



# Retina MacBook 2016 Teardown

Teardown of the Retina Macbook 2016 performed on April 21, 2016.

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# INTRODUCTION

A year after release, Apple just announced its first update to the 12" MacBook with Retina Display. It's sort of a baby update, so we decided to match it with a baby teardown. Besides a faster processor and zippier flash memory, what changed? There's only one way to know: crack it open and spill its secrets. Join us for a mini-teardown of the Retina MacBook 2016.

For a no-holds-barred disassembly of the initial Retina MacBook release, check out our [Retina MacBook 2015 teardown](#).

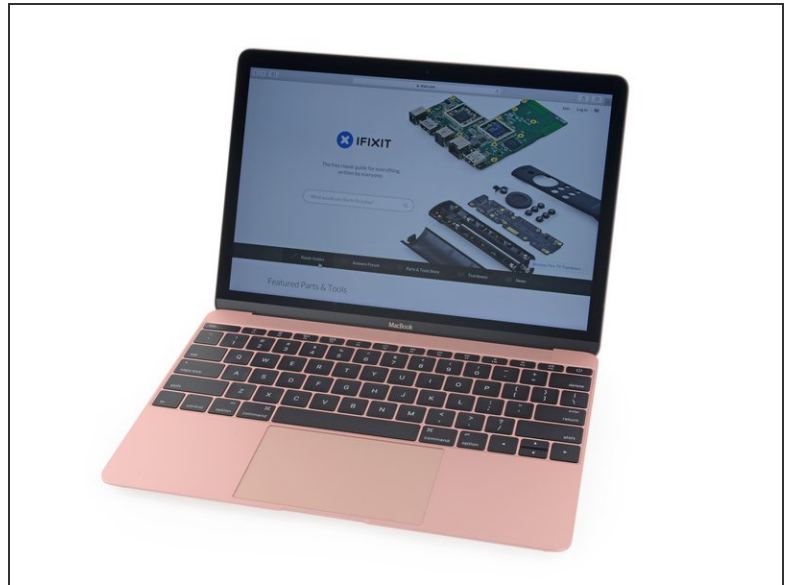
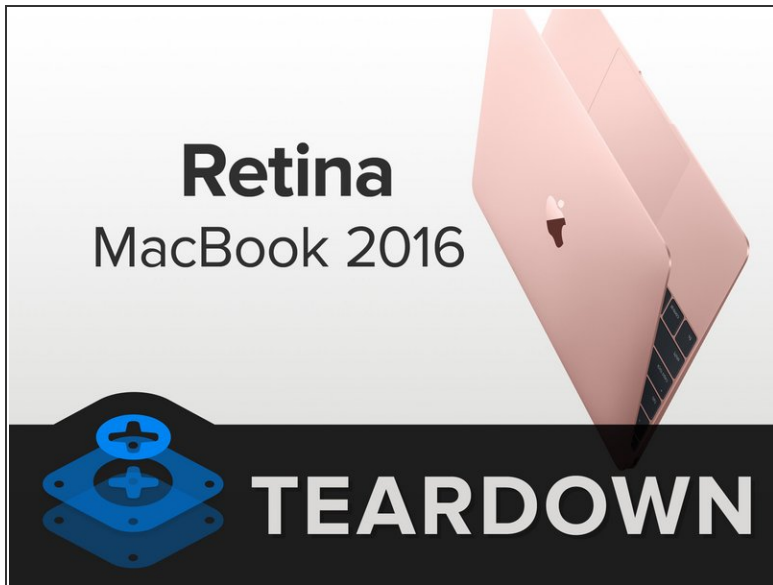
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## TOOLS:

- [P5 Pentalobe Screwdriver Retina MacBook Pro and Air](#) (1)
  - [T5 Torx Screwdriver](#) (1)
  - [Spudger](#) (1)
  - [Tweezers](#) (1)
  - [iPad Battery Isolation Pick](#) (1)
  - [Phillips #00 Screwdriver](#) (1)
  - [T8 Torx Screwdriver](#) (1)
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## Step 1 — Retina MacBook 2016 Teardown



- With the MacBook jumping on the Rose Gold bandwagon, who knows what's lurking *inside*? Here's the lowdown so far:
  - 12-inch 2304 × 1440 (226 ppi) IPS Retina Display
  - 1.1 GHz dual-core Intel Core m3 processor (configurable up to 1.3 GHz dual-core Intel Core m7)
  - 8 GB of 1866 MHz LPDDR3 RAM
  - 256 or 512 GB PCIe-based flash storage
  - Intel HD Graphics 515
  - 802.11a/b/g/n/ac Wi-Fi wireless networking and Bluetooth 4.0
  - Single USB-C port and 3.5 mm headphone jack

## Step 2



- If it weren't for the rose gold finish, we'd be hard-pressed to distinguish between this year's Retina MacBook, and the one of yesteryear.
- The exteriors look identical, from the Pentalobe screws in the lower case all the way down to the model number—A1534.
- ☑ The only telltale sign that something's different is the updated EMC number: 2991 compared to last year's 2746.

