SAUSALITOAUDIO

Home Pod Measurement Data

The Apple Home Pod is a relatively high-end voice assistant loudspeaker. The device is 6.8” tall and 5.6” in diameter using an approximately 4” woofer and 7 horn loaded midrange/tweeter units. The woofer is upward firing at the top of the unit. The tweeters are mounted in a circular array inside the enclosure and point inwards, each using a clever horn to port their acoustical energy to the outside near the base of the unit. The unit displays near perfect omni-directional characteristics in the horizontal plane. The crossover point appears to be ~500Hz.

Measuring this speaker is somewhat problematic. The speaker has no line input and all measurements had to be made from my laptop via AirPlay which introduces about 5 secs. of latency. The Home Pod’s tuning appears to change with volume level as well as with signal level. The Home Pod also adjusts its bass level to compensate boundary effects. For these tests, the unit was set to maximum volume with a moderate input signal to avoid engaging the dynamic processing as much as possible.

The reference horizontal axis was taken to be opposite the power cord and the reference vertical axis was taken to be 10° above the middle of the unit. This was done because in the intended use cases for this product the listener’s ear would typically be above the speaker. So, the 0H0V references axis in the measurements below is actually 10° up from the center of the speaker.

All measurements were made at Sausalito Audio which does not have a full anechoic chamber. The data is anechoic to ~500Hz and becomes increasingly corrupted by room reflections below that. Below ~150Hz the data should be largely disregarded.

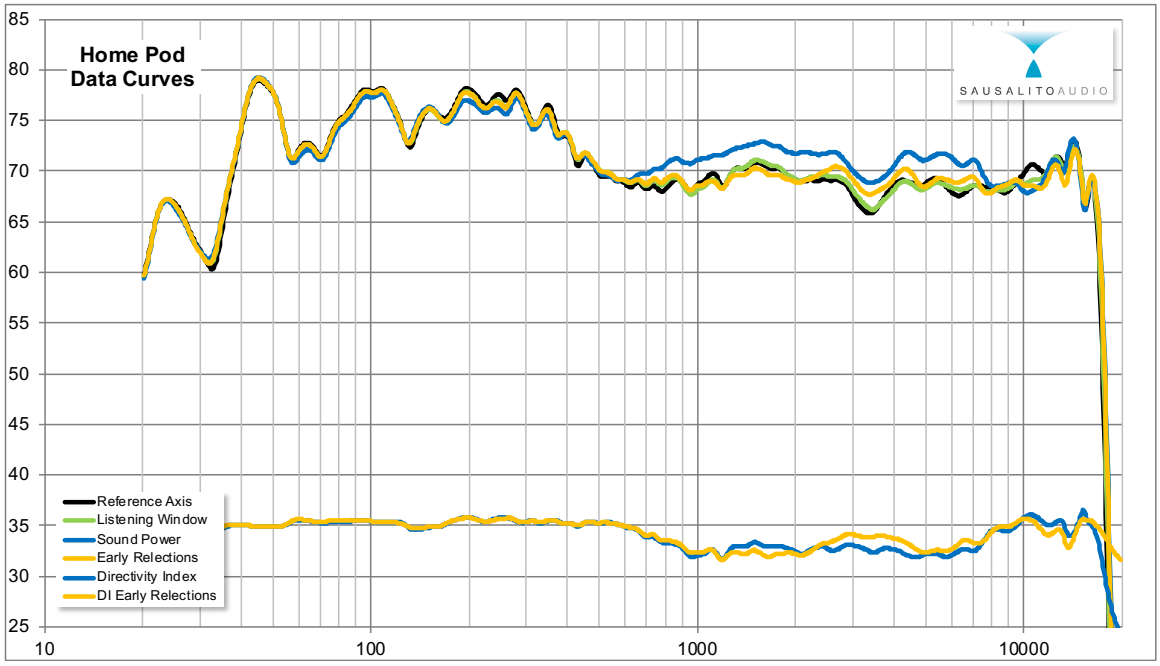

Figure 1: Spinorama chart for the Apple Home Pod. For information on how to interpret this chart, please see "Interpreting Spinorama Charts" on the SA web site.

