

Iteration 1

Reading a removed eMMC ic

Finding a starting point on a project like this is challenging. The goal is to remove and read the data off an eMMC ic. The plan is as follows.

1. Take apart an SD card reader.
2. Braid jumper wires together for VCC and VSS.
3. Solder jumper wires to the SD card reader.
4. Identify the eMMC chip on an old smart phone.
5. Remove eMMC chip from smart phone board.
6. Research the pins out on the eMMC.
7. Solder jumper wires to eMMC.
8. Plug it in and see if it reads.

Step 1

This reader was purchased from amazon for approximately \$10. Deconstructing it made the pin outs for the SD cards visible and accessible. Attempting to use the micro-SD card slot removes the need to bridge an extra pin to ground. While these pins are smaller, they are accessible.



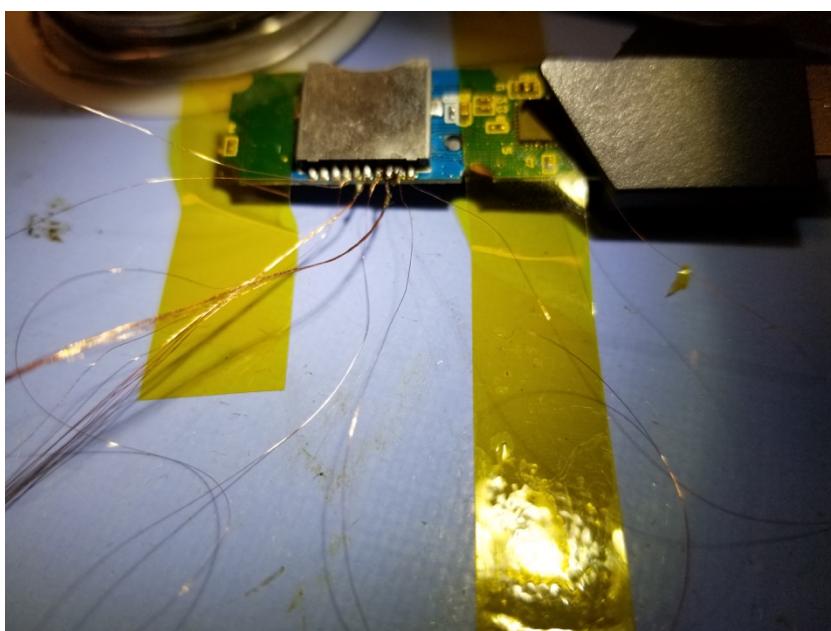
Step 2

About 10 jumpers need to be soldered together for VCC and VSS. The jumpers are about 0.02mm thick. Keeping them separated and preventing crossing will be a difficult task. A better solution probably exists but focusing on getting something together is the plan now.



Step 3

All together there are about 8 pins that need jumpers soldered. Using the micro SD card slot rather than the regular SD card slot is more efficient because the regular slot requires an extra pin to be grounded when a card is inserted. This choice makes the soldering more challenging as the pins are much smaller on the micro SD card slot, but not dealing with the extra pin is the pay off in this choice.



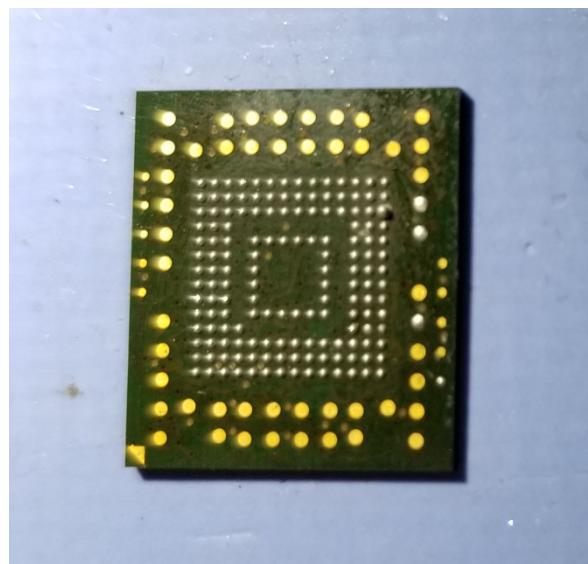
Step 4

The eMMC ic is taken from a scrap Motorola phone board. While the exact model phone is unknown the eMMC is identifiable on the board. The model of the eMMC is “SDIN8DE4-32G”, I found it on [Mouser's](#) website. The basic description from them is “eMMC 32GB 4.51 HS200 Auto eMMC WD/SD”



