



# Apple TV 4th Generation Teardown

Teardown of the fourth generation Apple TV on September 21, 2015.

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# INTRODUCTION

Apple fans are doing the happy dance, what with a slew of new devices coming out of Cupertino—including the first new Apple TV in more than three years. Our teardown engineers look pretty happy too. That's because we've got our hands on a 4th generation Apple TV. That's right, kids. It's teardown time!

Don't touch that dial—unless you're looking for more teardown news on our [Facebook](#), [Instagram](#), or [Twitter](#).

[video: <https://www.youtube.com/watch?v=ISA8uFwptJc>]



## TOOLS:

- [iFixit Opening Picks \(Set of 6\)](#) (1)
  - [Spudger](#) (1)
  - [TR7 Torx Security Screwdriver](#) (1)
  - [T3 Torx Screwdriver](#) (1)
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## Step 1 — Apple TV 4th Generation Teardown



- We like to start with some specs, and in this case a **lot** of the good stuff is packed into the fancypants new remote. The box itself contains:
  - Dual-core, 64-bit Apple A8 chip
  - Ethernet, 802.11a/b/g/n/ac Wi-Fi, IR receiver, and HDMI 1.4 connectivity
- ...whilst the remote is packing:
  - Glass Touch surface
  - Dual microphones
  - Accelerometer and gyroscope
  - Bluetooth 4.0, IR transmitter, Lightning connector

## Step 2



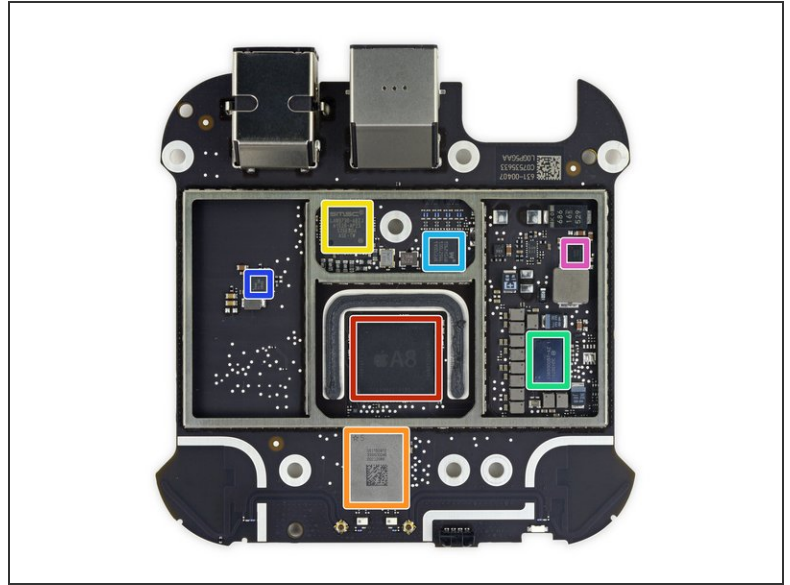
- The Apple TV has really packed on some pounds since its last iteration.
  - It seems to have lost a port in the process—the optical audio out has gone MIA.
  - ⓘ Meanwhile, the micro-USB port has morphed into a USB-C port. It doesn't bring anything new for end users, though—it's still for diagnostic and service functions only.
- Our teardown engineers go to work on the Apple TV and quickly find access through the bottom of the device—similar to the [3rd generation Apple TV](#).
- Only a few plastic clips stand in the way here, with no adhesive or screws in sight.

