Nexus 6P Teardown

Teardown of the Nexus 6P performed on October 28, 2015.

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INTRODUCTION

The cream of the season's Android crop is here—it's Google's own showstopping phablet, the Nexus 6P. In an historical first, this device comes to us via Chinese manufacturer Huawei—and since we've never had a Huawei offering on the teardown table, we're excited to get cracking! Will the cream rise to the top of the repairability bottle—or will the Nexus 6P give us sour milk face? Let's find out.

There's more teardown on tap—follow along on Facebook, Instagram, and Twitter for all the disassembly shenanigans!

[video: https://www.youtube.com/watch?v=Mj5UyVHnpS0]

🔧 TOOLS:

- iOpener (1)
- iFixit Opening Picks set of 6 (1)
- Curved Razor Blade (1)
- iSclack (1)
- Phillips #00 Screwdriver (1)
- Spudger (1)
- Plastic Cards (1)
- Tweezers (1)

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Step 1 — Nexus 6P Teardown

- Now that we've (un)wrapped up the opening act, it's time for the main event! Here's what Google has to say about its latest Android flagship:

  - Qualcomm Snapdragon 810 v2.1, 2.0 GHz octa-core 64-bit processor with Adreno 430 GPU

  - 12.3 MP/4K rear-facing camera with laser-assisted autofocus and electronic image stabilization, 8 MP front-facing camera

  - 5.7" WQHD 2560 × 1440 (518 ppi) AMOLED display

  - 3 GB LPDDR4 RAM with 32 GB, 64 GB, or 128 GB of internal storage

  - USB Type-C Port

  - Nexus Imprint fingerprint reader and Android Sensor Hub

  - Android 6.0 Marshmallow

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Step 2

- The all-metal, [aeronautical-grade anodized aluminum](#) chassis is another first for a Nexus device.

- We're *fairly* certain that the 6P isn't designed to function as a [ramp for your Tech Deck](#).

    - The raised camera mesa is apparently Huawei's strategy for squeezing a 4K camera into the new phone. Or, like us, they could just be [obsessed with mesas](#).

- Coming in for a closer look, we see that the glass lens cover slopes to a smooth curve at either end. Fancy!

Step 3

- Compared with its fraternal twin, the Nexus 5X (top), the 6P shines through with its Wide Quad HD AMOLED display.

- Just for fun, we also line up the 6P next to ye olde Nexus 6. With its nearly identical footprint, you get triple bonus points if you can tell which is which!

  - (i) The 6P is slimmer, at 7.3 mm, versus 10.06 mm on the Nexus 6. It also shaves off 6 grams, coming in at 178 g. (For comparison, the iPhone 6s Plus tips the scales at 192 g.)

- (i) For those who were wondering, yes, it doubles as an external battery pack. So when your 5X runs low on juice, just grab your 6P and a ~~umbilical~~ USB-C cable and you'll be good to go!

  - No word yet on what happens if you umbilical two 6Ps that are both at 50% power. We assume they'll both charge to 100%. Perpetual power, *solved*.

Step 4

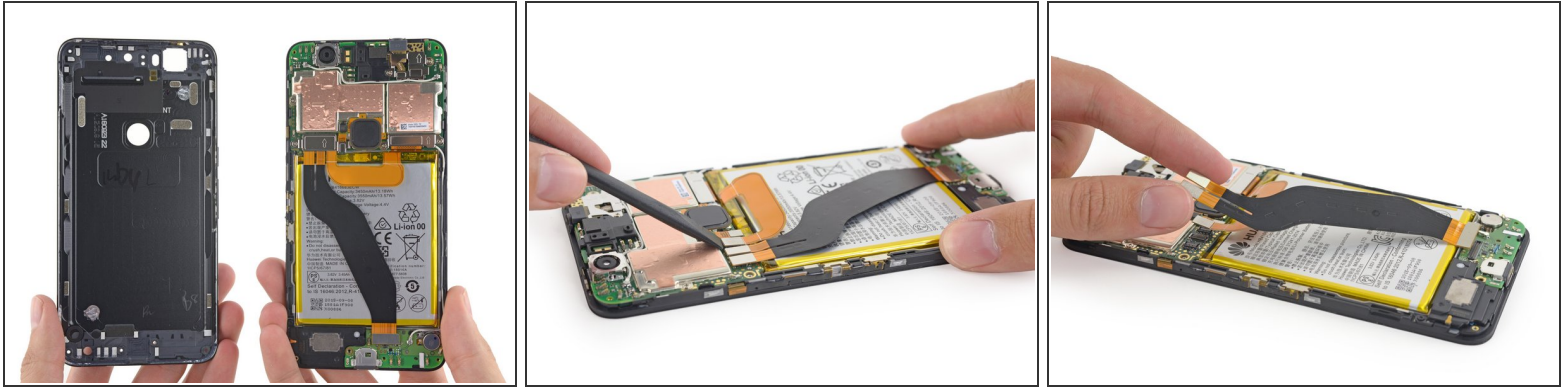
- Like the Nexus 6, there are no visible screws on the rear cover. Unlike the Nexus 6, this is a unibody device, so there won't be any handy peel-off rear cover.