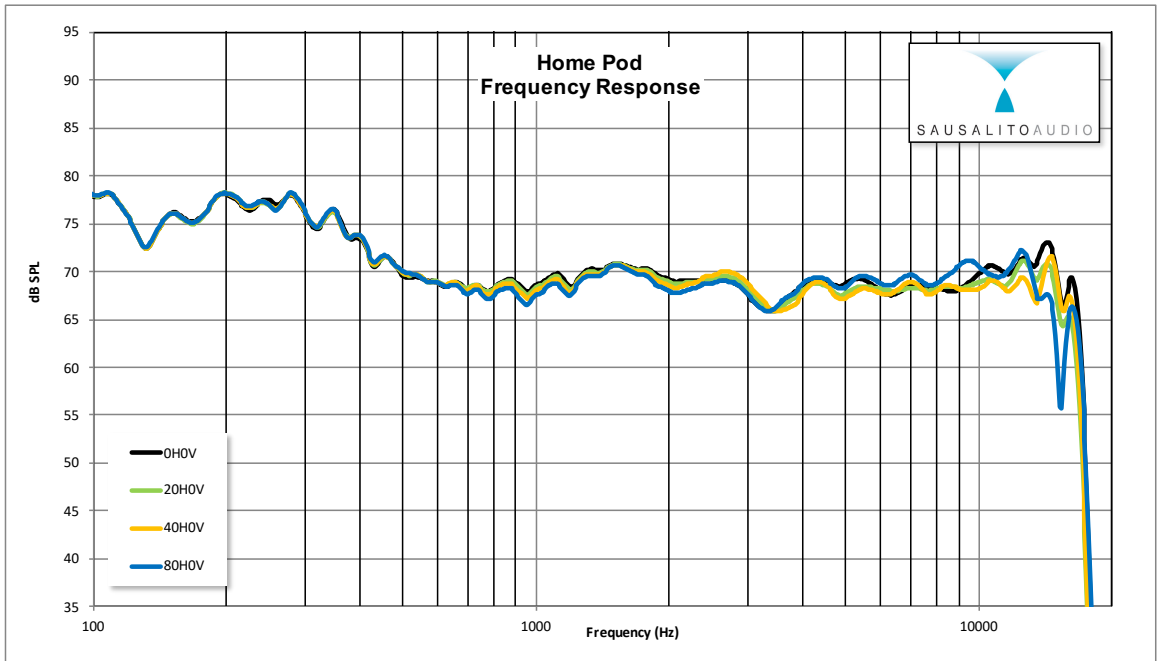

Figure 2: Frequency response curves at the referenced horizontal angles. 0° vertical is taken as 10° up from the center of the speaker.