## Step 3



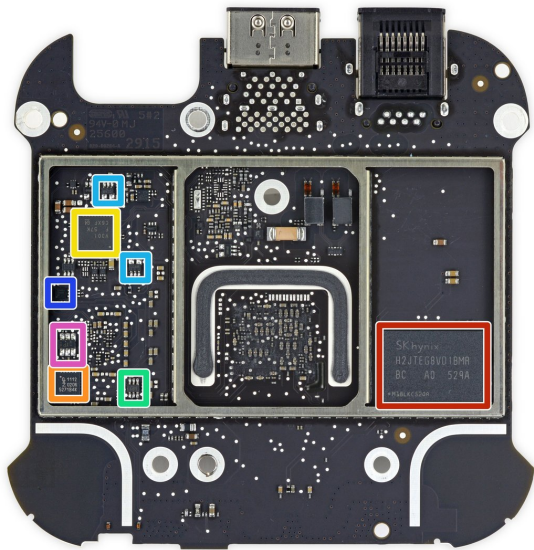
- Under the hood, we spy a few Torx screws.
- We take our Pro Tech Screwdriver Set out for a quick spin to release the combo heat sink/EMI shield.
- By the looks of it, this plate also serves as a bracket, giving the clips on the lower case something to latch onto. That's three functions in one component, folks.

## Step 4



- Here are some chips to go with your TV:
  - Apple A8 APL1011 SoC, with SK Hynix H9CKNNNBKTBRWR-NTH 2 GB LPDDR3 SDRAM
  - Universal Scientific Industrial 339S00045 Wi-Fi module
  - SMSC [LAN9730](#) USB 2.0 to 10/100 Ethernet controller
  - Apple 338S00057 (similar part number to the [338S00055](#) custom memory controller found in the Retina MacBook 2015) (power management IC)
  - Kinetic Technologies (formerly MegaChips) MCDP2700A1 DisplayPort-to-HDMI converter
  - Texas Instruments [TPS62130A](#) 3 A step-down converter
  - Fairchild Semiconductor DF25AU 010D 030D MOSFET

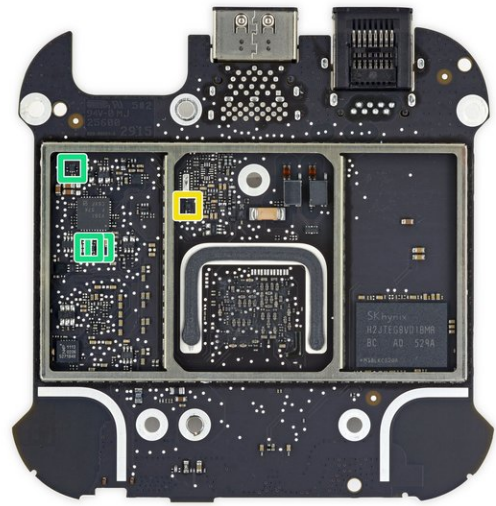
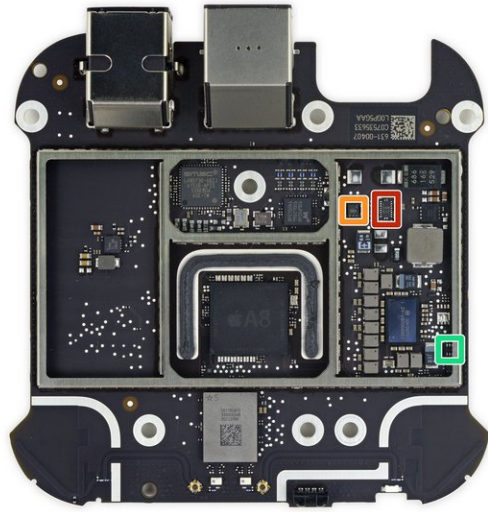
## Step 5



- More chips on the bottom of the logic board:
  - SK Hynix [H2JTEG8VD1BMR](#) 32 GB NAND flash memory
  - NXP Semiconductor CBTL0112 multiplexer/demultiplexer switch (likely)
  - Texas Instruments MSP430V301 16-bit microcontroller
  - Texas Instruments [INA213](#) current sense amplifier
  - ON Semiconductor [LMV331SQ3T2G](#) single comparator
  - Texas Instruments CD3255 power monitor (likely)
  - Nexperia (formerly NXP Semiconductor) [74LVC1G157GV](#) single 2-input multiplexer