- The 6P's smooth enclosure is broken only by this small, suspicious plastic panel at the bottom. Let's pile a hot iOpener on it and see what's inside.

- With enough heat, the panel is easily pried and peeled off, exposing four screws.

  - ⓘ Including one covered with a tamper evident seal. If this is your first visit to iFixit, check out our Repair Manifesto to see what we think about things like that.

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Step 5

- Getting to the screws under the plastic cover wasn't *too* hard, but signs now point to screws under the camera mesa cover too...

- The panel in question is made of tight-fitting, easily shattered, glass. Removing this won't be any fun at all.

  - 📌 We were pleasantly surprised by the easy opening procedure and minimal adhesive of the 5X. We had hoped this trend would include the 6P—it seems that in the Nexus family, blood doesn't run as thick as glue.

- ⓘ The ultra-tight fit renders our plastic tools useless—we resort to a curved razor blade, safety glasses, and prayers.

- Several frustrating minutes later, we are able to deploy the [iSclack](), and pop the phone out of its rear enclosure.
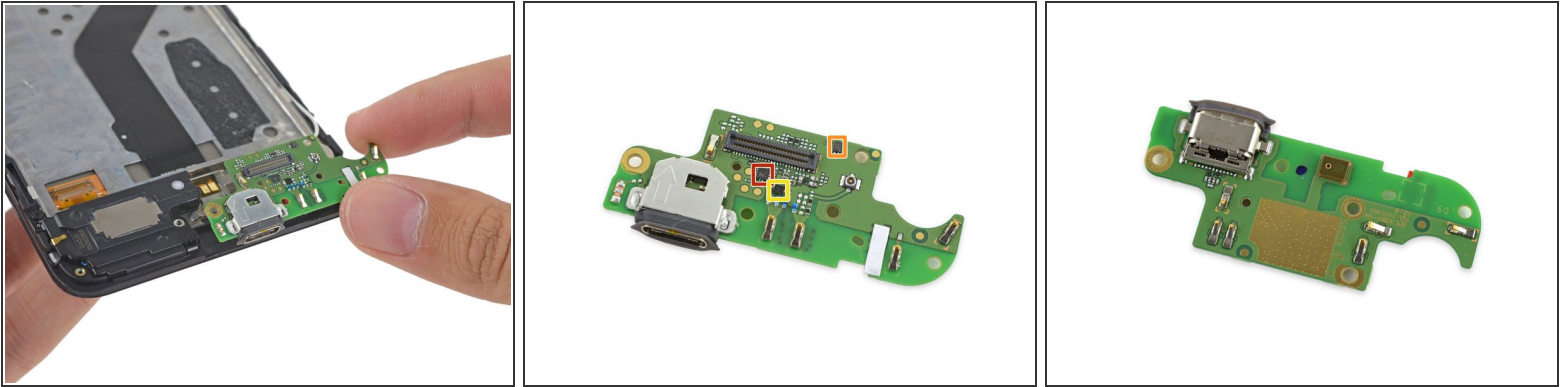
Step 6

- With the initial adhesive adventures behind us, the 6P has finally come out of its shell.

  - Unlike other phones we've seen lately, there's no discrete display assembly or easily removed rear cover here. Instead, the 6P's internals come out of the rear case in one mega-sized component assembly, leaving only the NFC antenna behind.

  ⚠️ This isn't a good sign for the 6P's repairability—in fact, it reminds us of our harrowing experience with the HTC One M7.

- On the bright side, it looks like a daughterboard interconnect cable is all that stands between us and the battery!

Step 7

- The battery is a *monster*—and, it's fiercely glued in. But at least we didn't have to dig *too* far to get here.

- This super-sized, 3.82 V, 13.18 Wh lithium-poly cell weighs in at a rated capacity of 3450 mAh.

