Samsung Galaxy Note8 Teardown

Teardown of the Samsung Galaxy Note8 performed on September 7, 2017.

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INTRODUCTION

The Note7 came in hot but went out in a show of flames and combustion. Rising out of its ashes is Fawkes the Note8! Samsung has pulled out all the stops on the specs of this phone, and added a few stops where the battery’s concerned. Join us—and hopefully not the local fire department—as we open up the Samsung Galaxy Note8!

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TOOLS:

- iOpener (1)
- iFixit Opening Picks (Set of 6) (1)
- Spudger (1)
- Phillips #00 Screwdriver (1)
- Tweezers (1)
- Halberd Spudger (1)
The Note8 is a *tall* phone. Let's see what occupies all that space:

- Edge-to-edge, 6.3" Super AMOLED display, 18.5:9 aspect ratio with 2960 × 1440 resolution (521 ppi) and Gorilla Glass 5
- Qualcomm Snapdragon 835 processor with 6 GB RAM
- 3300 mAh battery
- Dual-lens, dual OIS main camera system with one 12 MP wide-angle lens with f/1.7 aperture and one 12 MP telephoto lens with f/2.4 aperture
- 64/128/256 GB of internal storage with 256 GB available via microSD expansion
- S Pen slot, USB-C port, and headphone jack
- IP68 dust and water resistance rating
Step 2

- You can see right through this phone if you squint hard and have the ability to fire high-energy photons.

- The X-ray intel suggests a somewhat familiar layout, but a little physical poking and prodding is definitely in order. Ready the tools!

- But first, a quick exterior comparison of the Note8 and Note7 Fan Edition reveals a bigger display, slimmer bezels, and a fingerprint sensor that has migrated to the back of the phone—where it's now joined by not one, but two cameras.

Step 3

- This glue-ridden heat-pry-and-slice opening procedure is certainly not our favorite, but at least by now it's getting familiar. As usual, it all starts with our trusty iOpener.

- Cracking open the phone, we spy a delicate fingerprint sensor cable. This makes carving through all that glue a bit treacherous as the cable might be easy to slice right through if you aren't expecting it.
Step 4

- We are pleased that we get to use a Phillips driver to remove the midframe/NFC antenna/PMA and Qi wireless charging coil combo.

- After removing that maxed-out midframe, we remove the bottom speaker assembly to get our first peek at the internals.

  Familiar components, unfamiliar places — the battery is placed nearly dead-center, and the vibrator migrated to the bottom right. Goodbye standard Note/Galaxy S layout.

- Is this a subtle response to past battery woes, or just Samsung working to tidy up? Time to take a look at that power plant.
Step 5

- In line with other recent Samsung phones, the battery squats in a little pit of glue-lined sadness, but we quickly set to work digging it free.
- A little heat can help soften the glue here, but heat and lithium-ion batteries form a combustible mix—so we opt for a different solution.
- This Samsung SDI-made battery plonks down **12.71 Wh** (3300 mAh at 3.85 V) of capacity.
- That's 6% less than the Note7's **13.48 Wh**—but keep in mind that battery burned in more ways than one. The safely revamped battery in the Fan Edition clocked in at only **12.32 Wh**, so this actually represents an improvement (assuming of course no fire).
Step 6

Next we get our hands on the motherboard, along with the Note8’s many cameras.

If we were impressed with the number of cameras last time, the new Note ups the ante with four cameras:

- Facing the front of the phone we have an iris scanner and an 8 MP, f/1.7 camera.

- Facing the rear we have Samsung’s new dual camera module: one wide-angle and one telephoto camera, both with OIS. This system allows for some pretty cool new features.

- OIS confirmed. This magic bonus image reveals a squad of dense, dark shapes—those’d be the magnets—surrounding both camera lenses. Neat!
Step 7

Let's notate what powers all of this screen:

- Samsung **K3UH6H60AM-NGCJ** 6 GB LPDDR4X SDRAM layered over a Qualcomm Snapdragon 835
- Samsung **KLUCG4J1ED-B0C1** 64 GB UFS flash storage
- Qualcomm **WCD9341** Aqstic audio codec
- Skyworks SKY78160-11 power amplifier
- Avago AFEM-9066 power amplifier
- Wacom W9018 touch control IC
- Silicon Mitus SM5720 power management IC
Step 8

