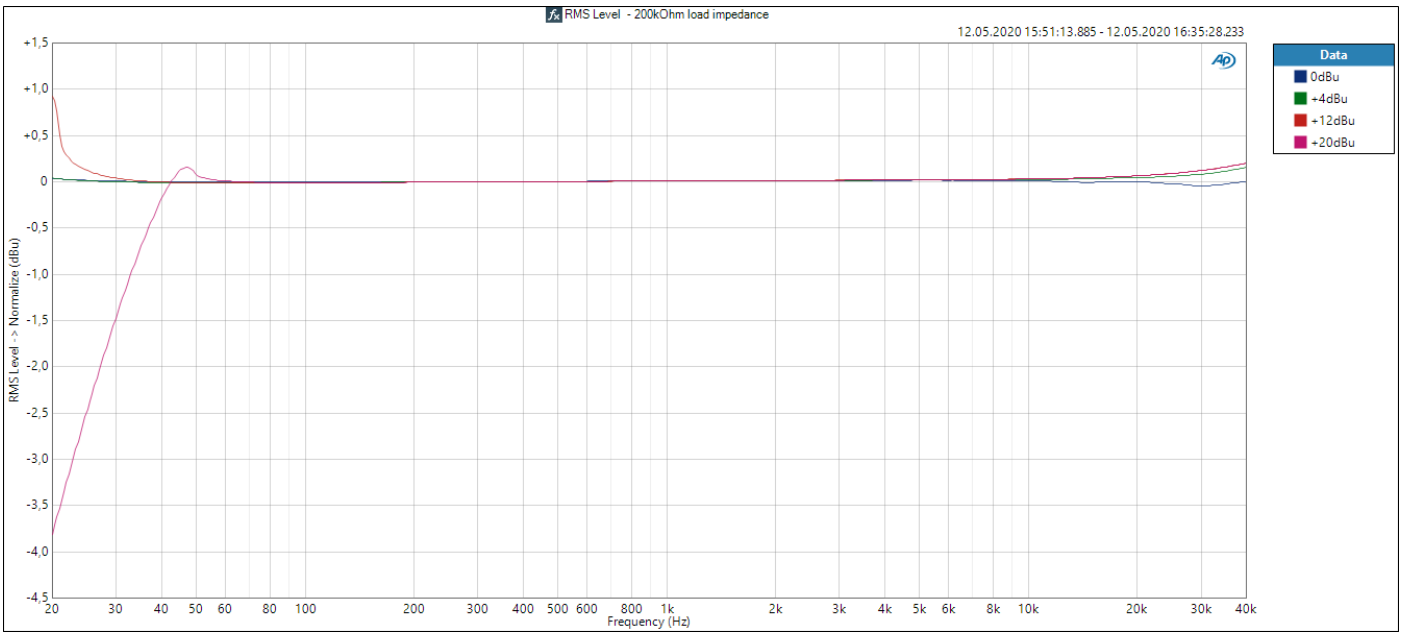
OTECABLES
WHEN SOUND REALLY MATTERS


# DIverse

## Measurement results

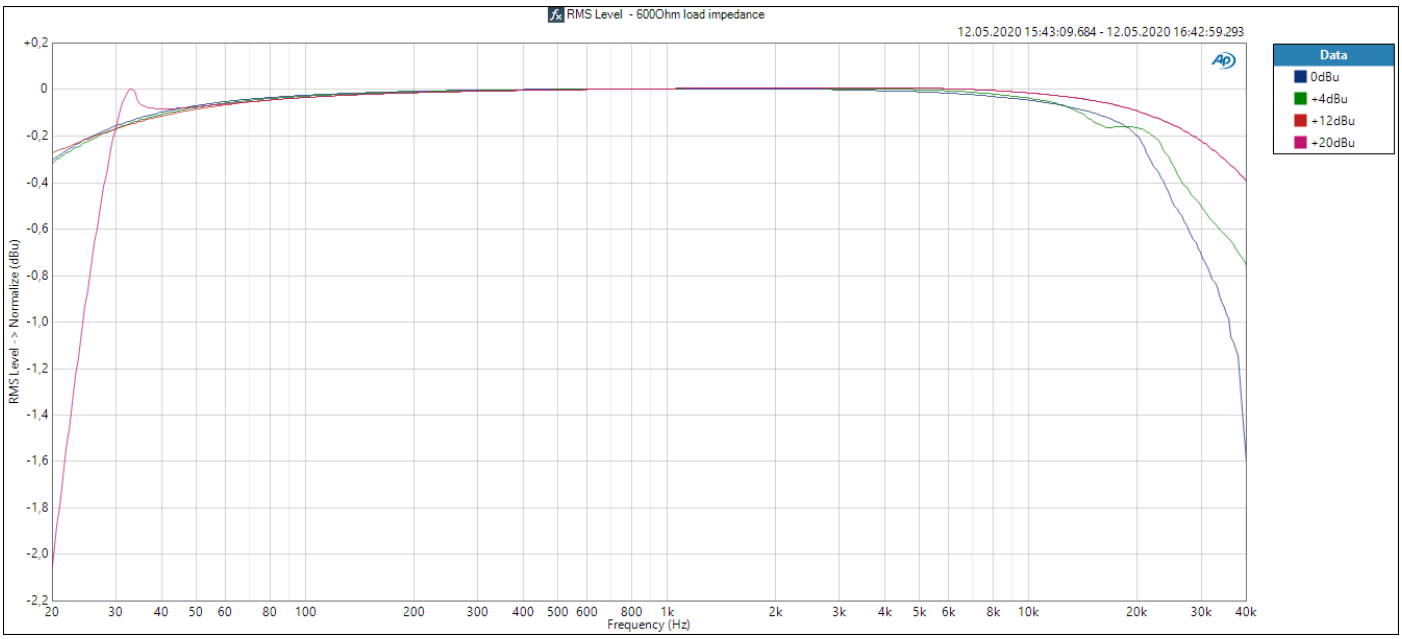
***DI**Verse BLUE*

## Frequency response at levels between 0 – +20 dBu
## normalized to 0 dB at 1 kHz, load impedance 200 kOhm




Frequency response is completely linear up to +4 dBu. At +12 dBu, a slight production of lower harmonics in the low frequencies starts to occur due to saturation of the transformer core, which is clearly manifested in the