OnePlus 6 Teardown

OnePlus adds another one to their...

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INTRODUCTION

OnePlus adds another one to their incrementally-expanding, arithmetic-themed line of smartphones. The OnePlus 6 looks pretty good on paper, but how will these fancy specs add up on the teardown table? Join us as we do a little repair-themed math of our own.

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TOOLS:

Heat Gun (1)
iSclack (1)
iFixit Opening Picks (Set of 6) (1)
Spudger (1)
Phillips #00 Screwdriver (1)
Tweezers (1)

Step 1 — OnePlus 6 Teardown







- OnePlus is known for adding up a lot of flagship-phone features while subtracting the flagship-phone price, and the 6's specs don't disappoint:
  - 6.28” Samsung-made AMOLED display with 2280 x 1080 resolution (402 ppi) and 2.5D Gorilla Glass 5
  - Octa-core, 64-bit Qualcomm Snapdragon 845 processor with 6 GB or 8 GB LPDDR4X RAM
  - Dual main camera with 16 MP (ƒ/1.7 with OIS) and 20 MP (ƒ/1.7) modules; 16 MP (ƒ/2.0) selfie camera
  - 64 GB, 128 GB, or 256 GB built-in storage
  - USB Type-C and 3.5 mm audio ports
  - OxygenOS based on Android Oreo 8.1

Step 2







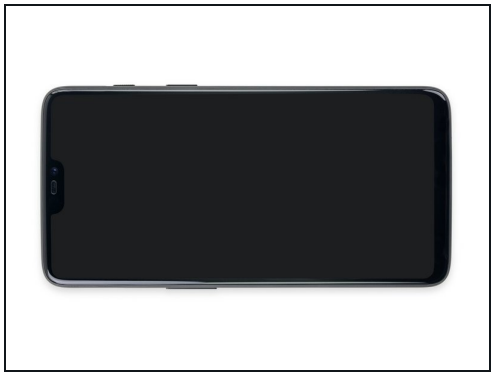
- Around back we have a camera bump that looks a tad Apple-like, paired with a fingerprint sensor in a layout and location reminiscent of other Android flagships.

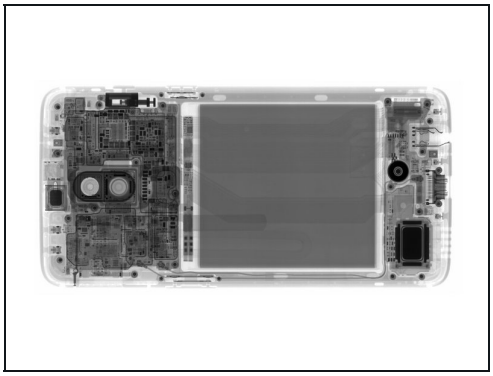
- NFC in the camera you say? Thanks for the tip—we'll keep an eye out for that during the following "unauthorized disassembly."

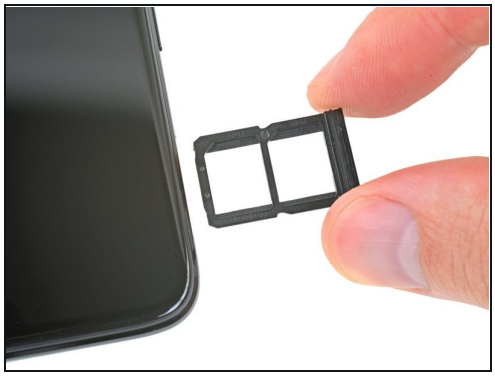
- On the bottom: headphone jack (yay!) and USB Type-C.

  Industrial design fans might note that despite its "budget" classification, OnePlus managed to get those components aligned better than its (much more expensive) Samsung counterparts.

