



Panasonic RZ-S50W (Japan) Bluetooth Headphones Teardown

Panasonic RZ-S50W (Japan) / RZ-S500W (Outside Japan) Bluetooth Headphones

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INTRODUCTION

A look inside the Panasonic RZ-S50W (Japan) / RZ-S500W (Outside Japan) Bluetooth Headphones



TOOLS:

- [Precision Utility Knife](#) (1)
 - [Probe and Pick Set](#) (1)
 - [Tweezers](#) (1)
 - [Jimmy](#) (1)
 - [Denatured alcohol](#) (1)
 - [Soldering Workstation](#) (1)
-

Step 1 — Panasonic RZ-S50W (Japan) Bluetooth Headphones Teardown



- Features:
 - Exceptional Sound and Noise Cancellation. Multiple MEMS microphones
 - Optimum Sound Isolation
 - Strong, Stable Connection
 - High-Quality Calling Sound
 - Approximately, 6 hours playback, and up to 20 Hours of use with charger
 - Bluetooth® 5.0
 - Capacitive touch sensor control

Step 2



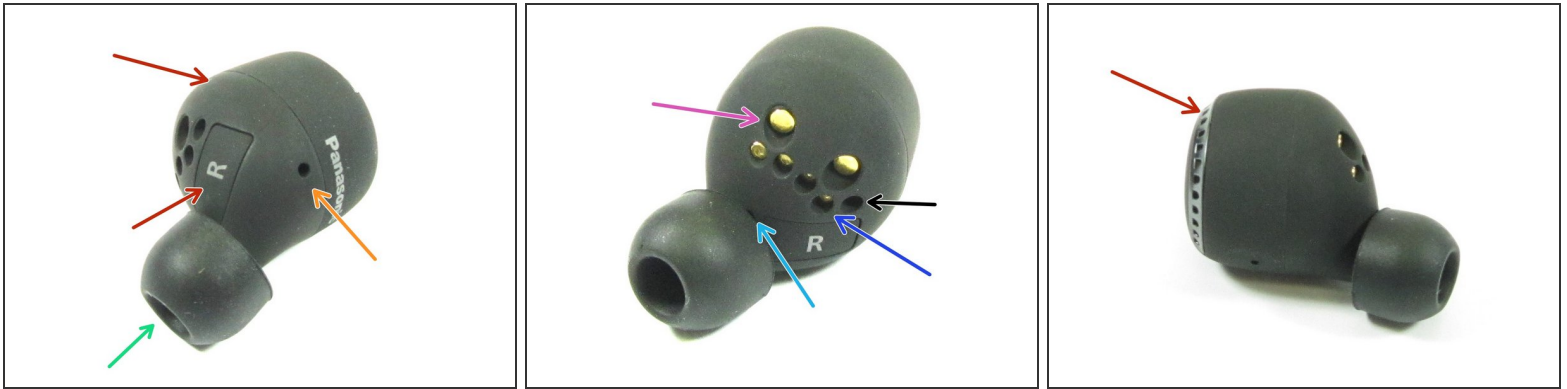
- What is in the box
 - Headphones / Charging Case
 - USB 'C' Cable
 - Headphone rubber tips for different sizes of ears
 - User's Manual

Step 3



- Charging case with headphones
- Close up view of headphones

Step 4



- Side views of Headphone
 - MEMS Microphones
 - Speaker Spatial Vent Port
 - Speaker Sound Port
 - Speaker Vent
 - USB Interface
 - Charger Interface
 - Vent Port

Step 5



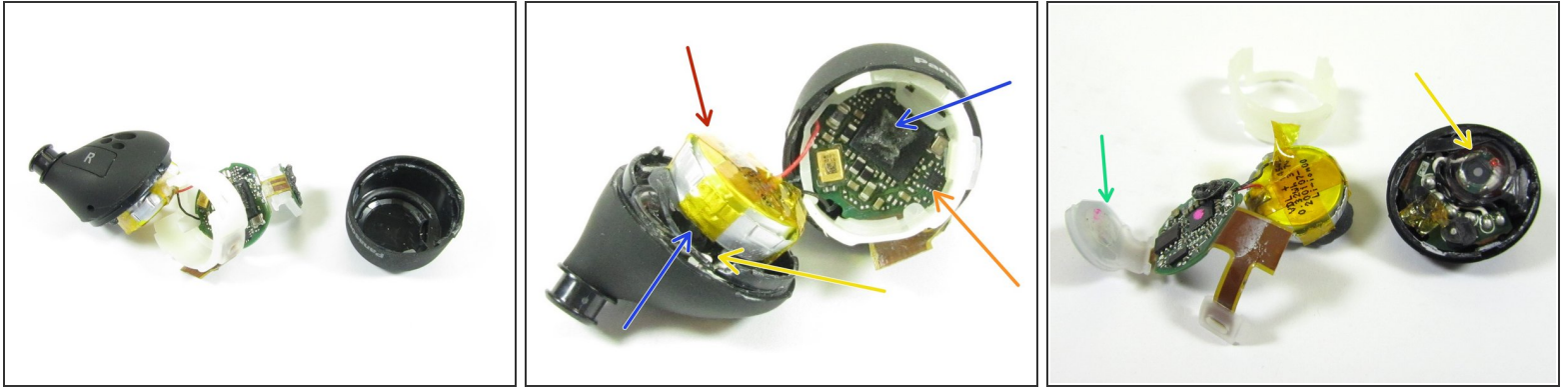
- View of Headphone with rubber ear piece [cap] removed
- Vent Port