frequency characteristics. At high levels of +20 dBu, there is a noticeable steep increase in distortion. (see FFT chart).
A slight diffusion of the chart in higher frequency spectrum can be attributed to the conditions of the actual measurements. (this is not due to the transformer self-resonant frequency, which for this type of transformer is at over 200 kHz)

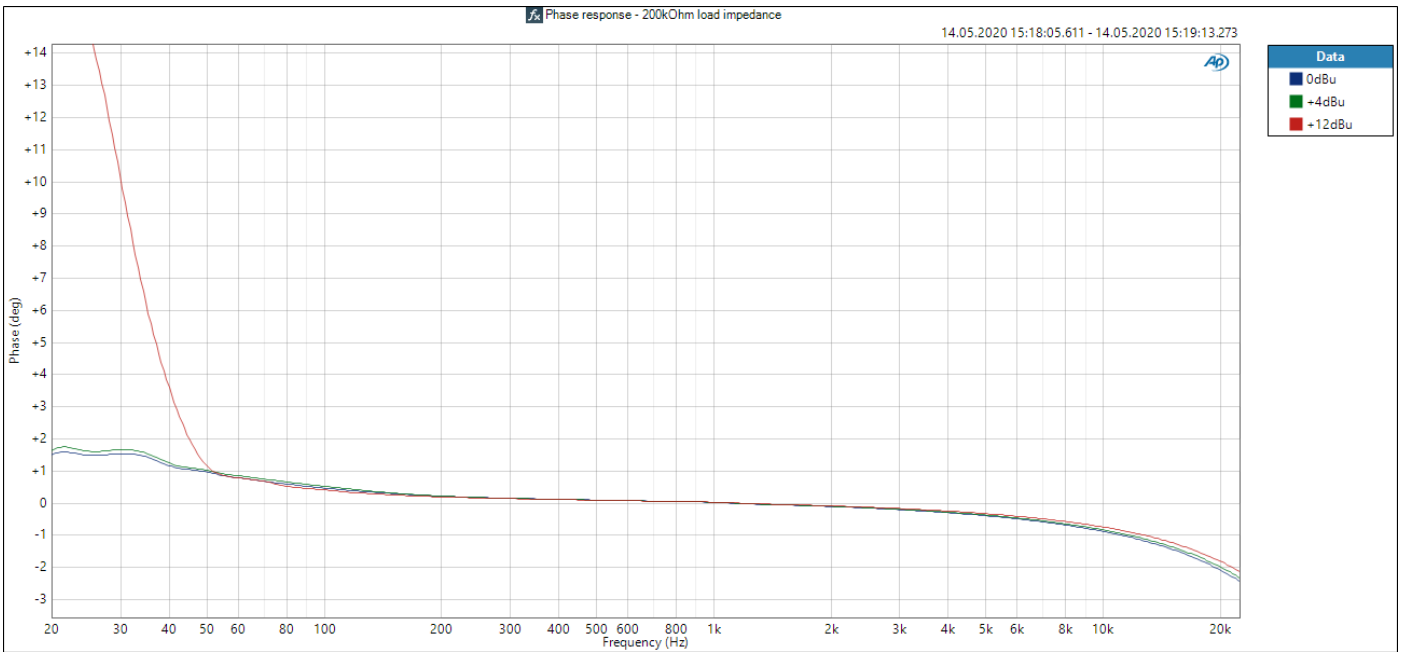
## Frequency response at levels between 0 – +20 dBu
## normalized to 0dB at 1 kHz, load impedance 600 Ohm




