

# Waversa Systems W Slim PRO

## Hifi Club Review

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**Waversa**systems

W Slim Pro



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Waversa W Slim PRO is a high-end model that came out as a successor to the W Slim Lite. It is a product with a similar concept to the W Slim Lite, but the goal is a completely different product. If the W Slim LITE is a product that realises high sound quality with convenience, the W Slim PRO is a product that adds convenience by realising high-end sound quality.



The power supply is important to provide good sound quality, and to do so, the power supply has to be enlarged to provide sufficient power. That's why high-end amps are big and heavy. However, the WSLim PRO gives out 200 watts of output and can drive medium and large high-end speakers well. And above all else, it delivers very high-end sound quality. However, it is a very slim size with a height of just over 4cm. How was this possible? The reason why high output is possible in such a thin size is because it is a full digital amplifier with Waversa digital technology. The WSLim PRO with built-in D Class amplifier is 100% full digital design from input to PWM output. If a general D class amp receives a digital input, undergoes DA conversion, analog amplification, and then outputs PWM, Waversa's full digital amplifier amplifies the input digital signal as it is and outputs it as PWM. , there is little change in sound quality due to capacitor characteristics, so much clearer sound quality is possible. However, it is said that designing for good sound quality is very difficult.

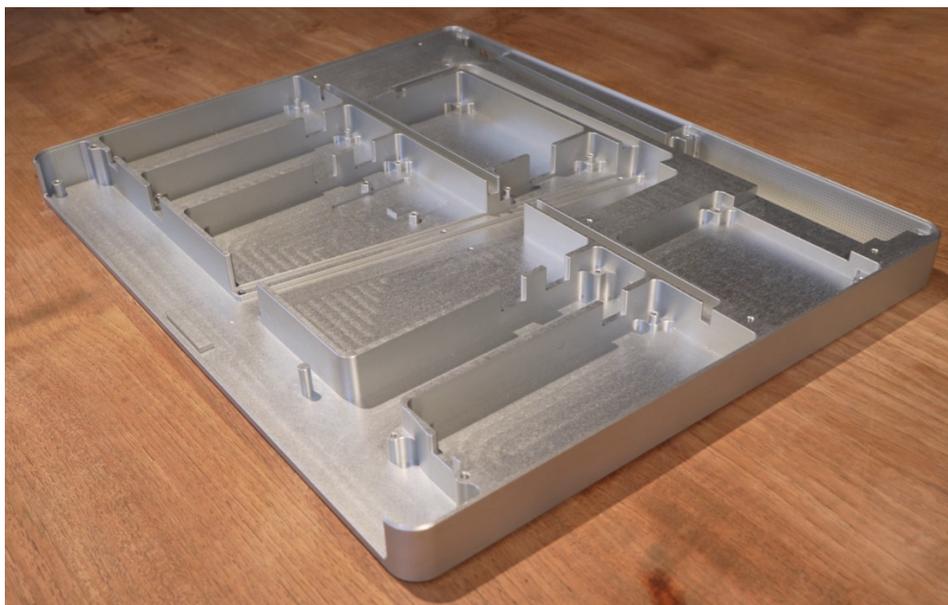


Let's take a look at how the WSlim PRO was able to deliver high-quality sound in such a slim size. The exterior shows excellent design perfection in a very compact form. On the front, there is a lit Waversa logo on the left and a dot display on the right to show various information. This is also 100% Waversa's own development.

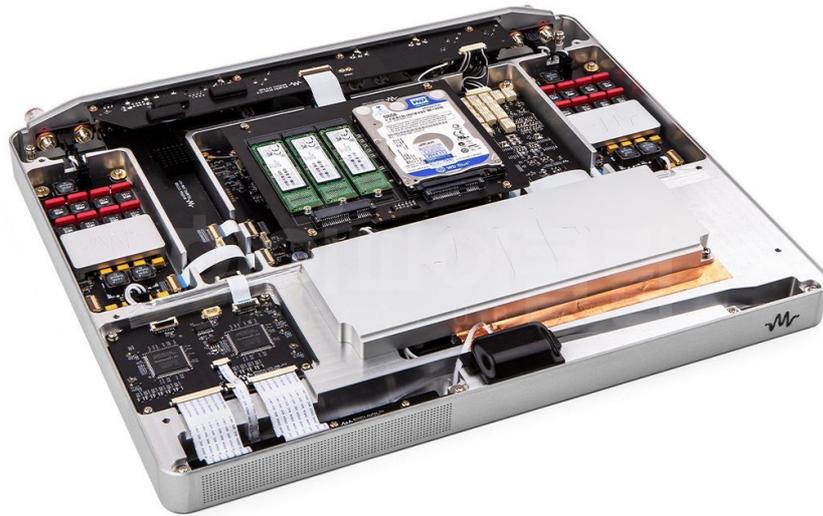


If you look at the back, you can judge the capabilities of the WSlim PRO. It can be seen that all the necessary terminals are arranged in a very narrow space. There are speaker binding posts on either side, and there are balanced and unbalanced analog inputs. Unbalanced terminals are for general lines, but phono input is also possible by selecting MM/MC phono from the menu. There is a dual BNC terminal that can receive an external clock, and a ground terminal is also prepared.

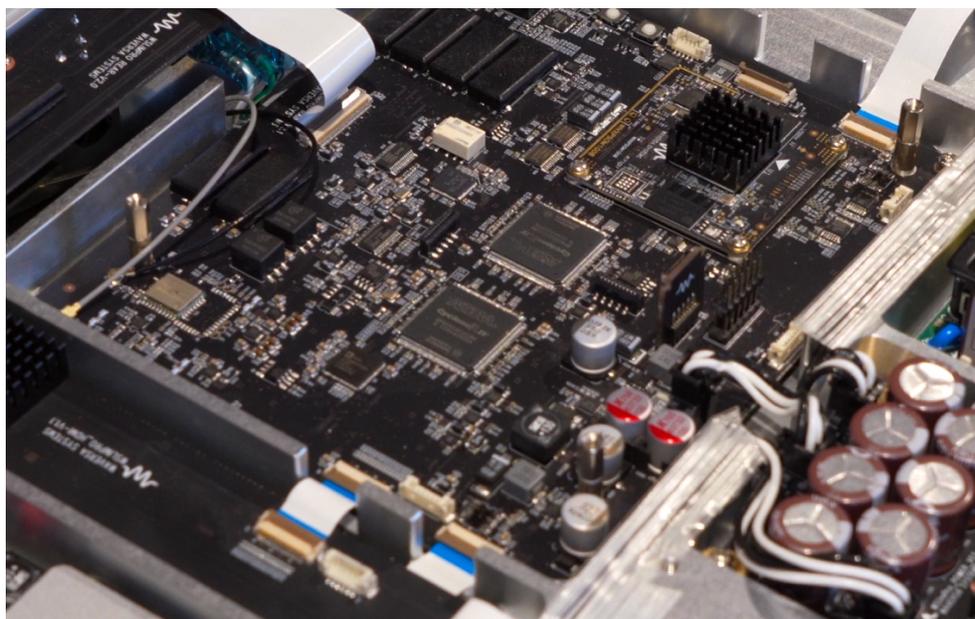
It can be used as a mono bridge by using one more Slim PRO using the link terminal, and it has AES/EBU and coaxial digital input terminals to connect an external DDC or transport. There is also an FM antenna terminal because an FM tuner is built-in. It has a Bluetooth antenna and an Ethernet terminal so a network play is possible, and a PC or USB device can be connected through the USB input. The USB-A terminal can connect to external USB devices such as an external hard drive or USB memory. There are also two HDMI terminals, so you can connect a TV or Blu-ray player to enjoy high-quality sound. There is also an optical jack that can be used.



If you look inside, the first thing that catches your eye is the CNC machined chassis. Even the case is very heavy. This monocoque chassis composed of one body can only be seen in ultra-high-end grades such as MSB Technology, and the partition wall is applied inside to block noise interference between each board. This aluminum CNC structure is for noise shielding, heat generation, and vibration control, and the biggest disadvantage is that the manufacturing cost is very high. In fact, at this price range of other brands, it should be seen as an unbearable amount of input, and just by looking at this chassis, you can see how great Waversa's commitment to high-end sound quality is.



From the inside, it looks like a well-designed city, and the power supply is sealed with a separate aluminum body for heat and shielding. There is an LCD panel control board to the right of it, and the WSlim PRO controls the LCD control with an FPGA chip designed by themselves to block noise generation at the source. There is a dual mono structure amplifier on both sides, an analog input circuit, and an expansion board on top of the main board where you can insert an SSD and three M2 SATA SSDs. By default, a 1TB SSD is provided as standard.



When you take out the SSD board, there is a main board, and the main board is an FPGA chip that implements Waversa's own core technology, WAP (Waversa Audio Processor). There is an ARM CPU that manages all functions of the WSlim PRO, and the noise isolator, a unique technology developed by Waversa is especially constructed in a compact size with a total of 7 utilised

The noise isolator was the hit product of Waversa in 2021, and it was a product that was popular because it removed digital noise and improved sound quality. It has since been miniaturized and put on a circuit board. If this is the case, it can be said that this is the product of their dedication to the best of sound. If you look at the amplifier section, you can see that expensive components such as BIMA capacitors and tantalum capacitors are arranged neatly. This also contains a lot of high-precision parts that cannot be found in products of the same price point.



The output is synchronized by combining 4 high-output PBTTL amplifiers per channel, and 16 single-ended amplifiers provide 200 watts per channel through parallel connection. It should be regarded as an achievement of power supply and amplifier design technology. The shield in the middle is a heat sink, and a custom-made digital amplifier chip is inside the heat sink. In addition, it is possible to expand the mono bridge through digital link input/output for two WSlim PRO units to work in tandem.



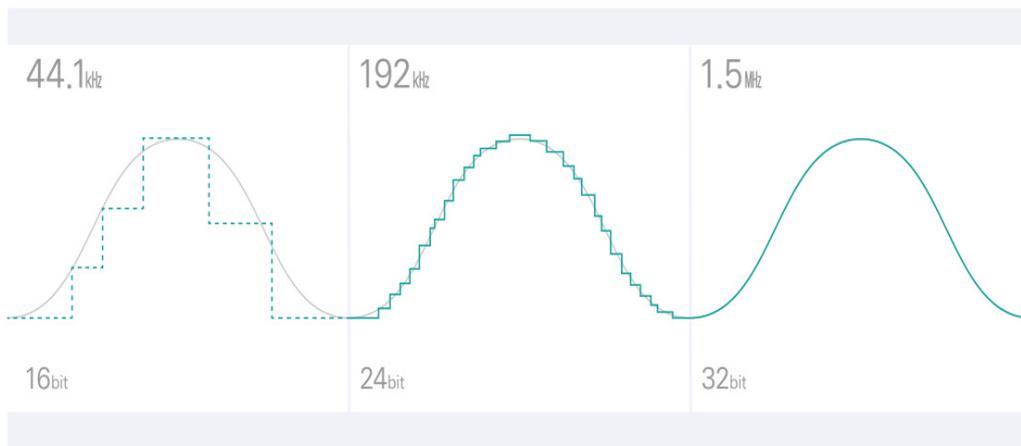
The importance of the amplifier's power supply cannot be overemphasized. The power supply of the WSlim PRO is an ultra-low noise power supply with the upgraded technology of WLPS, Waver's low-noise SMPS technology. With technology that minimizes the instantaneous power required by the amplifier and critical flaws of SMPS power supplies, the WSlim PRO's ultra-low noise floor starts from their power supply.

## Waversa Technology

For high-end sound quality, Waversa has put in not only an aluminum CNC case, but also an SMPS power supply and WAP, the world's only noise isolator, and cutting-edge amplifier technology designed in-house from a company with the world's best digital audio signal processing technology. Let's take a look at what technologies are included in the WSlim PRO.