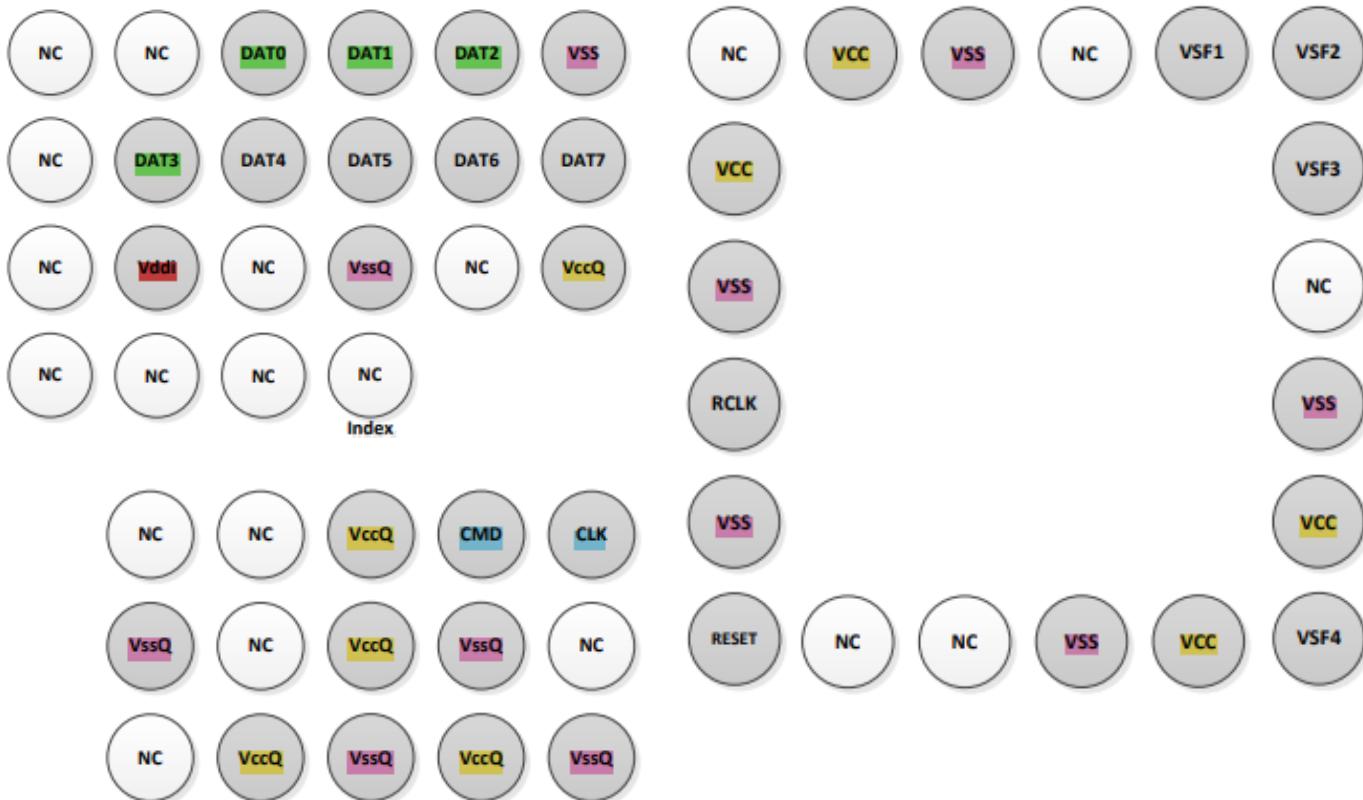
Step 5

I am using a hot air gun set to max temp, max air, with no nose on it. As soon as the solder melts it flips off because my tweezers are positioned to apply pressure on the chip. The best practice from research is to clean off and reball the ic, however, the ic is not going back onto any board making that step unnecessary. Also, the larger balls should be a bit easier to run the jumpers too.



