



# Evaluating High Capacity Batteries (Part II)

Another guide about the claim for a High Capacity battery. This is an actual possibility since it only claims a ~13% higher capacity

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## INTRODUCTION

iFixit is the place people turn to for answers. A question appeared asking for opinions about High Capacity batteries. This particular question was about batteries from "Injured Gadgets" which has a good reputation for quality replacement parts. Here is the question [Opinions What do you guys think of extended capacity batteries](#) Since I had previously done a guide regarding the infamous "Gold High Capacity" batteries [The myth of the "high capacity" batteries](#) it was proposed that it might be worthwhile to post a test regarding this type of battery.

For this test Apple iPhone 7Plus batteries were used because the original question was based on those. Besides the battery from Injured Gadgets I ordered one from a random eBay seller and one from iFixit. Prices ranged from USD \$8.50 - \$24.99

Usual disclaimer is that I am not on anybody's payroll for this. All materials and equipment are my own and have been purchased by me without any reimbursements etc. This test is not meant to call anybody out or to endorse anybody. I am an amateur tinkerer and use analyzers and meters that are sufficient for this but are most likely not what a professional would use.

### **TOOLS:**

- ZKETech EBC-A10H battery analyzer (1)
- Apple A1205 USB charger (1)
- Prototype board with iPhone 7Plus battery connector (1)
- Apple USB charge cable (1)

### **PARTS:**

- iPhone 7Plus battery eBay seller (1)
- iPhone 7Plus battery iFixit (1)
- iPhone 7Plus battery Injured Gadgets (1)

## Step 1 — Evaluating High Capacity Batteries (Part II)



- Here is the side-by-side of the batteries. Luckily the batteries have their own markings so they will be easy to identify during this test. Note: Apple symbol on the eBay battery.
- First step are to measure the physical dimension of each battery. This may seem tedious since it was done for each battery but for the integrity of this test its deemed necessary.
- First the iFixit battery. Weight is 42.79 gram
- Length is 108.82

## Step 2



- Width is 47.90mm with a thickness of 3.38mm
- Next we have the eBay battery. Weight is 44.02 gram

## Step 3



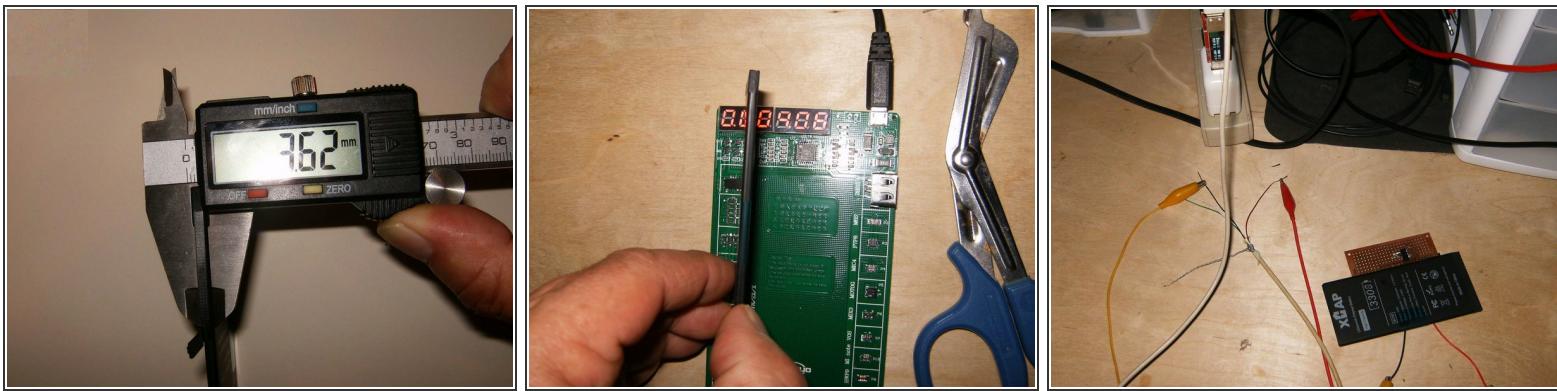
- Length is 108.9mm
- Width is 48.32
- and a thickness of 3.69mm