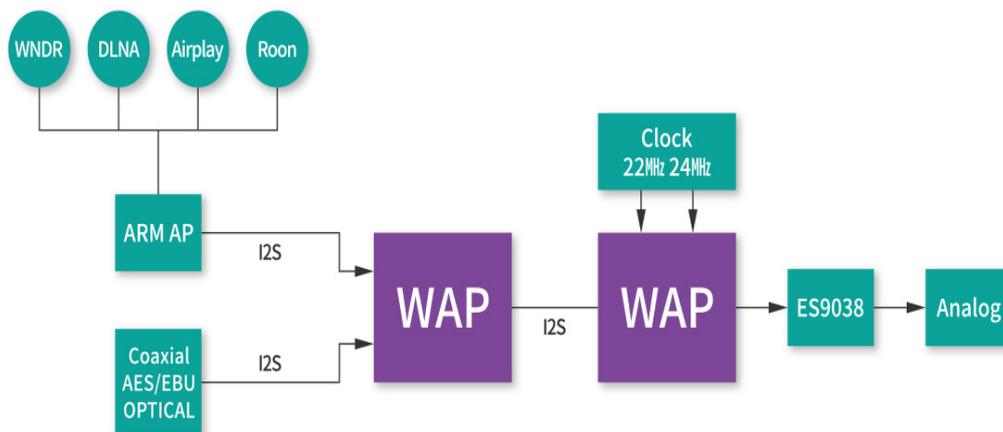
### **WAP (Waversa Audio Process)**

It is no exaggeration to say that the core of the WSlim PRO sound quality lies in the Dual WAP. WAP is a digital signal processing technology of Waversa's unique digital original tracking technology. It is the technology that creates the waveform.



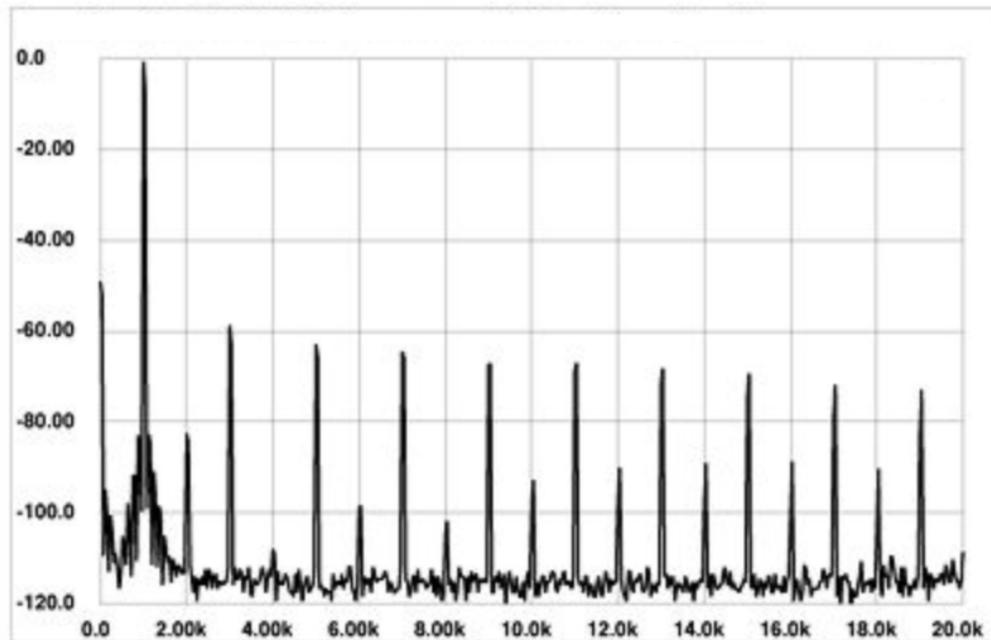
상기 이미지는 이해를 돕기 위한 것이며 실제로 측정된 것은 아닙니다.

