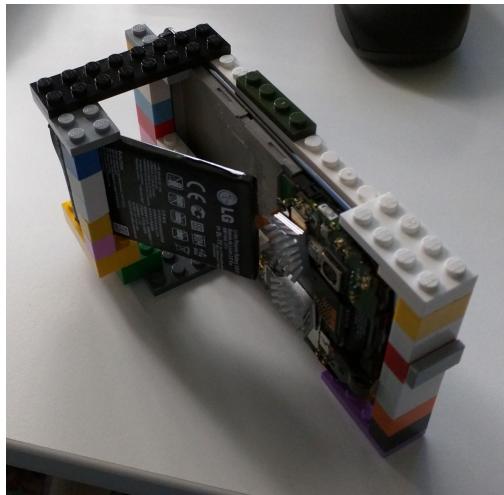


# Nexus 4 Thermal Rework

**WARNING:** Performing the instructions listed in this document may damage your Nexus 4 device and/or render it inoperable. **PROCEED AT YOUR OWN RISK.**



## Basic Device Setup

Used Nexus 4 devices can usually be procured used on Amazon for < \$100. First load the device with the stock Nexus 4 5.1.1 (LMY47V) ROM.

1. Download  
<https://dl.google.com/dl/android/aosp/occam-lmy47v-factory-b0c4eb3d.tgz>
2. Put the device into fastboot mode (hold power for 10 seconds, then on reboot hold volume down)
3. Unlock the device - fastboot oem unlock
4. Flash the device with Android - ./flash-all.sh
5. When the device boots (initial boot will take approx 10 minutes), quickly check that Wifi, Bluetooth, Camera are functioning in the Android UI.
6. Return the device to fastboot mode
7. Download the latest Nexus 4 Silk device image and flash the device -  
./flash.sh

8. Confirm the device boots and execute basic sanity tests

## Thermal Mitigation Rework

The Nexus 4 devices tend to favour overheating over cpu core shutdown when run hard continuously, which can result in damaging battery swelling over time:



Some modifications can help reduce this problem by:

- Adding heat sinks directly over the main processor and power management chips
- Creating an air gap between the battery and chassis, to reduce the heat transfer into the battery, held together by a LEGO stand

Ensure you have the following:

1. A smartphone repair kit:

[http://www.amazon.com/gp/product/B00BF0QE36?psc=1&redirect=true&ref\\_=oh\\_aui\\_detailpage\\_o05\\_s00](http://www.amazon.com/gp/product/B00BF0QE36?psc=1&redirect=true&ref_=oh_aui_detailpage_o05_s00)

2. 2-3 small heat sinks, like

[http://www.amazon.com/gp/product/B00A88DVTG?psc=1&redirect=true&ref\\_=oh\\_aui\\_detailpage\\_o04\\_s00](http://www.amazon.com/gp/product/B00A88DVTG?psc=1&redirect=true&ref_=oh_aui_detailpage_o04_s00)

and review the Nexus 4 Teardown at

<https://www.ifixit.com/Teardown/Nexus+4+Teardown/11781> to familiarize yourself with the internals beforehand.

Let's begin. Unscrew and remove the two screws at the bottom of the device:



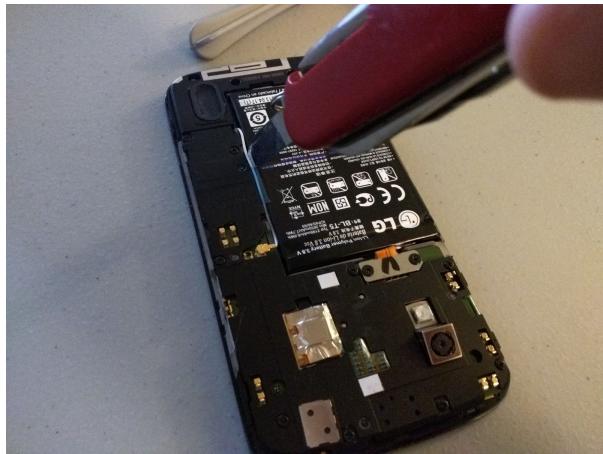
Remove the SIM holder:



Use a prying tool to remove the back cover. It takes a bit of force:



Cut the tape between the battery and WiFi antenna:



Use the prying tool to remove the battery from the chassis, it is only held in place by glue:



Remove the upper seven black screws that hold the motherboard cover down, keeping the bottom two in place. Take care not to strip the screws as they can be tight:



Use the prying tool to unsnap the motherboard cover:



**Break** the upper portion of the motherboard cover off around where the sim slot is. The lower portion of the cover must remain in place to hold the vibrator motor:



Detach the ribbon cable for the touch panel, careful to keep the display ribbon beside it in place.