Step 6



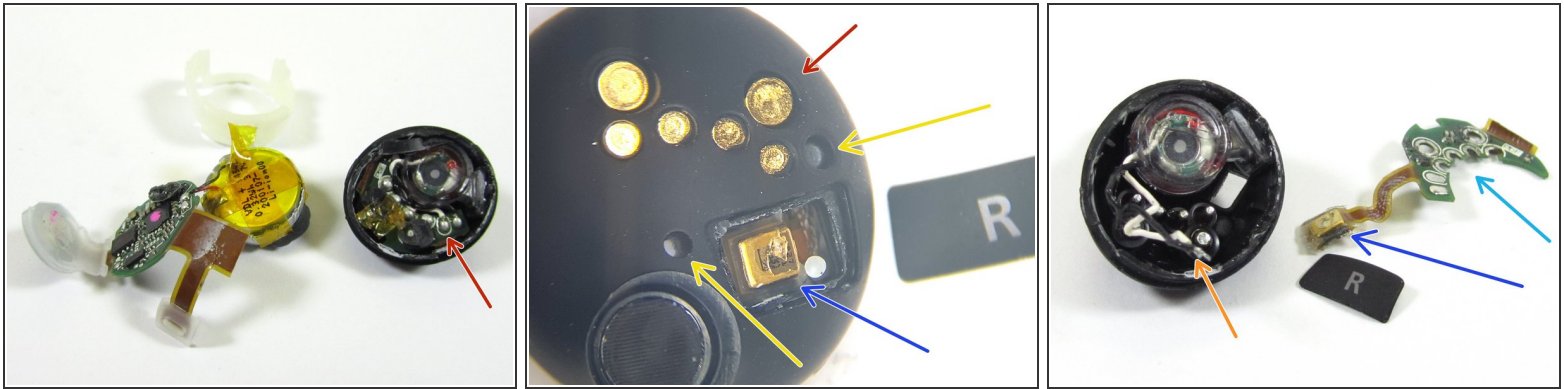
- Since the Panasonic Headphone enclosure is glued together, the only way in was to cut into the headphone.
- **This is a destructive teardown**
- A Razor Knife was used to cut into the Panasonic headphone along the seam in the headphone. Then a Jimmy Tool was used to open up the headphone
- Once opened, we get our first look at the inside of the headphone

Step 7



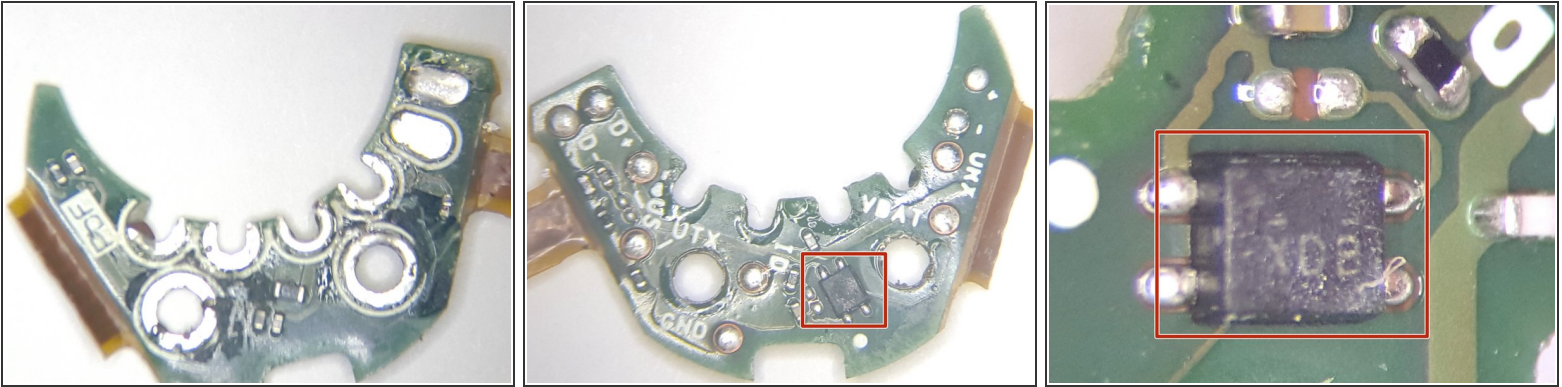
- Opening up the headphone, we can see the main PCB, Battery, Speaker, etc. Tweezers and a Pick Tool were used to removed the electronics from the enclosure
- Double sided foam tape was used to hold the main the PCB to the Battery and to the Touch Sensor / Antenna PCB. This foam tape had to be cut free. Then Denatured Alcohol was used to remove the foam tape glue from the PCBs and Battery
 - Battery
 - Main PCB
 - Speaker Area
 - Touch Sensor and Antenna
 - Double Sided Foam Tape

