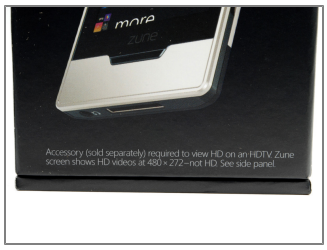
Microsoft Zune HD Teardown

Tools used in this guide

- Plastic Opening Tools
- Tri-wing Screwdriver

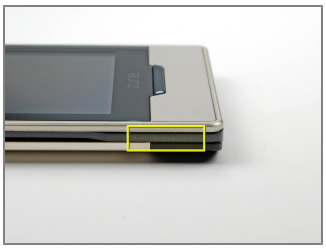


Step 1 -

- We got our hands on a brand new Zune HD. It's a very pretty device, but that will not spare it from the knife.
- Sparing no expense, we got the 32 GB "Platinum" model. However, it seems you need to spend an additional $90 if you want to get HD out of the Zune HD...
- To Microsoft's credit, our 32 GB Zune was $10 less than the 32 GB iPod touch we took apart last week. However, if you want more than 32 GB in your Zune, you're out of luck for now.

Step 2

- The Zune features a 3.3 inch OLED display and capacitive touch screen. OLED screens do not require a backlight like traditional LCDs. This means they can draw significantly less power than a traditional LCD. This isn't the first product with an OLED, but it's certainly cutting-edge technology, and something we haven't seen in any Apple devices yet.
- The Zune's OLED features a resolution of 480x272, a 16:9 aspect ratio. Microsoft clearly wants you to watch movies on the Zune.
- Microsoft claims the Zune's battery provides 8.5 hours video playback. That's long enough that your eyes should be worn out long before the battery.



Step 3

- Why hello there? What's your name beautiful? You're a very pretty device.
- Zune says "Hello." We say "Hello." back. Very cordial, this Zune is.
- The Zune is lighter than it looks. It weighs in at only 2.6 oz (74 grams). That's more than 35% less than the similarly-sized iPod touch.
- Microsoft even left us a message! (picture 3). Hello to you Seattle from San Luis Obispo!
- The Zune HD is 102.1 mm x 52.7 mm x 8.9 mm, while the iPod touch is 110 mm x 61.8 mm x 8.5 mm. If the iPod touch were square, it would have 20% more volume than the Zune. We could integrate to calculate the area under those curves, but we'll save that fun stuff for you mathletes out there.

Step 4

- Unlike Apple, Microsoft doesn't seem to be afraid to show off their screws. They probably don't want everyone doing what we're about to do, so they've adorned the Zune's exterior with tri-wing screws.
- The black plasic strip at the bottom of the Zune reminds us of the original iPhone.

Step 5

- Tri-wing screwdriver to the rescue!
- There's no "warranty void" sticker or seal to break when opening the Zune. Thanks Microsoft!

Step 6

- Opening the lovely device...
- This is **a lot easier** than opening the iPod touch.
- Yes, Apple, we're talking to you. Apparently it is possible to make something both pretty and serviceable at the same time...

Step 7

- A tribute to a Zune team member who passed away during development. May she rest in peace.

Step 8

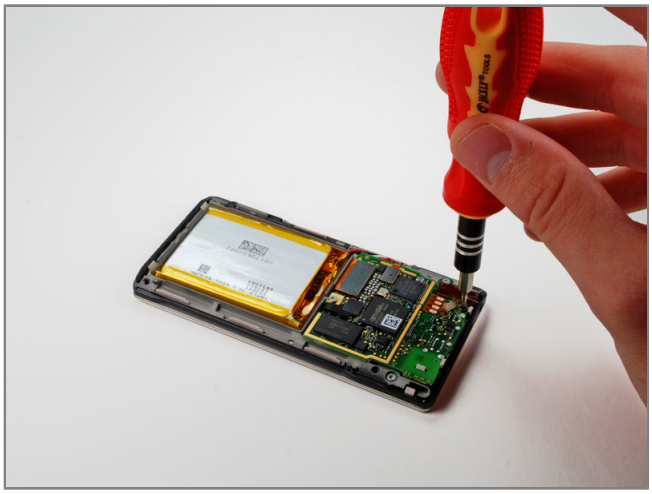
- The lovely internals.
- NVIDIA Tegra processor front and center. In a stark contrast to Apple's relationship with Samsung, NVIDIA's product page actually has a link to buy the Zune HD.
- To the right is the SiPORT HD Radio receiver. This chip supports AM, FM, HD Radio, Microsoft MSN Direct Data Services, and a slew of other frequencies (including the Weather Band).
- The SDRAM is Hynix! H5MS1G22MFP J3M 926A. In the upper left, is a 1 gigabit Hynix Mobile DDR SDRAM.
- The accelerometer is below the Hynix SDRAM and to the left of the Nvidia processor. It's a Kionix KXSD9.