- (i) For those of you keeping score, this powerhouse is rated at 230 mAh more than the cell we found in the original Nexus 6 and 700 mAh more than the battery in the iPhone 6s Plus.
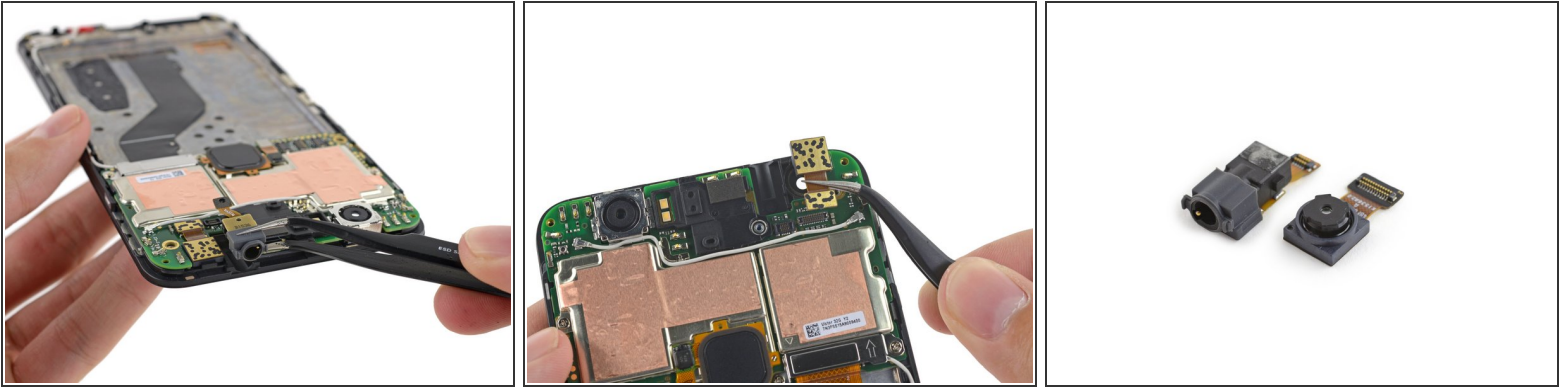
Step 8

- Next up, we pull out one of the smallest daughterboards we've ever seen. It's only a little more than a simple USB-C board.

  - (i) After that harrowing opening procedure, it's nice to see one repairability win in the 6P vs 5X comparison: a USB port mounted on a small and inexpensive daughterboard, rather than soldered onto the motherboard.

- The front side of the daughterboard features some control hardware and spring contacts for the LTE antenna...

  - Texas Instruments TUSB320 USB type-C port controller

  - AKM Semiconductor AK8789 hall sensor

  - Skyworks SKYxxxx antenna tuner (likely)

- ...And on the back we spy one of the 6P's three noise canceling microphones and a couple more contacts, for the vibrating motor and speaker.
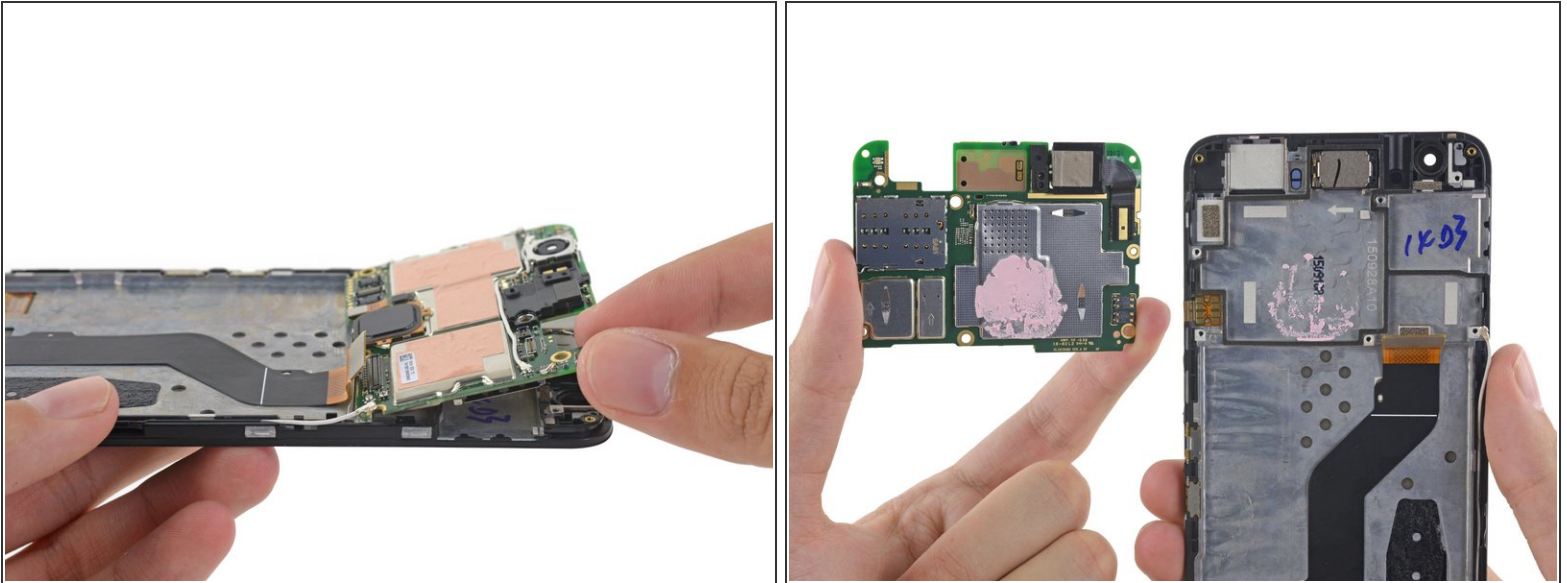
Step 9

