#) screws.
- We have **never** seen Apple use screws with a bit this small before.



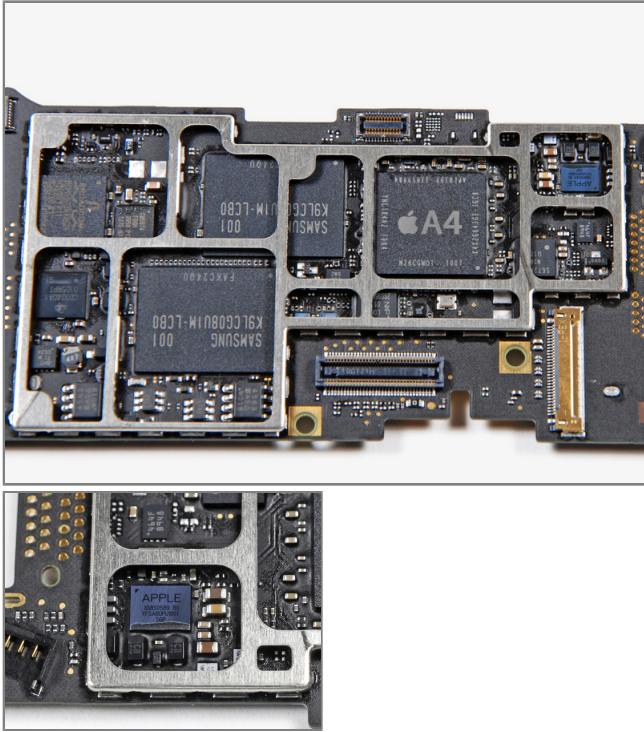
### Step 14

- Top and bottom of logic board with the EMI shield on.
- It looks like this board was made by [AT&S](#). We haven't seen Apple's PCB manufacturers brand their boards before.
- The logic board is about 4.5" wide, spanning about 60% of the iPad's width.



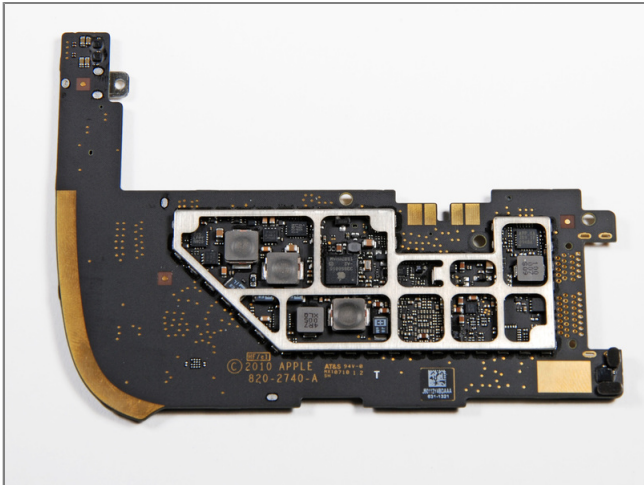
### Step 15

- Remove the EMI shield from the logic board, and presto!
- This board is markedly different than the [pre-production board](#) we uncovered.
- Markings on the A4:
  - N26CGM0T 1007 APL0398 33950084 YNL184A2 1004 K4X2G643GE
  - Yes, the K4X2 is a Samsung DRAM part number!
    - [Decoding](#) the part number shows there is 2Gb of memory inside. This translates into ~128MB of memory per die, for 256 MB total. (NOT 512MB, as we previously reported.)
- This means the A4 processor is probably being manufactured by Samsung.
- The DRAM was stamped at the end of January, while the processor die was likely manufactured the third week of February.



## Step 16

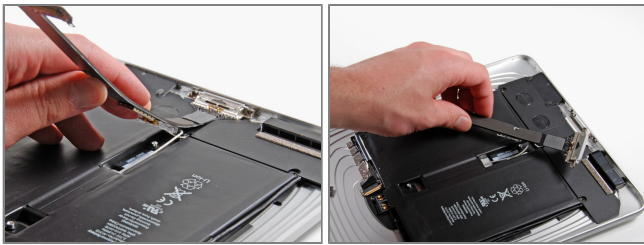
- A shot of the logic board minus the steel EMI shield.
- The manufacturer of the memory has switched from Toshiba on the FCC teardown to Samsung on this device.
  - 64Gbit MLC NAND flash.
  - We love how much easier Samsung's chip numbers are to interpret.
- Broadcom BCM5973 I/O controller.
- The Apple A4 is marked up much nicer than the part in [the FCC photos](#) from yesterday.
- Texas Instruments CD3240A1
- NXP: L061 01 4 ZSD950



