



# Retina MacBook 2017 Teardown

Teardown of the Retina Macbook 2017 performed on June 7, 2017.

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## INTRODUCTION

It has been just over a year since Apple unveiled its first update to the [Retina Macbook](#). A year later we hold the ~~same computer~~ second update. Join us as we teardown the 2017 Retina Macbook to try and determine where exactly Apple [thinks differently](#).

If non-drastric updates are your thing, make sure to check out the [2017 Macbook Pro Touch Bar teardown](#).

If teardowns of all shapes and sizes are your thing, make sure to catch em' all by following us on [Instagram](#), [Twitter](#), and [Facebook](#).

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### TOOLS:

- [P5 Pentalobe Screwdriver Retina MacBook Pro and Air](#) (1)
  - [Spudger](#) (1)
  - [Battery Blocker](#) (1)
  - [Phillips #00 Screwdriver](#) (1)
  - [T5 Torx Screwdriver](#) (1)
  - [Tweezers](#) (1)
  - [T3 Torx Screwdriver](#) (1)
  - [TR8 Torx Security Screwdriver](#) (1)
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## Step 1 — Retina MacBook 2017 Teardown



- We check out the Space Gray specification bump and see what this year's MacBook has to offer:
  - 12-inch 2304 × 1440 (226 ppi) IPS Retina Display
  - 1.2 GHz dual-core Intel Core m3 processor (Turbo Boost up to 3.0 GHz)
  - 8 GB of 1866 MHz LPDDR3 SDRAM
  - 256 GB PCIe-based SSD
  - Intel HD Graphics 615
  - 802.11ac Wi-Fi and Bluetooth 4.2
  - A single USB-C port and 3.5 mm headphone jack

## Step 2



- The larger trackpad. The USB-C port. The lone headphone jack. Why does this [all feel so familiar?](#)
- The new MacBook has model number A1534. Oh, so does the 2016 Retina MacBook. Don't forget the 2015 MacBook either. *They are all the same...*
- ⓘ Can we just use last year's teardown and call it a day?
- Okay, so the EMC number is a fresh 3099. Something must be different. The investigation continues!

## Step 3



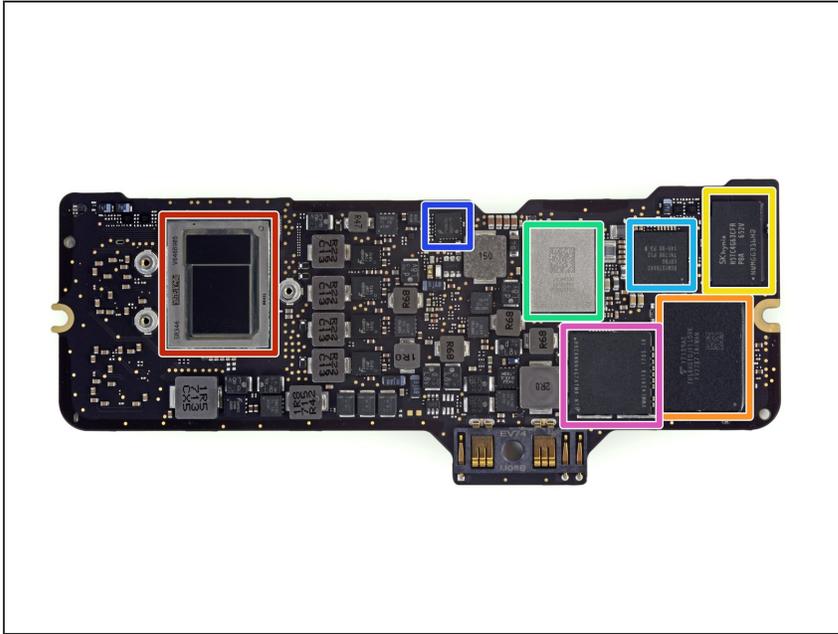
- Removing some Pentalobe screws allows us to get a peek at this MacBook's internals.
- The silicon buried underneath the trackpad doesn't appear to be any different from last year's MacBook. We find a handful of ICs:
  - Broadcom [BCM5976](#) touchscreen controller
  - STMicroelectronics [STM32F103](#) 32-Bit ARM Cortex-M3 microcontroller
  - Monolithic Power Systems [MP24830](#) white LED backlight driver and an International Rectifier [IRFH3702](#) single N-channel HEXFET power MOSFET (likely for driving keyboard backlight LEDs)
  - Texas Instruments [TMP421](#) temperature sensor and Bosch Sensortec BMA282 accelerometer
  - Macronix [MX25L2006E](#) 2 MB Serial NOR Flash
  - Maxim Integrated MAX11290 24-bit delta-sigma analog-to-digital converter (likely)