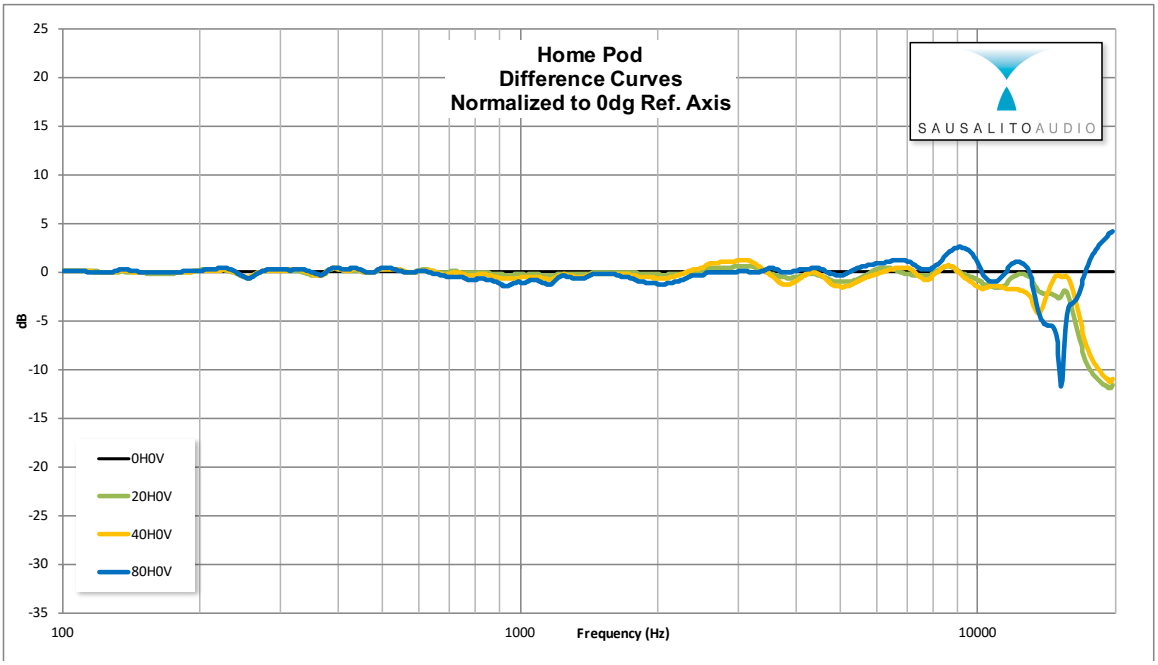

Figure 3: The data from figure 2 normalized to the reference axis of 0° horizontal, 0° vertical to more clearly show how the response of the speaker changes as one moves off the center line.

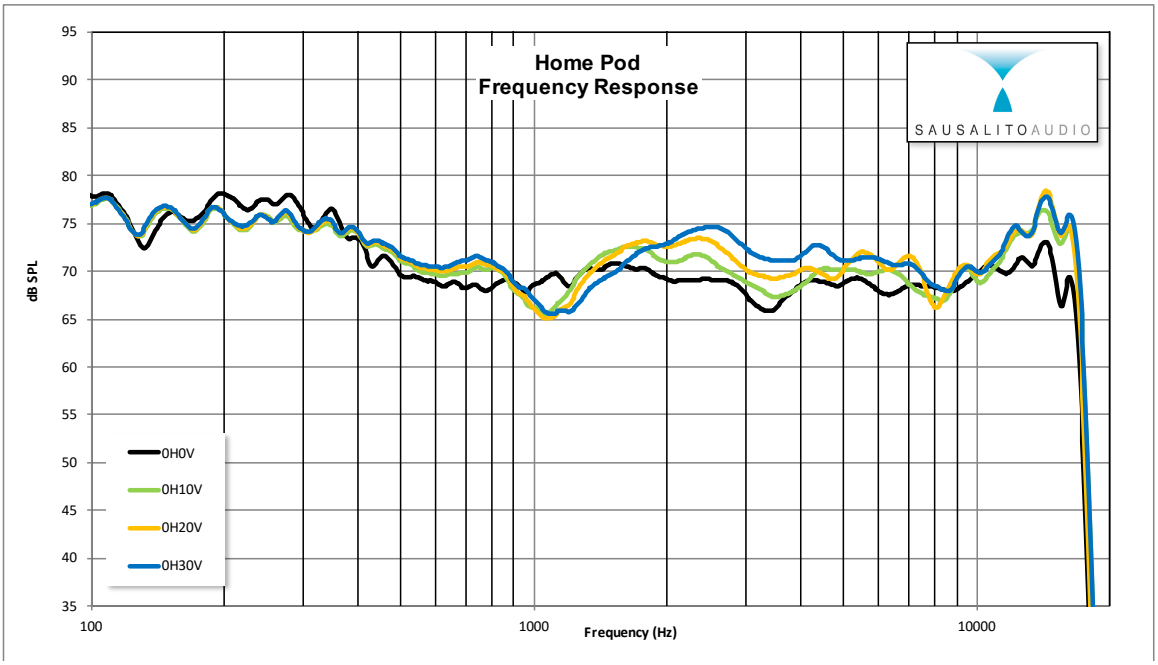

Figure 4: Response curves for 10°, 20° & 30° above the 0° vertical reference which is 10° above the center of the speaker.