Step 8



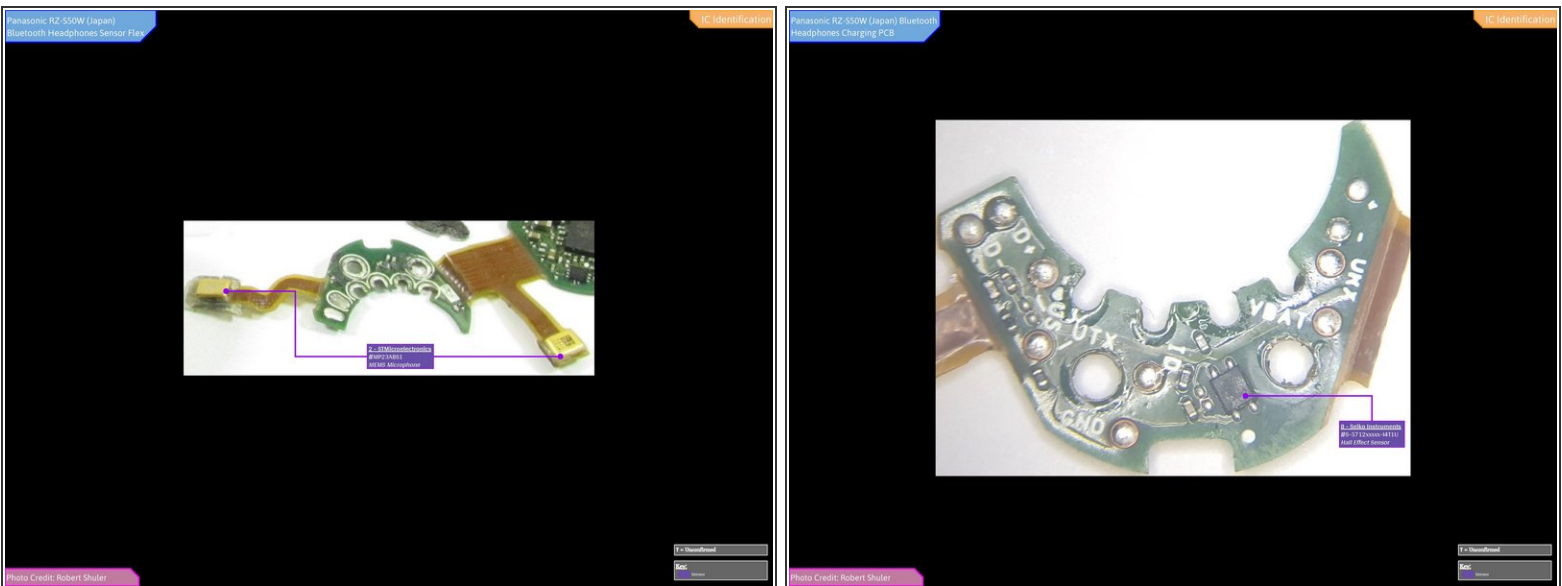
- At first, I wasn't sure about the solder balls. Then I realized they are used to anchor the USB and Power Interface pins on the outside of the Headphone to the internal circuit board.
- I had to used a soldering iron to remove the solder balls, so that the internal interface circuit board could be removed. I had to also remove solder from the speaker wires to free up the internal circuit board.
- The internal circuit board was also attached a MEMS Microphone that appeared to be monitoring the Speaker Chamber of the Headphone, since it was faced in. I had to remove the outside panel with 'R' on it with a Razor Knife to free the MEMS Microphone. Once the MEMS Microphone was freed, the interface circuit board could be pulled out
- USB and Power (Charger) Interface
- MEMS Microphone
- Sound Ports
- Speaker Wires
- Internal Circuit Board that interface Power and USB to the Headphones

Step 9



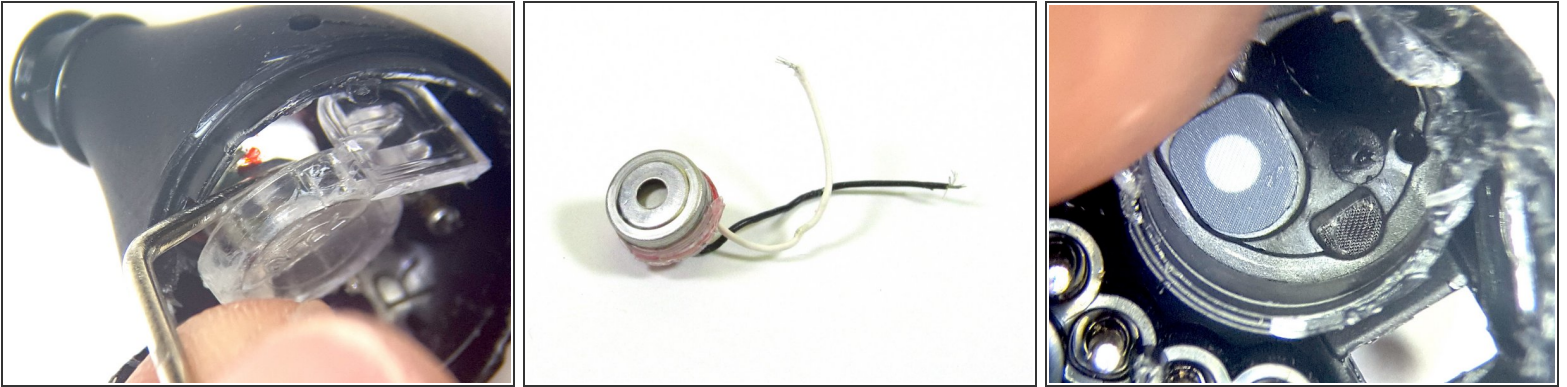
- There was not much to see on the internal interface board. There was one IC component that could not be crossed. If you happen to know the component, please leave a comment below
 - Unknown Component

Step 10



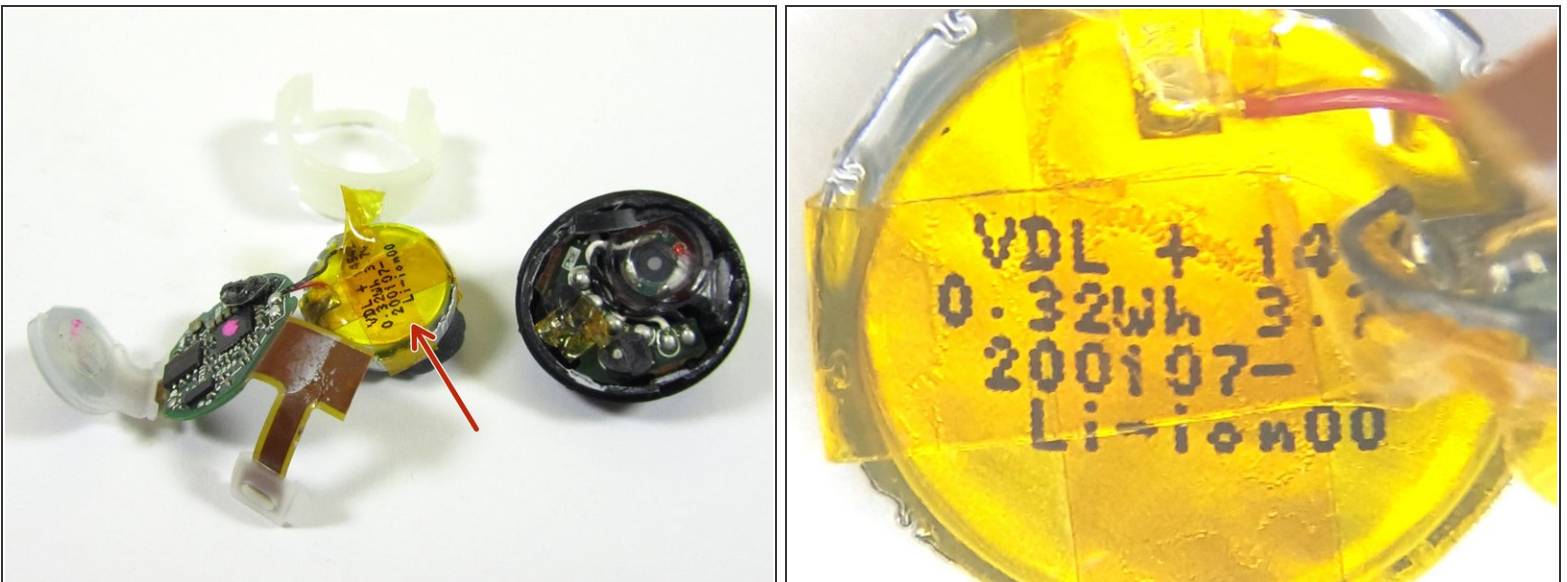
- Full Sensor Flex/Charging PCB IC Identification:
 - ❗ You may need to enlarge the picture to view the text.