Step 3





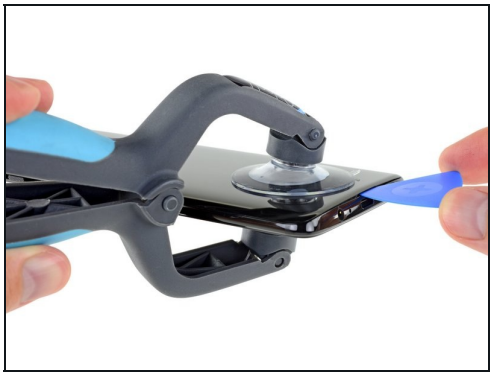
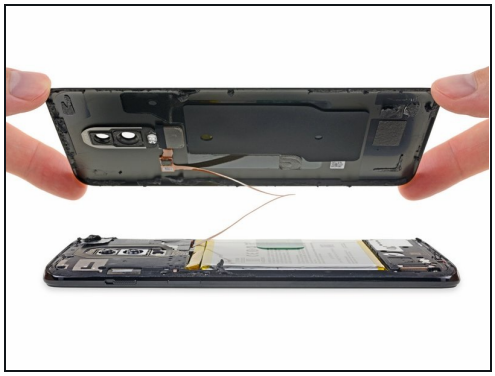


- No need to go in blind when you have X-ray vision—our friends at Creative Electron give us an overview of this smartphone's terrain.
  - Everything looks pretty standard—except for the huge sliding mechanism for the alert slider! If we didn't know any better we'd have guessed it was some kind of linear actuator.

- Satisfied with our virtual foray into the phone, we turn to the SIM card tray and find the first evidence of the OnePlus 6's rumored water resistance—an integrated rubber gasket.

ⓘ OnePlus doesn't list an official IP rating for the phone, but it's already clear they've put some thought into guarding the insides.

Step 4

- Android phone with a glass back? Gone is the classic OnePlus metal casing! But we've seen this before...
- ...and we have a well-tested solution. The heat gun softens things up and the iSclack and opening pick take care of the rest.
- We lift the back in trepidation, waiting for the familiar tug of a fingerprint sensor cable.
- But we're pleasantly surprised—the OnePlus 6 comes with a cable long enough to completely remove the back without worrying about tearing the cable.

📌 Breakable glass backs are the pits, although this one's far easier to repair than the ones on recent iPhones. (At $549, an iPhone X back glass replacement *costs more than this entire phone.*)

Step 5







- We pop off a nice red bracket to free that lengthy fingerprint sensor cable, and spy the NFC antenna OnePlus so graciously pointed out.

  ⓘ Prior OnePlus antennas did just fine without a glass back (which isn't even for wireless charging). So this glass seems to be mainly just for looks. And cracking.

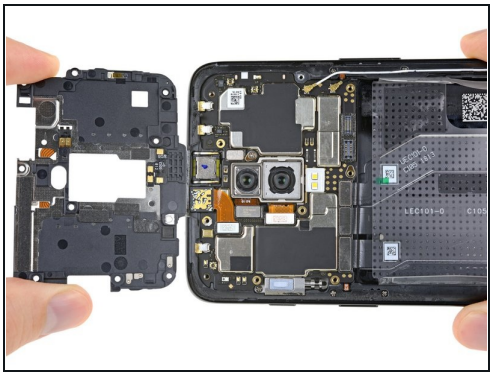
- The friendly green tab on this relatively accessible battery says, "由此拉起可拆出电池". This translates to "Pull up and out to remove the battery."

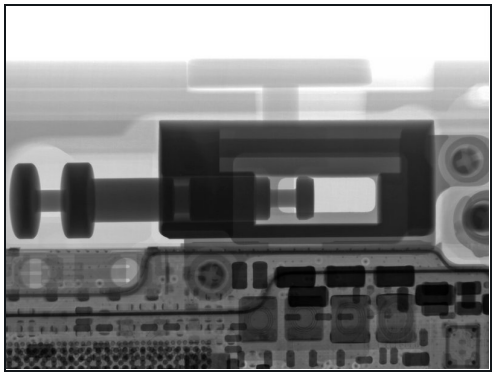
  ⚠ This does **not** translate to "battery is not removable"—as is written in English in the bottom right corner.

- Despite inconsistent labeling, this battery should be consistently easy to remove with that pull tab—it's only lightly adhered in place. Here OnePlus decidedly one-ups its competition.

- However, the battery falls behind its peers in capacity, with 12.70 Wh—slightly under the Galaxy S9+ (13.48 Wh) and Google Pixel 2 XL (13.6 Wh).