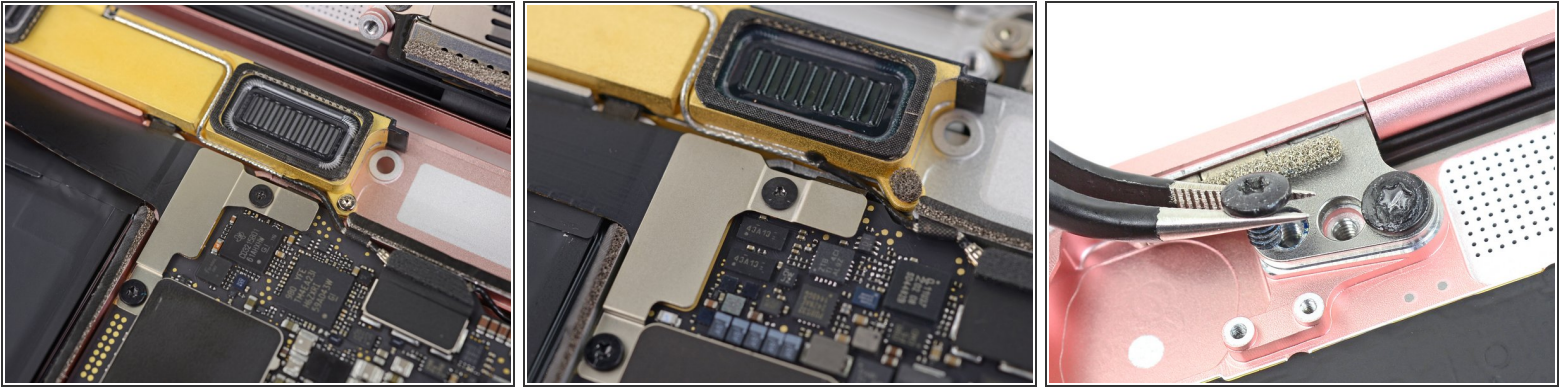
## Step 3



- Popping the hood on this MacBook gives us an indication that the rose gold beauty is much more than skin deep.
- Before delving any deeper into *this* beauty, we take a quick look at the chips powering the trackpad:
  - Broadcom [BCM5976](#) Touchscreen Controller
  - STMicroelectronics [32F103](#) ARM Cortex-M3 Microcontroller
  - International Rectifier [IRFH3702](#) Single N-Channel HEXFET Power MOSFET



