Huawei P9 Teardown

Torn down in Germany on April 27, 2016

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INTRODUCTION

The ~~Apple~~ Huawei P9 looks classy, familiar, and well-built, and has been making waves even far from Huawei's original audiences. Just how far did Huawei go to imitate (and perhaps surpass?) the iPhone? Time to tear this sucker down and find out.

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🔧 TOOLS:

- P2 Pentalobe Screwdriver iPhone (1)

Yep, we're serious.

- Phillips #00 Screwdriver (1)
- Tweezers (1)
- iSclack (1)
- Suction Handle (1)
- Spudger (1)

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Step 1 — Huawei P9 Teardown

- Huawei made ~~an iPhone~~ a luxury unibody phone. Are the specs as pretty as the case?

  - 5.2" 1080 x 1920 (~423 ppi) IPS-NEO LCD

  - Huawei Kirin 955 Octa-core CPU (4x 2.5 GHz Cortex-A72 + 4x 1.8 GHz Cortex-A53) and Mali-T880 MP4 GPU

  - Dual 12 MP, f/2.2, 27 mm, Leica optics, dual-LED flash; 8 MP front-facing camera

  - 32 or 64 GB internal storage, expandable via MicroSD (up to 128 GB additional)

  - Rear-case-mounted fingerprint sensor

  - Android 6.0 Marshmallow

Step 2

- Huawei beat Apple to the smooth-rear-case-punch, offering a slim phone, without the infamous *camera bump*.

- Antenna bands, chamfered edges, brushed aluminum and—Pentalobes? The P9 seems to have taken the iPhone design as law, down to the nasty proprietary five-lobed screws.

  - ⓘ This marks the first time we've seen such a tiny pentalobe screw outside the Apple ecosystem; we can only hope this is an outlier, not a trend.

  - ⚑ Seriously, there's no good reason to use pentalobe screws. They are shallow and have round lobes, making them excessively easy to strip. The *only* reason to use them is to prevent the average user from getting them out.

Step 3
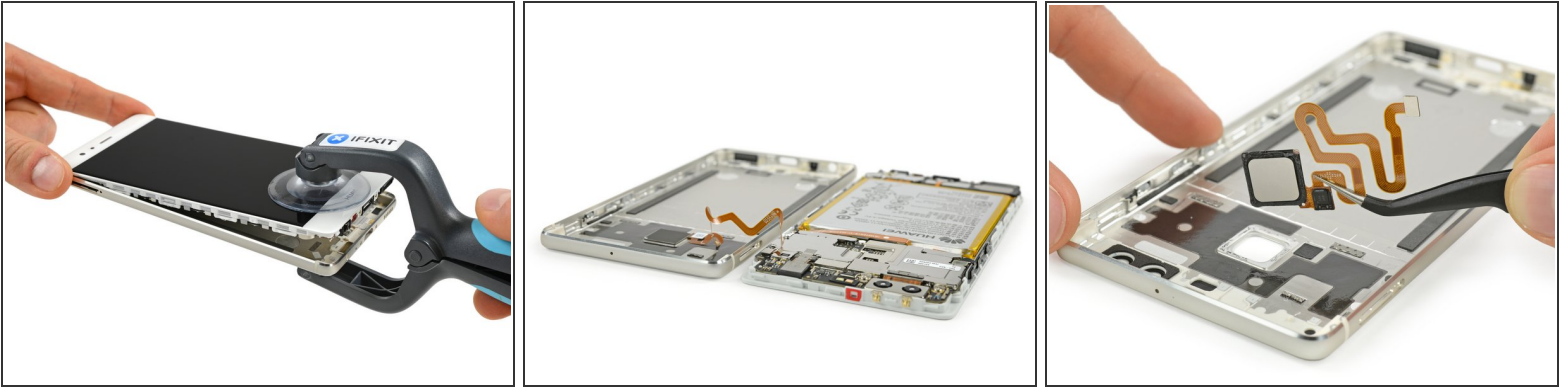
- Following our iPhone design hunch, we break out the iSclack, just in case there's a sneaky fingerprint sensor cable trap.

- Turns out Huawei fixed that too! A long accordion-like cable allows the rear case to be almost entirely separated from the rest of the phone, making disconnection easy.

- A little heat and some prying earns us a somewhat familiar-looking fingerprint sensor.

Step 4



- Brackets and screws start flying as we dig right in, disconnecting the battery for starters.

- First to fall: the 8 MP, ƒ/2.4, selfie cam, its connector secured by some simple tape.

- The front-facing camera is cute (and packs a pixel-dense punch), but we're *really* after its big brother(s).

