



# Google Pixel 3a Teardown

Teardown of the Google Pixel 3a, performed May 2019.

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## INTRODUCTION

The Pixel 3a breaks all the rules—a polycarbonate back panel, no wireless charging, visible bezels, a headphone jack, and a top-notch camera in a budget phone. Is there a method to Google's madness? A teardown might be the only way to find out!

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## TOOLS:

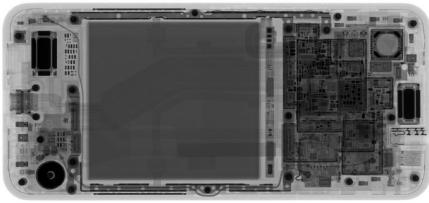
- [iSlack](#) (1)
- [iFixit Opening Picks set of 6](#) (1)
- [Pro Tech Toolkit](#) (1)
- [Spudger](#) (1)
- [T3 Torx Screwdriver](#) (1)
- [Tweezers](#) (1)

## Step 1 — Google Pixel 3a Teardown



- This phone's raw specs aren't meant to impress, but there's quite a lot here for the price:
  - 5.6" OLED display with FHD+ 2220 × 1080 resolution (441 ppi) and Dragontrail Glass
  - Octa-core, 64-bit Qualcomm Snapdragon 670 processor (2.0 GHz + 1.7 GHz) with 4 GB LPDDR4x RAM
  - 12.2 MP, f/1.8, OIS main camera with dual-pixel phase detection autofocus; 8 MP selfie camera
  - 64 GB built-in storage
  - USB-C and a mysterious 3.5 mm "headphone jack"
  - Android 9.0 Pie
- *(i)* This budget-oriented Pixel is also defined by the specs it *lacks*: no wireless charging, and no ingress protection rating. It's [2016](#) all over again!

## Step 2



- If you're in a hurry, here's a teardown TL;DR in X-ray form—courtesy of [Creative Electron](#).
- Those of us without X-ray powers can only see this pristine, polycarbonate exterior.
- *(i)* The polycarbonate build should be more durable than a [glass back](#), although it's likely no match for the rigidity of the [metal construction](#) of yore.
- One thing has persevered through the Pixel's changing materials—the [partial matte finish](#) on the back.
- Meanwhile, this Pixel's party piece—a rear camera like the one in the rest of the Pixel 3 line—promises some serious firepower for a budget phone.
- Turning to the front of the phone, we note how this notch-less 3a has bezels similar to the standard Pixel 3, but has just one front-facing camera.

## Step 3



- The 3a looks very much like its older brother, the Pixel 3, but with fewer seams. Ours also came in a rather distinctive color, which Google dubs "Purple-ish," but which we dub "[Thanos Edition](#)."
- That seamless enclosure points to a screen-first entry on this phone—we're hoping this will mean easier screen replacements than what we saw on the [Pixel 3](#).

 Dread it, run from it, but screen repairs arrive all the same.

- Google also managed to fit a headphone jack in here—which weirdly feels like a luxury feature on this budget phone.
- From the back, it's hard to tell the 3 and 3a apart. Supposedly that brittle glass cover makes for a more premium handset, but we can't see the difference from here.
- The [iPhone XR](#) and [Galaxy S10e](#) would also like to take your budget smartphone dollars—but at \$700+, they're not trying *that* hard. The Pixel 3a packs a slower processor and plastic construction, among other changes, to bring the price down a ton.