At higher load values (in this case at the limit of 600 Ohm), a decrease in higher frequencies takes place due to circuit loss (transfer accuracy). In contrast, the distortion in lower frequencies is decreased by desaturation of the transformer core.

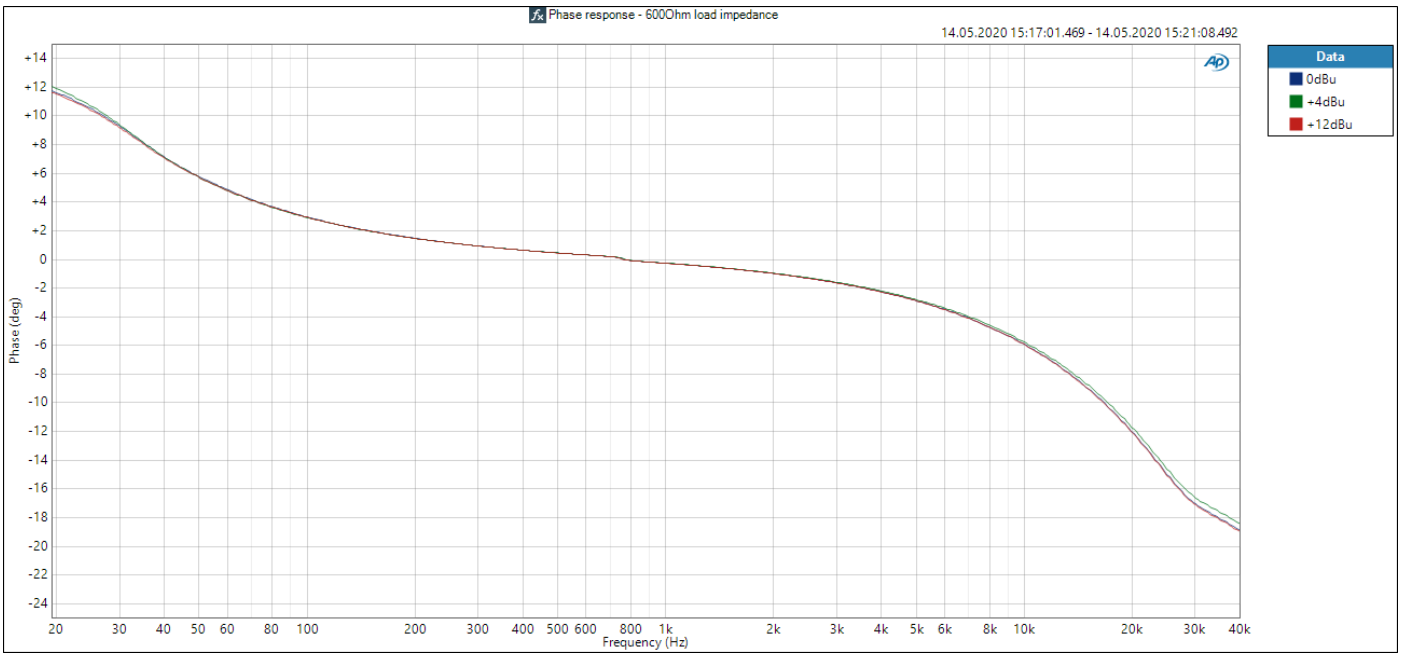
***DI**Verse BLUE*

## Phase characteristics at levels between 0 – +12 dBu
## load impedance: 200 kOhm




Phase characteristics are linear for conventional amplitudes. At higher amplitudes (from +12 dBu), measurements become less accurate due to increase in higher harmonics.