  - (i) We're *slightly* bummed we didn't get to test out the fancy software features that compliment this hardware. The Perfect Selfie will have to wait.

Step 5

- The fancy dual-rear-facing camera is on a single ribbon cable, making it easy to pluck free.

  - (i) This ([purportedly impressive](#)) dual camera unit is made up of two image sensors: An ordinary 12 MP RGB sensor, and a 12 MP monochrome sensor.

  - ⚑ The additional monochrome sensor aims to add depth and contrast to color photos (while functioning as a nice black-and-white camera, too).

- The dual-camera assembly is noticeably shorter than the bump-inducing iPhone 6s camera, but not by much.

Step 6
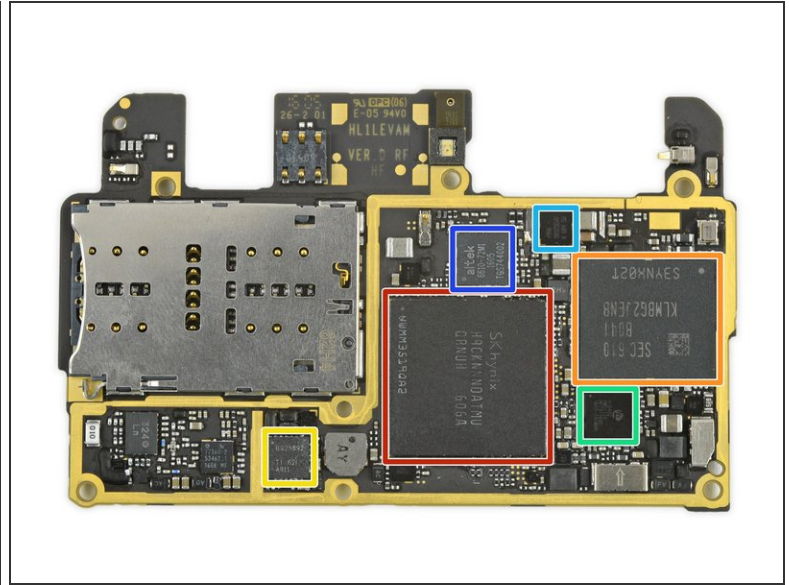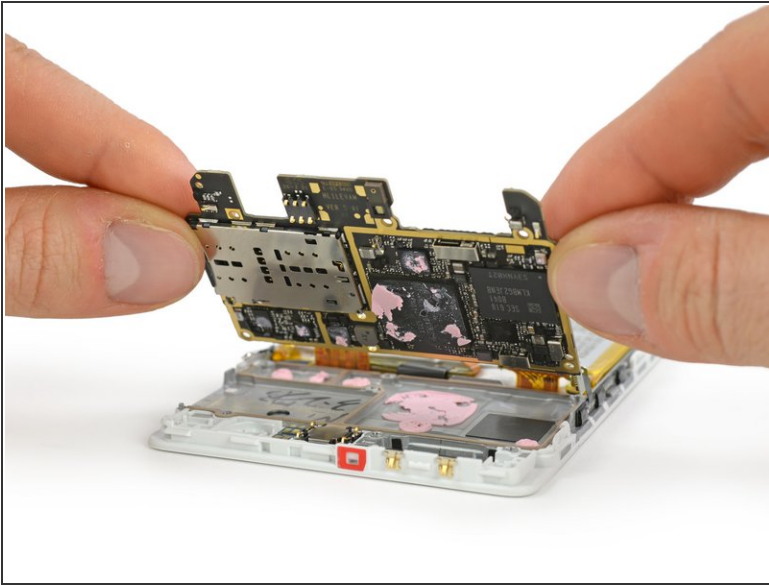
- Who left their gum in here? Peeling up the motherboard reveals more thermal paste in a phone than we've seen in awhile.

- Here are the front-side chips:

  - HiSilicon Kirin 955 (likely a HiSilicon Hi3650) octa-core processor layered underneath 3 GB of SK Hynix H9CKNNNDATMUQRN-UH LPDDR3 RAM

  - Samsung KLMBG2JENB-B041 32 GB eMMC NAND flash memory

  - Texas Instruments BQ25892 fast charging IC

  - HiSilicon Hi6402 audio codec

  - Maxim Integrated MAX98925 audio amplifier

  - Altek AL6610-72M1 AI camera processor (likely)