## Step 4

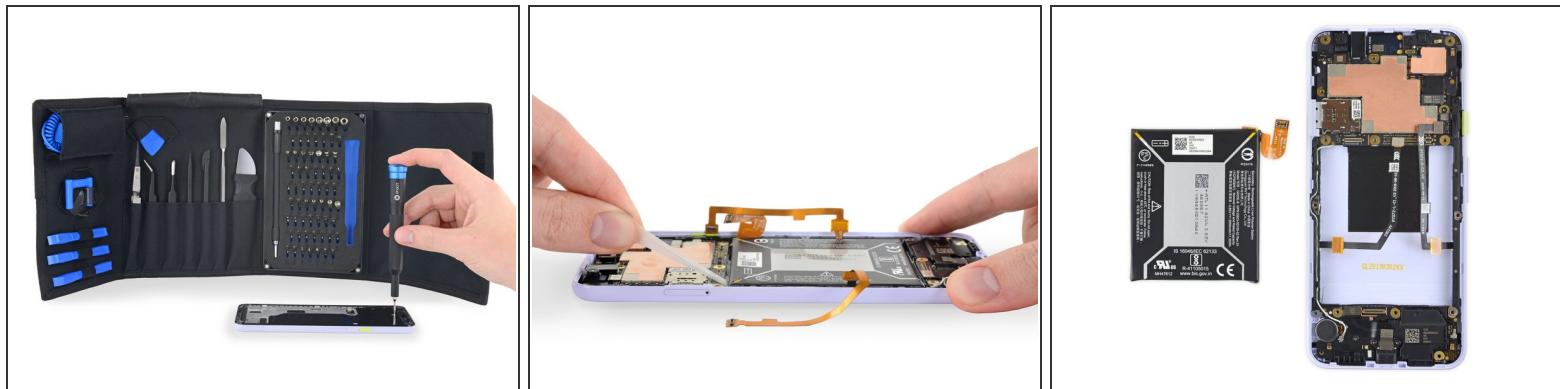


- *What, no iOpener?* Although it would help, this phone was easy enough to open without heat—a rarity these days.
- A spongy, easily-separated adhesive secures the display—which is good for repairs. But it's probably a trade-off that also leaves this phone less than waterproof, so beware.
- The usual tiny side bezels leave this expensive OLED panel vulnerable to our opening pick. Expecting this, we safely slice alongside the display and free it from the phone.
- Just like [old times](#), the display is connected to the motherboard by a single ribbon cable.
- Rumors pointed to a "gOLED" display made by LG, but this is unmistakably a Samsung panel.

***(i) Spoiler alert:*** we're also tearing down a 3a XL, and [that's got a Samsung panel, too.](#)

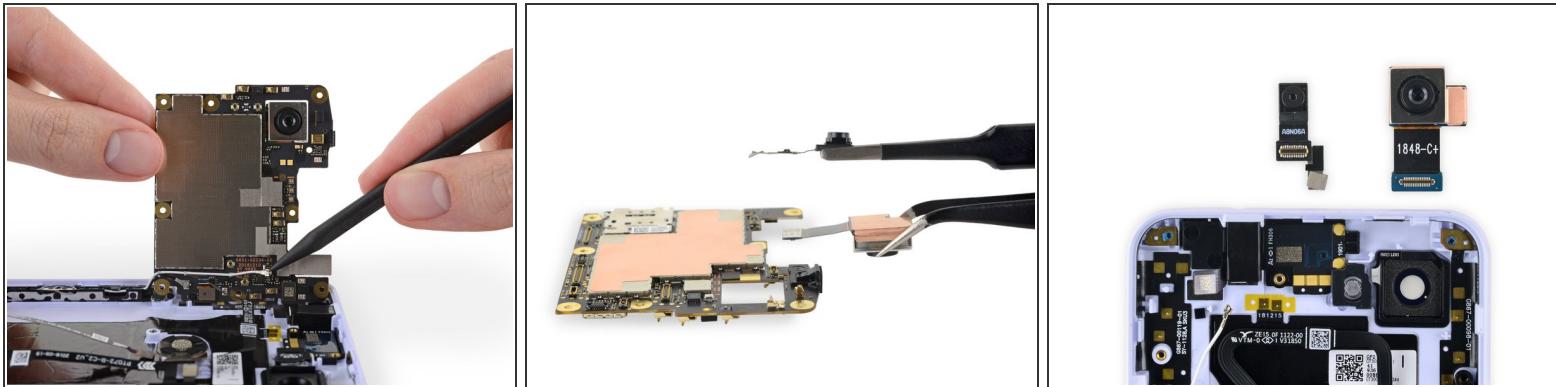
- Also along for the ride is a Synaptics [S3706](#) touchscreen controller.