## Step 6



- IC Identification, continued:
  - Renesas (formerly Intersil) [ISL95870AHRUZ-T](#) PWM DC-DC controller
  - Texas Instruments [TPS715A01](#) 80 mA / adj. LDO regulator
  - Diodes Incorporated [74LVC1G125FW5-7](#) non-inverting buffer/bus driver
  - Diodes Incorporated [74LVC2G07FW4-7](#) dual buffer gate



## Step 7



- Last to come out of the box: a great big chunky heat sink with a cute little power supply board tucked away inside.
- ❗ Heat rises, so this heat-generating component lives on top of the stack, with the heat-sensitive logic board beneath.
- The redesigned power supply is rated at 12 V at 0.917 A. Compare that to the [3rd-gen Apple TV's main reactor](#), which pumped out 3.4 V at 1.75 A.
- We noticed a distinct lack of cables connecting the power supply to the logic board. We're theorizing the power is either transmitted by magic, or through the heat sink screw posts.
- And as a fun bonus, some chips:
  - NXP Semiconductor [TEA1738LT](#) switch mode power supply controller
  - Toshiba [TLP291](#) photocoupler
  - STMicroelectronics [STF6N65M2](#) 650 V N-channel MOSFET

## Step 8



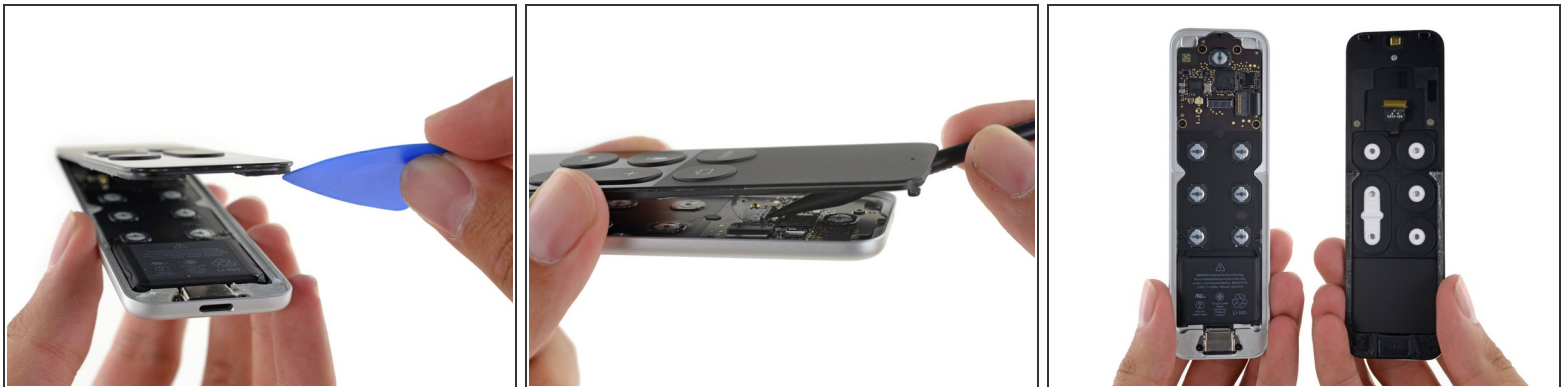
- Behold, the new Siri Remote! Featuring dual microphones, a Glass Touch surface, and a Lightning connector, this remote is definitely a bit more complex than the [Apple Remote](#) of yesteryear.
- Apple also packed in an accelerometer and gyroscope, which they hope you'll use to play games —[and browse Airbnb](#).
- With Bluetooth 4.0, the new Remote doesn't need direct line-of-sight with your TV.
  - That is, unless you want to control your *actual* TV. Apple points out that the remote for their new TV [can also control a television or A/V receiver](#).

