

## Alternative Case for AK2 Plus Intel N100 Mini PC (Firebat, Kamrui, NiPoGi) [Updated 120mm Fan Version]



Th3Rom3

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### Summary

A replacement for the standard case of AK2 Plus based MiniPCs from different brands. Reduced size and improved cooling.

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### Update: Added 120mm fan version

A revised version which enables 120mm case fans to be mounted as lid has been added. I ran this setup with a fan powered by the AK2 Plus board directly for over a week without any stability problems. Read below for more information.

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A replacement for the standard case of AK2 Plus based MiniPCs from different brands. I did not like the included case due to the small vent openings, the inverted design and the relative amount of wasted space. So I decided to design my own case replacement for my own use.

I believe most of those MiniPCs use the same mainboard layout but if you want to have a first sanity check to see if it is compatible, here is the spacing for the four mainboard screws:  
83mm x 90mm

I have checked compatibility with my version of the system. The mainboard has the markings  
AK1\_ADN\_V11  
2023.06.19

#####

If you use this case you will lose functionality of:

- the original case
- status led
- 2.5" SATA mount
- injection molded power button

You will get:

- better SoC temperatures and/or more performance headroom for PL1 & PL2.
- inverted setup (fan facing upwards, RAM downwards)
- smaller footprint (see comparison pictures)
- VESA mount functionality for bundled mounting bracket (may not be part of every SKU)

Prints flat in two pieces without supports and overhangs. Due to the operating temperature of the MiniPC I would suggest printing in materials like PETG or ABS since PLA might lose some structural integrity due to the temperature.

For better compatibility (and to be honest because I was too lazy to do so) I did not fully enclose the I/O ports of the MiniPC. Feel free to adjust according to your liking. I have included the Autodesk Fusion project archives to enable easy adjustments or remixing.

If you decide to mod your MiniPC please take care during initial disassembly. It is not rocket science and easily done with common tools (i.e. philips head screwdriver). The most critical component are the antennae connections which are very fragile and prone to breaking off the wifi module. I personally used a

pair of tweezers to carefully pry away the PCB antennae while loosening the adhesive.

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### **120mm Fan Version:**

I added a 120mm fan version which has the same outer measurements as standard 120mm case fans and enables mounting a fan on top of the case instead of a lid. The fan can get its power from the 5V rail of the SATA power connector. I removed the included blower fan and cut off some of the heat sink shroud to enable additional ventilation. Do those modifications at your own risk.

Please ignore the shoddy heatsink cutout aswell as the improvised screw terminal attachment of the fan cable. I will solder a permanent solution down the line.

I did not include a fan grill design, as you can chose basically any 120mm fan grill design out there. The pictures show this design:

<https://www.printables.com/model/117333-120mm-fan-grill>

If you decide to power the 120mm fan from the board directly make sure to check polarity of the cable (be advised that I probably have switched the polarity of the colored leads during my many iterations of this project) as well as that your chosen fan can operate at 5V power. My Pure Wings 2 (max 1200rpm) has more than enough airflow at 5V that the SoC never exceeds 80°C even at elevated TDP of 15W and full Prime95 load. All while being virtually inaudible operating at 5V.

Assembly uses the original motherboard screws of the MiniPC and eight standard fan mounting screws for the fan and the fan grill. The motherboard as well as the fan screw directly into the plastic of the bottom shell. No other non printed parts are necessary. Furthermore I have cut off the power line from the internal SATA combo cable and made a custom connection for the fan to use the board to power the fan at 5V.

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### **Standard Version**

Assembly uses the original motherboard screws of the MiniPC and four M3x10 screws for the lid. No other non printed parts are necessary.

Both the motherboard as well as the top shell screw directly into the plastic of the bottom shell. However there should be enough space to accommodate heat-set inserts if more longevity over many assembly/disassembly cycles is needed.

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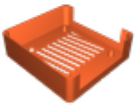
If you decide to remix/modify/improve the design I would kindly ask you to share it as a remix for the community. Otherwise the design is provided as-is and may or may not get updated or supported in the future.

## Model files

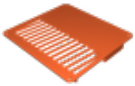


### STL (standard version)

2 files



**ak2-plus\_case\_bottom-shell.stl**



**ak2-plus\_case\_top-shell.stl**

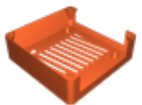


### Autodesk Fusion .f3d (standard version)

2 files

**ak2-plus\_case\_top-shell.f3d**

**ak2-plus\_case\_bottom-shell.f3d**



**ak2-plus\_case\_120mm-edition.stl**

☐ 120 mm fan version

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