## Step 5



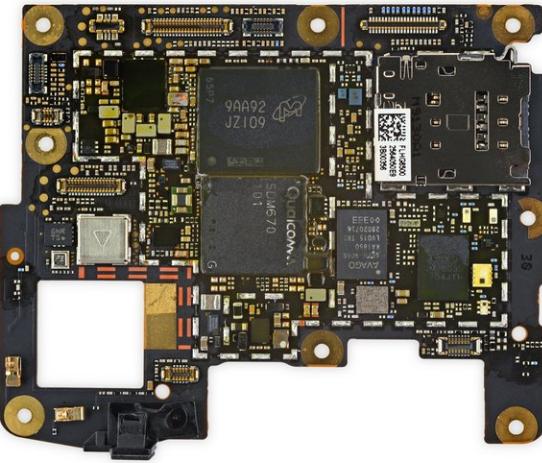
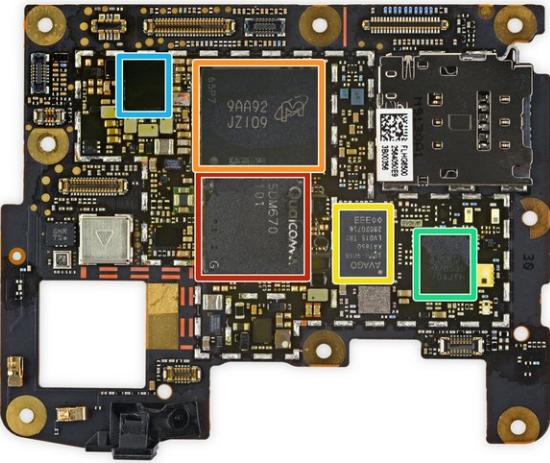
- We came overprepared with our [Pro Tech Toolkit](#) and its 64 driver bits—we only need one to twirl away these Torx screws and remove the midframe, along with its embedded earpiece speaker.
- On our way to the battery, we fold aside a couple of golden flex cables for the Active Edge sensors. In Pixels past, these cables were routed *under* the battery, out of sight and easy to destroy with wayward prying. It's nice to see them out of harm's way here.
- Onward to battery extraction, where two adhesive strips stand in the way. We locate the pull tabs and they cooperate without much fuss. Success! The battery is out.
- This battery beats out the [Pixel 3's 11.2 Wh battery](#) with its own 11.55 Wh (3.85 V, 3000 mAh) powerhouse. That falls neatly between the [iPhone XR](#) and Samsung [Galaxy S10e](#), at 11.16 Wh and 11.94 Wh, respectively.

## Step 6



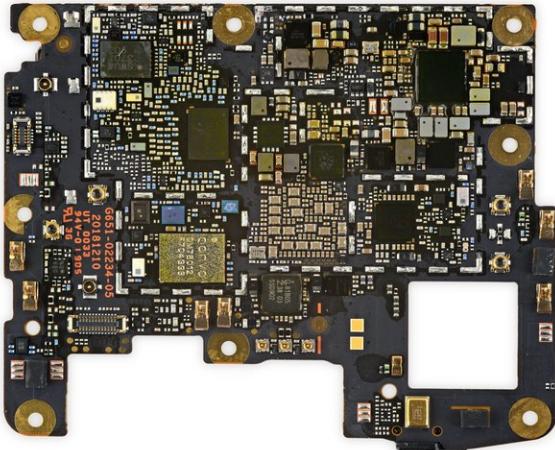
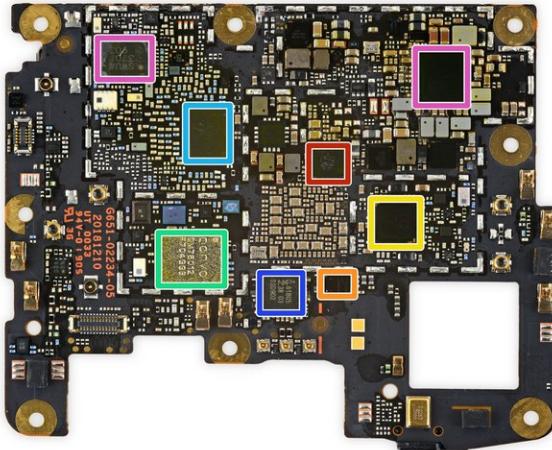
- Next to come out is the motherboard, with some wiry antenna barnacles attached to its underside.
- Our teardown engineers often develop tweezerhands as a result of their work environment.
  - Some find it alarming, but what better type of hands to pull out a couple tiny cameras?
- The 3a inherits the well-reviewed 12.2 MP rear camera from the Pixel 3. Instead of having two 8 MP selfie cameras, the 3a only has one, averaging the  $f/1.8$  and  $f/2.2$  apertures to a middling  $f/2.0$ .

## Step 7



- Let's peep at these pixels to figure out what the chips are.
  - Qualcomm [SDM670](#) Snapdragon 670 octa-core processor + Adreno 615 GPU
  - Micron MT29VZZZAD8DQKSL 64 GB flash storage + 4 GB LPDDR4X DRAM
  - Avago AFEM-9046, probably a front-end module
  - Qorvo QM78035, probably a voltage controlled oscillator
  - Qualcomm PM670A PMIC
- *i* And this time around we *don't* get a peep at Google's [Pixel Visual Core](#), which we saw in our [last couple Pixel teardowns](#).