Step 6



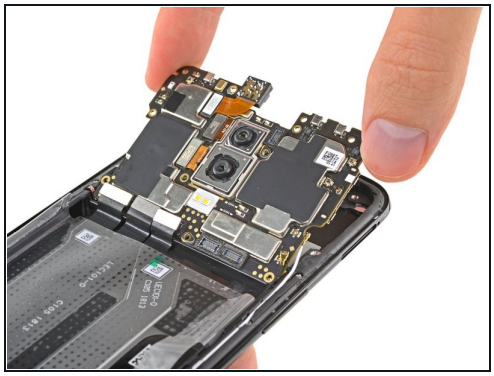


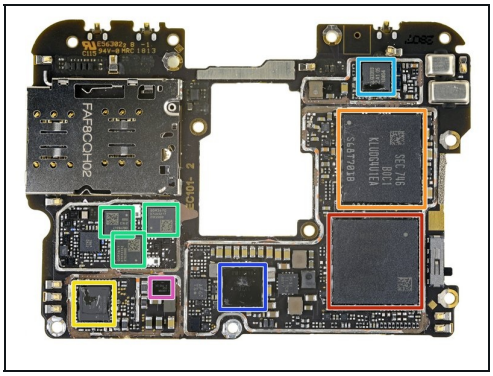
- Nine Phillips screws bite the dust and the plastic antenna frame doesn't budge. But a secret tenth screw behind a liquid damage indicator grants access.

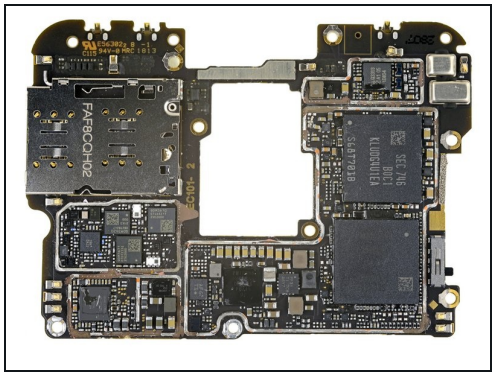
- Under the plastic midframe, we get up-close and personal with that oversized slider mechanism.
  - The slider button moves a hefty metal plunger, which flips a mechanical switch soldered to the motherboard. The X-ray image provides an even better view.

ⓘ Why the seemingly overwrought design? Is it something to do with ingress protection? Or maybe it gives the switch better tactile feedback? Share your best guesses in the comments.