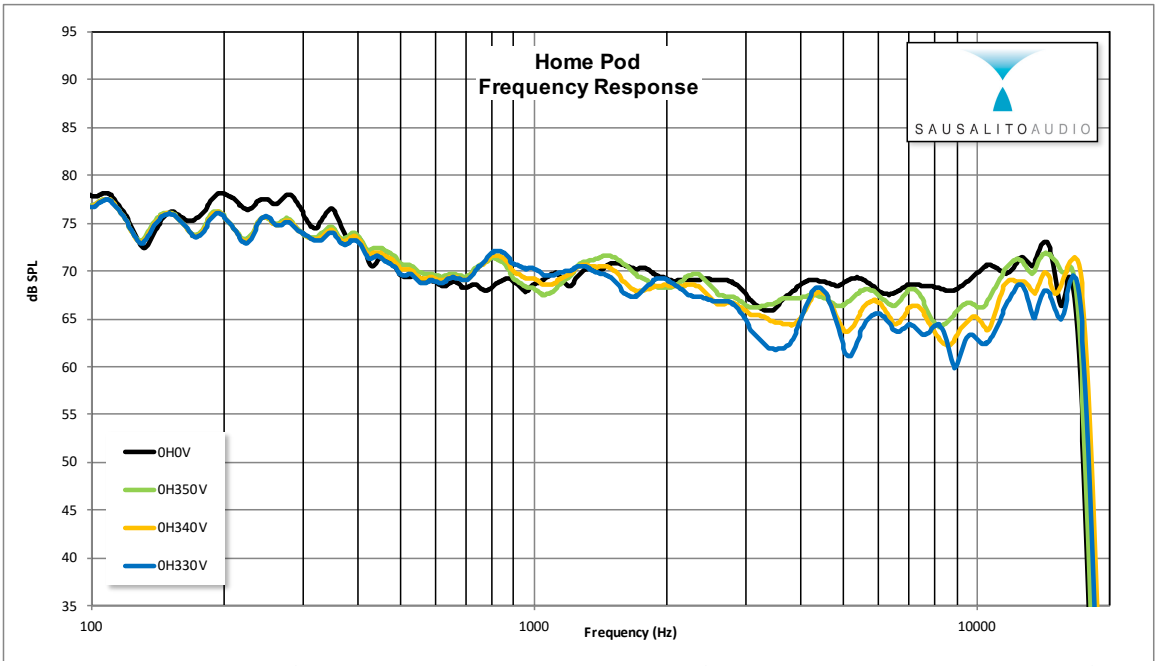

Figure 5: Response curves for 10°, 20° & 30° below the 0° vertical reference which is 10° above the center of the speaker.