This high-speed processing cannot be achieved with a software-based DSP chip, which is why an FPGA chip designed with hardware is required.



In general, if an interpolation method that takes an intermediate value of two signals is used to reduce quantization errors and sampling errors during digital signal processing, Waversa's WAP technology converts the original signal into a digital value through comparison of before and after digital signals. Waversa's unique technology that restores detail and overtone information with a technology that estimates this waveform is called WAP/X.

## WAP/X

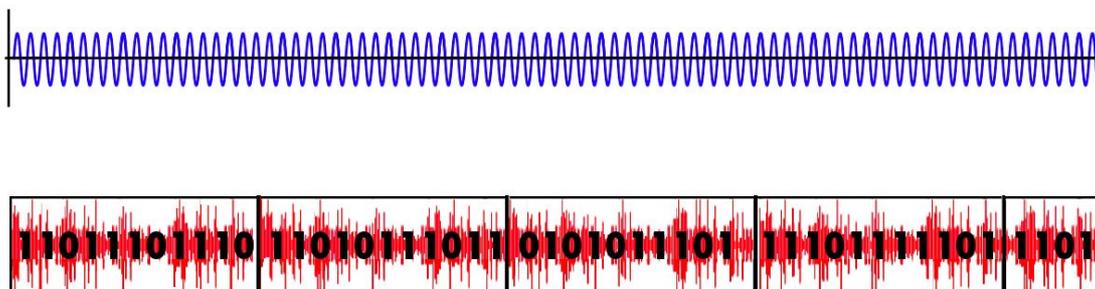


Transistor amplifiers with a lot of odd harmonics (example)

Transistors add more “odd-order overtones (dissonances)” due to the characteristics of the device. So, the sound becomes dry and sharp. If you remove this excessively with the NFB (Negative Feedback) circuit, the overtones of the instrument disappear as well, making the sound uncomfortable. In order to improve the shortcomings of such device characteristics, Wavers expanded the WAP function and introduced a unique digital technology called WAP/X. WAP/X adds even-order overtones (harmonics) for sound quality, giving a much richer and warmer tone, and it is a function that has been well-received by all users of Waversa products, with the user being able to turn it on and off.

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## WNDR (Waversa Network Direct Rendering)



A protocol is needed to communicate between computer devices. Apple's Airplay,

Microsoft's DLNA, and ROON's RAAT are such protocols. WNDR (Waversa Network Direct Rendering) is a network audio transmission standard developed by Waversa itself. It is a transmission method that is optimized for continuous signal processing without buffering. It is a protocol with strong resistance to noise. As a protocol, Waversa's proprietary protocol was developed by Waversa's own technology.

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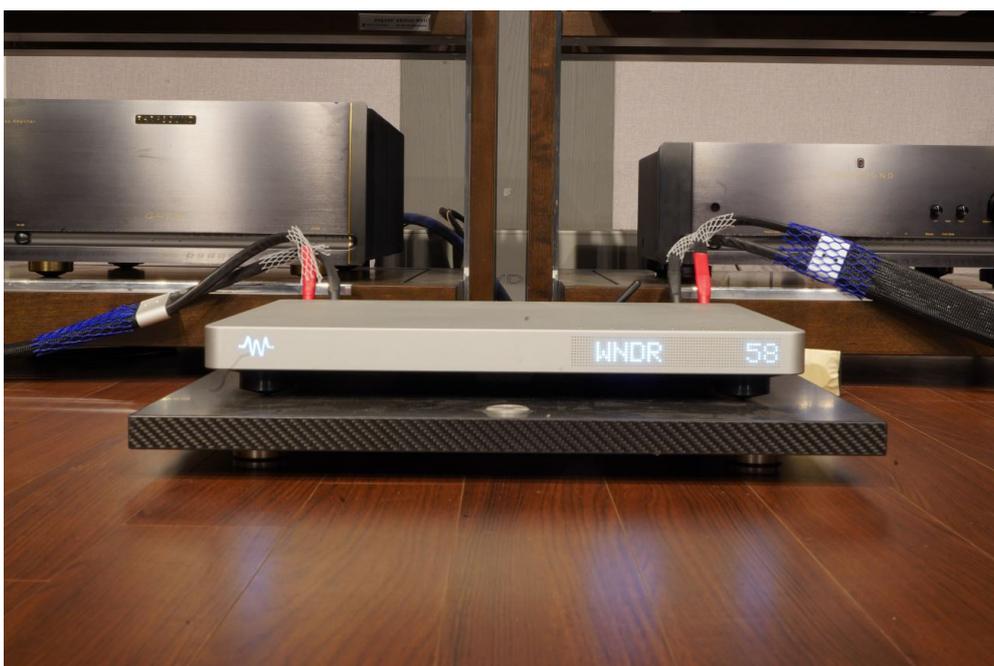
## Dynamic Range

