OPPO PM-1 PLANAR MAGNETIC OVER-THE-EAR HEADPHONES REVIEW

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OPPO PM-1 Planar Magnetic Over-the-Ear Headphones Review *Highlights*

OPPO, known for their very high quality universal players, including the OPPO BDP-105 Blu-ray player, has now ventured into another arena: headphones. Their first model, just released, is the OPPO PM-1, which is an over-the-ear design, using planar magnetic drivers. At a time when everyone seems to be offering headphones and/or earbuds as part of their product portfolio, only a handful really stand out as top notch performers. The PM-1 is destined to join that group.

I found the PM-1's to be extremely comfortable, as they weigh less than 1 pound, and the sound was spectacular, requiring very little power to drive them. OPPO's new HA-1 fully balanced headphone amplifier arrived in time for me to listen to the PM-1's, and the amplifier's bias into Pure Class A made the PM-1's sing like a Nightingale. The bench tests reflected the fine detail that the PM-1's delivered. OPPO has entered the headphone arena with a winner on the first try.

Watch the video to see a description of some of the features.
https://youtu.be/natN4ESqJfI

The OPPO PM-2 planar magnetic headphones are about to be released and are to be very similar to the PM-1's, with plastic parts that don't affect the sound, replacing hand machined aluminum parts. Jason Liao, of OPPO, provided the following information (the full statement is at the end of this review):

"The PM-2 is basically a more affordable version of the PM-1. With so much effort putting into the development of the PM-1's planar magnetic driver, we want to make the technology available at a lower price point so more people can try it."

We will look forward to reviewing the PM-2's and testing how they compare to the PM-1's.

Introduction to the OPPO PM-1 Planar Magnetic Over-the-Ear Headphones Review

OPPO is a brand name that every audio/video aficionado knows very well, and the number of posts on forums about their fantastic Blu-ray players (officially, they are universal players, since they play every codec from here to the far reaches of the known universe, and do it with distortion in the few thousandths of a volt) illustrate the vast interest.

OPPO PM-1 PLANAR MAGNETIC OVER-THE-EAR HEADPHONES REVIEW SPECIFICATIONS

- Design: Planar Magnetic Over-the-Ear Headphones
- Open Back
- Diaphragm: 7.14 Inches^2 Surface Area
- Magnet Structure: Neodymium
- MFR: 10 Hz – 50 kHz
- Efficiency: 102 dB @ 1 mW
- Nominal Impedance: 32 Ohms
- Dimensions: Each Earpiece – 4″ x 3″ Oval, 1.5″ Thick
- Weight: 0.9 Pounds
- MSRP: $1,099 USD
- Color: Black with Chrome Trim and Black Lambskin Ear Surrounds
- OPPO Digital
- Tags: OPPO, PM-1, Planar Magnetic, Headphones, Over-the-Ear, Audio, Headphone Reviews 2014

The BDP-105 is their latest model, and it can easily be converted into a music and video server, by simply connecting a USB drive to the rear panel. I have done this myself, and have 83 GB of music, including high rez (24/192) music stored on a 2 TB drive for all three 105's that I use throughout my test labs (my wife calls one of them the living room). They are Seagate My Passport Ultra drives that I picked up at Costco for $139/each, and they are powered by the USB connection, so they power on when the 105 is on, and they power off when you turn off the 105. The beauty of this is that you simply name the albums and music tracks (if they are missing) on your computer, as you would any file, and the names show up on your iPad (the app is in the iTunes library). No screwed up names from bad metadata. Touch an album name and it opens to show the list of tracks, as you have named them. Tap the track, and it plays (along with the rest of the album).

So, what to do when you have reached the zenith of performance in your universal player? Release some headphones, of course. The PM-1 planar magnetic headphones are the result, and they are *some* set of cans for sure. They weigh in at just under one pound, and with sheepskin ear cups, they are as comfortable as a velour covered easy chair is for your backside. No headaches with long listening sessions either. And that is just the fit. Read on to see what I think about their performance.

Design, In Use, On the Bench, and Rating

In a planar magnetic driver, a conductor is printed, using electrically conductive ink, onto the surface of the diaphragm, in the shape of a spiral, so that it resembles a conventional cone voice coil, but is flat rather than being wound around a tubular core. Very thin wires are connected to each end of the printed voice coil, which are connected to the headphone's input jacks. A cable is attached to the jacks and the other end has either a 1/4″ or 1/8″ stereo phone plug that connects to a headphone amplifier, or your portable music players.

