

November 2021

## iEMatch 4.4mm

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## iEMatch 4.4mm vs iEMatch 3.5mm

The new iEMatch 4.4 shares a lot in common with the iEMatch+ 3.5mm. It's been designed to operate in balanced configuration with a headphone amp with a 4.4mm balanced output socket. Like the iEMatch 3.5 it reduces the volume for sensitive IEMs by either 12dB or 24dB, depending on the sensitivity switch position.

The impedance has been made higher than the iEMatch 3.5, so that a typical balanced headphone amp can drive it more easily. The impedance in the 3.5mm version was designed mainly for single ended applications.

Impedances in Ohms	iEMatch 4.4 Input Impedance	iEMatch 4.4 Output Impedance	iEMatch 3.5 Input Impedance	iEMatch 3.5 Output Impedance
Single Ended, -12dB	40	8.4	13.6	2.5
Balanced, per phase, -12dB	20	8.4	6.8	2.5
Single Ended, -24dB	51	3.5	16	0.9
Balanced, per phase, -24dB	25.5	3.5	8	0.9

Next, we'll take look at the effect of each iEMatch on a typical headphone amp's output voltage when presented with the above input impedances:

<b>Output Voltage (rms)</b>	<b>ZEN CAN</b>	<b>Gryphon</b>	<b>NEO iDSD</b>	<b>hip-dac</b>	<b>ZEN DAC V1/V2</b>
<b>iEMatch 4.4, -12dB, Bal</b>	11.6	6.2	6.1	3.7	3.4
<b>iEMatch 4.4, -24dB, Bal</b>	13.2	6.3	6.2	4.6	4.1
<b>iEMatch 3.5, -12dB, Bal</b>	4.1	2.9	3.8	1.4	1.3
<b>iEMatch 3.5, -24dB, Bal</b>	5.2	3.4	3.9	1.72	1.56

It's clear from the results that the amplifier sections put out much more voltage, and thus power, by raising the impedance on the iEMatch 4.4 compared to the iEMatch 3.5 when driving a balanced load. In the case of the ZEN CAN, it puts out around 2.7 times the power! Of course, adding an IEM to either one will reduce the output power a little.

Although the damping factor for the IEM is reduced by raising the impedance, the effect on the frequency response of the IEM will be minimal. It may even err on the side of being beneficial as the diaphragm and magnetic system of some IEMs can become overdamped by driving them from too low an impedance.

Good damping factor is approximately considered between 2.5 and 10. For a typical 16ohm IEM, the 4.4mm iEMatch provides a damping factor of 1.9 on -12dB and 4.6 on -24dB. By setting the sensitivity switch to -24dB the damping factor increases 2.4 times. Because the input impedance of the iEMatch 4.4 is higher and the amp section can put out more power, you can use the -24dB setting if it makes the frequency response of the IEM more amenable.



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