## Step 9



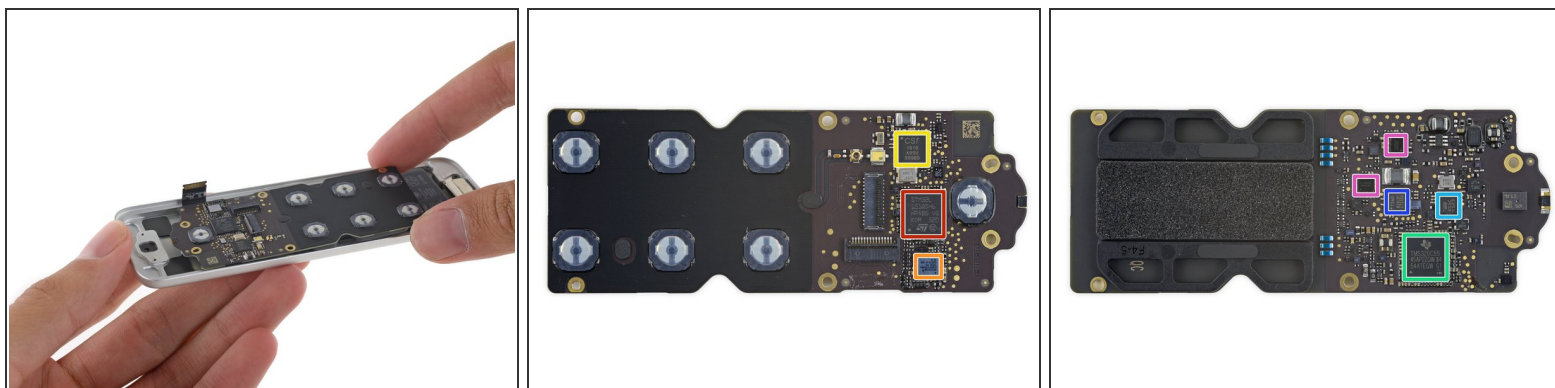
- We found where Apple was hiding all the adhesive! Looks like our [iOpener](#) and [pick](#) don't get the day off after all.
- The entire top end of the remote is a giant button. Beneath it lies a gap that gives us a nice, consistent groove to pick apart.
- "Hey, Siri—say *Ahhhh*."
  - If only it was that easy... Actually, it was pretty easy. It seems there's a first for everything!

## Step 10



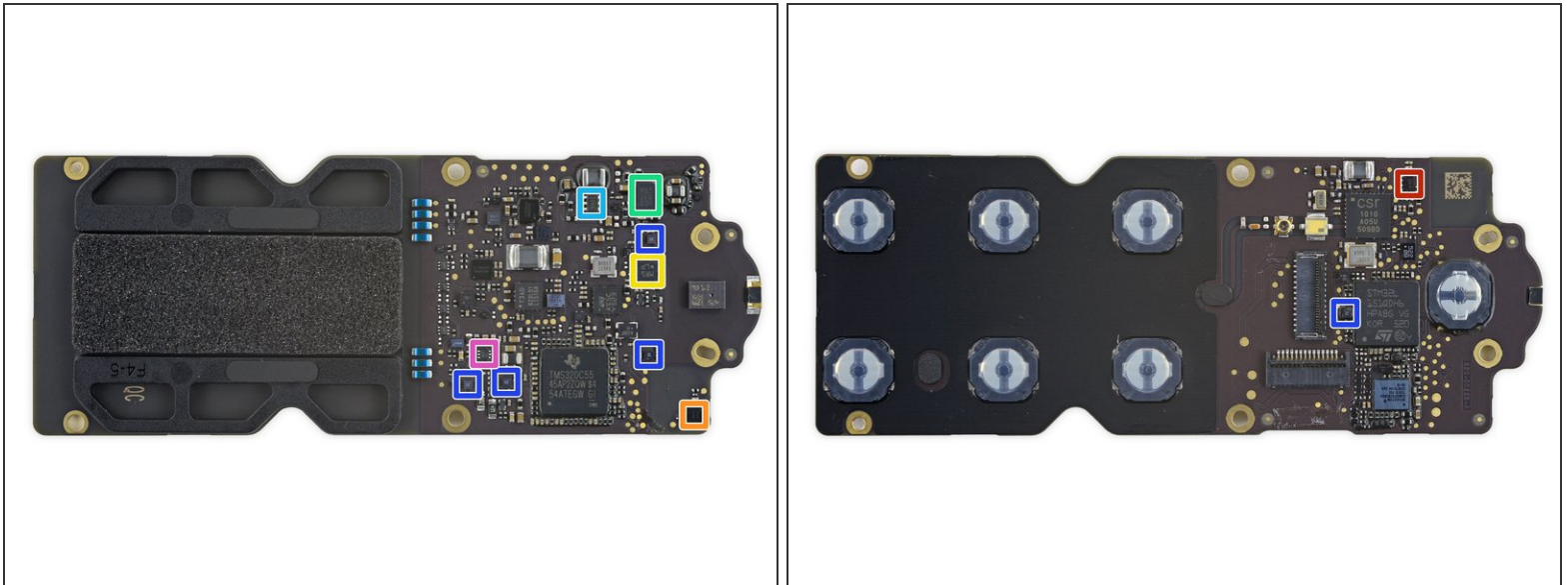
- We're suddenly having flashbacks to the [iPhone 5s](#). The top half is connected by a ribbon cable, hidden in the center of the device.
- Our in-house EOD expert gets to work with a [spudger](#) and carefully disarms the trap.
- With the top and bottom separated we notice a hidden [yin yang](#) motif. That's so zen of you, Apple.