The PM-1 has a 7.14 square inch (surface area) oval-shaped diaphragm, and a voice coil is printed on both sides which increases the sensitivity of the headphones. Indeed, I found the PM-1's to play at a satisfactory volume using less power than with other headphones.

Here is a close-up photo of the lambskin headphone ear cups. You can see that the sides of the cups are perforated. This allows for air circulation that keeps your ears cool and prevents perspiration. They are very soft, and coupled with their very light weight (the headphones weigh less than 1 pound), I found them to be extremely comfortable, and I didn't get my usual headache from wearing headphones for extended periods.

The Presentation Case is made from MDF, covered in dark maroon cherry veneer.

Pushing a lock button on the front of the presentation case allows it to be opened, and voila! The black box at the bottom contains one set of cables with a 1/4″ phone plug. A second set of cables with a 1/8″ phone plug and a foam set of ear cups are contained in a denim pouch that is included for carrying the phones. I attached the cable with the 1/4″ phone plug, and when the cable is coiled up, I could put the headphones back in the case with the cable attached. Not all headphones allow you to keep the cable attached when you put the phones in their case. Note that this is not a carrying case. It is a Presentation Case. The denim pouch is for carrying them. You could also use a headphone stand (OPPO has an optional Lucite stand) to put them on, and I store them this way when I am listening on a daily basis, but I like to protect my phones from dust, so in the box they would go if I take off for vacation.

I tested the PM-1's using my iPod and a HiFiMAN EF5 triode headphone amplifier with DY-1 power supply. The connection from the iPod to the amplifier was an analog RCA stereo interconnect. I also used the headphone output from an OPPO BDP-105, configured to play music from a 2 terabyte hard drive connected to the OPPO. All of my music, including 24/192 tracks, are stored on this hard drive. The headphone output of the BDP-105 is driven by two channels of its Sabre 32 DAC and two very high quality op-amps.

The ear cups fit perfectly around my ears (noting that ears are oval shaped, like the PM-1's ear cups), and lambskin is *very* soft. You will love the comfort.

The sound from the PM-1's was what I have come to expect from top of the line planar magnetic headphones: Superb! There was no audible distortion at any level.

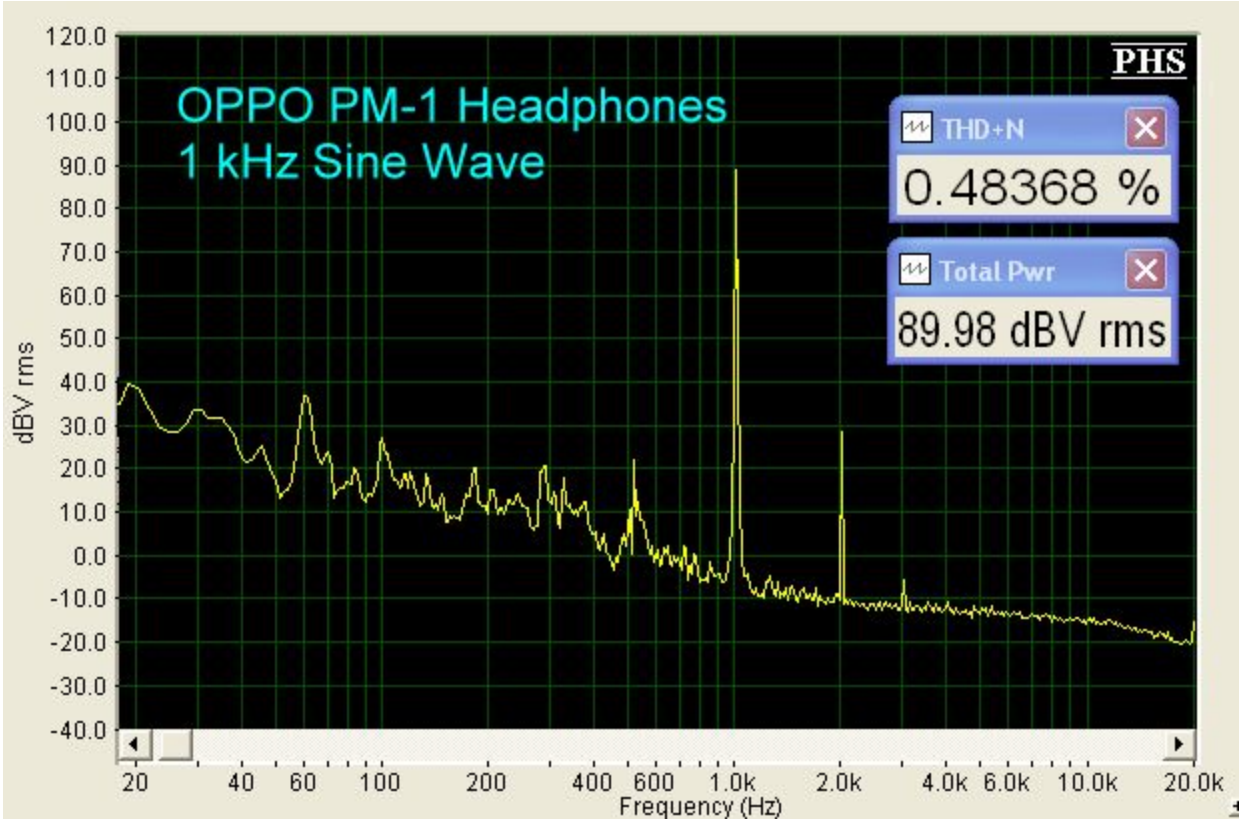
The PM-1's have a very neutral tonality. Headphones are like speakers. They can have the same overall design, same number of drivers, etc., but each speaker model sounds different. Headphones all have their own distinctive sound as well. The Audeze LCD-X phones that I reviewed recently have a midrange that is a bit forward. I liked it very much. The PM-1's are neutral. I liked that presentation also. I haven't listened to HiFiMAN's top headphones yet (planar magnetic), but will do so in the future. I am sure they will sound different than either the Audeze or OPPO phones. Note that the differences are not huge. They are subtle, but noticeable.

I sat for hours at a time, listening to classical and pop music with the PM-1's. Regardless of the genre, the sound was effortless, and the smallest transients were audible. In particular, deep bass sounds fantastic on a top notch set of cans like the PM-1's, because the diaphragm is only moving a millimeter or two, so distortion does not creep into the output. The only way I have been able to get around this problem using speakers, is to have three 18″ subwoofers, with each one turned up about 20% of it output capability. This keeps the distortion very low.

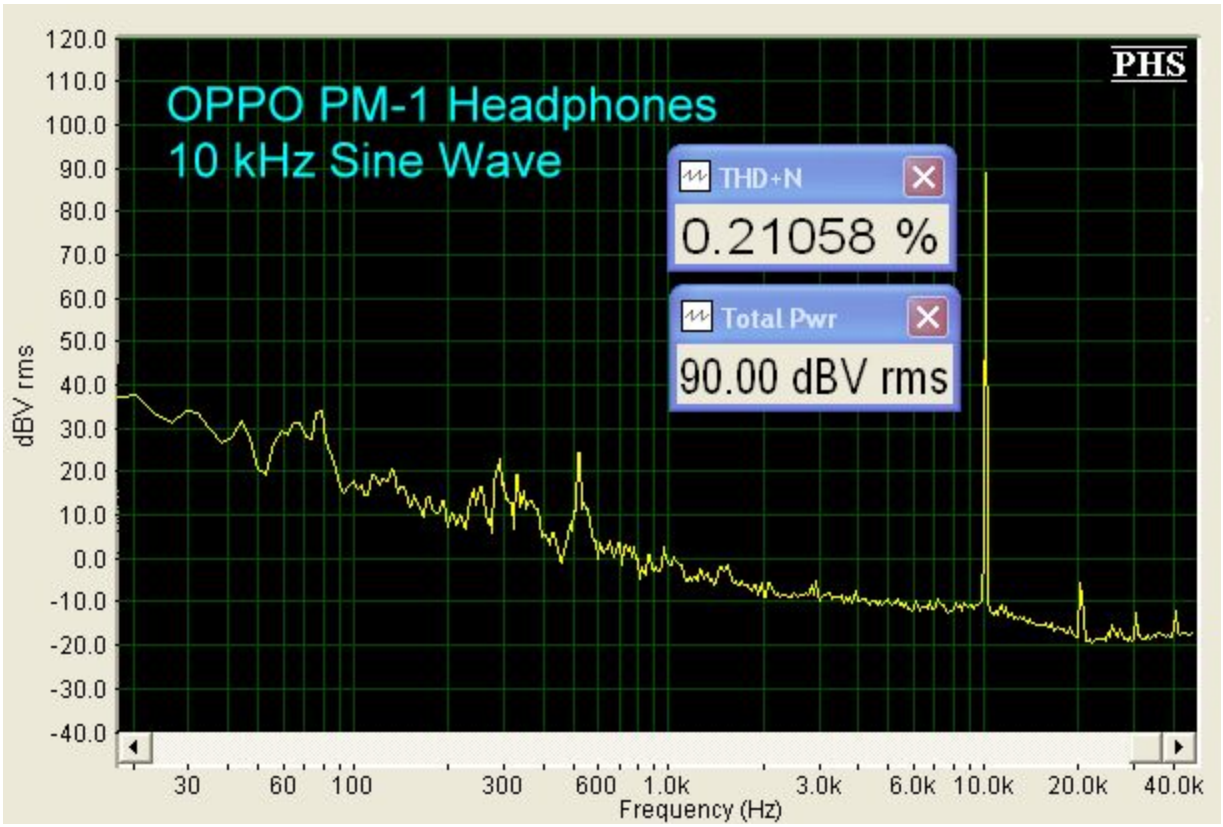
I also used the OPPO BDP-105's headphone jack and iPad app to select music from a USB hard drive connected to the 105.

Below are some distortion spectra at 1 kHz, 10 kHz, and 20 kHz. I placed the tip of the microphone about 1 cm from the center of the inside of one of the ear cups. I could not seal the headphone for the tests, so the SPL numbers are probably about 5-10 dB less than what would be the case if the headphones were over your ears.

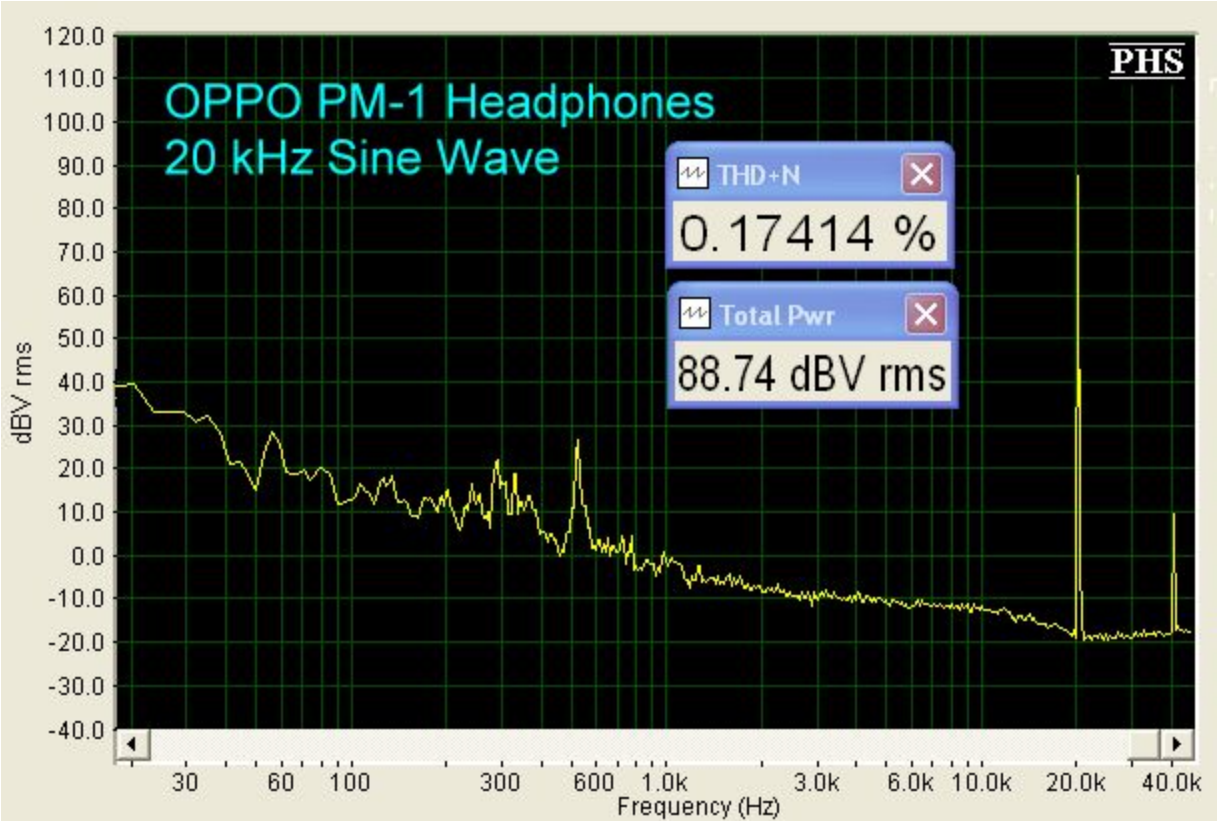
At 1 kHz, distortion was only 0.5%, with a prominent second harmonic, and a very small third.