Step 11



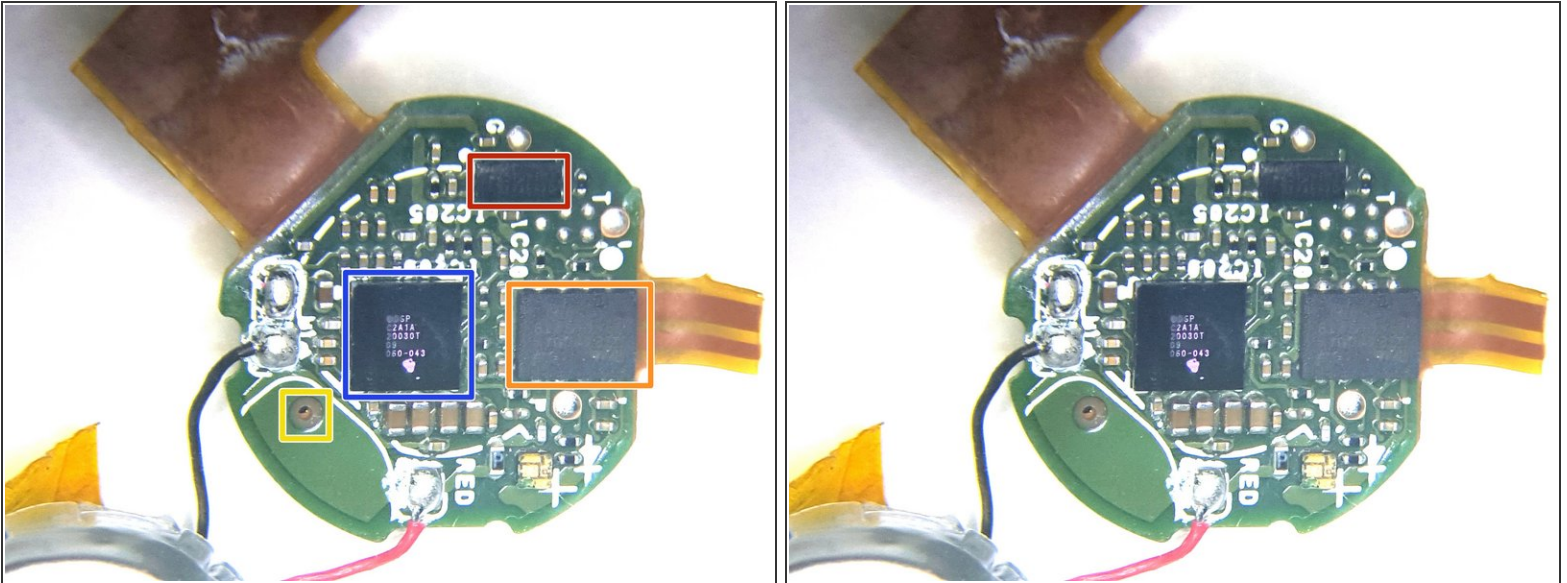
- Next the Speaker sound chamber cover was removed with the use of a Pick Tool and Tweezers. A Razor Knife was used to cut the glue holding the speaker in place
- The speaker had no identifiable markings
- With Speaker removed, we can see the sound chamber and sound ports

Step 12



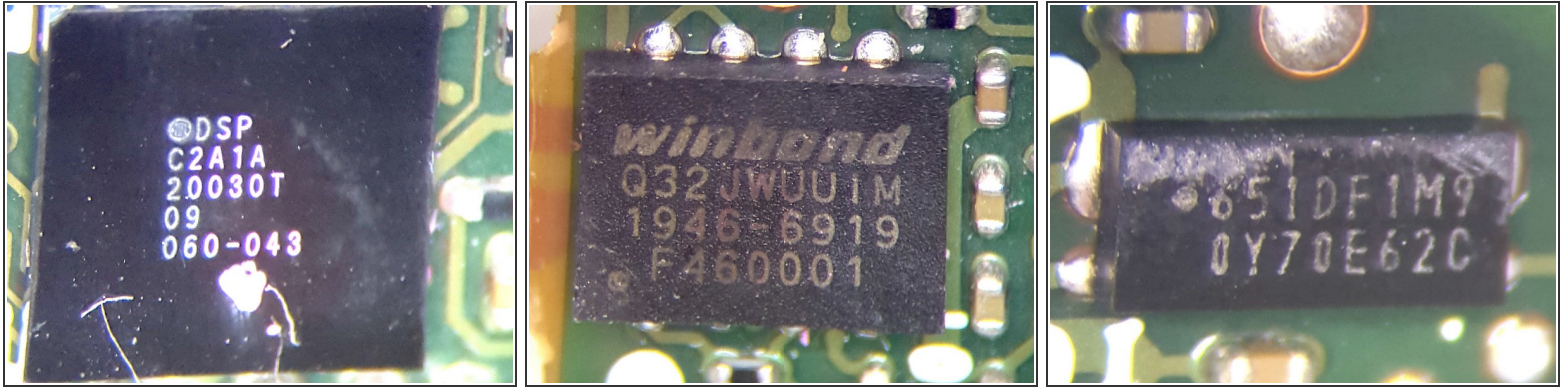
- Closeup view of the Battery
 - Li-Ion 3.7V, 0.32Wh
 - The battery appears to be from [VDL Electronics Co., Shenzhen, China](#)