Step 7
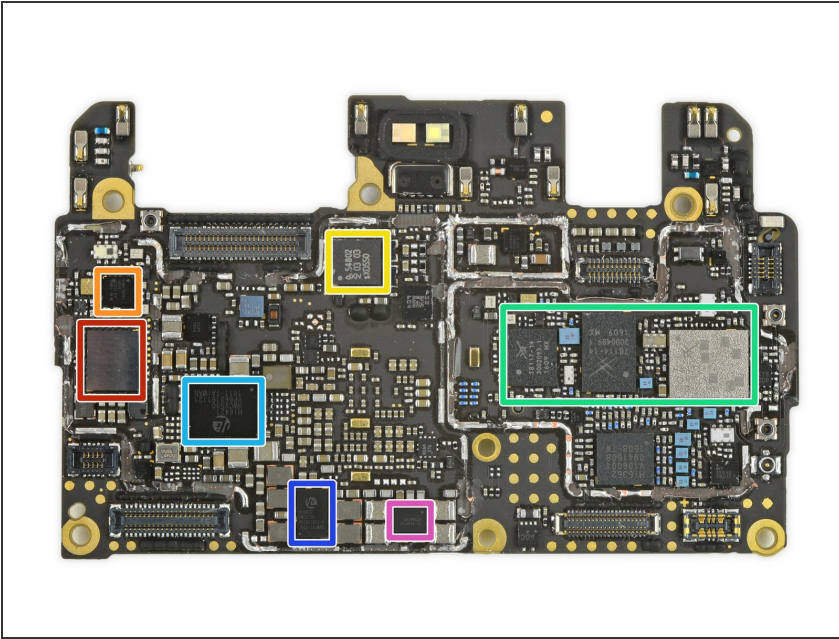
- And bringing up the rear:
  - Broadcom [BCM4345](#) 5G Wi-Fi and Bluetooth 4.0 controller
  - Broadcom BCM47531A1—likely similar to the [BCM4752](#) GNSS controller
  - NXP Semiconductor [54802](#) (PN548) NFC controller
  - Skyworks [SKY78117](#), [SKY78114](#), and [SKY78113](#) SkyOne front-end modules for WCDMA/LTE and FDD/TDD LTE
  - HiSilicon Hi6421 power management IC
  - HiSilicon Hi6422 power management IC
 - Skyworks [SKY87020-13](#) power management IC

Step 8
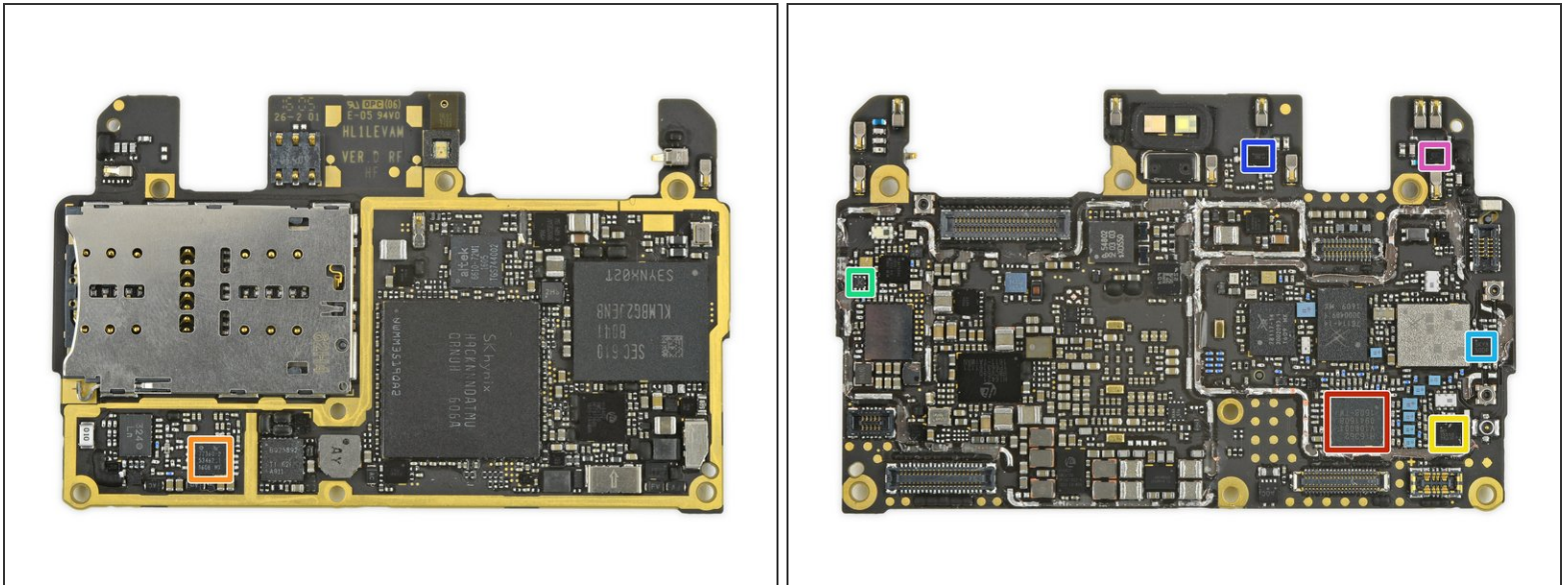
- IC Identification, pt. 2:

  - HiSilicon Hi6362 RF tranceiver

  - Skyworks [SKY77360-12](#) quad-band GSM power amplifier module

  - Skyworks [SKY13552-669LF](#) DP12T antenna switch

  - Skyworks [SKY13351-378LF](#) switch

  - Skyworks [SKY13598-683LF](#) RF switch

  - Skyworks [SKY19225-001](#) antenna tuning switch

 - Skyworks [SKY19003-001](#) shunt switch

Step 9
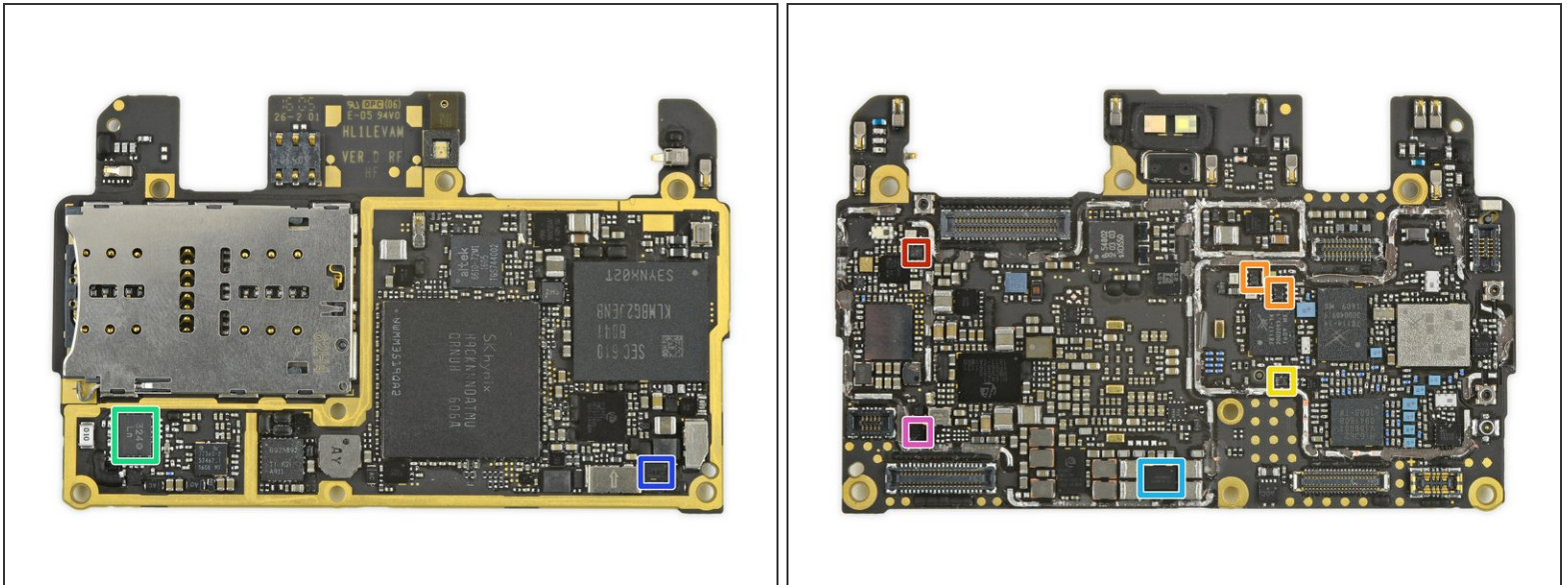
- IC Identification, pt. 3:
  - NXP Semiconductor [BGU8009](#) GPS/GLONASS/Galileo/BeiDou low-noise amplifier (LNA)
  - NXP Semiconductor [BGU8M1](#) LTE LNA
  - NXP Semiconductor [BGU8H1](#) LTE LNA
  - Murata 324 Ln RF switch (likely)
  - Texas Instruments [LP8758-E0](#) 4-ch. step-down DC-DC converter
  - Texas Instruments [TPS65132](#) display power supply
 - Texas Instruments [DRV2605](#) haptic driver

Step 10
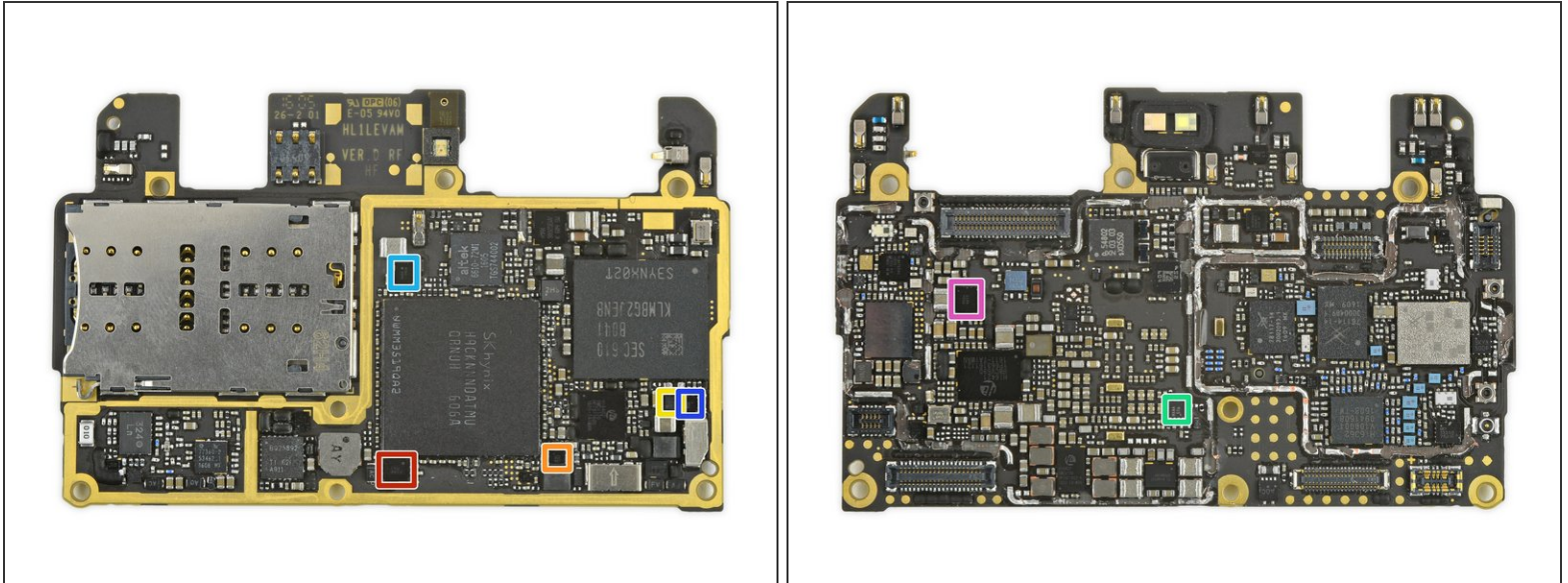
- IC Identification, pt. 4:

  - ON Semiconductor battery fuel gauge (likely)

  - Monolithic Power Systems MP3312GC LED driver

  - Texas Instruments flash controller (likely)

