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Amazon Echo Dot Teardown

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TEARDOWN

Amazon Echo Dot Teardown

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Tools



iFixit Opening Tool

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T6 Torx Screwdriver

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Introduction

Amazon's Echo line is expanding—or in the Dot's case, shrinking! The new hockey-puck-sized Echo Dot lets you add some Alexa-infused personality to your existing home speaker setup. We're going to do it, but not before we've thoroughly taken it apart. Alexa, brace yourself—it's teardown time.

Step 1 Amazon Echo Dot Teardown

If you're curious about the innards of the other Echos, we've got teardowns of the [original Echo](#) and the [Amazon Tap](#) as well.



- If Amazon ever ventures into the canned tuna fish business, they'll have a great package design ready to go. In the meantime, the Dot contains some tasty morsels:

- Dual-band, dual-antenna 802.11 a/g/b/n Wi-Fi with MIMO
- Alexa Voice Search
- 7-microphone array
- Light ring volume adjustment
- Bluetooth 4.0 for sending and receiving audio
- 3.5 mm audio output for external speakers

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Step 2

- Topside, the Dot looks *exactly* like its older brother, the Echo, complete with its action and mic mute buttons, light ring, volume ring, and microphone array.
- 📌 [The Echo scored a respectable 7 out of 10](#) on the repairability scale, so we're hopeful these design similarities bode well for the Dot.
- Things are a little different down below, where we're greeted by a rubber cover and some labeling—and not much else.
- Amazon bestows the Dot with a new model number: S04WQR.
- 📌 Our pals at [Creative Electron](#) were good enough to do a little recon work for us and sent over this X-ray image of the Dot. But a mysterious dense object seems to be obscuring much of the view. What did Amazon put in there?

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Step 3



- For a more exacting visual comparison, we dug up an original Echo.
- And by "dug up," we mean we grabbed it from the corner of the teardown table, where it has been faithfully serving up groovy repair tunes ever since we reassembled it.
- ① Since the Dot is designed to work with your existing speakers, it doesn't need the Echo's sophisticated downward-firing speaker system (or the space and weight that goes with it). So with the [first stage separated](#), we're left with this tiny crew capsule.
- TL;DR: it looks like Amazon pretty much just chopped out the middle of the old Echo. Neat!

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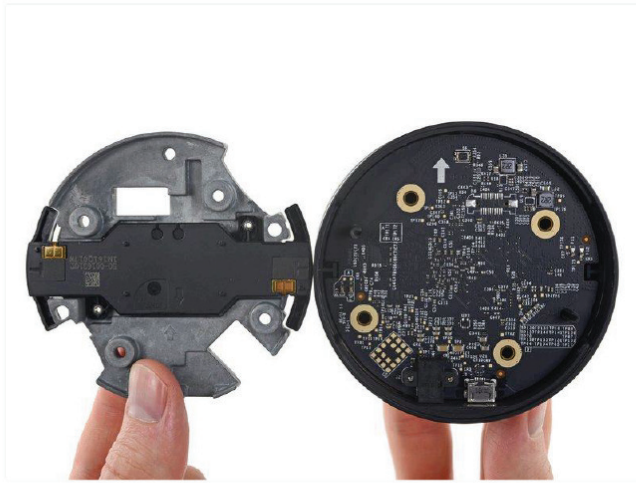
Step 4



- We peel away the grippy rubber pad, fully expecting to find our first screws—but instead, we're greeted by glue. Boo!
- We'd like to report that the lower case simply *clips* in place, but when the first opening pick fails to pop it free, we insert another. And another. And another.
- Yep—it's glued, too.
- We wrestle it free eventually, but so far the Dot is off to a decidedly less friendly start than its [older sibling](#).

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Step 5



- Our first look inside reveals what sophisticated tech insiders will instantly recognize as a big metal thing.

⚠ This steel plate appears to be the culprit behind our somewhat frustrated first X-ray attempt.

- Fortunately, this metal thing has screws! Some long T6 Torx screws are threaded through the Dot from bottom to top; our driver dispatches them forthwith.
- Out tumbles the metal thing, with a small speaker riding piggyback.

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Step 6



- Yep, it's a speaker, albeit a small one. It connects to the Dot by way of a couple pairs of spring contacts.