Step 9

- Battery: 3.7V, 2.45Wh, 660 mAh
- That's about 16% less capacity than the 789 mAh battery in the new iPod touch. However, Microsoft promises longer run time than the touch for both music and videos.
- Let's make up some fun units. Apple claims 30 hours of music for the touch, and Microsoft claims 33 hours for the Zune. That means the touch uses 26.3 milliamp hours per hour, while the Zune uses only 20 milliamp hours per hour. However, if you really care about getting the most for your milliamps, it's hard to beat an iPod shuffle (7.3 mAh/hour).

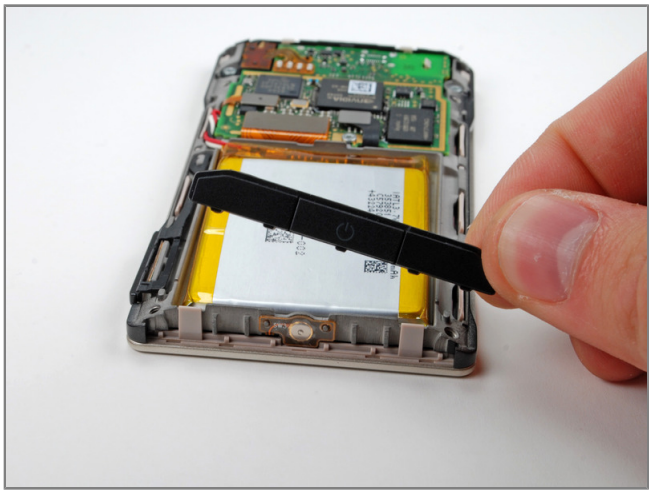
Step 10

- Removing the bottom backplate.
- We assume this is here to improve the reception for the Zune's antenna(s). A nice feature (nowhere to be seen on the iPod touch) is the Zune's built in HD radio. It's the only HD you can actually play on your Zune.



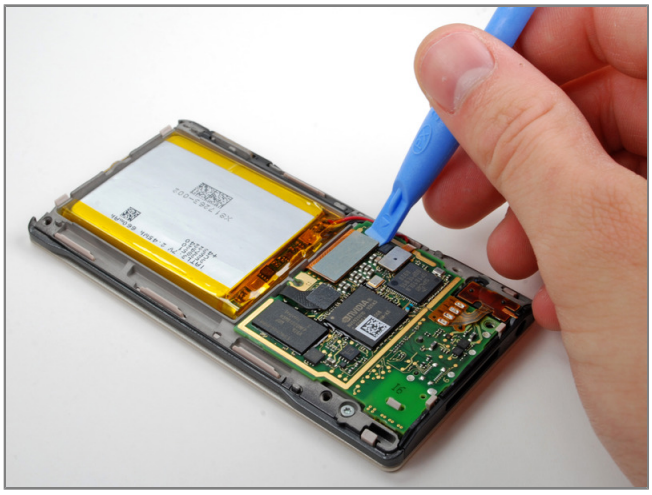
Step 11

- Removing a Torx screw near the bottom of the logic board.
- The layout of the device appears a little simpler than the iPod touch.



Step 12

- Taking off the top power button cover...
- The Zune sports only three external buttons, while the iPod touch has four. Apple doesn't think their users are smart enough to handle a multi-button mouse, but they expect people to be able to use four different buttons on their iPod touch. Steve Jobs is probably already trying to figure out how to remove two buttons from the iPod touch.

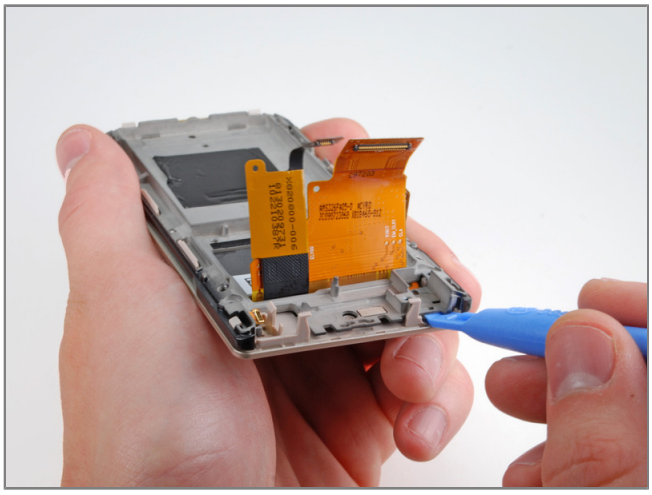


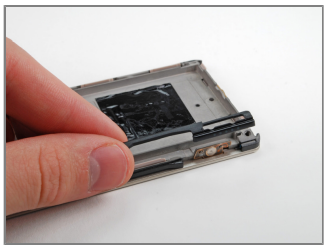
Step 13

- Disconnecting the display...
- Yes, this is an iPod opening tool. Yes, we know this isn't an iPod.

Step 14

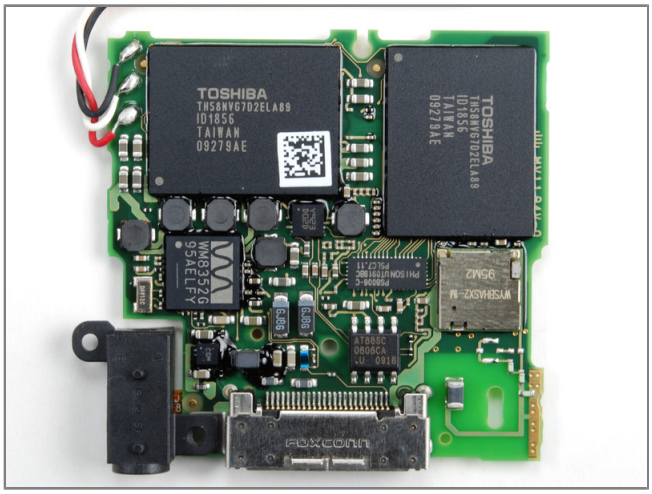
- Logic board comes out!
- Like the iPod touch, the Zune has a soldered battery. The battery should be easier to replace than on the new iPod touch, since the Zune's battery has individual wires for the battery leads. In the touch, the battery leads run through a single ribbon cable, making hand-soldering a challenge.

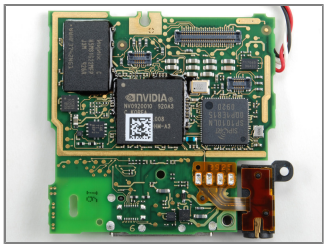




Step 15

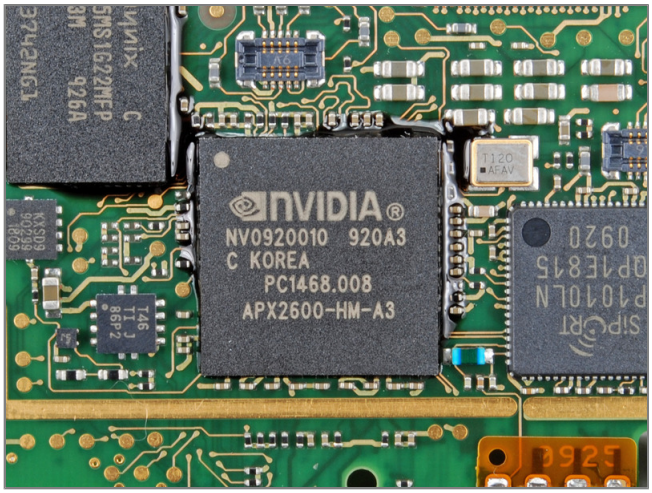
- Prying the inner chassis off the front panel.
- You can see the digitizer (left) and OLED data cables.
- The inner chassis is cast aluminum and helps to give the Zune its solid feel. The iPod classic has a similar chassis, but there's no internal chassis on the iPod touch.





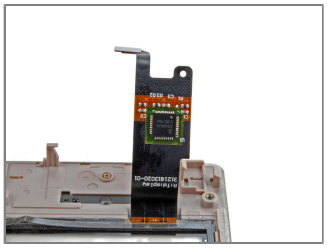
Step 16

- At least in our Zune, Toshiba is the NAND flash supplier, and it's in two separate packages. We are told that the 16 GB version has one package of Hynix NAND.
- The long rectangular chip near the center of the board is the Phison Electronics PS8006 NAND controller.
- Above the dock connector is an Atmel 8 kilobit AT88SC0808CA CryptoMemory EEPROM chip.
- On the left side (with the sine wave logo) is a Wolfson Micro WM8352 audio codec.
- As evidenced by the writing on the dock connector, the Zune is actually manufactured by Foxconn, the same company that produces iPods for Apple.



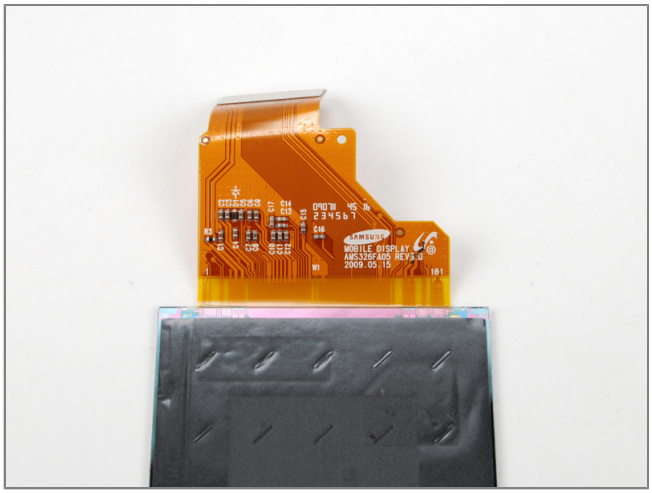
Step 17

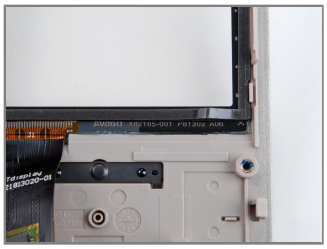
- The NVIDIA Tegra APX2600 processor.
- The APX2600 features a ARM11 600 MHz core.
- NVIDIA bills this as a "computer-on-a-chip." The Tegra integrates the CPU, GPU, northbridge, southbridge and memory controller into a single package.



Step 18

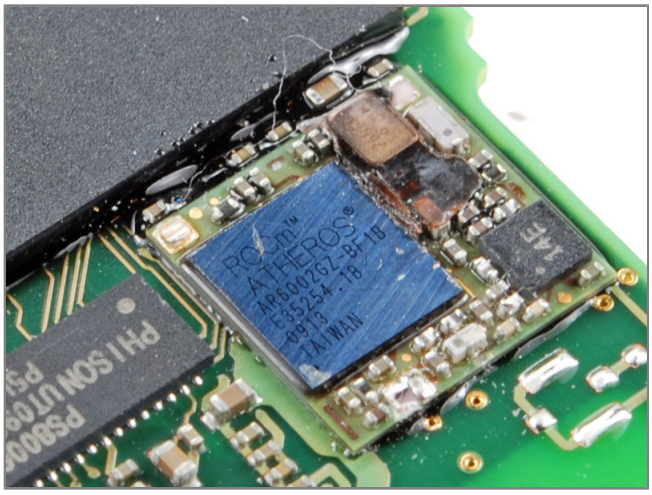
- Separating the OLED display from the glass and digitizer.
- The OLED screen is incredibly thin (1 mm) and seems more rugged than a traditional LCD panel.
- It appears that the digitizer may be from RiT Display, and the controller from Avago.





Step 19

- The Samsung display is model AMS326FA05. Interestingly, the date code on this OLED is four months old, so they may have been stockpiling these from a while to have enough for the Zune launch.
- The glass is stamped with Avago X82165-001 P81302 A06.
- It will be interesting to see how well the Zune HD holds up to being dropped. Fortunately, the Zune was designed in a way that should make repairing a broken front glass possible.



Step 20

- We desoldered the EMI shield to see what was beneath...
- It's an Atheros AR6002. Unlike the new iPod touch, this chip does not support 802.11n.
- Atheros claims this chip is super power efficient: "The game-changing power efficiency delivered by the AR6002 significantly extends battery life. In fact, the AR6002 consumes 70% less power in active mode than competitive solutions and near-zero power in standby."

Step 21

- Zune HD, displayed in nine easy-to-assemble pieces!
- We found components inside from Atheros, Atmel, Avago, Kionix, Phison Electronics, RiT Display, Samsung, Toshiba, and Wolfsom Micro. Did we miss one? Let us know.