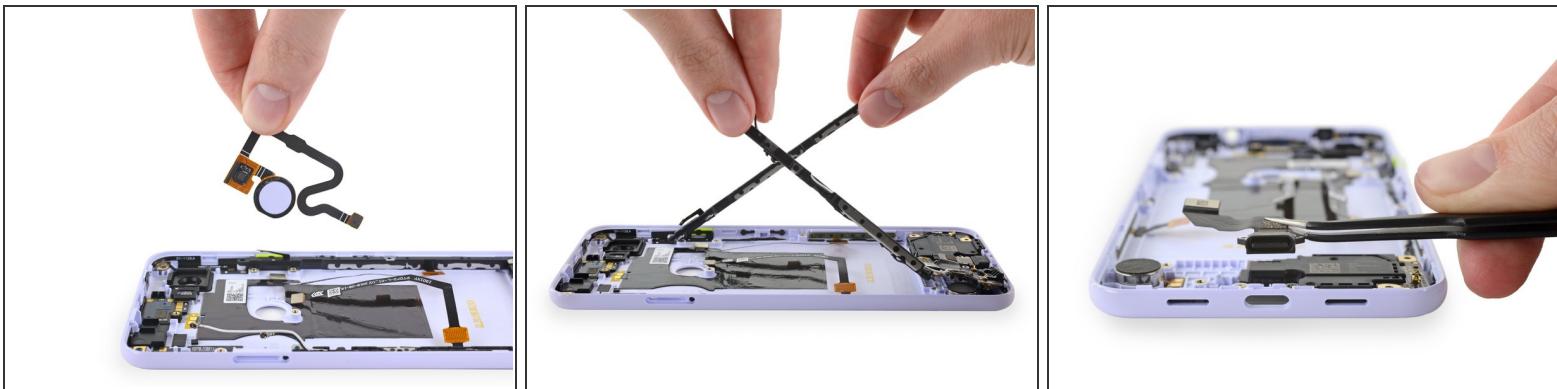
## Step 8



- Back side:

- Google [H1C2M](#) Titan M [security chip](#)
- STMicroelectronics [ST33J2M0](#) ARM SecureCore microcontroller
- Qualcomm WCN3990 wireless combo SoC
- Qorvo [QM78012](#) RF fusion module
- Qualcomm SDR660 RF transceiver
- NXP 81B05 38 03 SSD902, probably an NFC controller
- Murata SWUA 370 90 and Qualcomm PM670 PMIC

## Step 9



- After the motherboard, there isn't much left in the barrel. That's not a bad thing, especially when each part comes out easily and in one piece.
- First we fish out the fingerprint sensor, complete with its wavy [tail flex cable](#).
- Next, these plastic rails—serving dual purposes as both cabling routers and brackets which press the [squeeze sensors](#) in place.
- Down at the bottom edge, we find a *modular* USB-C port! This is a welcome design for this high-wear component, especially since the 3a does not offer wireless charging.
  - The headphone jack also makes a [cool modular comeback](#).
- Down south we also spot the vibration motor—a small, round LRA (*Linear Resonant Actuator*) as found in just about every smartphone not made by Apple or Google. No fancy [precision haptic motor](#) for this Pixel.

## Step 10



- After running the gauntlet of this teardown, we lay out our seemingly infinite number of ~~stones~~ parts.
- While taking this phone apart was far from a "snap," we did enjoy some of the throwbacks to a prior, more-repairable era.
- How does this phone fare in the repair endgame? Check the score below to find out!

ⓘ If you're looking for a more *cinematic* offering in this series, check out our [Pixel 3a XL video teardown](#).

ⓘ If you'd like to marvel at the innards, [we've made some wallpapers](#) for you!

## Step 11 — Final Thoughts



- The Pixel 3a earns a **6 out of 10** on our repairability scale (10 is the easiest to repair):
  - Most components are modular and can be easily replaced once the display assembly is removed.
  - Repair-friendly stretch-release adhesive secures the battery.
  - The only screws are standard T3 Torx fasteners.
- The display comes off first, but is thin and poorly supported. Foam adhesive makes the opening process relatively easy.
- The myriad long, thin ribbon cables connecting the internal componentry can be obnoxious to work around, and are easy to accidentally tear.