ⓘ It's not punchy enough for playing music, but it gives Alexa a way to talk back if your other speakers are turned off or disconnected.

- The speaker is lightly adhered to this shapely blob of steel, which seems to be a simple weight in the base of the Dot. It's likely designed to keep the device planted, so you can twist the volume ring without accidentally spinning your Dot across the table.

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Step 7

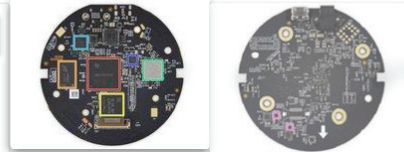
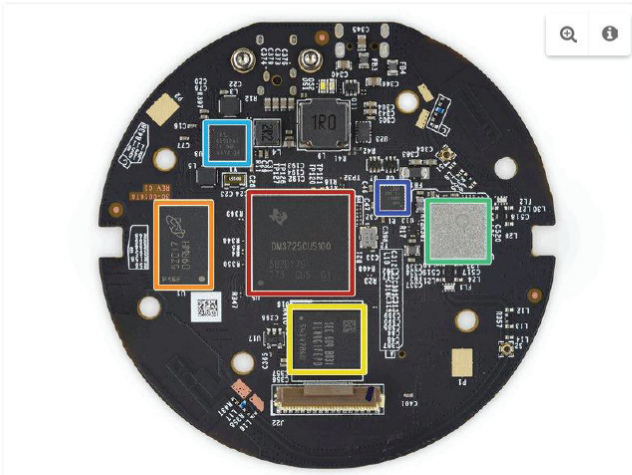


- With the screws removed, only a thin ribbon cable ties all these layers together. Introducing Amazon Echo Dot: *Accordion Edition*.
- ① At one end lies the motherboard and ports, while a separate board at the other end hosts the volume controls and microphone array. A single cable threads its way through the intervening layers to connect the two boards.
- We shuffle the layers of plastic and silicon back together temporarily; it's all coming apart soon enough.
- After tweezing away the ribbon cable, we're ready to inspect the motherboard.

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Step 8

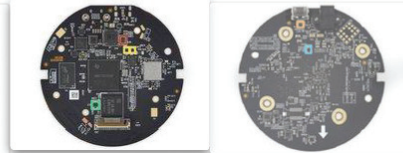
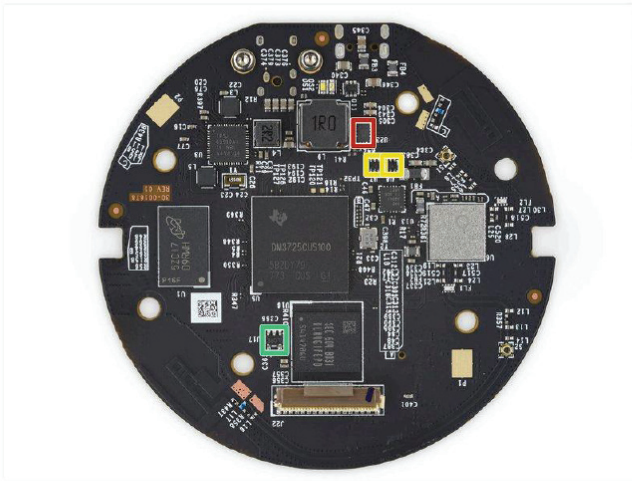
Edit



- Chips on one side, ports on the other. Here's what this motherboard is packing:
 - Texas Instruments [DM3725CUS100](#) Digital Media Processor
 - Micron [MT46H64M32LFBQ](#) 256 MB (16 Meg x 32 x 4 Banks) LPDDR SDRAM
 - Samsung KLM4G1FEPD-B031 4 GB High Performance eMMC NAND Flash Memory
 - Qualcomm Atheros [QCA6234](#) Integrated Dual-Band 2x2 802.11n + Bluetooth 4.0 SiP
 - Texas Instruments [TPS65910A1](#) Integrated Power Management IC
 - Texas Instruments [TLV320DAC3203](#) Low Power Stereo Audio Codec w/ Headphone Amplifier
 - Texas Instruments [TPA2025D1](#) 2 W Class D Speaker Amplifier

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Step 9



● IC identification, continued:

- Monolithic Power Systems **MP2145GD** 6 A synchronous step-down converter
- Maxim Integrated **MAX14585AEVB+** hi-speed USB analog switch
- NXP Semiconductor **NX3L1G3157** SPDT analog switch
- Texas Instruments **LP3985IM5X-3.0** 150 mA / 3.0 V LDO regulator
- Diodes Incorporated **74LVC1G125** single buffer

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Step 10



- With disassembly nearly complete, we tear into the control wheel. It's a dead ringer for [the one we found in the original Echo](#), complete with its geared encoder wheel.
- That's just fine by us, since it means at least some replacements parts can likely be shared between the original Echo and the Dot.
- It also means servicing instructions for one will likely be *echoed* by the other. All in all, it's a win for fans of repair and bad puns everywhere.

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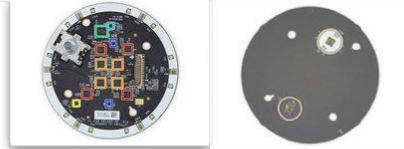
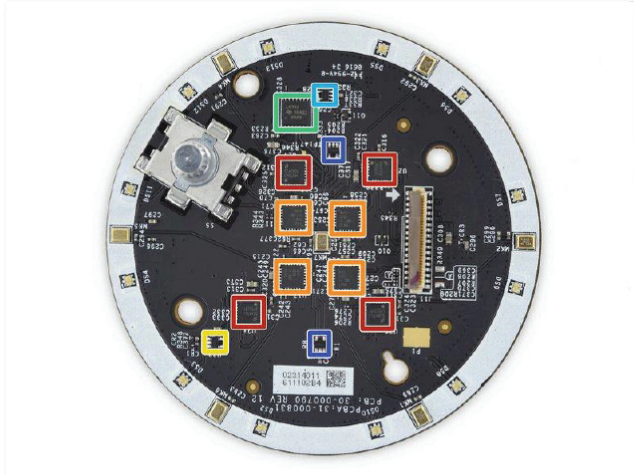
Step 11



- We slap the control ring back together just long enough to see the encoder wheel doing its thing.
- There's just something soothing about [gears](#).

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Step 12



- And buried in the top layer we find another control board, functionally identical to the one we dug up in the [original Echo](#).
 - National Semiconductor [LP55231](#) Programmable 9-Output LED Driver (x4)
 - Texas Instruments [TLV320ADC3101](#) 92dB SNR Low-Power Stereo ADC (x4)
 - Diodes Incorporated [LMV321SE](#) Single Operational Amplifier
 - Texas Instruments [SN74LVC74A](#) Dual Positive-Edge-Triggered D-Type Flip-Flops
 - Diodes Incorporated [74LVC1G14](#) Schmitt Trigger Inverter
 - Diodes Incorporated [74LVC1G125](#) Single Buffer (x2)

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Step 13



- Amazon Echo Dot Repairability Score: **6 out of 10** (10 is the easiest to repair)
- The majority of the device is held together by standard Torx screws.
- Many components are common to the original Echo, making it easier to source parts.
- The rubber foot, base cap, and speakers are held in place with tough adhesive.
- The headphone jack and USB port, two common points of failure, are soldered directly to the motherboard.

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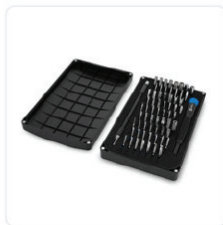


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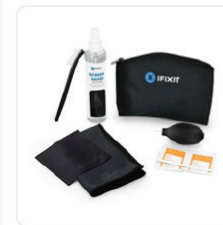


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Still can't figure out the microphone manufacturer?

[robertd1129](#) - Apr 20, 2016

Microphones are Knowles :: SiSonic™ Microphones

<http://www.knowles.com/eng/Products/SiSo...>

[Markus Ulsass](#) - Apr 26, 2016



Can we know which model exactly ? or at-least its near specifications ?

[kaushik wavhal](#) - Oct 13, 2016

Most likely SPA1687LR5H-1 since it is connected to the ADCs differential inputs and meets the specs and the dimensions.

[Johannes](#)

[Johannes H](#) - Jan 6, 2018



does this have the same audio amp as the Echo (TI TPA3110D2)

[Peter Cooney](#) - May 23, 2016

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