Adhere a small heat sink over the ARM. The placement can be tricky due to the slightly-raised metal guides for the ribbon cable and the resistors on the display ribbon cable (don't short them)

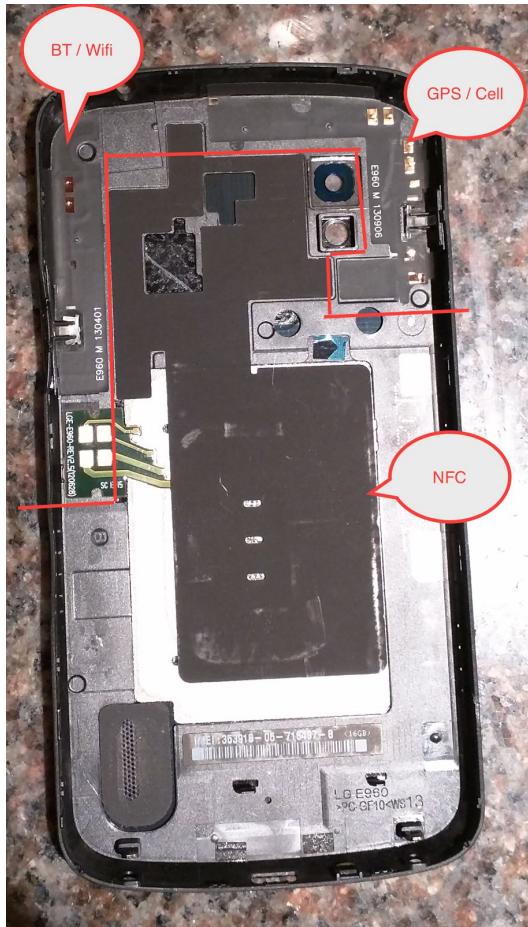
out, the display goes funny until reboot when you do). Play with it until it seems to fit well enough:



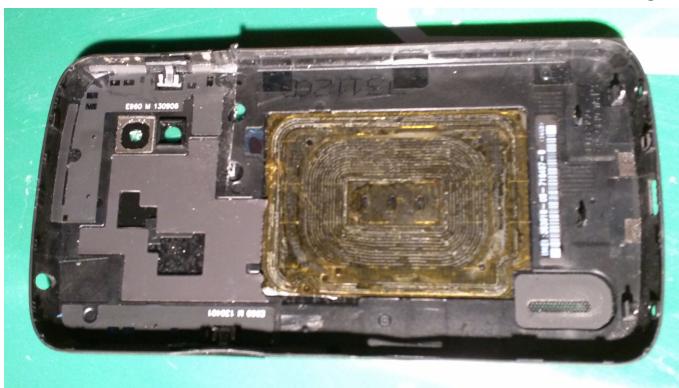
Restore the screw in the upper-left, to help hold the motherboard down against the chassis. The other screws will no longer fit without the back cover (NOTE: ignore the second heat sink in this image, it is no longer used):



The BT/Wifi antenna is on the back cover, and now needs to be put in place. However with the battery unattached and heat sink in place, the back cover needs to be cut up for the antenna to fit:



Remove the bulk of NFC antenna for easier cutting:



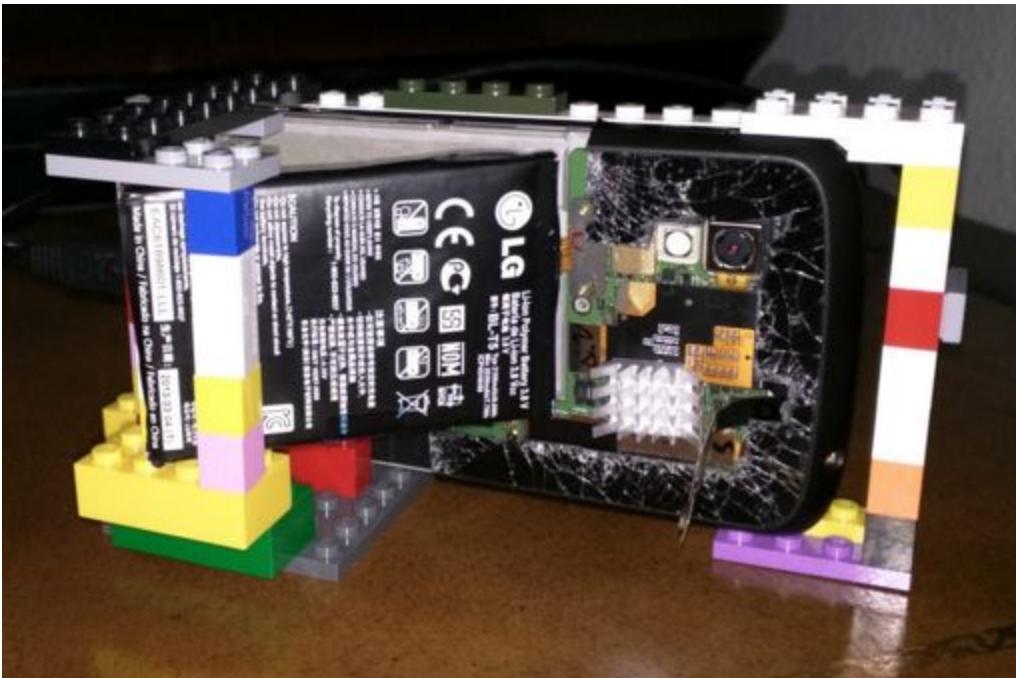
then use normal scissors to cut out the excess. Note that the shiny covering on the back will splinter and make a bit of a mess:



Snap the minimal back covering back onto the device:



Done! The device is ready for a nice Lego stand. Ensure that the battery does not come in contact with the chassis and in particular the heat sink. The touch panel ribbon cable just dangles, secure it with something if it's a bother.



## Thermal Mitigation++

The device is still overheating? Try adding a couple heat sinks directly onto the display where it feels hot:



and if the device is exposed to direct sun, cover the battery with paper/Lego/etc such that there is still room inside for airflow and the heat sinks remain exposed, such as:

