

iFi Audio xDSD

With a more compact and elegant design, plus both wired and wireless connectivity, iFi Audio's new top-of-the-range portable DAC/headphone amp seems to have it all
Review: **Cliff Joseph** Lab: **Paul Miller**

The iFi Audio range of portable DACs and headphone amps has been one of the main challengers to the popular Chord Mojo [HFN Jan '16], with its first-generation nano iDSD [HFN Dec '14] picking up an EISA Award back in 2014. The company recently updated its range with the entry-level nano iDSD Black Label [HFN Apr '18], which offers a highly competitive audio upgrade for just £199. However, it's this new xDSD model that's setting the standard for the company's latest range of products, with a more streamlined and portable design, improved connectivity, and a £399 price tag that pits it right up against the Mojo.

GLEAMING CASEWORK

The xDSD makes a good impression straight out of the box, its slimline, metallic design looking considerably more elegant than its somewhat chunky predecessor – not to mention the rather nondescript slab of metal that is the Chord Mojo. Looking rather like a small whisky flask, the unit measures just 67x19x95mm (whd), so you can easily carry it around in a jacket pocket when travelling. The gleaming magnesium alloy casing weighs just 127g, but certainly feels sturdy enough to cope with a few bumps when you're out on the road.

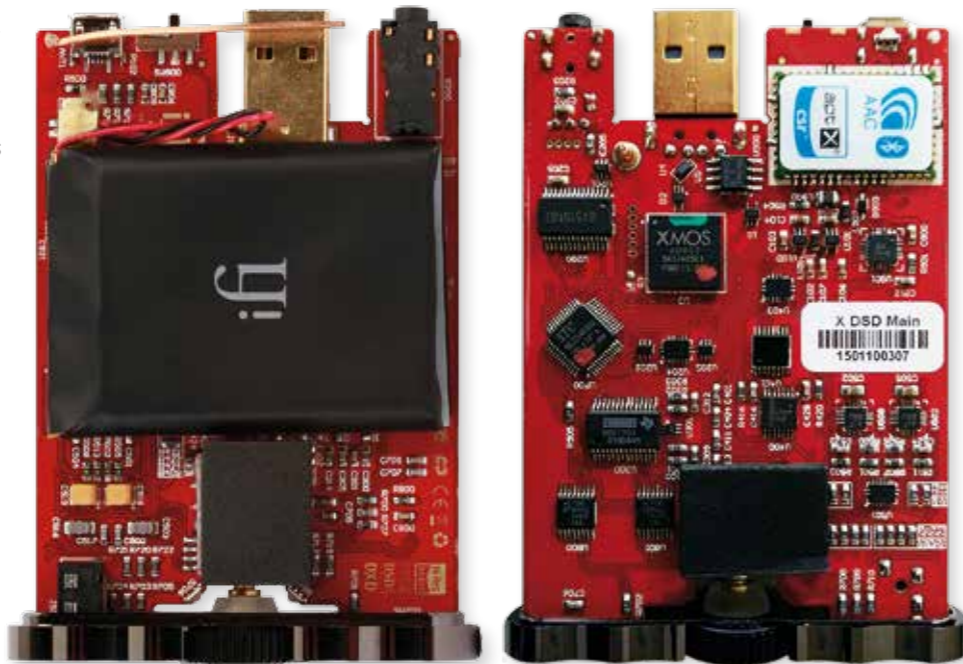
The xDSD uses the same Burr-Brown DSD1793 DAC chip as the rest of iFi Audio's portable range, but includes a redesigned headphone amp, along with additional connectivity options, including Bluetooth with AptX (a feature lacking in the Chord Mojo, unless you buy an optional add-on accessory), which allows you to stream music wirelessly from a computer or mobile device to the DAC. You'll still need a wired connection for your headphones, but that does at least reduce the tangle of wires and adapters that you have to carry around with you. It also provides a quick and easy option for connecting your

RIGHT: One side of the PCB carries a 1750mAh Lithium-Polymer battery (and copper wire antenna), the other side has a surface-mount X MOS USB solution and Texas DSD1793 DAC

mobile devices to a more substantial amp or speaker system at home. There's a single 3.5mm connector on the front for your headphones, but this can also be switched to a fixed-level line-out mode if you want to connect it to your home hi-fi system.

One other addition is a combined 3.5mm coaxial/optical digital input to cater for high-end digital audio players (DAPs) or other devices such as a TV or networked media server. However, most computers and mobile devices will rely on the xDSD's 'male' USB-A connector for audio input. Using a male connector means that you'll need to buy an adapter in order to connect most Android or Apple iOS devices to the xDSD (there's a micro-USB connector on the back as well, but this can only be used to charge the unit).

To be fair, Chord has adopted a similar approach with its Mojo, yet rivals such as RHA's Dacamp L1 [HFN Apr '17] do include a standard 'female' USB connector that doesn't require any additional adapters.



'The opening cymbal crash rang out like shattering glass'

Using the xDSD with a computer is actually more straightforward, as iFi Audio includes a thick, metre-long adapter cable.

HOLOGRAPHIC SOUNDFIELD

File format support is a little complicated too. The S/PDIF interface supports files up to 192kHz/24-bit, but USB rather depends on which version of the device's firmware you choose.

The pre-installed v5.3 firmware supports up to 384kHz/24-bit, along with DSD256 and the MQA format used by the Tidal streaming service. However, you also have the option of

'downgrading' to an earlier v5.2 firmware that does not have MQA but supports 768kHz/24-bit and DSD512. I was happy to stick with the default firmware for my Tidal account, but it's handy to have that other option for purists who have a library of suitable high-res downloads.

Like the Black Label model, the xDSD has a switch on the back that allows you



LEFT: The xDSD's slimline magnesium alloy case is light and rugged, while the large Power/Volume dial is easy to use when it's stowed in a pocket or bag. The 3.5mm connector can switch between headphones and line-out as required

'Rapture' from *The Very Best Of Blondie* [EMI/Chrysalis 7243 4 99288 2 4], I tend to listen out for the bass guitar to come bouncing along and kick the song into action, but on this occasion the xDSD made me really pay attention to the sharp, percussive intro as well.

The opening cymbal crash rang out like shattering glass. The firm and precise drum beat set the pace, and the lightly tapped high-hat ticking along with an infectious rhythm created the perfect opening for that impeccably funky bass line to make its entrance. It was a nicely balanced sound too – the lightly jangling lead guitar riff livelier and more pronounced than it can sound, and adding to the irresistible rhythm of bass and drums, rather than drowning them out.

DELVING DEEP

I did feel, though, that the XBass+ option made little difference to the mid-bass on 'Rapture', so I delved into the deeper, electronic sounds of 'Prime Evil' by The Orb [*Bicycles And Tricycles*; Cooking Vinyl 0711297469820] to see how it handled some seriously deep bass.

Even unassisted, the xDSD delivered the track's opening bass line with a deep, rumbling sound that drove the song forward with a sinuous, almost sinister, rhythm. Thankfully, the xDSD didn't screw things up as I tapped to activate the bass effect, and it managed to avoid the exaggerated bass boom that's currently fashionable with many headphone brands. The XBass+ effect is more calculated and

to select either the default 'Listen' filter, or the alternative 'Measure' [see PM's boxout, below]. It also has a button that allows you to choose two analogue effects, called 3D+ and XBass+. As the name suggests, the XBass+ option is designed to enhance lower frequencies, while iFi Audio describes 3D+ as 'a holographic soundfield' that attempts to increase the sense of stereo separation while wearing headphones.

These two effects can be turned on or off individually, or used both at the same time, by repeatedly pressing the 'Selection' button – which brings me to one aspect of the xDSD that can be frustrating. The design of the xDSD is well suited to portable use, and the large volume dial with its central glowing button feels comfortable. However, there are quite a few glowing LEDs on that front panel, some of which can cycle through an entire rainbow of colours as you select different settings, and trying to remember what the various combinations of coloured lights mean will surely be irksome to many users.

That slimline design does have one drawback, too, as it doesn't leave much room for the internal battery. The iFi Audio website says the battery will last for ten hours when using the S/PDIF connector, but USB – likely to be the main input for a portable device such as this – only lasts for six hours. Oddly, using Bluetooth increases that to eight hours, but the Chord Mojo still has bragging rights here with eight to ten hours for a wired connection.

A PERFECT START

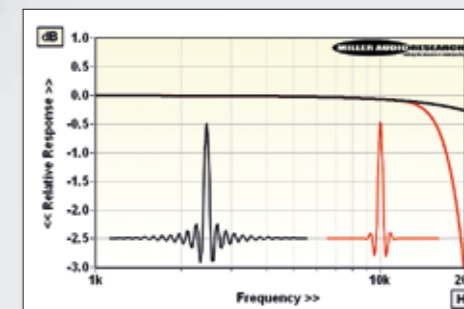
The xDSD is primarily designed for mobile use, and it certainly proved a tremendous improvement over the standard output from my iPhone when listening to my library of lossless ALAC files through Audio-Technica MSR7SE headphones.

Normally when playing Blondie's



LISTEN OR MEASURE?

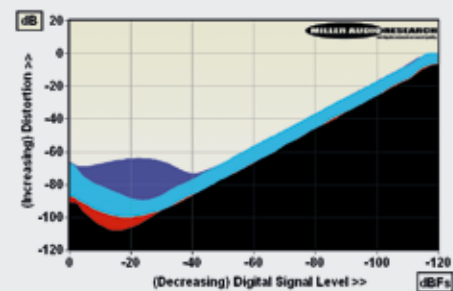
The tiny switch referring to 'Measure' and 'Listen' is potentially misleading as you may 'listen' to either setting! Moreover, iFi Audio has its screen printing reversed around this little switch, so 'Listen' is 'Measure' and vice-versa. So it'll be interesting to discover which, if any, headphone bloggers can hear the difference! In practice, iFi Audio suggests that 'Listen' is optimised for transient response while 'Measure' delivers the flatter frequency response. The former selects a standard linear phase digital filter [black traces, inset Graph] that offers a moderate 53dB stopband rejection and a response that reaches out to -0.27dB/20kHz and -1.5dB/45kHz with CD/48kHz and 96kHz media, respectively. The 'Listen' option selects a slow roll-off type, not dissimilar to Pioneer's interpolative (IIR) Legato Link filter of the 1980s, with its minimal ringing (much reduced time domain distortion) but curtailed treble (-3.3dB/20kHz) with CD/48kHz sources [red traces]. This filter's reduced acausal distortion may confer some subjective advantage, but the poor (7dB) stopband rejection means I'd recommend it for 96kHz+ downloads rather than 44.1kHz/48kHz files. PM



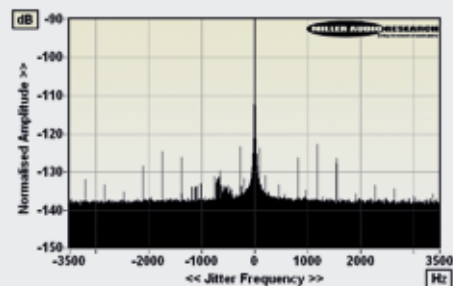
IFI AUDIO XDSD

We've tested numerous iterations of iFi Audio's portable DAC/headphone amps, including the nano iDSD [HFN Dec '14] and 'Black Label' variant [HFN Apr '18], but this new xDSD model is clearly a cut above. I'll come to its superior digital performance in a moment for the xDSD is not only significantly 'cleaner' but it's also the most powerful battery-powered amp the brand has offered – rated at 270mW/50ohm and 500mW/16ohm, it delivered a comparable 330mW/25ohm on the test bench with 3.35V or 18.7mW/600ohm for high impedance headphones. Distortion increases with loading only at high frequencies, so at just –1dB below maximum output (262mW/25ohm) there is a lift from just 0.0036% to 0.0044% at 1kHz between 600ohm and 25ohm loads [black versus red traces, Graph 1 below]. At 20kHz the effect is slightly more pronounced with the biggest 'difference' occurring at –25dB (~1mW/25ohm) with 0.0038%/unloaded vs. 0.063%/loaded [cyan vs. blue traces, Graph 1].