## Step 4



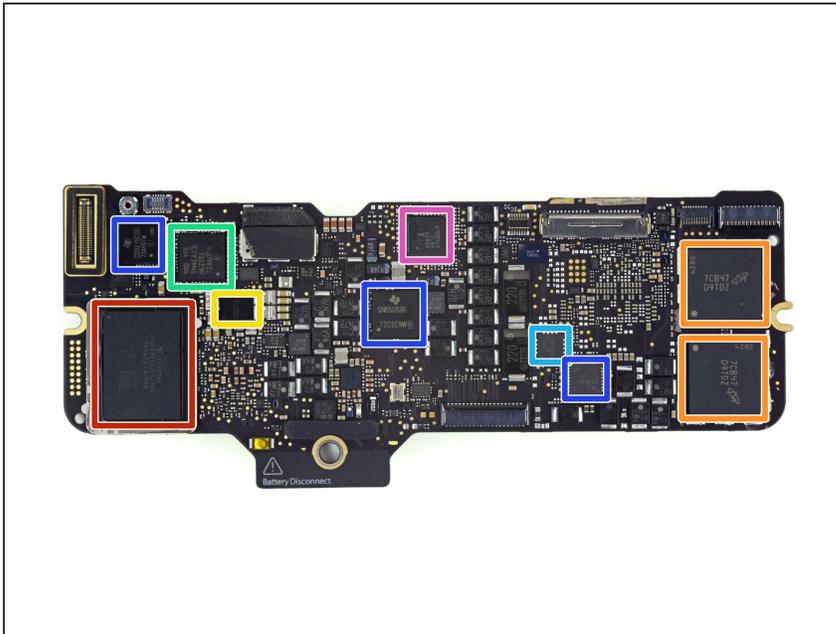
- Last year we noted that Apple moved away from its inclusion of a tri-point screw in the MacBook and replaced it with a Phillips screw.
- Tinkerers and repairers can rejoice! Even though we saw [a barrage of tri-point screws in the iPhone 7](#), we still see the Phillips screw standing strong.
- Although we were armed with our [64 Bit Driver Kit](#) and prepared for any pesky tri-point screws, it is always a relief to see the repair friendly Phillips screw.
- More of the same is always good when it comes to repair. It is not so good when it comes to permanent, soldered components. To the logic board we go!
- ...But not before we [isolate](#) that battery to safely depower the system. Speaking of which, this year's battery exactly matches [last year's](#) 41.41 Wh juice box.

## Step 5



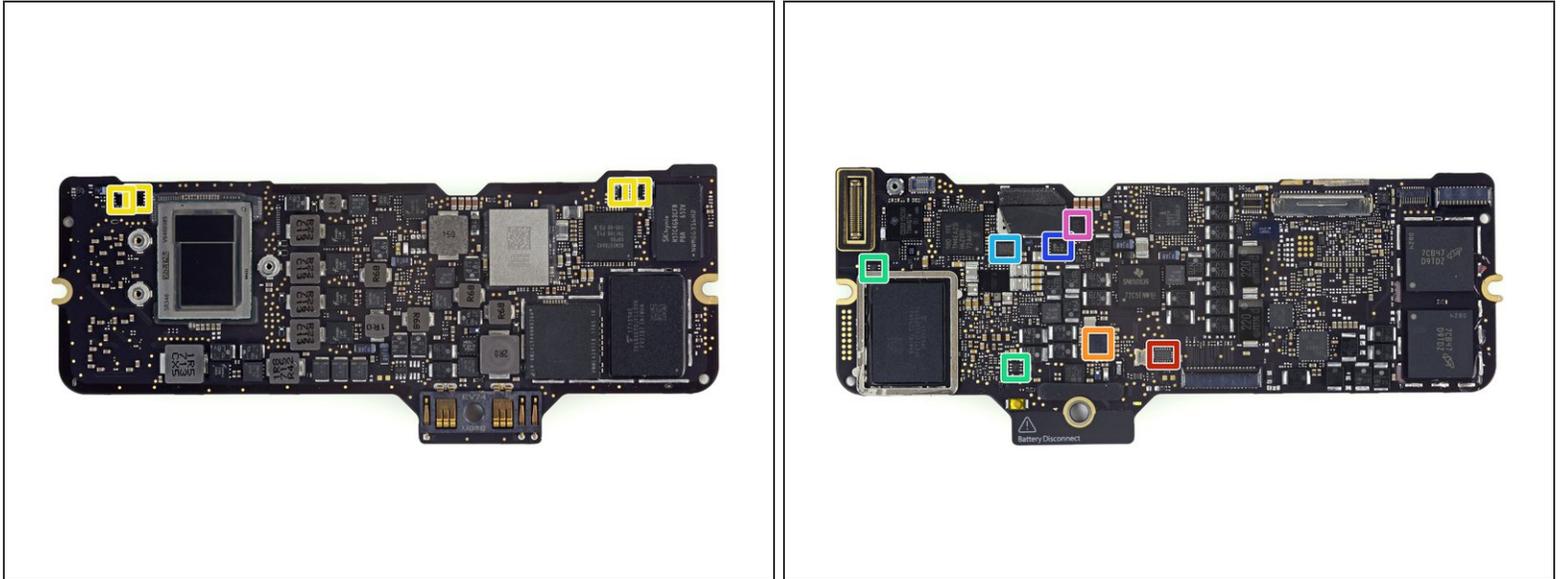
- We finally stumble across some subtle differences in the chipset:
  - Intel [SR346](#) Intel Core m3-7Y32 Processor (4M Cache, up to 3.00 GHz)
  - Toshiba TH58XGT0JFLLDVK 128 GB NAND Flash (+ 128 GB on the reverse side for a total of 256 GB)
  - SK Hynix [H5TC4G63CFR](#) 4GB DDR3 SDRAM
  - Universal Scientific Industrial 339S0251 Wi-Fi module
  - Broadcom BCM15700A2 (as seen in several other MacBook models, but this version has a notably different form factor)
  - National Semiconductor [48B1-11](#) (LP8548B1) display backlight driver
  - SK Hynix H9CKNNN4GTATMR-NTH (with SSD controller presumably layered underneath)