Step 13



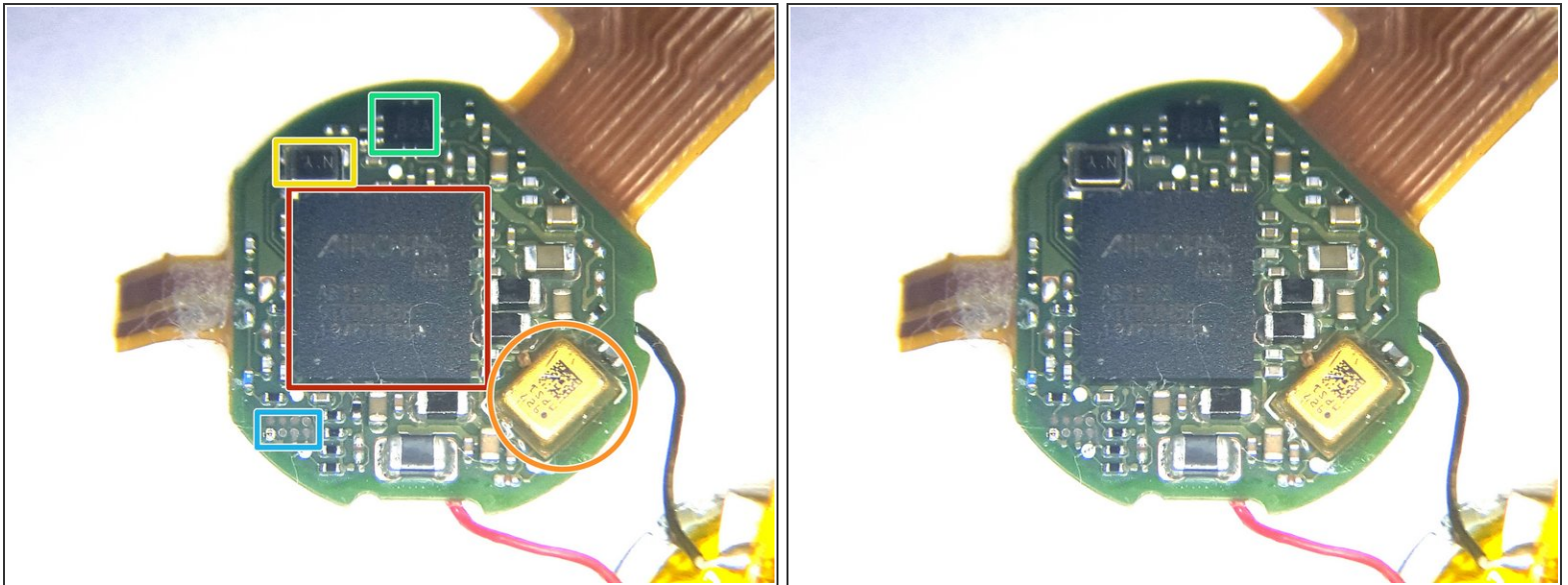
- Closeup view of the Antenna/Touch Sensor side of the Main PCB
 - [DSP Group](#) - C2A1A Hybrid Active Noise Cancellation (ANC) Codec and Audio Digital Signal Processor (DSP)
 - 651DF1M9 - Could not cross part number, but during a web search found out that it may be an integrated battery management IC
 - [W25Q32JWUIMTR](#)- SPI FLASH 32Mb
 - MEMS Microphone Port

Step 14



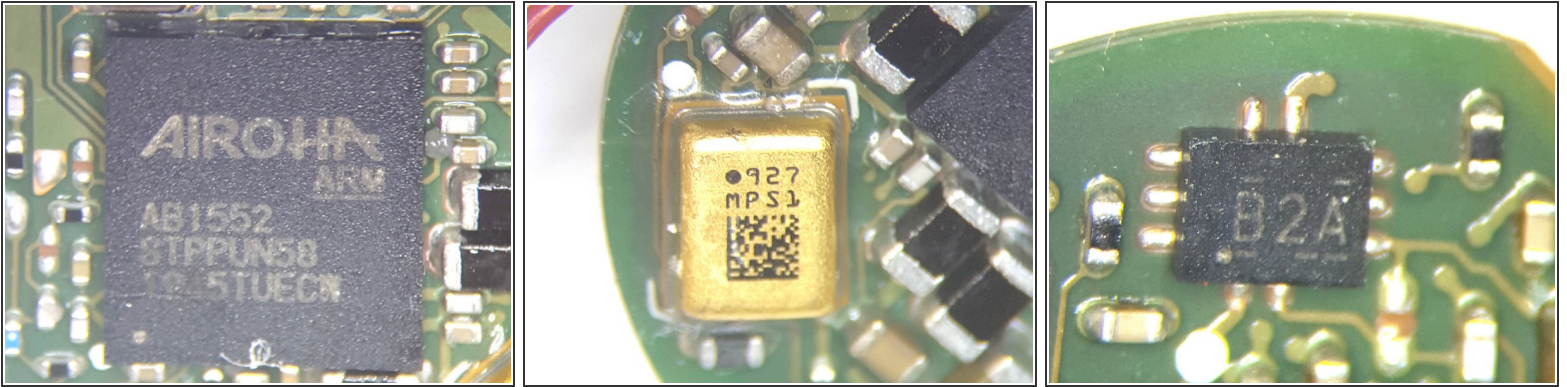
- Closeup view of some of the components on the Antenna/Touch Sensor side of the Main PCB
- [DSP Group](#) - C2A1A Hybrid Active Noise Cancellation (ANC) Codec and Audio Digital Signal Processor (DSP)
- [W25Q32JWUUI MTR](#) - SPI FLASH 32Mb
- 651DF1M9 - Could not cross part number, but during a web search found out that it may be an integrated battery management IC