## Step 17

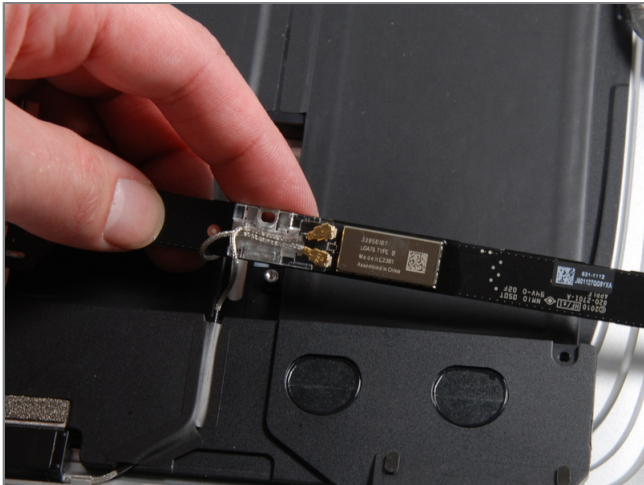
- A reverse shot of the logic board.
- The gold strip on the curved edge most likely helps ground the board against the "steps" cut into the aluminum rear case.
- Apple part #820-2740-A.
- The Apple-branded IC on this side of the board is labeled 338S0805.





### Step 18

- Removing the single screw securing the dock connector cable to the rear case.
- Notably lacking from this RF/data cable is anything GPS related. Check out the [FCC iPad teardown](#) to see where the GPS will be in the 3G device.



### Step 19

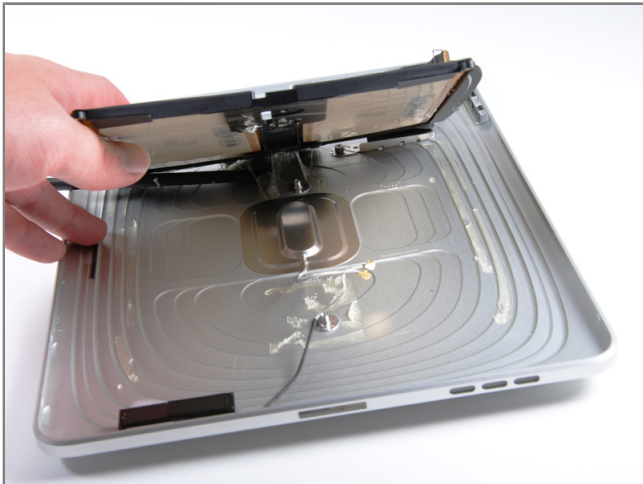
- The 802.11n WiFi/Bluetooth card is integrated into the dock connector cable.
- Hiding under the case:
  - Broadcom [BCM4329XKUBG](#) 802.11n WiFi + Bluetooth 2.1 + EDR and FM
- Don't worry, the capacitor near the lower right corner of the Broadcom chip didn't come that way. The solder melted and it moved when we heated the steel casing to remove it.





### Step 20

- The speaker assembly is larger than we expected:
  - The connector found on the speakers and other components is typical of the connectors seen in MacBook Unibody laptops. Translation: the iPad isn't that cramped for space.
- Dual speakers provide mono sound. Two small sealed channels direct sound toward three audio ports carved into the bottom edge of the iPad. The audio-out jack provides stereo sound, of course.



### Step 21

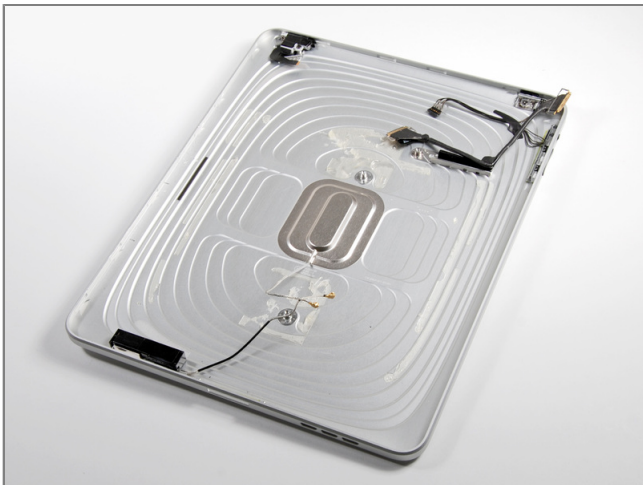
- That's a hulk of a battery: it weighs 148g with the casing.
- Confirming our suspicions from yesterday, the battery integrates two separate 3.75V lithium polymer cells wired in parallel for such ample battery life.
- Battery cell markings:
  - P11GA6-01-C01F
  - 741-00310A +





## Step 22

- The iPad battery is a lot bigger than an iPhone 3G battery. The iPhone battery has about 1/5th the capacity provided by the iPad battery.
- The second shot shows the battery cover peeled back to expose the protection and connection circuitry for each Li-Poly battery.
- The third shot shows the other side of the battery board, which is stamped with [Compeq](#).