Step 7

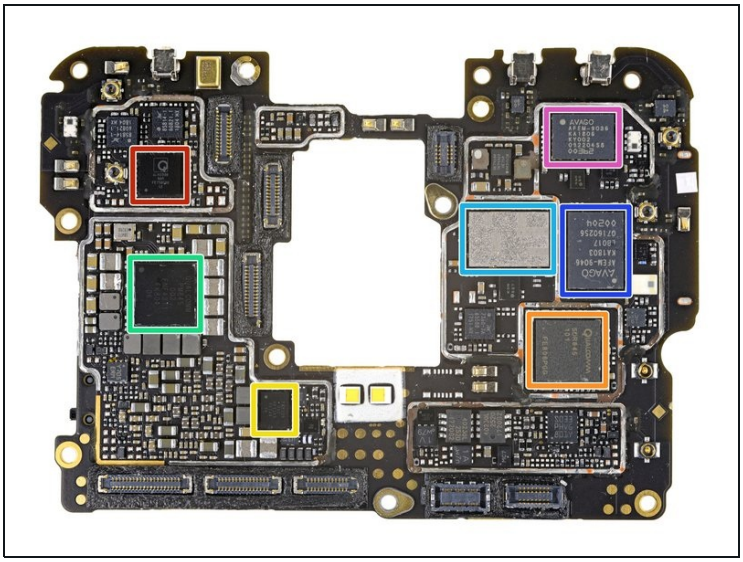


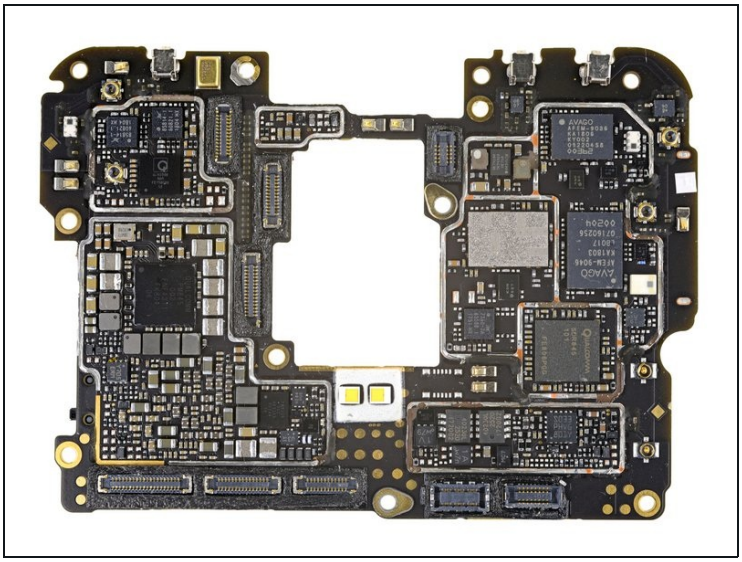




- Having removed all the connectors tethering the motherboard to the phone, we slide it free and take a look at what chips it holds:
  - Samsung K3UH7H70MM-AGCJ 8 GB LPDDR4X DRAM (layered over Qualcomm Snapdragon 845)
  - Samsung KLUDG4U1EA-B0C1 128 GB embedded universal flash storage
  - Qualcomm WCD9341 Aqstic Audio Codec
  - Qualcomm QDM3620, QDM3670, QDM3671 Diversity Receive Modules
  - NXP Q3303 NFC Controller
  - Qualcomm PMI8998 PMIC
  - Maxim Integrated MAX98928 audio amplifier