- We continue our [sleuthing](#) along the bottom of the phone and come across what appears to be a speaker box.

- ⓘ Front-facing speakers are becoming a bit of a trademark for Google, and were found in last year's [Nexus 9](#) and the [Nexus 6](#).

  - We suspect Google's motive for including these front-facing speakers is simple enough: [people prefer](#) speakers that face them.

- Of course that says nothing about how it actually *sounds*. We'll have to wait until we put our 6P back together to give it a listen.
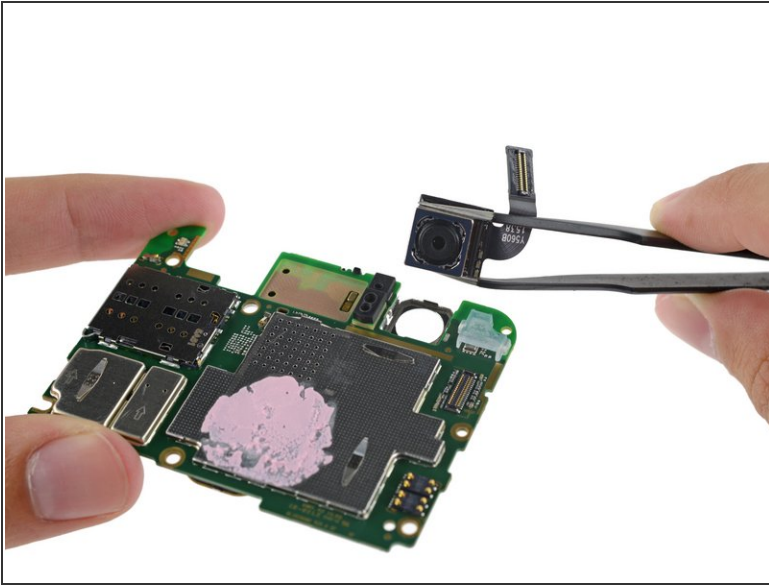
Step 10

- Next to fly free is the headphone jack, which we find encased in a little rubber sleeve. *Hmmm.*
  - While we've been watching carefully for signs of ~~life~~ [waterproofing](), this small sleeve alone doesn't indicate whether Google might be preparing for rising tides.

- Moving along, we pull out the front-facing (i.e. selfie) camera. This 8 MP, *ƒ*/2.4 camera is up 3 MP from its counterpart on [the 5X](), but still maintains the same 1.4 micron pixel size.