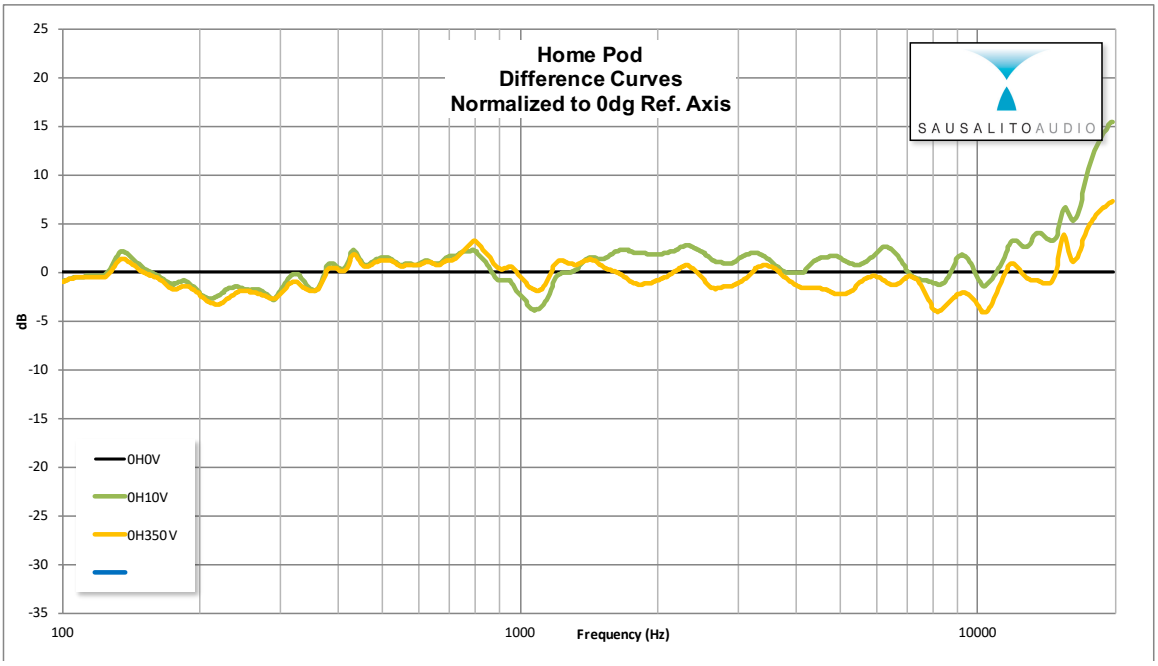

Figure 6: +10° & -10° vertical response normalized to 0° vertical reference axis to better show change over the 20° vertical listening window.

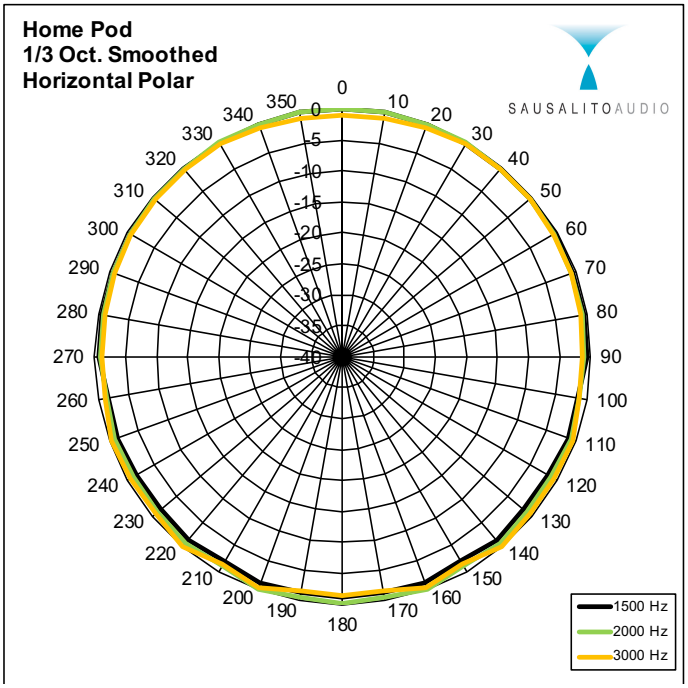

Figure 7: Horizontal polar response at the indicated frequency. Data is normalized to 0dB and smoothed to 1/3 octave per the convention for polar plots.