## Step 11



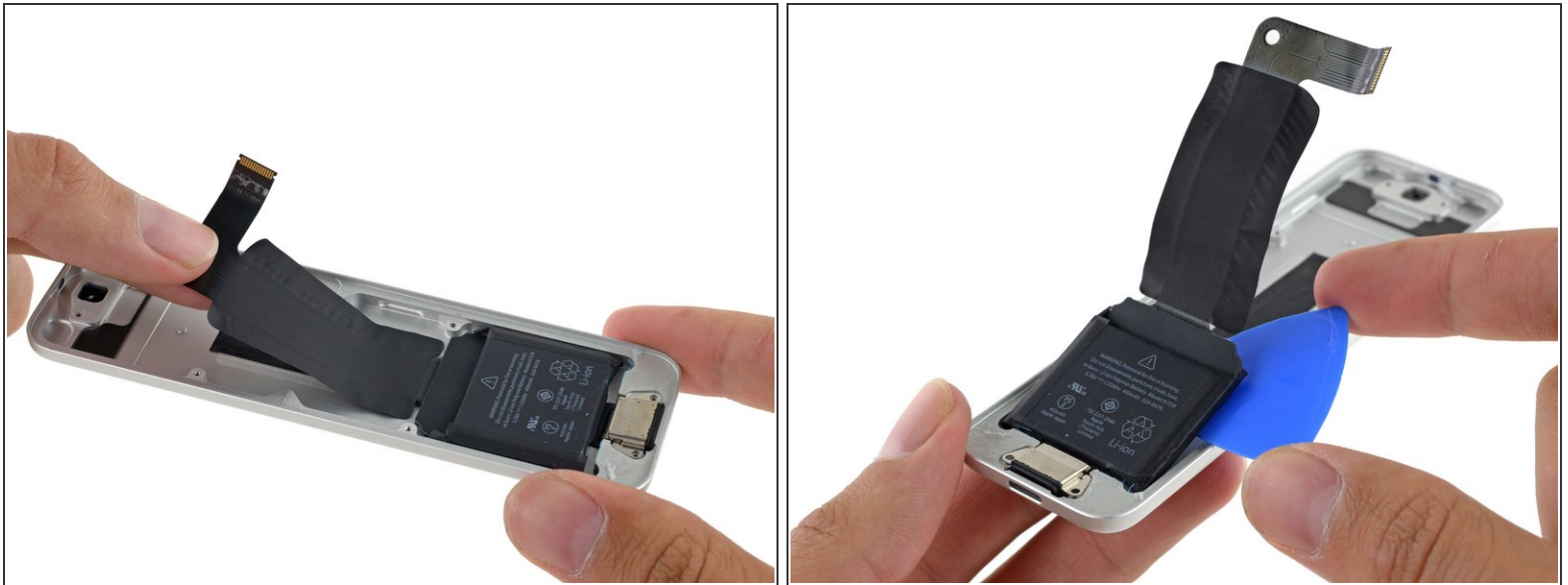
- *OICURAQT*—That's what we say whenever we identify an IC, like the ones on this logic board:
  - ST Microelectronics [STM32L 151QD](#) ultra-low-power ARM [Cortex-M3](#) MCU
  - Broadcom [BCM5976C1KUB6G](#) touch screen controller (as seen in the iPhone 5s/5c and iPad Air)
  - CSR (Qualcomm) [CSR1010](#) Bluetooth radio
  - Texas Instruments [TMS320C5545](#) ultra-low-power digital signal processor
  - STMicroelectronics [STMLS05](#) 5-channel PMOS load switches
  - InvenSense [ITG-3600](#) 3-axis gyroscope
  - Texas Instruments [BQ24250C](#) battery charger and TI 49C37GI