- We snap a few photos of our new-found peripheral friends and [head for the core]().
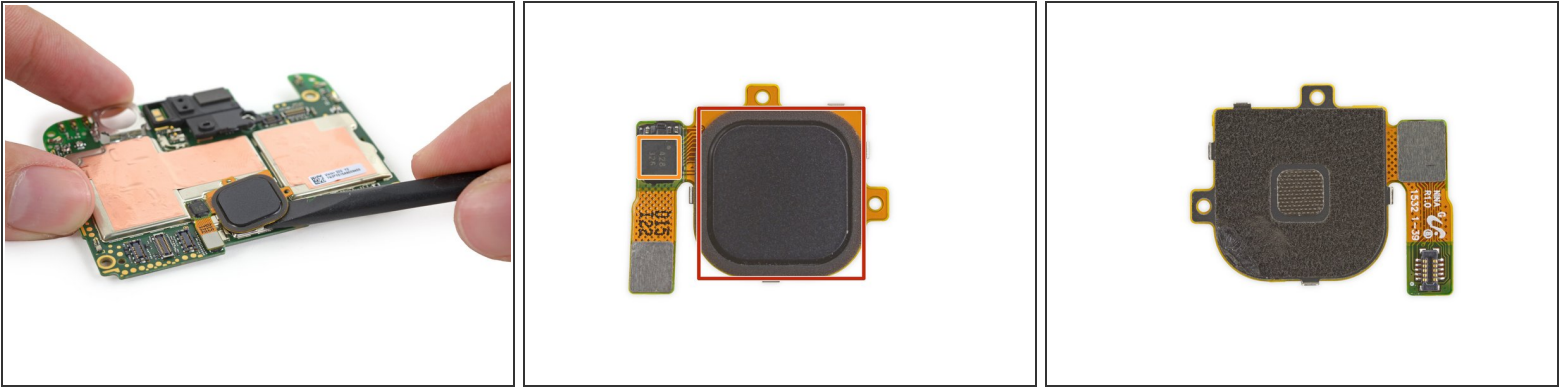
Step 11

- Most of the peripherals are out of the way, allowing us to focus on the motherboard—glue-free and topped off with a glob of ~~bubblegum~~ thermal paste, just the way we like it.

- Well, this is awkward. Although the front-facing camera didn't put up much of a fight, it appears the main camera is soldered in place.

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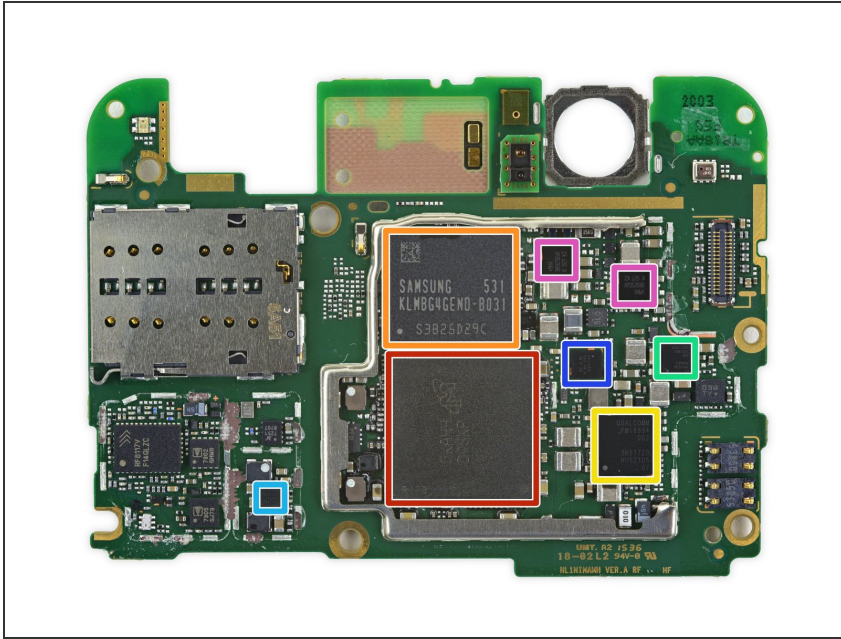
Step 12

- . . . Or not!

- While you *do* have to remove the motherboard to access the main camera, it turns out that only the camera *bracket* is soldered to the board. The camera itself is easily disconnected and removed.

- ⓘ This 12.3 MP camera features the same Sony [IMX377](#) image sensor and *ƒ*/2.0 lens as found in the 5X, but thanks to the boost in processing power from the Snapdragon 810, the 6P can take advantage of an EIS (electronic image stabilization) algorithm, and shoot slow-mo video at up to 240 fps.
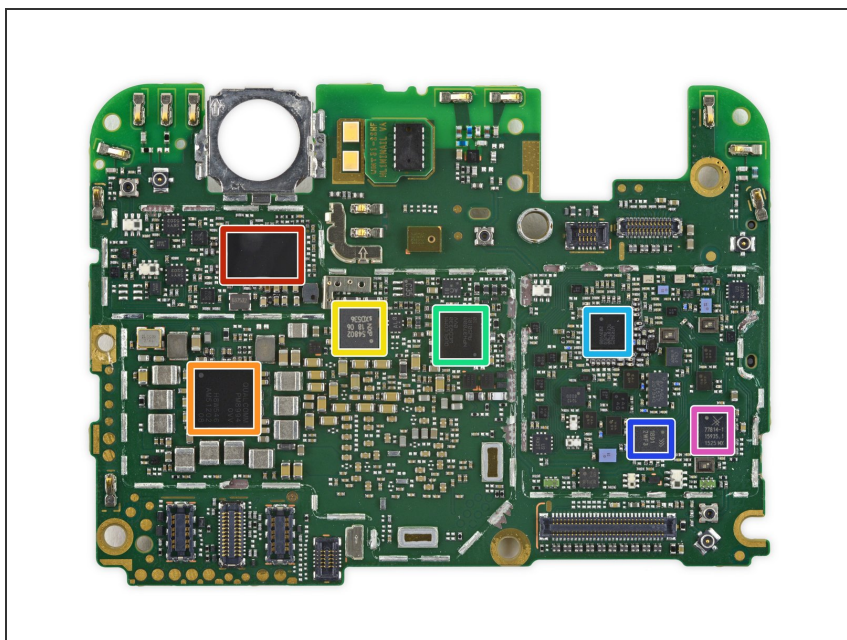
Step 13