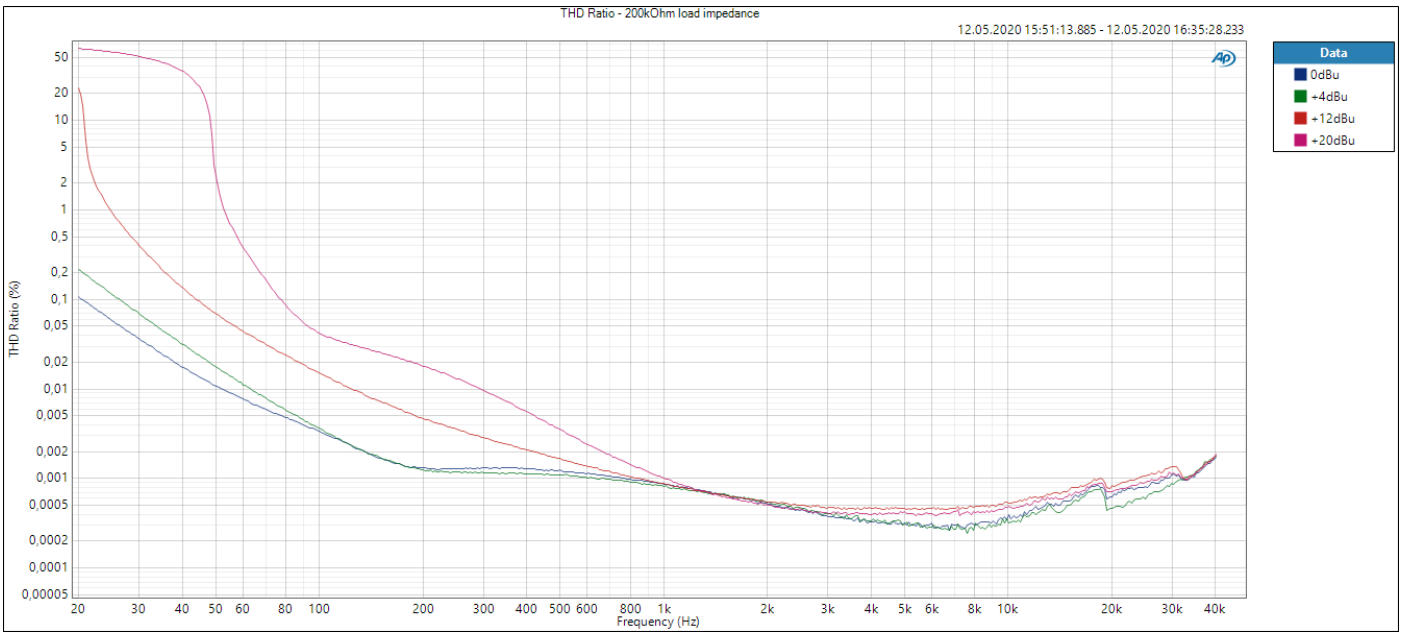
## Phase characteristics at levels between 0 – +12 dBu
## load impedance: 600 Ohm




After applying load, a slight linear shift occurs at the edges of the spectrum. By desaturation of the transformer core, production of harmonics is decreased and phase characteristics are comparable even at higher levels (+12 dBu).