  - ON Semiconductor FUSB301A USB-C controller

  - ANGSemi Microelectronics AS3646B analog switch

  - Maxim Integrated MAX13042E 4-ch. bidirectional level translator

  - Renesas (formerly Intersil) ISL91110IIAZ adjustable buck-boost regulator

Step 11
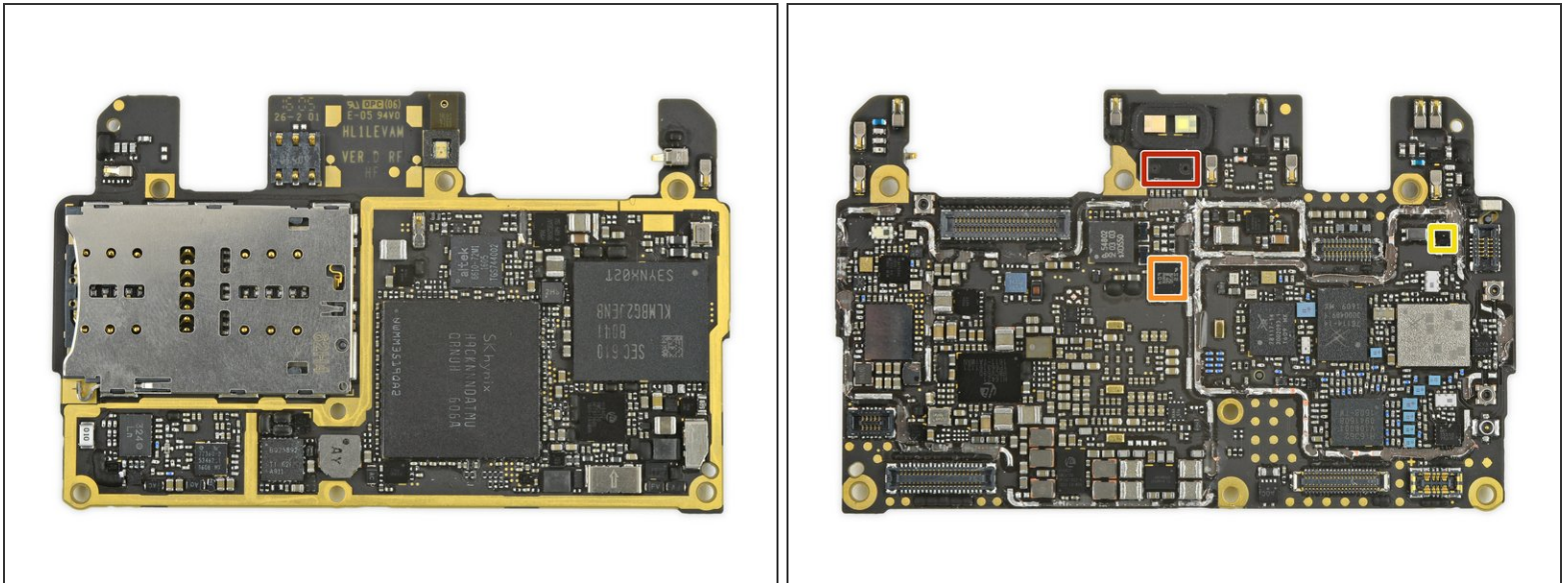

- IC Identification, pt. 5 (sensors):

  - STMicroelectronics VL53L0X time-of-flight sensor (likely)

  - STMicroelectronics LSM6DS3 3-axis accelerometer/gyroscope

 - AKM Semiconductor AK09911 3-axis compass

Step 12
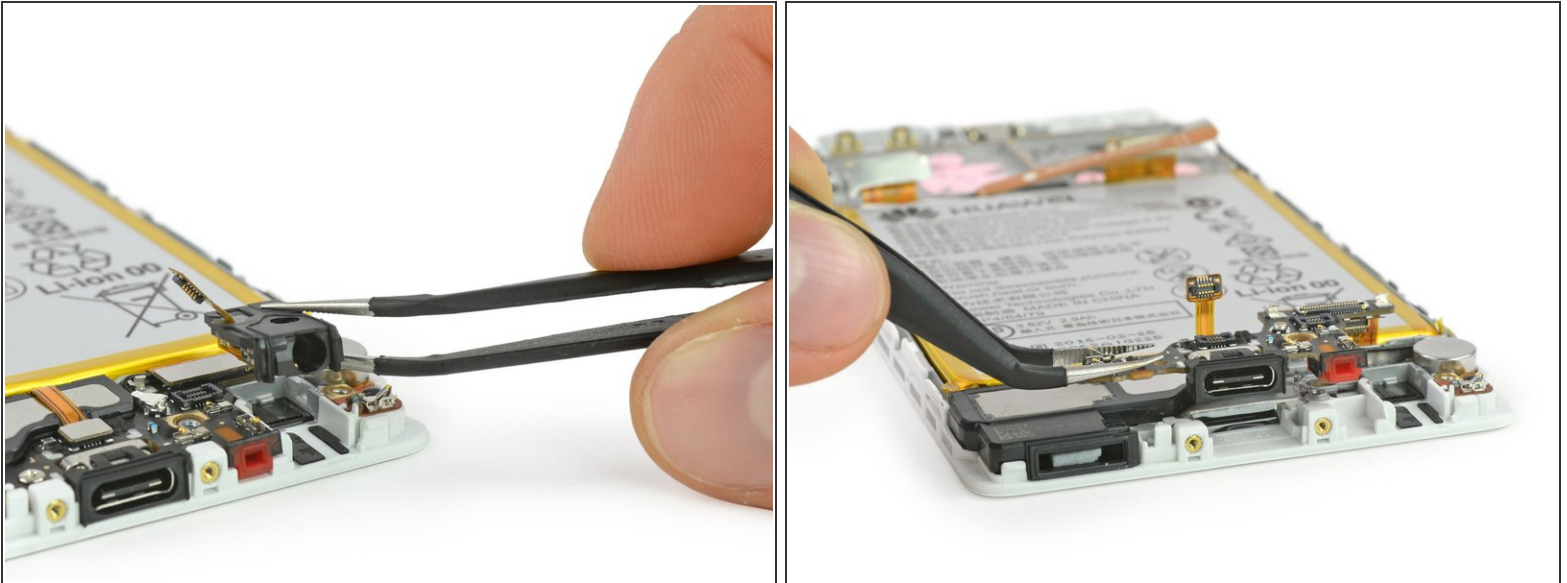
- Huawei is making it rain modular parts!