Step 15



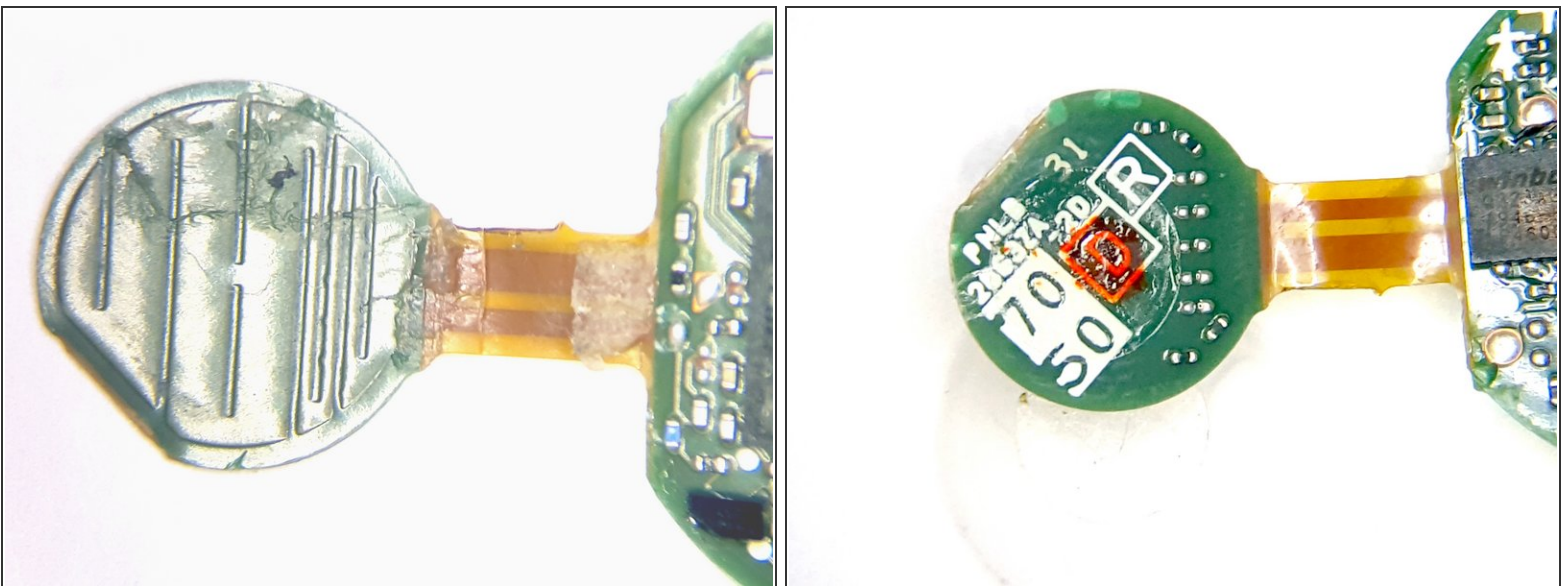
- Battery side close up view of the Main PCB
 - [AIROHA AB1552](#) - ARM Cortex M4/Bluetooth 5.0 Dual Mode
 - 927 MPS1 MEMS Microphone. The Headphone uses three MEMS microphones with this part number
 - Could not cross the part number. If you know the part, please leave a comment below. The 2D bar code on the part reads as STM927352NH2S011
 - Crystal Oscillator
 - Unknown component. Labelled B2A. Please leave a comment if you happen to know this component
 - Unknown component. Labelled SV4CP 240. Please leave a comment if you happen to know this component. Separated from PCB during teardown