- Flipping the board over we find:
  - Qualcomm **WTR5975** RF transceiver
  - Avago AFEM-9053 power amplifier
  - Skyworks **SKY77365-11** quad-band GSM/GPRS/EDGE power amplification module
  - Qualcomm PM8998 PMIC
  - Murata KM7628048 Wi-Fi module
  - Qualcomm PM8005 power management IC
  - Maxim Integrated MAX77838EWO AMOLED power management IC
Step 9

- IC identification, part 2:
  - IDT P9320S wireless charger IC
  - Maxim MAX98506 audio amplifier
  - NXP Semiconductor PN80T NFC controller w/ secure element
  - Qualcomm QET4100 40 MHz envelope tracker
  - Qualcomm ? D5319 mid-band diversity IC
  - Qualcomm ? D5320 high-band diversity IC (likely)
  - Samsung S2M005X02 power management IC (likely)
Step 10

IC identification, part 3:
- Samsung S5YY4N02 image processor (likely)
- Murata 361 low-band diversity
- ON Semiconductor FXLA0104QFX 4-bit voltage translator
- NXP Semiconductor NCX2200 comparator
- ON Semiconductor FAN48618 1 A voltage regulator
- ON Semiconductor FPF3688UCX load switch
- Vishay DG2730 2-port, 480 Mbps USB 2.0 DPDT analog switch
IC Identification, part 4:

- RDA Microelectronics RDA6213N FM transceiver (likely)
- NXP Semiconductor PCAL6524 24-bit I/O expander
- Richtek RT8010GQW 1 A DC/DC converter
- Texas Instruments LP5907-Q1, LP5907, and TLV74315P LDO regulators
- Skyworks SKY65611-11 GPS/GLONASS/Galileo/BeiDou LNA
Step 12

- IC Identification, part 5 (sensors):
  - AKM Semiconductor AK09916C 3-axis electronic compass
  - Ablic (Formerly Seiko Instruments) S-5712CCDL1-I4T1U hall effect sensor
  - STMicroelectronics LSM6DSL 3-Axis accelerometer/gyroscope
  - STMicroelectronics LPS22HB pressure sensor
  - Maxim Integrated MAX86902 heart rate sensor (likely)
Step 13

- We reserve the right to continue bellyaching about the opening procedure on these phones, but once inside it’s not all bad news.

  - The USB-C port, a component that will experience wear, can be removed with the daughterboard.

  - Meanwhile, the 3.5 mm headphone jack is present (huzzah!) and completely modular. We find this essential on premium handsets.

  - All that, plus an IP68 water/dust ingress protection rating that bests Apple’s efforts. Not too shabby.

  - The front-facing sensor (likely AMS TMD4906) assembly is also present on its own little board—another easily replaceable module!

  - Next we open up the S Pen compartment … to find the S Pen. Kind of obvious I guess, but we couldn’t help ourselves.
Step 14

The Note8’s OLED panel has been much ballyhooed, with many superlatives, but we’re mostly just interested in how it comes off.

Answer: bring heat and alllllll your opening picks.

This Samsung-manufactured display [bests all previous smartphone displays](#) and represents a significant step forward from what we saw in the S8 series just a few months ago. Small wonder that a certain fruit company wants in on the action.

- Along for the ride: Samsung S6SY661X (likely touch controller)
- And a Winbond W25Q80EW 8 Mb serial flash memory
Step 15

- With both the Note7 and Note8 styluses on hand, we couldn't help but do our own comparison—Star Wars style.

- After glorious combat we asked our friends at Creative Electron to show us the inner-workings of the S Pen.

  Unfortunately, they found no kyber crystals.

Step 16

- We hope you took notes along the way, because this Note is kaput!

- Big thanks to Creative Electron for once again bringing our teardown into a new dimension!

- Feast your eyes on all the bits and stay tuned for a score.
Step 17 — Final Thoughts

REPAIRABILITY SCORE:

- The Samsung Galaxy Note8 earns a 4 out of 10 on our repairability scale (10 is the easiest to repair):
  - Many components, including all of those that experience wear, are modular and can be replaced independently.
  - The only screws in this phone are standard Phillips screws.
  - The battery can be replaced, but tough adhesive and a glued-on rear panel make it unnecessarily difficult.
  - All repairs require removing the glass rear panel, which is challenging due to the large amount of adhesive.
  - Replacing the display requires removing the glass rear panel and the display, both of which are fragile and secured with strong adhesive.