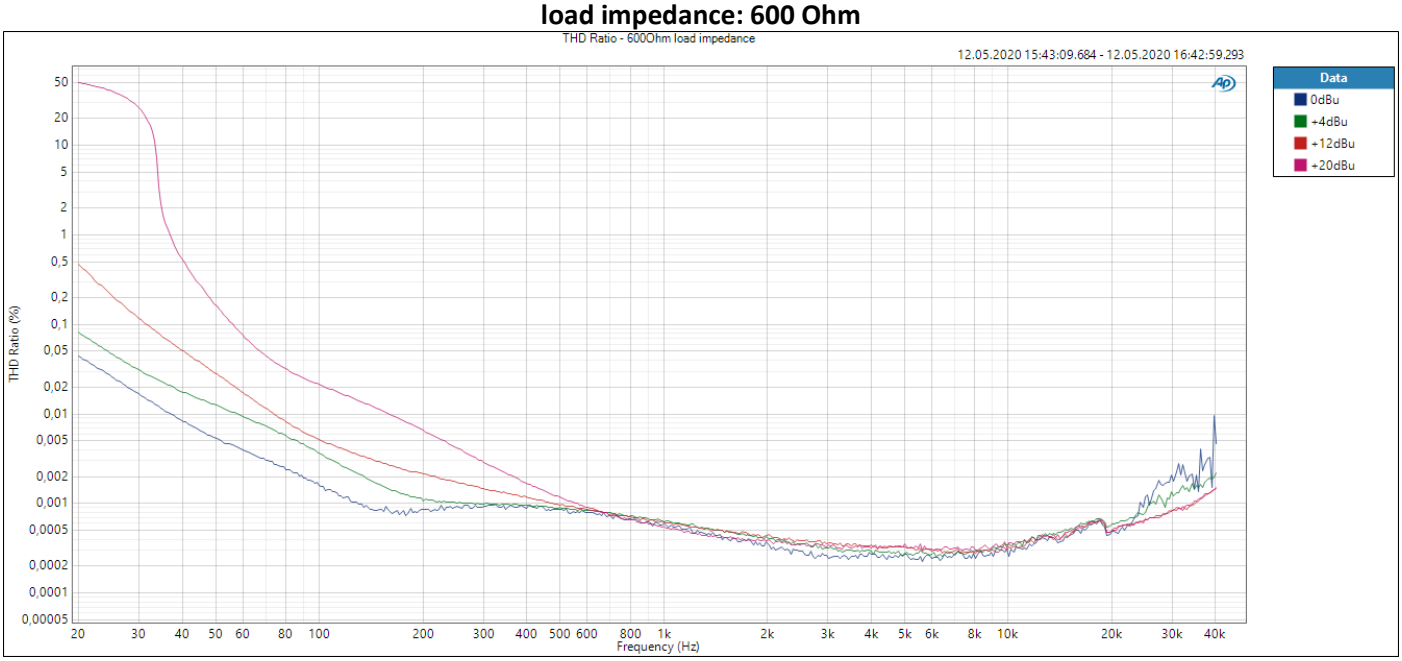
***DI**Verse BLUE*

## Total harmonic distortion (THD) at levels between 0 - +20dBu
## load impedance: 200 kOhm




At +12 dBu, a slight production of lower harmonics in the low frequencies starts to occur due to saturation of the transformer core. At high levels of +20 dBu, there is a noticeable steep increase in distortion.

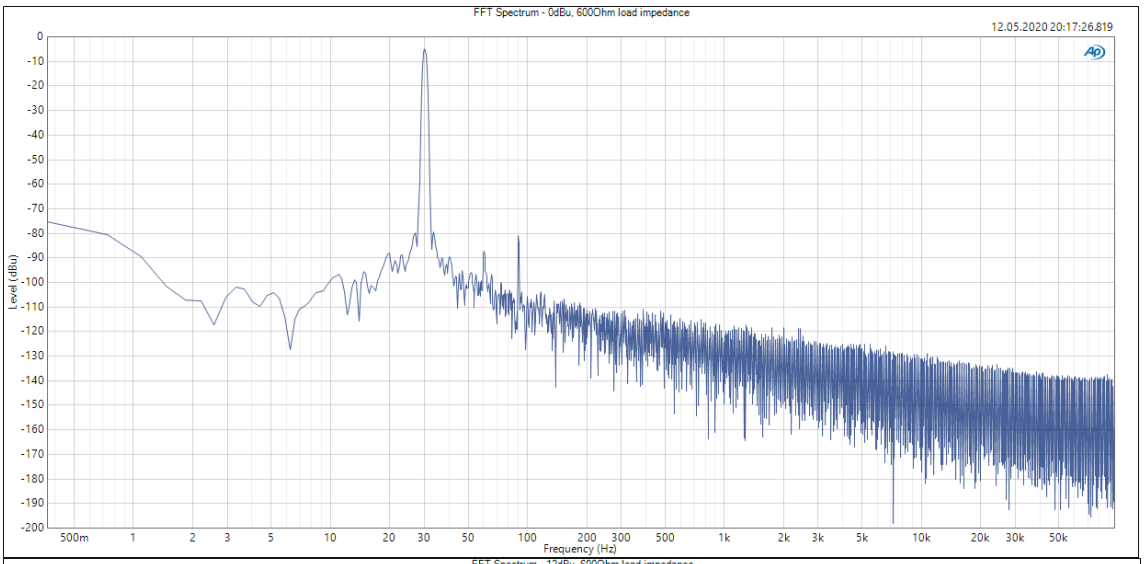
## Total harmonic distortion (THD) at levels between 0 - +20dBu
## load impedance: 600 Ohm

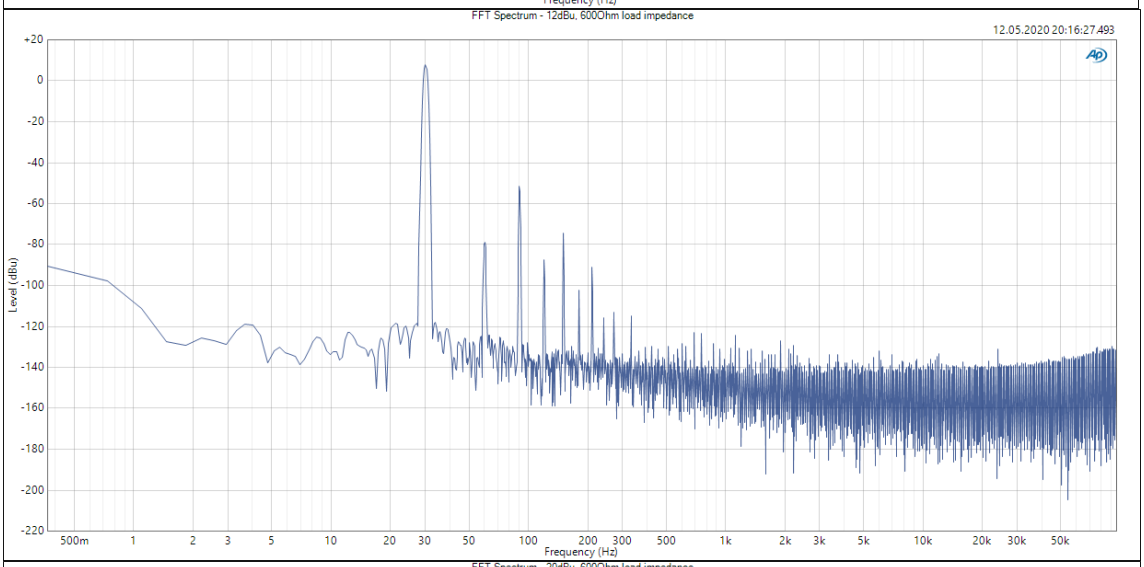


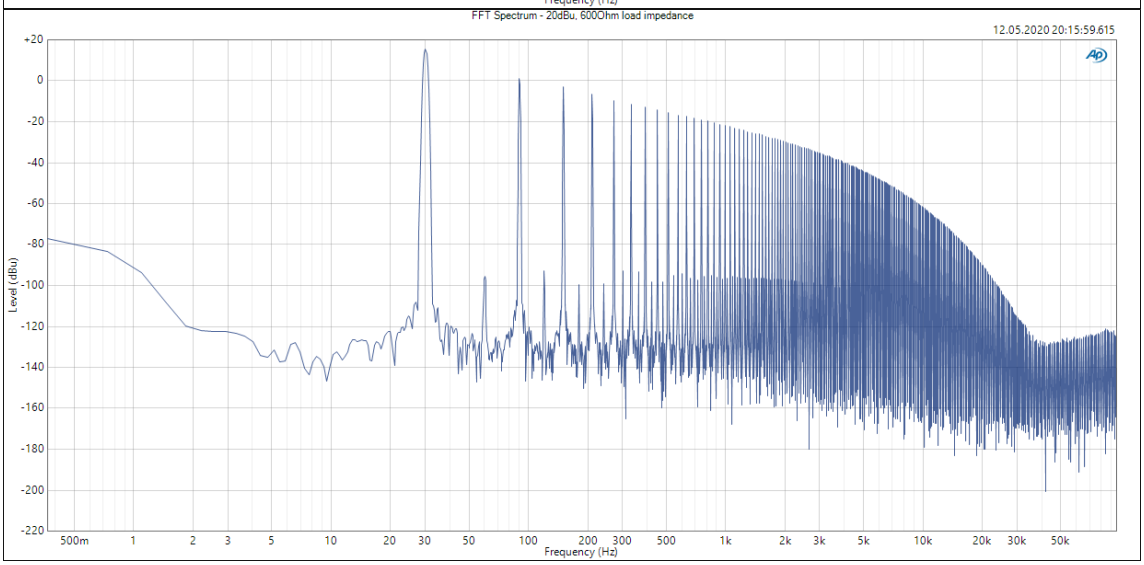

By desaturating the core, distortion of the lowest frequencies is decreased (except for extreme amplitudes around +20 dBu)