## Step 4



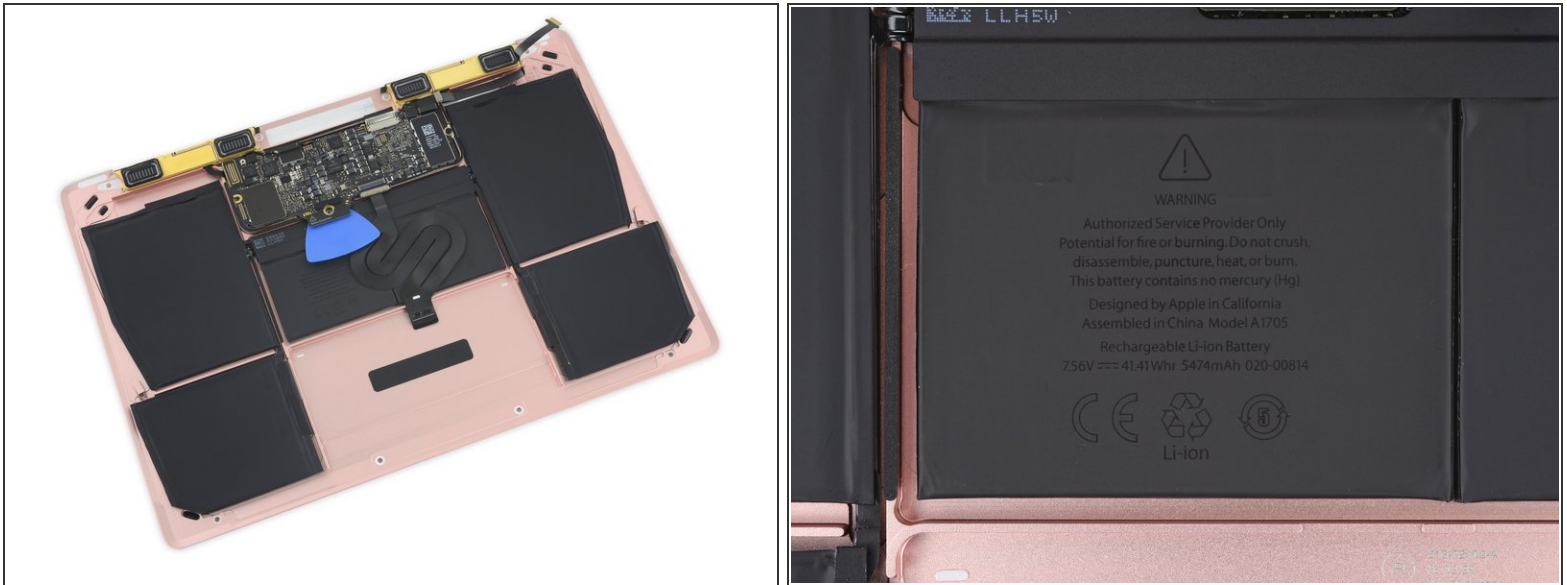
- *What's that?* The pesky tri-wing screw [we saw last year](#) grew another, um, wing—now it's a regular ol' repair-friendly Phillips.
- ❗ If you weren't put off by the Pentabolbes on the lower case, then a tri-wing probably won't slow you down much—but hey, we'll take what we can get!
- Thankfully, all the other internal screws remain standard Phillips and Torx screws.
- ⚠ However, another surprise awaits at the hinge screws, whose Torx heads are filled with some sort of substance that disintegrates when you insert a screwdriver. Are you sealing our MacBook with tamper-evident screws, Apple?

## Step 5



- And at the other end of the MacBook, it seems the USB-C hardware has also changed. The cable is now perma-fixed to the USB board, condensing the two components into a single unit.
- ...Also, the silicon is new and moved from the cable itself to the USB board. Here's a comparison of the new USB-C hardware (top) with that of the 2015 Retina MacBook (bottom).
  - Parade Technologies PS8741A (likely an iteration of the [PS8740](#) USB Type-C Redriving Switch)
- ⓘ This new USB and cable arrangement is one thing that's *not* compatible with previous Retina MacBooks.