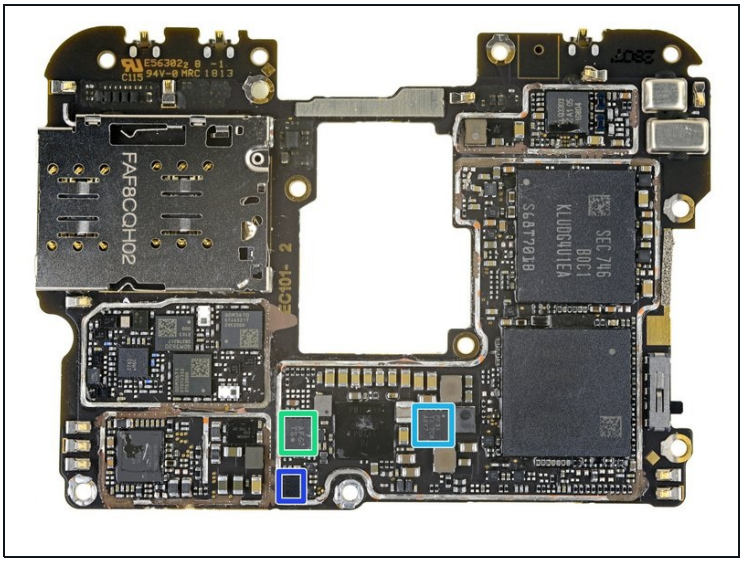
Step 8

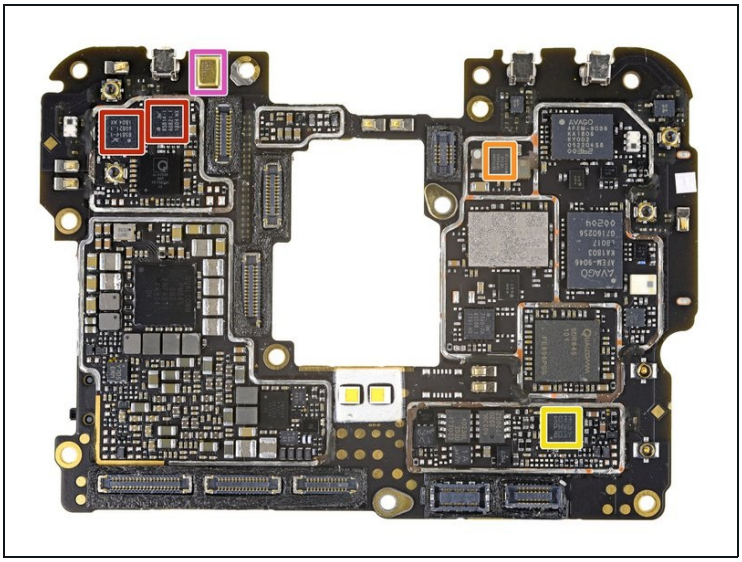




- Next we flip the board and check out the rest of its chips:
  - Qualcomm WCN3990 2x2 802.11ac Wi-Fi with MU-MIMO companion
  - Qualcomm SDR845 RF transceiver
  - Qualcomm PM8005 PMIC
  - Qualcomm PM845 power management
  - Skyworks SKY78160-11 WLAN power amplification module
  - AVAGO AFEM-9046 front end module
  - AVAGO AFEM-9036 front end module

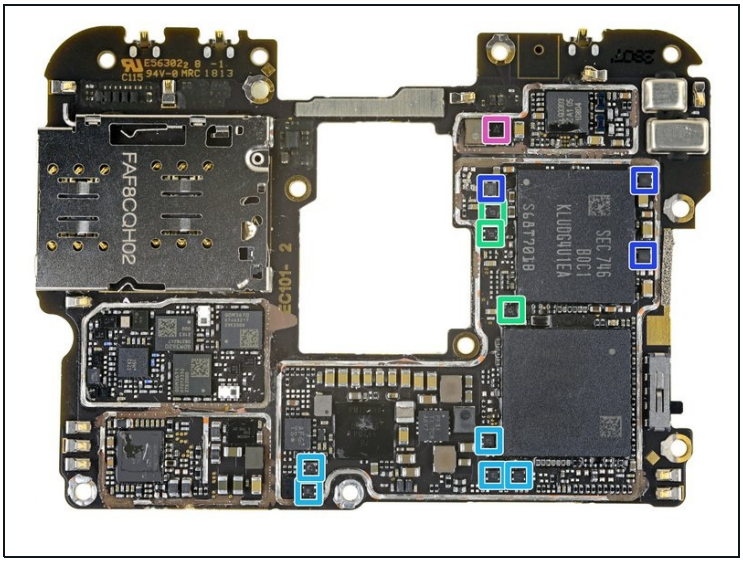
Step 9

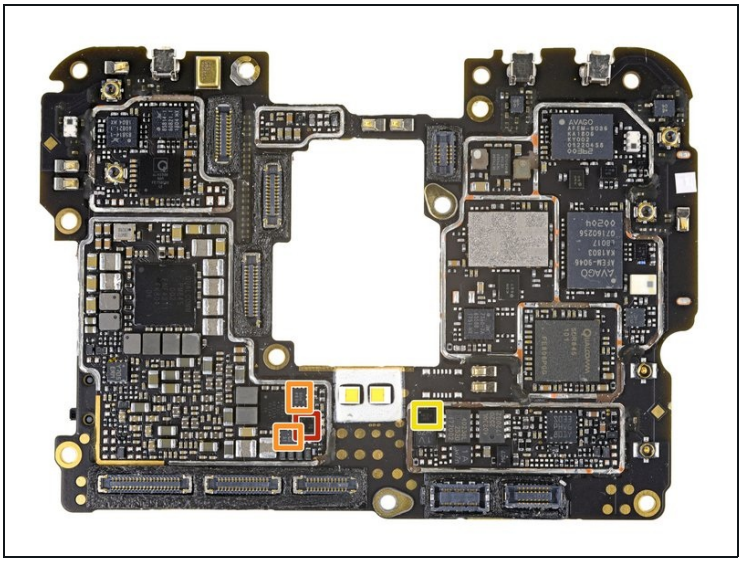




- IC Identification, pt. 2:
  - Skyworks SKY85814-11 WiFi dual-band 802.11ac front-end module
  - Qualcomm QET4100 envelope tracker
  - STMicroelectronics STM8S003F3 8-bit Microcontroller w/ 8 Kb flash
  - Bosch Sensortec BMI160 3-axis accelerometer/gyroscope
  - Texas Instruments TPS65633B AMOLED display power supply
  - Texas Instruments TXS0104E 4-bit bidirectional voltage-level translator
  - Knowles MEMS microphone