Step 16



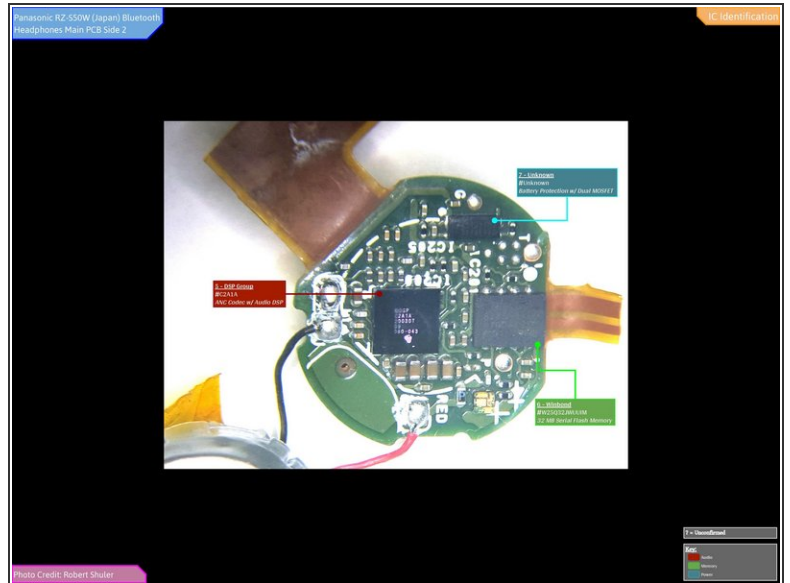
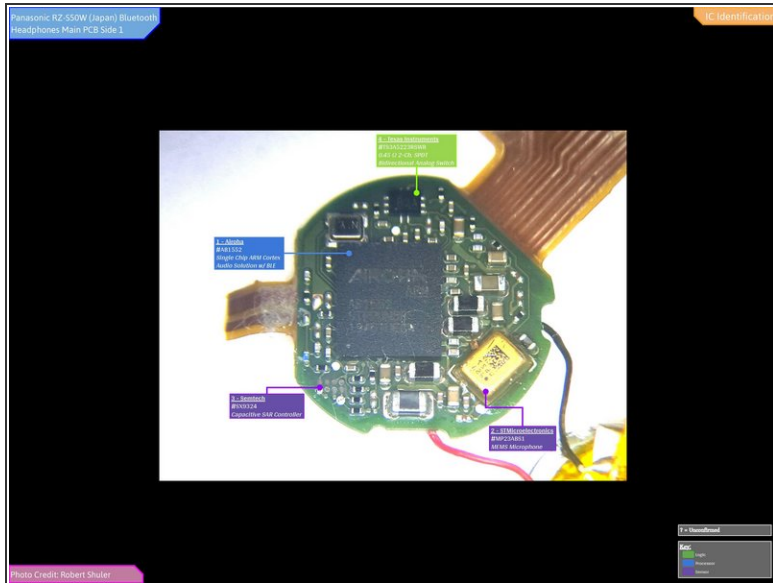
- Closeup view of some of the components on the Battery side of the Main PCB
- [AIROHA AB1552](#) - ARM Cortex M4/Bluetooth 5.0 Dual Mode
- 927 MPS1 MEMS Microphone. The Headphone uses three of these MEMS microphones
 - Could not cross the part number. If you know the part, please leave a comment below. The 2D bar code on the part reads as STM927352NH2S011
- Unknown component. Labelled B2A. Please leave a comment if you happen to know this componentNew line.

Step 17



- Closeup view of top and bottom side of the Touch Sensor Flex PCB and PCB Antenna

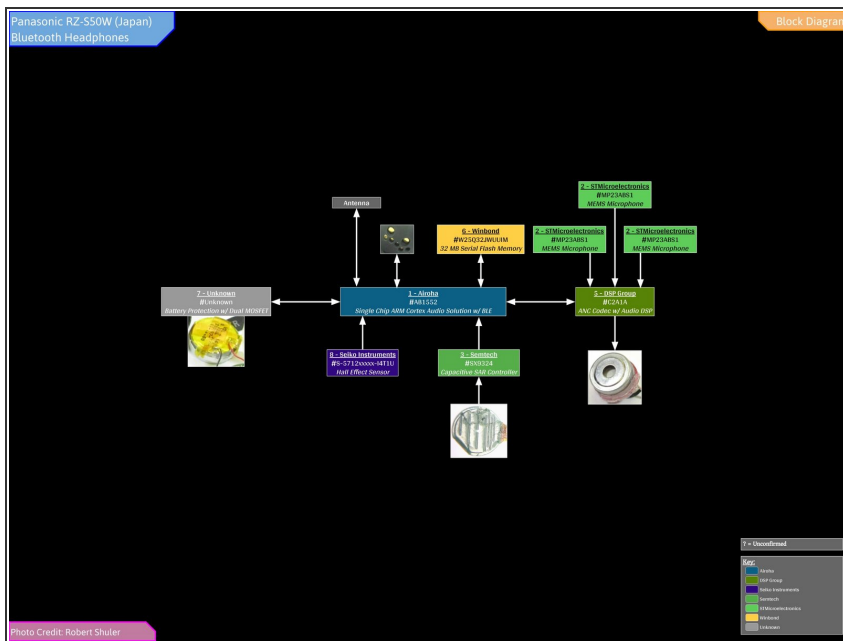
Step 18



- Full Main PCB IC Identification:

i You may need to enlarge the picture to view the text.

Step 19



- Predicted Block Diagram of the Panasonic RZ-S50W Bluetooth Headphones:

i You may need to enlarge the picture to view the text.

Step 20



- Teardown Exploded View of the Panasonic Headphone