***DI**Verse BLUE*

**FFT spectrum for 30 Hz at levels between 0 – +20 dBu**
**load impedance: 600Ohm**



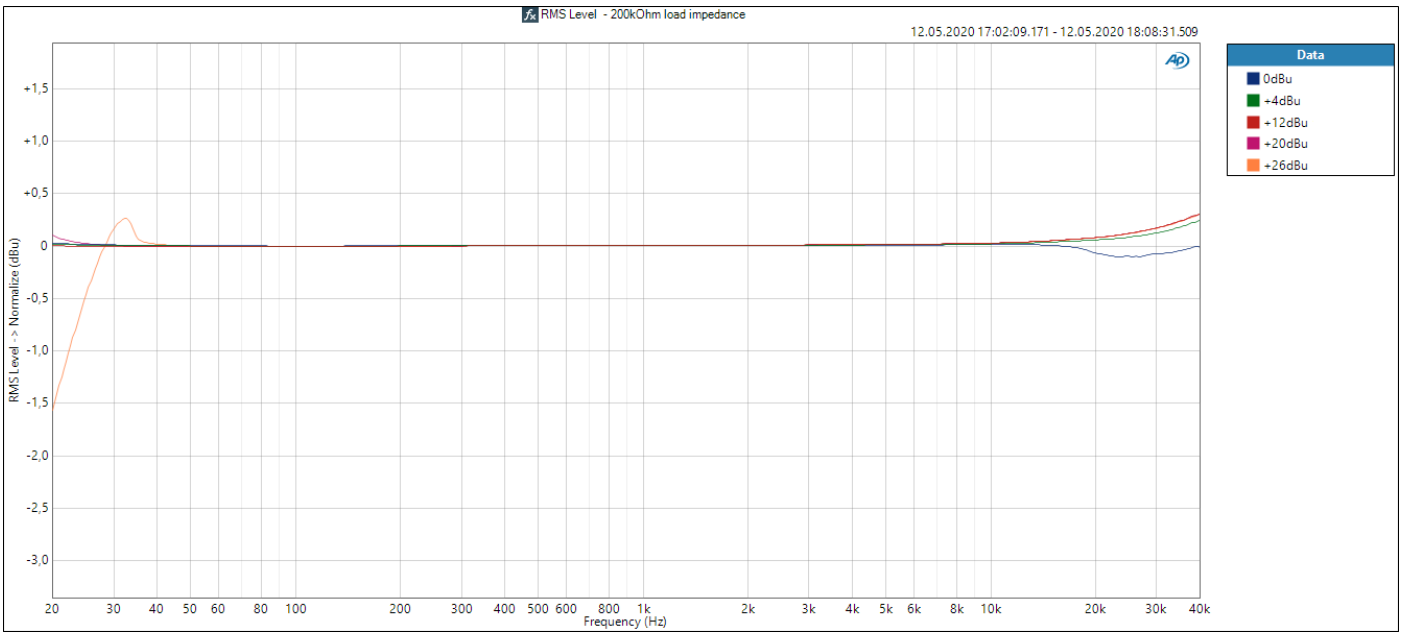




The THD curve differently interprets properties described in previous charts. Subjectively positive distortion of the signal is characterized mostly by production of lower harmonics (3rd harmonic is dominant). By further increasing the amplitude, the production of higher harmonics (5th - 7th) is increased. At extreme amplitudes, a complete collapse of the transfer function is reflected in the chart. When doing measurements on ***DI**Verse* RED, it was not possible to produce a high enough amplitude for this to manifest.