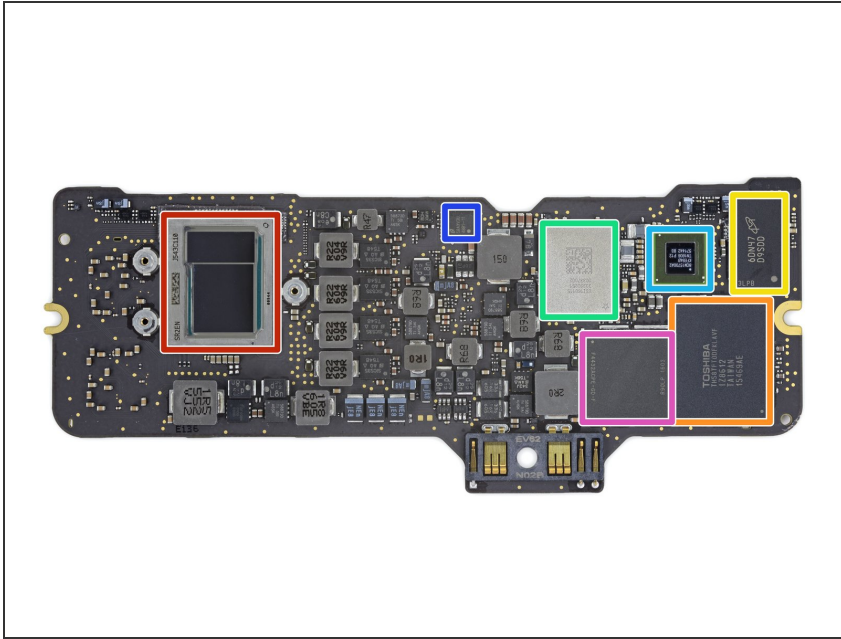
## Step 6



- The battery's form factor seems 100% identical to the multi-lobed cell we found in the 2015 Macbook.
  - And yet somehow, Apple managed to squeeze in a 4% capacity increase from the 7.55 V, 39.71 Wh battery in [last year's model](#). Apple claims this new 7.56 V, 41.41 Wh Li-ion power source should provide up to 11 hours of iTunes movie playback.
  - ❗ We're guessing this capacity increase is owed to improved battery chemistry (though it's also possible that Apple's engineers have shaved away *just* enough material from the lower case to allow for a thicker battery).
  - Unfortunately, they did *not* squeeze in any of those nifty adhesive pull tabs we've seen in [Apple's iDevices](#).
- 👉 Regardless, our tests indicate this beefier battery is compatible with last year's MacBook. Nice!

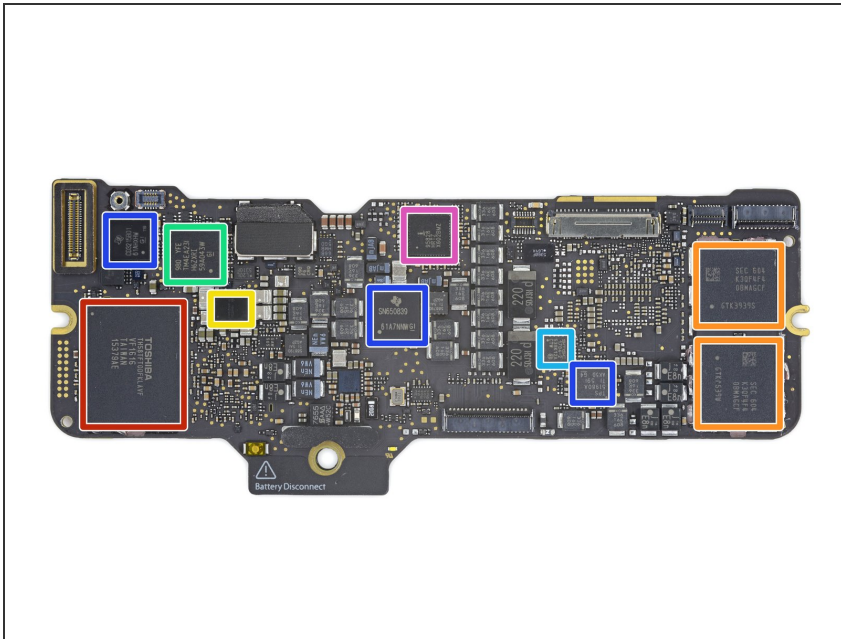


## Step 7



- Logic Board! What chips is *this* MacBook serving up?
  - Intel [SR2EN](#) Intel Core m3-6Y30 Processor (4M Cache, up to 2.20 GHz)
  - Toshiba [TH58TFT0DFKLAVE](#) 128 GB MLC NAND Flash (+ 128 GB on the reverse side for a total of 256 GB)
  - Micron [MT41K256M16LY-107](#) 4Gb DDR3L SDRAM
  - Universal Scientific Industrial 339S0250 Wi-Fi Module
  - Broadcom BCM15700A2 (as seen in several other MacBook models)
  - National Semiconductor [48B1-11](#)
  - F4432ACPE-GD-F (with SSD controller presumably layered underneath)

## Step 8



- But wait, there's even more chips on the back:
- Toshiba [TH58TFT0DFKLAVE](#)  
128 GB MLC NAND Flash
- Samsung K3QF4F4 4 GB  
LPDDR3 RAM (x2, for a total of 8 GB)
- Apple 338S00066
- Texas Instruments/Stellaris [LM4FS1EH SMC Controller](#)  
(Replacement codename for TM4EA231)
- SMSC [1704-2](#) Temperature Sensor
- Texas Instruments SN650839, TPS51980A, and CD3215B01
- Intersil 95828

## Step 9



## REPAIRABILITY SCORE:



- Retina Macbook 2016 Repairability Score: **1 out of 10** (10 is the easiest to repair)
  - Those pesky tri-wing screws are gone, replaced with lovely standard Phillips screws—but tamper-evident hinge screws make you feel like a hoodlum for repairing your own machine.
  - The processor, RAM, and flash memory are still soldered to the logic board.
  - The battery assembly remains entirely, and very solidly, glued into the lower case.
  - The Retina display is still a fused unit with no separate, protective glass. If the display needs replacing, it'll cost a pretty penny.
- ⓘ While it's no more repairable than last year's edition, it does benefit from sharing a lot of the same parts and [repair procedures](#).