## Step 4



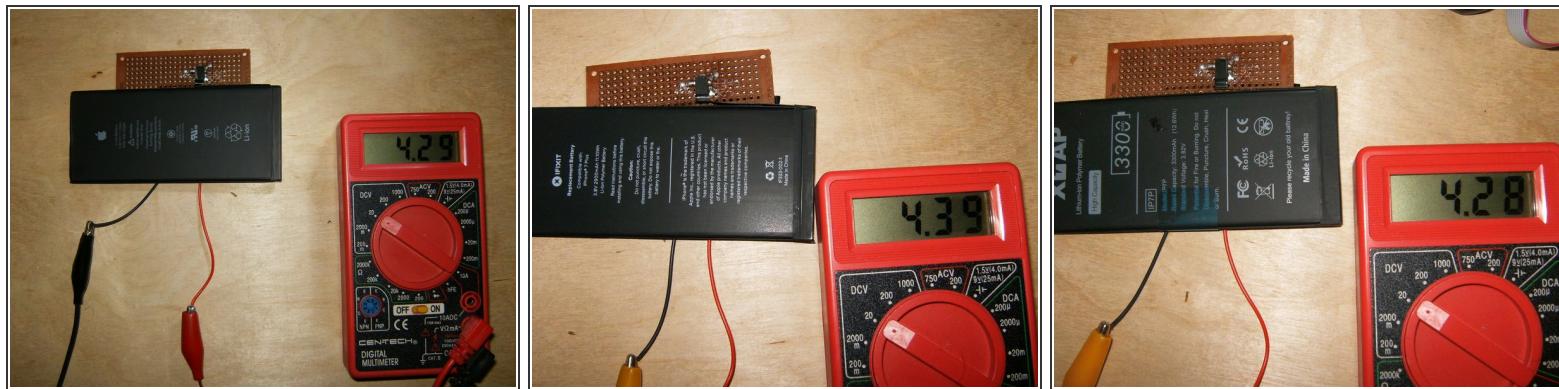
- Now the XCAP battery. Weight is 45.86gram
- length is 109.54mm and width is 48.87mm.

## Step 5



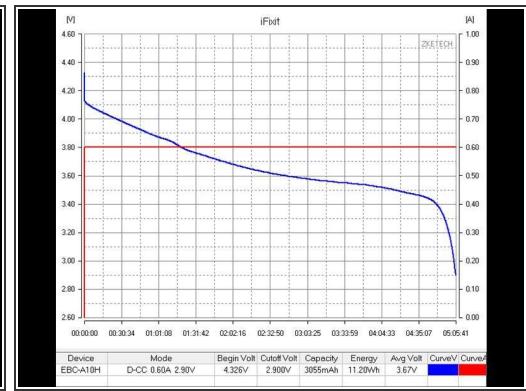
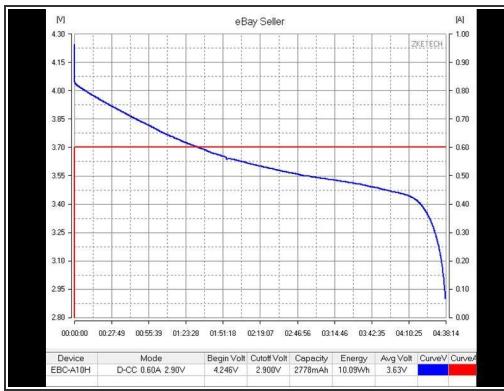
- Thickness of the XCAP is 3.62mm
- Yes, it is boring and tedious but to ensure that this guide compares like to like it is felt to be necessary.
- For the question on Answers, the batteries were all charged using a “Fast Charging Activation Test Fixture” by Jageud. During those tests the board only managed to charge all three batteries to around 4.09 Volt.
- I did not want to use my lab power supply but wanted to stay with equipment that others may have available as well. As a tinkerer by heart, I opted for an Apple charger as well as an Apple charge cable. I hacked the original 30 pin connector off and determine + and - wires
- I then connected the positive to positive and negative to negative directly to the prototype board, bypassing any communication etc. from the battery to the charger. Charging was monitored with a USB ammeter. All batteries were charged this way to around 4.24V. It is possible that this is where the battery protection prevents overcharging.