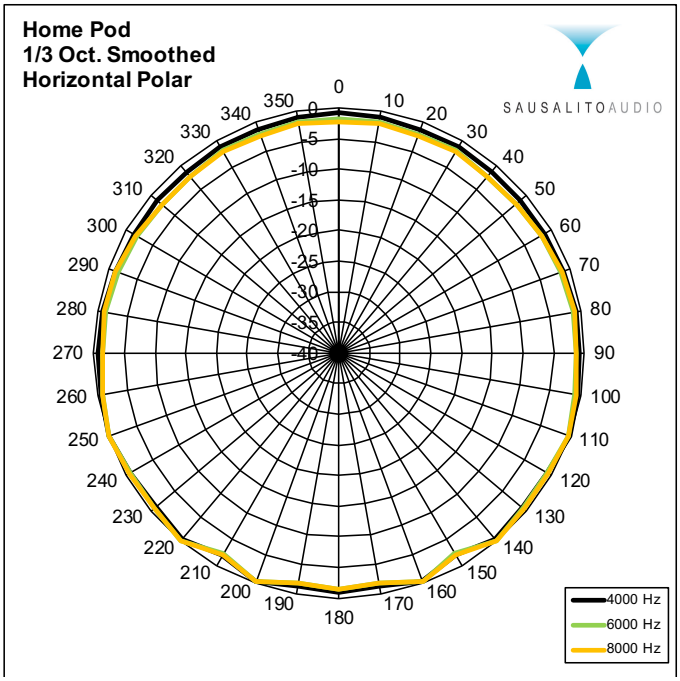

Figure 8: Horizontal polar response at the indicated frequency. Data is normalized to 0dB and smoothed to 1/3 octave per the convention for polar plots.

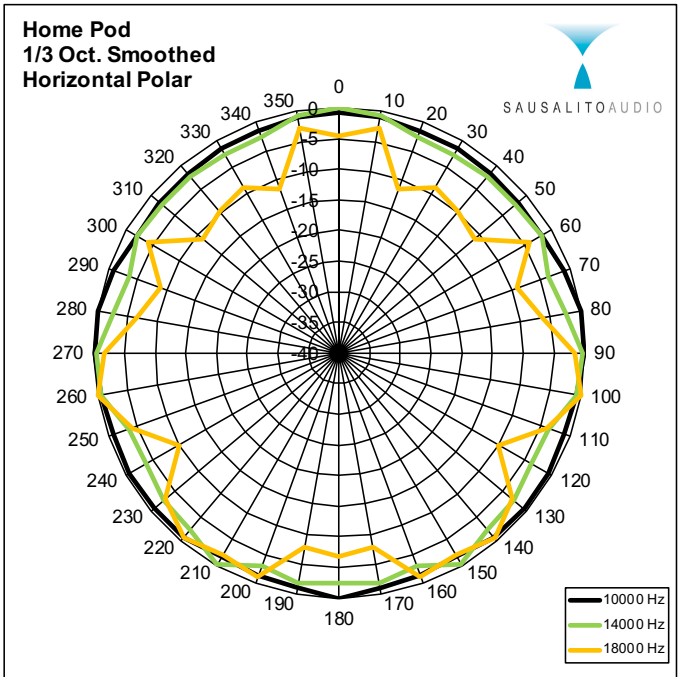

Figure 9: Horizontal polar response at the indicated frequency. Data is normalized to 0dB and smoothed to 1/3 octave per the convention for polar plots.

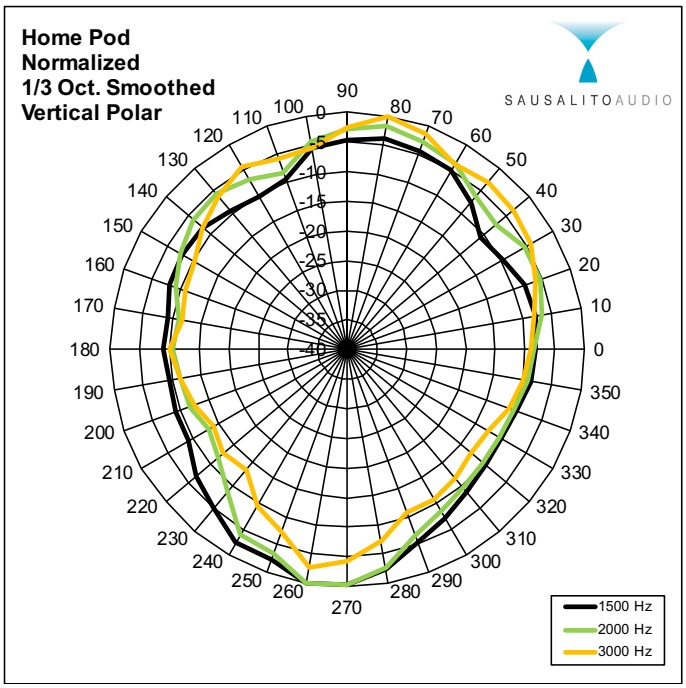

Figure 10: Vertical polar response at the indicated frequency. Data is normalized to 0dB and smoothed to 1/3 octave per the convention for polar plots.