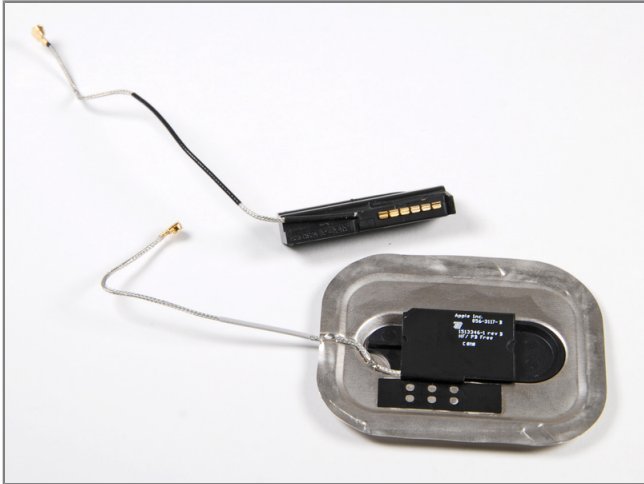


## Step 23

- The bare rear case. The antenna behind the apple logo looks just like the antenna on the new [iMacs](#).
- A little prying with a metal spudger is required to separate the antenna from the rear case.
- Tolerances look pretty tight in the antenna compartment. Check out that pocket just for the antenna to sit in.







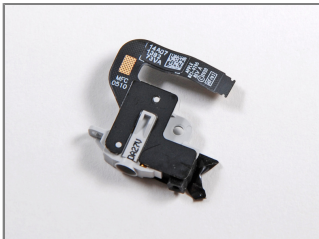
### Step 24

- Here's a detail shot of both WiFi antennas. The wireless reception should be decent with such dense antennas.
- Adding 3G capability to a Wi-Fi only iPad is not going to be a very feasible upgrade. Based on the photos released by the FCC, the 3G models include additional antennas as well as a plastic strip in the rear panel to improve reception.

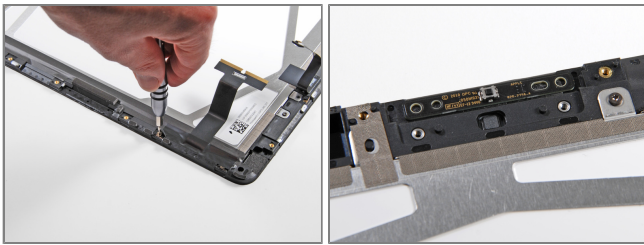
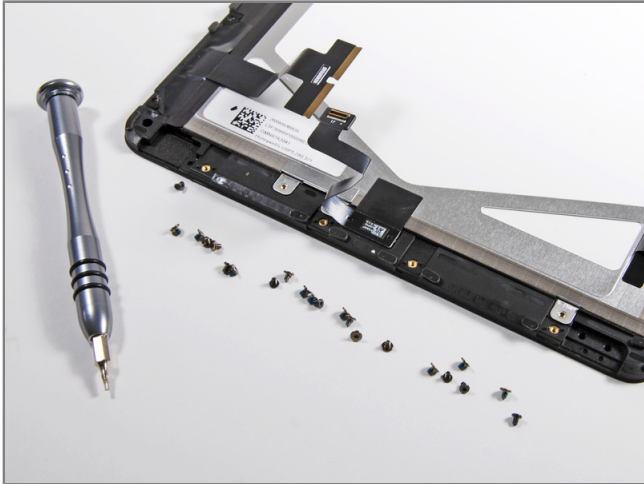


### Step 25

- Remove a couple screws and pull the headphone jack out of the rear case.
- As with most portable devices, the headphone jack is **very** well fastened to the case.
- The microphone's right next to the headphone jack and goes through the same data cable as the headphone jack.
- Like the iPhone, it appears that the iPad features a liquid sensor in its headphone jack. If you get your iPad wet, don't expect Apple to fix it under warranty for you.







