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 Razsor Knife was use 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 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 use 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. The 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)

- **W25Q32JWUUMTR** - 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
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 component

**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:

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

Step 19

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

  You may need to enlarge the picture to view the text.
Step 20

- Teardown Exploded View of the Panasonic Headphone