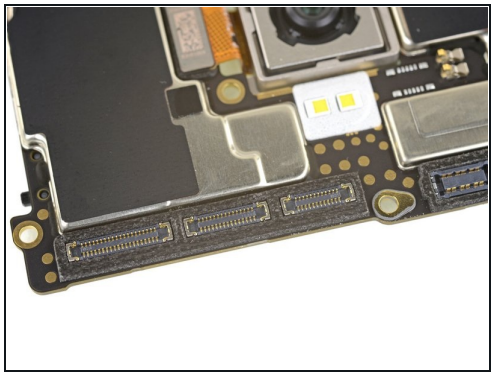
Step 10



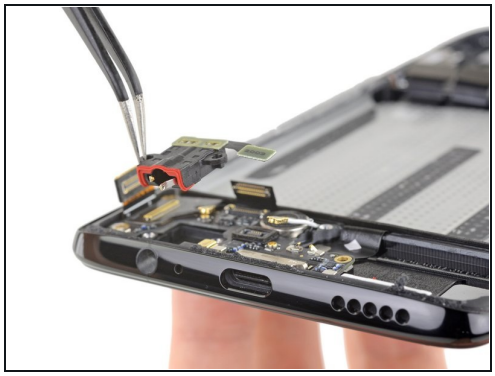


- IC Identification, pt. 3:
  - Maxim Integrated MAX14743 dual SPDT analog switch
  - ON Semiconductor FSUSB42UMX and NL3S2223 2-port 480 Mbps USB 2.0 analog switch
  - ON Semiconductor FPF2280 OVP load switch
  - Texas Instruments LP5907SNX-2.8 250 mA LDO regulator
  - ON Semiconductor NCP114AMX300TCG and NCP114AMX180TxG 150 mA LDO regulator
  - ON Semiconductor NCP140AMXD330TCG 300 mA LDO regulator
  - ON Semiconductor DC-DC Converter

Step 11







- Before we leave the board, let's talk waterproofing. We found some! There are black silicone seals surrounding all these flex cable sockets—as we found previously on the OnePlus 5, and just like on every iPhone since the 6s.

- Moving down to the other end, under the single loudspeaker assembly, we find more gaskets surrounding the speaker grille, USB Type-C port, and nicely modular headphone jack.

Nice to see OnePlus go for gaskets over goo, making disassembly and reassembly a snap. We probably wouldn't jump into the pool with it, but it's nice to have a little protection that doesn't impede repair.

Step 12







- Let's circle back and talk cameras for a moment.

- Although a dual rear-camera setup first emerged on the OnePlus 5, this OnePlus includes OIS—a feature we haven't seen since the OnePlus 3T. Coupled with the brand-new IMX519 sensor from Sony, this seems like a significant step up, although early reviews have been surprisingly ... mixed.

- Alongside it resides the 20 MP Sony IMX 376K sensor, returning from the earlier OnePlus 5T. The selfie cam gets the 16 MP IMX 371, which has been in circulation since the OnePlus 5 days.

- Returning to the bottom edge, we flip out this little daughterboard and survey what's left in the chassis.

- That OLED panel is firmly glued in place—it probably won't come out undamaged. You'll likely only be removing a *broken* display of course, but the procedure for doing so sure isn't repair-friendly.

Step 13



- That's a wrap! If we had one word to describe the sheer number of pieces we pulled from this phone, it would be twelve.
- While we're on the subject of hard numbers, let's give this phone a repairability score.

Step 14 — Final Thoughts



- The OnePlus 6 earns a **5 out of 10** on our repairability scale (10 is the easiest to repair):
  - The battery can be accessed almost the moment you open the phone, and is only lightly adhered in place. Plus, there's a convenient pull tab.
  - Many components are modular and can be individually replaced.
  - All the threaded fasteners are of the standard Phillips variety.
  - Display replacement, the most common repair, is not prioritized in the design and will take a lot of work.
  - Front and back glass means twice the risk of cracks—without even the benefit of wireless charging.
  - The primary access point for all repairs is heavily glued in place.