At 10 kHz, distortion dropped to 0.2%. All of the three harmonic peaks were very small.



At 20 kHz, distortion was a very low 0.2%.



As I was writing the review, the new OPPO HA-1 fully balanced headphone amplifier (along with the optional OPPO headphone stand) arrived on my doorstep, so I had a chance to listen to it before publishing this review. It has a built-in DAC (the same SABRE DAC as in the BDP-105 universal player), and will decode up to 24/384 PCM as well as both DSD64 and DSD128, so it is fully up to date with emerging high resolution music files. The amplifier is biased into Pure Class A operation.

The sound was satin smooth and had plenty of power such that I only had to turn the volume control up to about the 11 o'clock position for satisfying volume levels, using the 1/4″ cable that came with the headphones. OPPO then sent a balanced headphone cable for the PM-1. It is 3 meters in length and will retail for $149. The cable is made from single crystal oxygen free copper.

Below, you can see the standard 1/4″ phone plug and the balanced plug. With a balanced amplifier, the – (negative) output legs are separate, and are not grounded, as compared with a non-balanced amplifier, where the – legs are grounded and thus, connected together. Using the balanced plug therefore utilizes both the + and – legs of each channel of the stereo balanced amplifier and delivers twice the voltage of the unbalanced configuration.

When I used the balanced cable, I had to turn the volume down to the 9 o'clock position to get the same volume that I was getting using the 1/4″ unbalanced cable and the volume control set to 11 o'clock. I recommend purchasing the optional balanced cable with the PM-1, as this makes full use of all the circuitry in the HA-1 amplifier. A full review of the HA-1 is forthcoming. Notice the cool VU meters on the front panel. You can change the panel to display several things, including the VU meters, and a bar graph of the audio spectrum. At $1,195, it has everything.

Consumer audio continues its love affair with headphones. There are many phones in the hundreds of dollars category. Once you go above $1,000 ($999.95 is included :=>), the consumer has what I would call “Ultra-Phones” available. In the ultra-phone arena, I have not heard any that sound bad. But they all sound different, in a musical kind of way. At $1,099, the PM-1’s are not a casual purchase. But if you are a serious listener, and enjoy the special experience that headphones deliver, the PM-1’s would be an important and worthwhile investment. Congratulations to OPPO for getting it right on their first attempt!

OPPO PM-1 Over-the-Ear Headphones Rating

- **Looks:** 
- **Build Quality:** 
- **Comfortable Fit:** 
- **Sound Quality:** 
- **Value:** 

The OPPO PM-2 planar magnetic headphones are about to be released. They are similar to the PM-1’s, but small things like the lambskin ear cups being replaced with synthetic material, and hand machined metal parts that don’t affect the sound quality being replaced with plastic parts, result in a price of only $699. Jason Liao at OPPO sent me the following detailed description of the PM-2 that you won’t find on the OPPO website:

“*The PM-2 is basically a more affordable version of the PM-1. With so much effort putting into the development of the PM-1’s planar magnetic driver, we want to make the technology available at a lower price point so more people can try it. The PM-2 and PM-1 are more similar rather than different. The PM-2 will use the same drivers, industrial design and mechanical design of the PM-1. The two will share many parts. It is our goal to make the PM-2 sound the same as (or as close as possible to) the PM-1. There will be some material differences: the PM-2 will use synthetic leather instead of lambskin, and a few metal parts will be replaced with plastic parts. The cost reduction for the PM-2*

will mainly come from better yield when we make the parts. The raw materials have a cost difference (lambskin leather vs synthetic leather, aluminum vs plastic etc.), but the cost difference from the yield has more impact. For example, some of the machined aluminum parts require significant machine shop hours to make, and if there is a slight mistake in any of the steps, the part is wasted. On the other hand, pretty much every piece of plastic parts that comes off the injection mold can pass QC and be used in the PM-2 production. The same goes for selecting the good part of leather to sew into ear pads and head bands, and rejecting many of the finished leather ear pads and head bands due to imperfections in the leather or workmanship.

The packaging of the PM-2 will be simpler, and the standard cable will be made of OFC instead of OCC copper.

Jason Liao

OPPO Digital”