## Step 12



- Chip identification, continued:
  - Analog Devices [ADAU7002](#) audio converter
  - AKM Semiconductor AK8963 3-axis electronic compass
  - Bosch Sensortec BMA282 accelerometer
  - ON Semiconductor memory (likely)
  - Texas Instruments [TPS61220](#) boost converter
  - ON Semiconductor [NCP335FCT2G](#) 2 A load switch
  - Diodes Incorporated [74LVC1G58FW4](#) Configurable Multi-function Gate

## Step 13



- Look at that! A ZIF connected Lightning port cable.
- If Apple can pack a ZIF connector into a tiny remote like this then why is the iPad Lightning port soldered to the logic board?
  - Answer: Apple proprietary secret.
- With just a bit of glue to pick apart, the Lightning cable/battery is out in a flash.



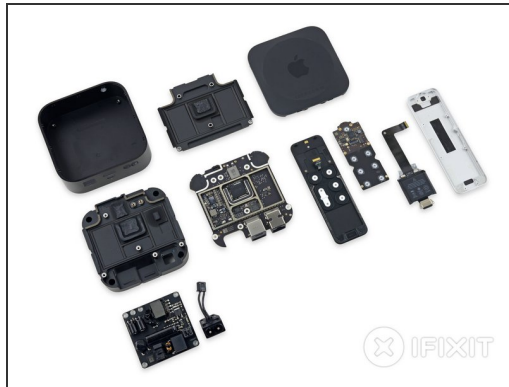
## Step 14



- With the Lightning port/battery assembly free of the remote, we see that the battery is soldered to the Lightning port.
- While we've never been a fan of soldered-on batteries, at least the Lightning port isn't soldered to the logic board!
- Because this 410 mAh battery is rechargeable, you'll never scramble to find batteries for your TV remote again. Thanks, Apple!
  - At least not until it [dies](#) and you need to replace it.
- And hiding out at the base of the flex cable are two ABLIC, Inc battery protection chips.



## Step 15



- Apple TV (4th Generation) Repairability: **8 out of 10** (10 is easiest to repair).
  - Modular construction and only a few major components simplifies repair.
  - The power supply is a separate, replaceable component, and even its AC-in jack is modular.
  - Standard Torx screws used throughout, nothing proprietary.
  - The remote is held together with adhesive, but a wide gap makes it easy to pry apart.
  - The remote's battery and Lightning cable are soldered together—but not to anything else, so they should be an inexpensive component to replace.
  - Everything important is soldered to the logic board, meaning replacement or board-level soldering is required to solve port problems.
- And that's a wrap. See you for an iPhone teardown down under! G'day, mate!