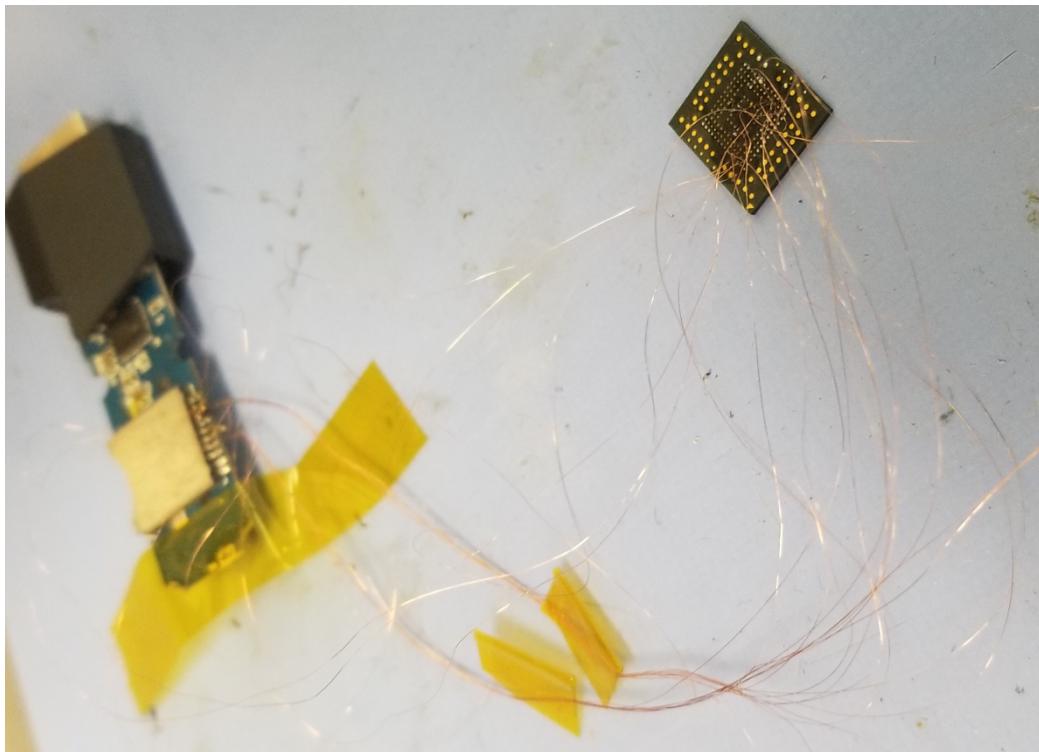
Step 6

The exact eMMC datasheet couldn't be found. I used the next closest one was as they appear to share the same BGA layout. In other words, this data sheet should give me enough information to run jumpers to it. Also by probing the motherboard the pin outs match up. The datasheet says Vddi should have a capacitor between it and ground for powering the ic. Looking on the board the ic came from I can see the capacitor exists. In order to save some time and effort a jumper could just be run off of Vddi to the old board.



Step 7

This is where a major issue occurred. All the jumpers are soldered onto the ic, but now VCC and VSS seem to be connected. At some point VCC and VSS got crossed and I removed half the jumpers before I found the crossed line. With how difficult it is to keep the VCC and VSS jumper in order, it would be a waste of time to continue here. All jumpers were removed from the ic and the pads on the ic cleaned.



Summary

Things seemed to go well until the VCC and VSS got mixed up. More time should have been spent on step 2. It's important that VCC and VSS are braided tightly together and identifiable. Soldering to the pads on the ic was also a little more difficult than expected. With fresh solder that should also be easier. Iteration 2 must improve on step 2. A better plan for connecting the jumpers to the readers is also worth investment.