- Spudger ready, we turn our attention to the square Nexus Imprint sensor.

  - 📌 Wait. Square? Wasn't this thing round when we first saw it?

- It turns out this version of the Imprint sensor is quite different from the one we found in the 5X. The circular profile of *this* fingerprint reader is solely due to the round hole in the 6P's rear case.

  - ⓘ Perhaps Huawei is planning to use this very fingerprint reader in one of their other phones. Handy.

    - Fingerprints FPC1020 fingerprint sensor

    - Fingerprints FPC2050 fingerprint controller (likely)
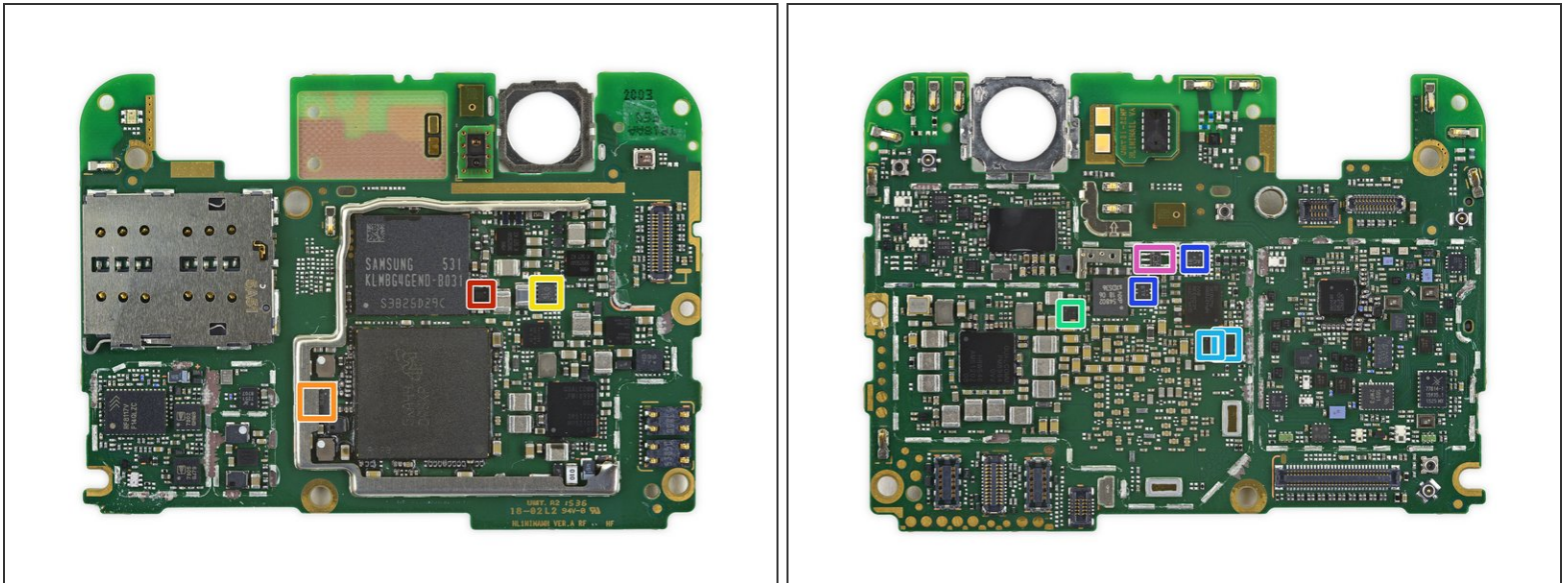
Step 14

- We smell chips! With the motherboard free and the EMI shielding pulled away, it's time for a look at the silicon:

  - Micron MT53B384M64D4NK-062 3 GB LPDDR4 RAM, layered over Qualcomm Snapdragon 810 v2.1, 2.0 GHz octa-core 64-bit CPU

  - Samsung KLMBG4GEND-B031 32 GB eMMC 5.0 NAND flash

  - Qualcomm PMI8994 power management IC (found in many 2015 Android smartphones including the Nexus 5X)

  - Qualcomm SMB1351 Quick Charge IC (Likely an iteration of SMB1358 found in the Nexus 5X)

  - Qualcomm QFE1100 envelope tracking IC

  - ST Microelectronics STM32F411CE 32-bit 100 MHz ARM Cortex-M4 RISC microcontroller

  - Maxim Integrated MAX98925 audio amplifier

Step 15
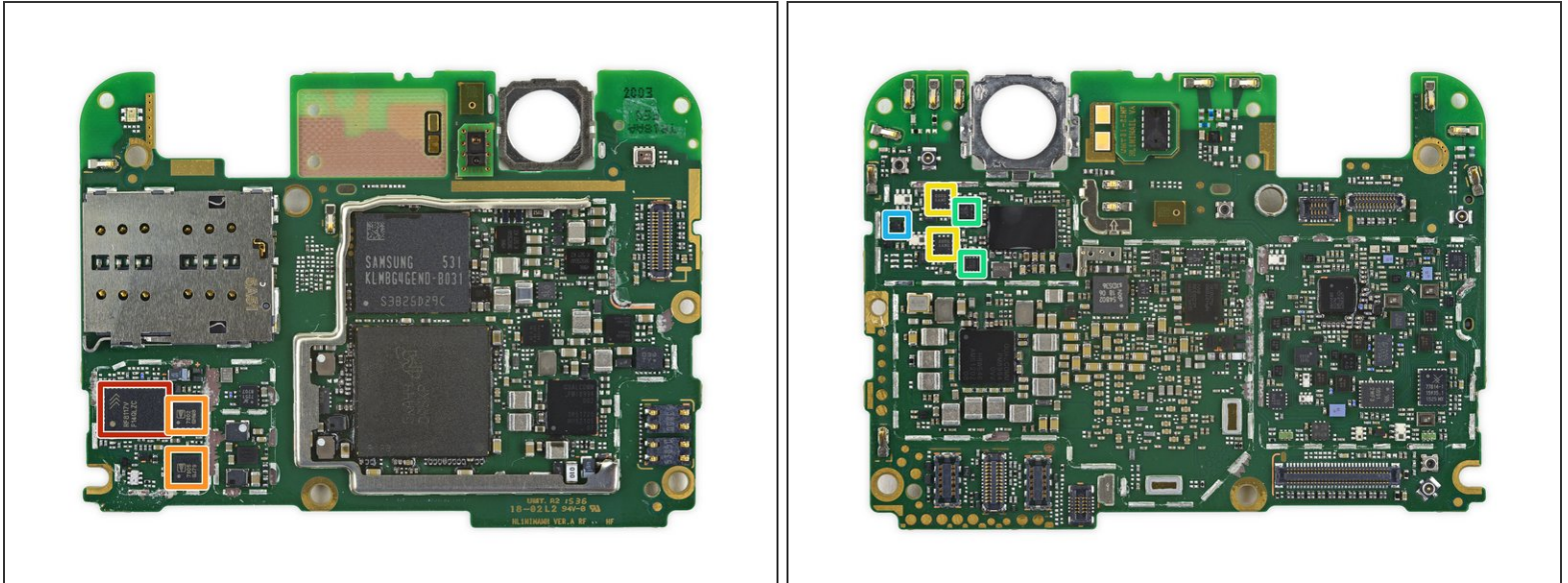

- The back of the motherboard is brimming with even more control hardware:

  - Broadcom BCM4358 5G WiFi 802.11ac client

  - Qualcomm PM8994 power management IC (as seen in the Nexus 5X and HTC One M9)