- Despite rumors of a headphone jack free iPhone, the P9 features a standard 3.5 mm audio jack, compatible with your existing headphones.

  - ⓘ It's also an independent, modular component that comes right out without desoldering!

- The USB-C daughterboard also comes free with minimal hangers-on.

  - ⓘ USB ports classically suffer a lot of wear—we plug our phones in at least once a day—so it's good to see a separate and easy to replace USB-C port.

Step 13
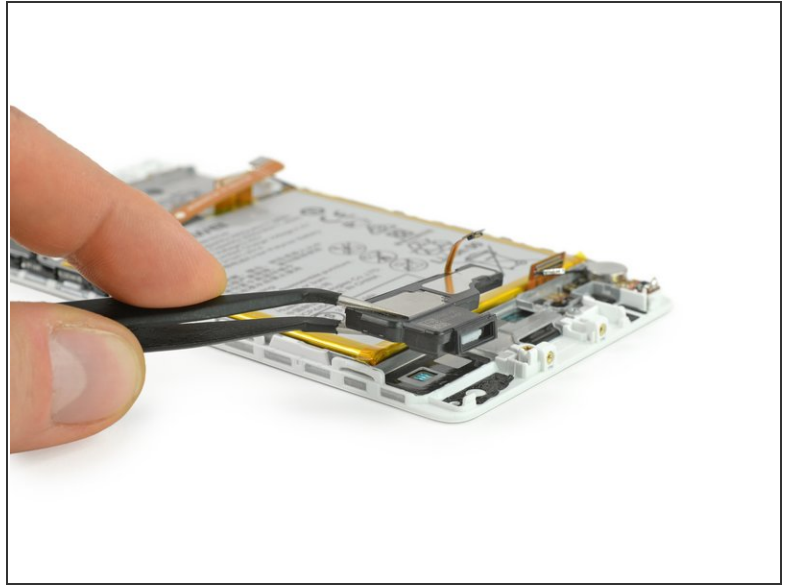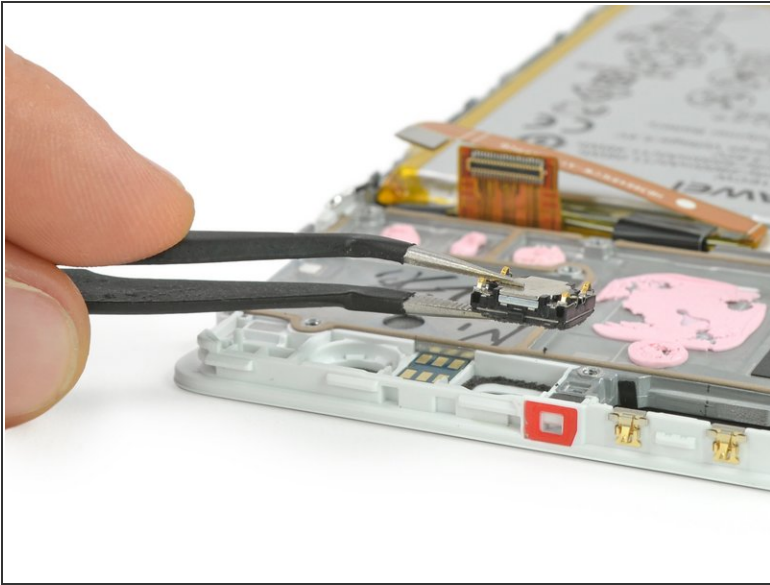
- The itty bitty spring-contact-connected earpiece speaker pops right out of the display assembly.

  - ⓘ Spring contacts are always a nice find, they make disassembly nearly foolproof.

- The loudspeaker (complete with foam plug) takes a little encouragement from a plastic opening tool, but is shortly freed as well.

  - ⓘ That bit of foam may be a method of ingress proofing for the speaker, keeping dust and pointy objects at bay. But it looks a bit like an afterthought, if you ask us.