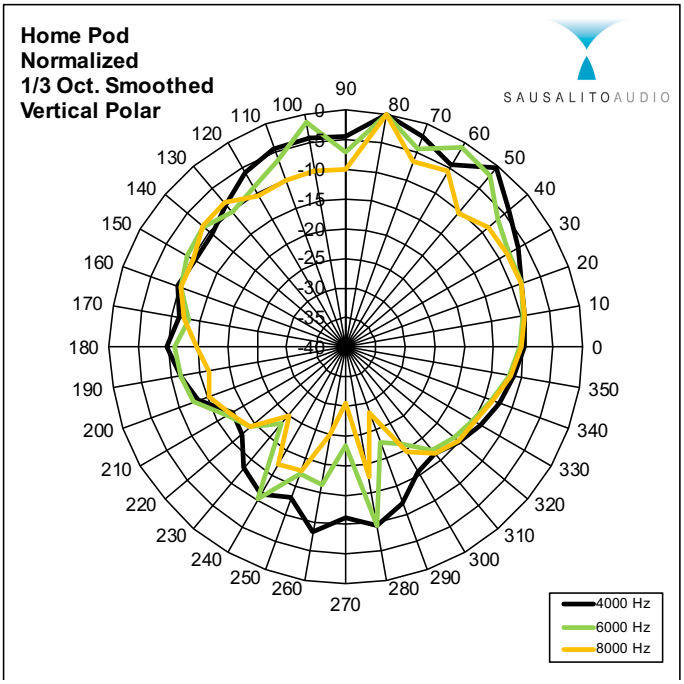

Figure 11: Vertical polar response at the indicated frequency. Data is normalized to 0dB and smoothed to 1/3 octave per the convention for polar plots.

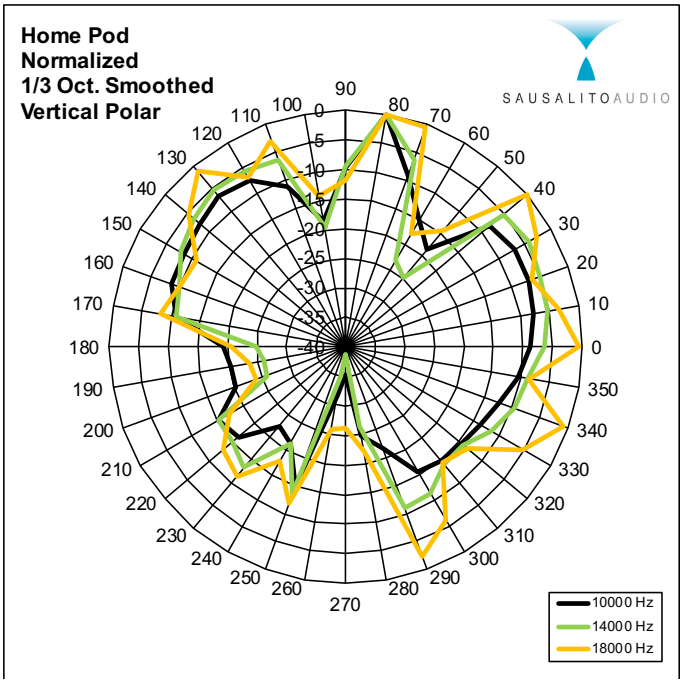

Figure 12: Vertical polar response at the indicated frequency. Data is normalized to 0dB and smoothed to 1/3 octave per the convention for polar plots.