## Step 6



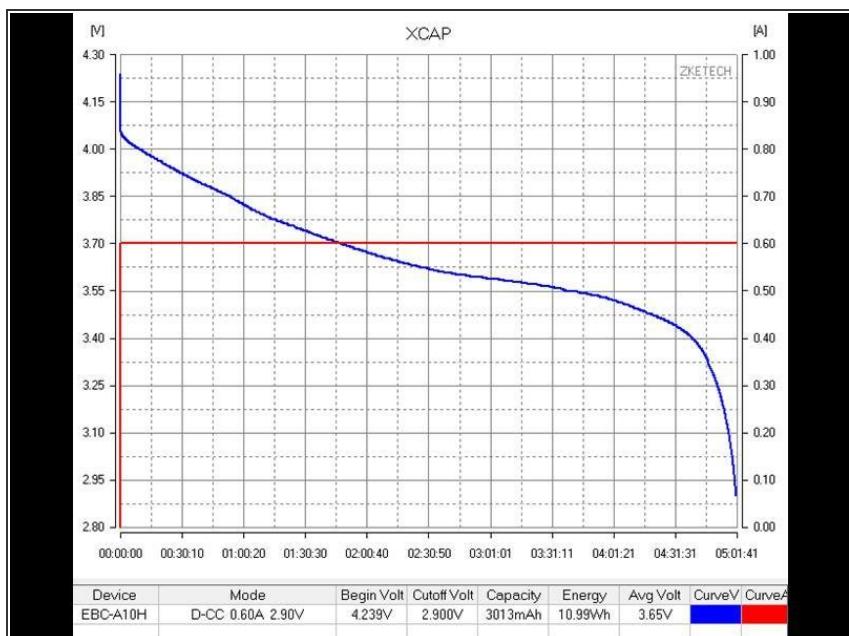
- Once the ammeter showed that the batteries were no longer accepting a charge, the batteries were checked with a run-of-the-mill multimeter.
- eBay battery charged to 4.29V
- iFixit 4.39V (anomaly)
- XCAP batter 4.28 V

## Step 7



- After charging all the batteries I ran a constant current test on all batteries with my ZKETech EBC-A10H analyzer. The software is EB tester Software V1.8.5 All battery tests had the same parameter of a constant current draw of 0.6 Amp and a stop test voltage of 2.9V
- Results for the eBay battery Device:EBC-A10H Mode:D-CC 0.60A 2.90V Begin Volt:4.246V Cutoff Volt:2.900V Capacity:2778mAh Energy:10.09Wh Avg Volt:3.63V Title:eBay Seller
- Here is the iFixit battery data: Device:EBC-A10H Mode:D-CC 0.60A 2.90V Begin Volt:4.326V Cutoff Volt:2.900V Capacity:3055mAh Energy:11.20Wh Avg Volt:3.67V Title:iFixit

## Step 8



- Finally the XCAP battery data:  
Device:EBC-A10H Mode:D-CC 0.60A 2.90V Begin Volt:4.239V Cutoff Volt:2.900V Capacity:3013mAh Energy:10.99Wh Avg Volt:3.65V Title:XCAP

As shown, yes it is possible to get a higher capacity battery, no matter how nominal the result may appear. This is to once more clarify that this is not to call anybody out. Amongst all three batteries there was no dud. All of them delivered “the goods” . The anomaly with the iFixit battery having taking a higher charge may be related to the battery management board. Further investigation will follow by disassembling the batteries to check the hardware on those. Maybe that will shed more light on this. Guide to follow.

Please leave a note on this guide about any comments, suggestions or questions that may arise. I will try to clarify whatever I can.