Step 14
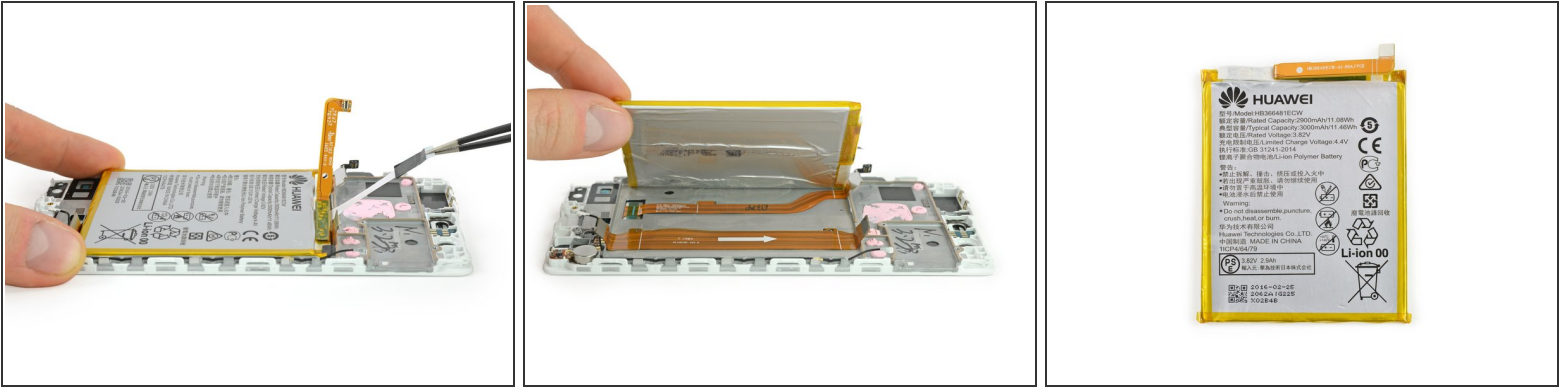
- Pulling at some familiar black tabs we are elated to find adhesive pull tabs under the P9's battery.

  - (i) We can't praise these tabs enough. They are an easy-to-use and inexpensive way to secure the battery in a reversible manner.

  - And a good thing, too—with those two orange interconnect cables under the battery, prying through thick adhesive easily could have been dangerous for Mr. P9's health.

- Huawei lists a couple specs for their battery: A "rated capacity" of 11.08 Wh and a "typical capacity" a bit higher at 11.46 Wh.

- That puts the P9 battery ahead of the iPhone 6s Plus's 10.45 Wh and just under the Samsung Galaxy S7's 11.55 Wh battery.

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Step 15
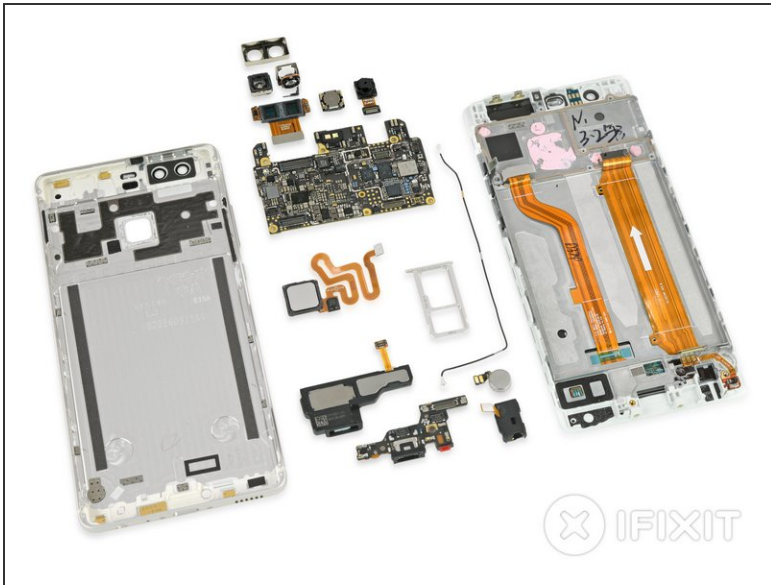
- Huawei P9 repairability score: **7 out of 10** (10 is easiest to repair):

  - Modular components with spring contacts, thoughtful cabling, and minimal adhesive all make repair cheaper and easier.

  - The battery is straightforward to access. Removing it requires knowledge of the adhesive removal technique, but is not difficult.

  - The display assembly is a fused unit, and replacement requires near complete disassembly of the phone.

  - The P9 inexplicably uses Pentalobe security screws on the exterior, requiring a specialty screwdriver to open the phone.