## Step 6



- And for the opposite side:
  - Toshiba TH58XGT0JFLLDVK 128 GB NAND Flash (+ 128 GB on the reverse side for a total of 256 GB)
  - Micron [MT52L512M64D4PQ-107 WT:B](#) 4 GB 1866 MHz LPDDR3 RAM (x2, for a total of 8 GB)
  - Apple 338S00227-A0 power management IC
  - Texas Instruments/Stellaris [LM4FS1EH SMC Controller](#) (replacement codename for TM4EA231)
  - Texas Instruments [TMP513A](#) thermal/power management with temperature sensor and current shunt monitor
  - Texas Instruments SN650839 programmable power management, TPS51980A step-down converter (likely), and CD3215C00 USB type-C controller
  - Intersil ISL95828 PWM controller for Intel CPUs

## Step 7



- And just for some extra credit:
  - Dialog Semiconductor (formerly Silego) SLG3NB444V clock generator
  - Renesas (formerly Intersil) ISL95530 Li-ion battery charger
  - Maxim Integrated [MAX98357B](#) class D audio amplifier
  - Texas Instruments [TMP102](#) temperature sensor
  - Winbond [W25X20CL](#) 2 MB serial NOR flash memory
  - Renesas (formerly Intersil) ISL8009B synchronous buck regulator
  - ON Semiconductor memory (likely)

## Step 8



- [Rumor](#) has it that the second gen butterfly mechanism inherited from the Pro makes this MacBook way more usable—so what's inside?
- Comparing the space gray "new" keyboard to the rose gold MacBook of yesteryear, we can see:
  - The mechanical switch that detects the keystroke is a simpler rounder dome, not the fancy 'x' shape it once was.
  - The plastic butterfly mechanism also accommodates the new switch, swapping to a new, slightly thinner frame.
- While not really a mechanical change, the control and option keys got some new ink. They now mark keyboard shortcuts rather than translating for PC users.

## Step 9



- Minimal changes in the MacBook means minimal steps in the teardown! Make sure to check out the [Retina MacBook 2016](#) and [Retina MacBook 2015](#) to see more of these machines' construction.
- If you want some more maximal changes, check out the recent [iMac 4K refresh teardown](#).

## Step 10 — Final Thoughts

### REPAIRABILITY SCORE:



- Retina Macbook 2016 Repairability Score: **1 out of 10** (10 is the easiest to repair)
  - Apple did not return to tri-point screws, and instead used only Torx and Phillips screws within the computer.
  - The processor, RAM, and flash memory are *still* soldered to the logic board.
  - A large amount of strong adhesive holds the battery assembly to the lower case .
  - The Retina display is a fused unit with no separate, protective glass. If the display is damaged, it'll be arduous and expensive to repair.
- ① While it's no more repairable than the last two years' editions, it does benefit from sharing a lot of the same parts and [repair procedures](#) as the other Retina MacBooks.