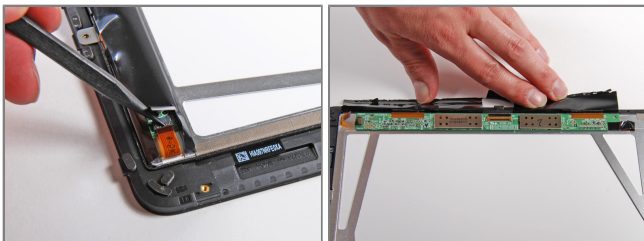
## Step 26

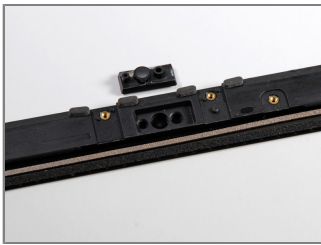
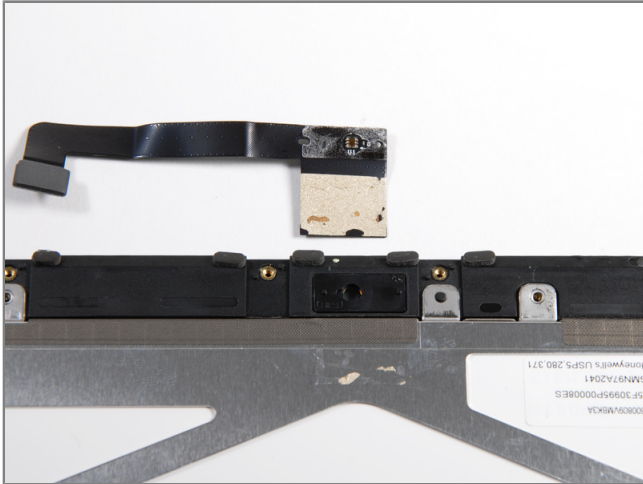
- Ants on parade? Nope, just the T4 Torx screws holding each tab to the display assembly.
  - Each clip holding the display assembly to the rear case is fastened down with its own T4 Torx screw.
- Luckily, the home button is a digital switch with its own circuit board, making replacement that much easier.



## Step 27

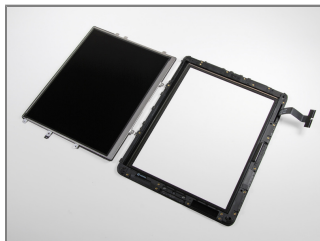
- Disassembling the display assembly.
- A thin ribbon cable connects the LED driver board to the LED backlights.
- The LED driver circuitry and the interconnects between the actual LCD and the display data cable connector are contained within the same circuit board.





## Step 28

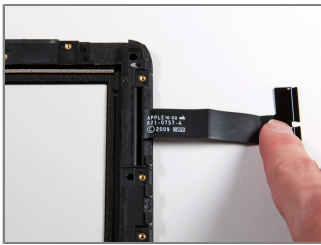
- The ambient light sensor lives in a compartment that a camera would love to call home.
- We suspect that this compartment was intended for the ambient light sensor all along, and the rumors of a camera that would fit here were overzealous. The layout does look very similar to the camera's view ports on the [MacBook Pro 13" Unibody](#).



## Step 29

- The display seems to be glued around its perimeter but can still be removed from the plastic framework.
- The display assembly weighs in at:
  - 153g for the LCD
  - 193g for the front glass
- The glass seems quite thick (~1.18 mm), which is not a huge surprise considering the size of the iPad. Compare that to about 1.02 mm for the iPhone.
  - The iPad would require thicker glass due to the increased "lever arm" caused by pressing down at the center of the screen. This is analogous to the difficulty of bending a one inch section of a ruler compared to bending the entire twelve inch ruler.





### Step 30

- Some front glass/digitizer part numbers.
- The part number on the display frame reads:
  - HIA097NRFE0XA
- On the digitizer cable:
  - 821-0757-A



### Step 31

- Peel back the sticker, and more part numbers can be seen near the bottom of the LCD.
- The numbers read:
  - A01327200 EP001A
  - 10 1 25 S NE M213
- We don't know who made this particular LCD. Do you? Another iPad we opened contained a LCD panel that was manufactured by LG.



## Step 32

- As always, the final layout shot.
- Here's the weight breakdown: Aluminum back: 138 grams, Battery: 148 grams, LCD: 153 grams, Glass (and frame): 193 grams, Speaker: 17 grams, Main board: 21 grams, Everything else: 27 grams
- Total: 697 grams (that's more than the .68 kg Apple quotes, has anyone else weighed their complete iPad?)
- This iPad may be apart, but we'll continue to dig deeper into its chips. Follow [@ifixit](#) for the latest updates!

To reassemble your device, follow these instructions in reverse order.