The dynamic range of the amplifier can be adjusted according to the matched speaker and system environment. Levels 1 to 5 are supported. If the level is lower, the sound will be warmer in comparison to resolution. If the level is raised, the dynamic range will be widened, and the low and high frequencies will be expanded to make the stage bigger and the sound processing will come to life well. With such technology and generous input, the W Slim PRO can deliver high-end sound quality from an all-in-one amplifier that is a little over 4cm.

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## Results

Summarizing the sound quality of the W Slim PRO, you can say “quietness”, “bandwidth”, “resolution”, “ultra-low distortion”, “strong driving force”, etc. What you feel when the first note of the W Slim PRO comes out is the dark background. This quietness does not come from just figures such as THD or S/N ratio, etc. Perfect power supply design, high-level noise countermeasures that other brands do not have, and WAP's digital signal processing technology, this quietness is enabled by the highest quality of the chassis. It will be the result of the perfect combination of hardware and software.



And the wide bandwidth spreads to the extent that it is questionable whether such a wide bandwidth is possible even with a digital amplifier. Not just digital or D-class, but also compared to general high-end amplifiers, the WSlim PRO's bandwidth is wide.

Resolution is the most important virtue of high-end audio. The resolution of the WSlim PRO is excellent in all bands, and nuances are heard in areas that were not heard in the same music before. What is most surprising is the openness of the high frequency and the amount of information, on offer with Waversa's ultra-low noise solution such as a noise isolator being able to open up the high frequency like this.



The clarity of the high frequencies and the amount of information are overwhelming enough to exclaim, "Is it possible to expand this high frequency range in a digital sound source?" The transparency and clarity of the treble is so overwhelming that the quality of the treble makes you feel as if you have changed a tweeter into a diamond tweeter.

A well-designed digital amplifier can have many advantages over analogue amplifiers. This is because the above-mentioned DA converter chip is not needed, and it can be designed not to be affected by timbre changes of such things as resistors and capacitors.

Waversa WLPS SMPS power supply technology and PBTL-type 16 parallel-connected single-ended amplification digital amplifier technology drive medium and large-scale high-end speakers without difficulty, and a powerful driving force that delivers clear sound quality without any distortion even at high volumes.

## Summary

The WSlim PRO was planned in 2019 and it took 3 years to come to fruition. In the process, the CPU was replaced and a complete redesign was made last year. It is a product released after more than three years of difficulty, such as having to replace discontinued parts due to the supply-demand crisis of semiconductors and components. But there is so much more to gain. The WLPS power supply technology was put in, and a noise isolator was installed inside, and as a result, it was completed with much superior specifications.

If you want a simple audio system with high-end sound quality, please consider the WSlim PRO. It has all of Waversa's cutting-edge technology and is definitely one of the best products in terms of function and sound quality.

\*This review is a text version of the YouTube video review:

<https://www.youtube.com/watch?v=mBbnDnYIAgg>

Specifications	
Input	Analog Balanced & Unbalanced Phono USB A,B Ethernet HDMI AES / EBU Optical Coaxial Bluetooth FM
Storage	SSD 1TB
Output Power	Stereo 200W/ch, Mono 400W/ch
Dimensions	430 x 375 x 54 mm
Weight	9.3 kg