Importantly, these figures are an order of magnitude better than we've seen from earlier iFi Audio portables as is the spectacular 107-108dB A-wtd S/N ratio, recorded via its fixed 2.1V line output and re. 10mW when configured in 'headphone mode'. The low 500mohm output impedance is very impressive too, ensuring the xDSD/headphone system response is largely unaffected by swings in load impedance. I discuss the response and digital filters in my boxout [p69]. Meanwhile the underlying digital/line performance is superb, the DSD1793 DAC delivering a low 0.0003% distortion at –30dBfs/1kHz, increasing to just 0.0015%/20kHz. Jitter is as low as in any high-end DAC solution – less than 20psec at all sample rates [Graph 2, below]. PM



ABOVE: THD vs. digital signal level at 1kHz (black, 600ohm; red, 25ohm; 0dBfs = 330mW and –25.2dBfs = 1mW) and 20kHz (cyan, 600ohm; blue, 25ohm)



ABOVE: High res. 48kHz/24-bit jitter spectrum, USB in/fixed line out. Jitter at 10mW/25ohm is also low

HI-FI NEWS SPECIFICATIONS

Maximum output (re. 0dBfs into 47kohm)	2.12V (unbalanced line out)
Max. power output (re. 0dBfs into 25ohm)	330mW (headphone out)
Output Impedance (20Hz-20kHz)	0.45-0.81ohm
A-wtd S/N ratio (0dBfs; re. line/10mW)	107.2dB / 107.8dB
Distortion (20Hz-20kHz, line/ re. 10mW)	0.0024-0.04%/0.004–0.043%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to –0.3dB/–1.5dB/–9.1dB
Digital jitter (48kHz/24-bit data)	<20psec
Power consumption	Battery-powered device
Dimensions (WHD) / Weight	67x19x95mm / 127g



LEFT: The xDSD provides S/PDIF and USB-A for wired connections, along with Bluetooth for wireless input too. The micro-USB connector on the far-right is used for charging only

precise, seeming to reach down to just the very lowest frequencies and gently bring them a little more into focus, but without overwhelming or unbalancing the midrange frequencies, or the light, shoulder-swaying percussion that floated above on this track.

PUNCH TO THE JAW

Another tap on the Settings button on the front of the device adds the 3D+ effect as well. The vast, multi-tracked rondo of 'The Prophet's Song' by Queen [A Night At The Opera, 2005 reissue; Parlophone 3 38457 2 5] provided the perfect soundstage here, and I was pleased also to have the chance to check out the MQA version of the song on Tidal by plugging the xDSD into my office computer. The echoing vocals sounded wonderfully crisp and clear, and precisely placed as they volleyed from left to right.

And, as the harmonies reached their shrieking climax – 'listen to the mad maaan!' – the xDSD landed Brian May's power chords like a clean, sharp punch to the jaw. I've heard claims of '3D sound' before, and they rarely amount to anything more than a gimmick, but the xDSD again managed to make a gentle but effective sound adjustment. As the Queen harmonies echoed back and forth, the sound over my Audio-Technica MSR7SEs seemed to shift physically just a little, rising up and then expanding out into the air, as though the earpieces were being held slightly higher and further apart than would be normal.

And, of course, if you really wanted to get a sense of space, you still had the option of using the xDSD with a conventional speaker system. Switching between 'headphone' and 'line-out' modes, I listened to the solo vocal of Kate Bush on 'My Lagan Love' [Hounds

Of Love; EMI 7243-8-57978-2-8] rising effortlessly from my Opera speakers and filling the room with the warm, wistful tone of her voice as she sang of her lost love. It's impressive to hear a sound of such richness and clarity emanating from such a tiny device and, on the same album, the xDSD proved equally deft with the dense avalanche of percussion that piles up on 'The Big Sky (Meteorological Mix)'.

It managed to separate the cascading layers of drums admirably, preventing them from merging into sonic mush, and kept focus on the firm slap-bass – which can often just get drowned out when I'm listening via my smartphone.

Almost inevitably, the Bluetooth streaming isn't in quite the same league, with music sounding a little less clear and open through both headphones and speakers. But that's very much due to the limitations of the Bluetooth technology, rather than a criticism of the xDSD itself. It's still useful to have that wireless option, and it demonstrated that the xDSD can challenge the mighty Chord Mojo on both sound quality and versatility. ☺

HI-FI NEWS VERDICT

It's not perfect – the limited battery life leaves some room for improvement – but the lightweight xDSD still packs a heavyweight punch. Its slimline design is ideal for travelling, and includes features that few of its rivals can match, including Bluetooth connectivity that's useful at home and on the road. But it's the sheer sound quality on offer that earns it a place at the forefront of this competitive field.

Sound Quality: 88%