  - NXP PN548 NFC controller

  - Qualcomm WCD9330 audio codec

  - Qualcomm WTR3925 RF transceiver

  - RF Microdevices RF1891 antenna switch module

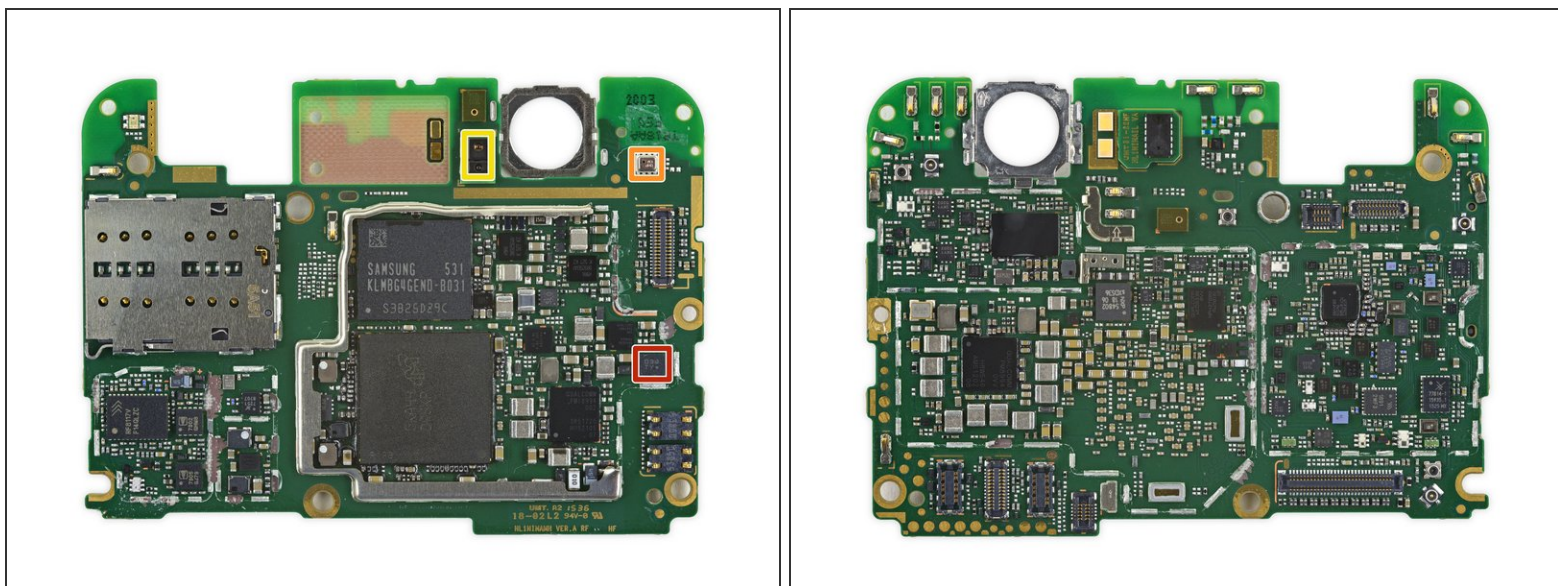 - Skyworks SKY77814-11 power amplifier module for LTE

Step 16

- IC Identifications, pt. 2:

  - ON Semiconductor [FAN53526UC89X](#) 3.0 A step-down switching regulator

  - Texas Instruments display power supply (likely)

  - Texas Instruments [TLV62084](#) step-down converter

  - Texas Instruments [TPS61256A](#) boost converter

  - Texas Instruments [INA231](#) output current/voltage/power monitor

  - ON Semiconductor [NLAS2750](#) dual SPDT analog switch and [NCN1154](#) DP3T analog switch

  - Texas Instruments [LMV7275](#) comparator

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Step 17

- IC Identification, pt. 3:

  - Qorvo (formerly TriQuint) RF8117V RF power amplifier

  - Qorvo (formerly RF Micro Devices) RF7302 and RF7305 power amplifier module

  - Skyworks SKY15203 antenna switch

  - Skyworks SKY85608-11 5-Ghz, 802.11ac switch and low noise amplifier (likely)

  - NXP Semiconductor BGU80x9 GPS/GLONASS/Galileo/COMPASS LNA

Step 18

- IC Identification, pt. 4 (sensors):

  - Bosch Sensortec [BMI160](#) 3-axis accelerometer/gyroscope

  - Bosch Sensortec [BMP280](#) pressure sensor

  - AMS [TMD27723](#) ambient light sensor

Step 19

- Nexus 6P Repairability Score: **2 out of 10** (10 is easiest to repair)

  - Solid external construction improves durability.

  - Once the arduous opening procedure is complete, the battery is immediately accessible.

  - It's very difficult—although not impossible—to open the device without damaging the glass camera cover. Because of the unibody design, this makes every component extremely difficult to replace.

  - The display assembly cannot be replaced without tunneling through the entire phone. This makes one of the most common repairs, a damaged screen, difficult to accomplish.

  - Tough adhesive holds the rear cover panels and battery in place.