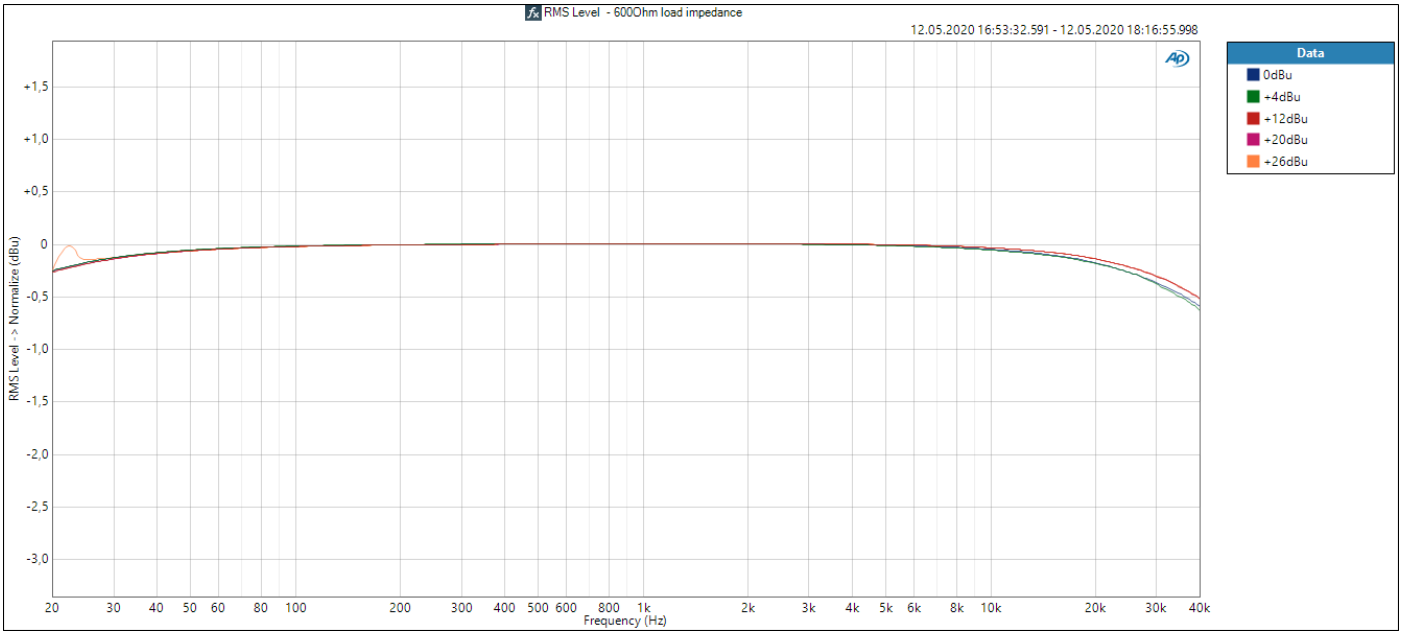
***DI**Verse RED*

**Frequency characteristics at levels between 0 – +26 dBu**
**normalized to 0 dB at 1 kHz, load impedance: 200 kOhm**




Frequency response is completely linear at levels up to +20 dBu. At +26 dBu, production of lower harmonics in low frequencies starts to occur due to saturation of the transformer core.
A slight diffusion of the graph in higher frequency spectrum can be attributed to the conditions of the actual measurements (this is not due to the transformer self-resonant frequency, which for this type of transformer happens at over 200 kHz)

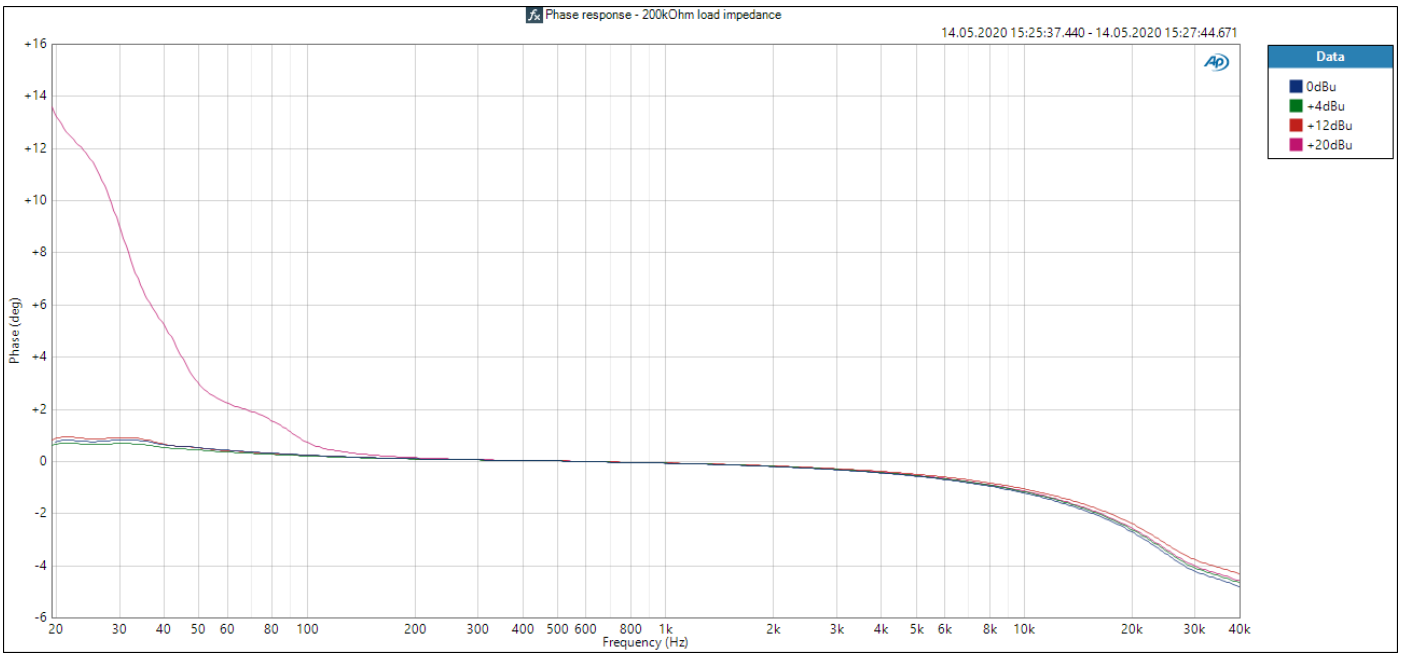
**Frequency characteristics at levels between 0 – +26 dBu**
**normalized to 0 dB at 1 kHz, load impedance: 600 Ohm**




At higher load values (in this case at the limit of 600 Ohm), a decrease in higher frequencies takes place due to circuit loss (transfer accuracy). In contrast, the distortion in lower frequencies is decreased by desaturation of the transformer core.

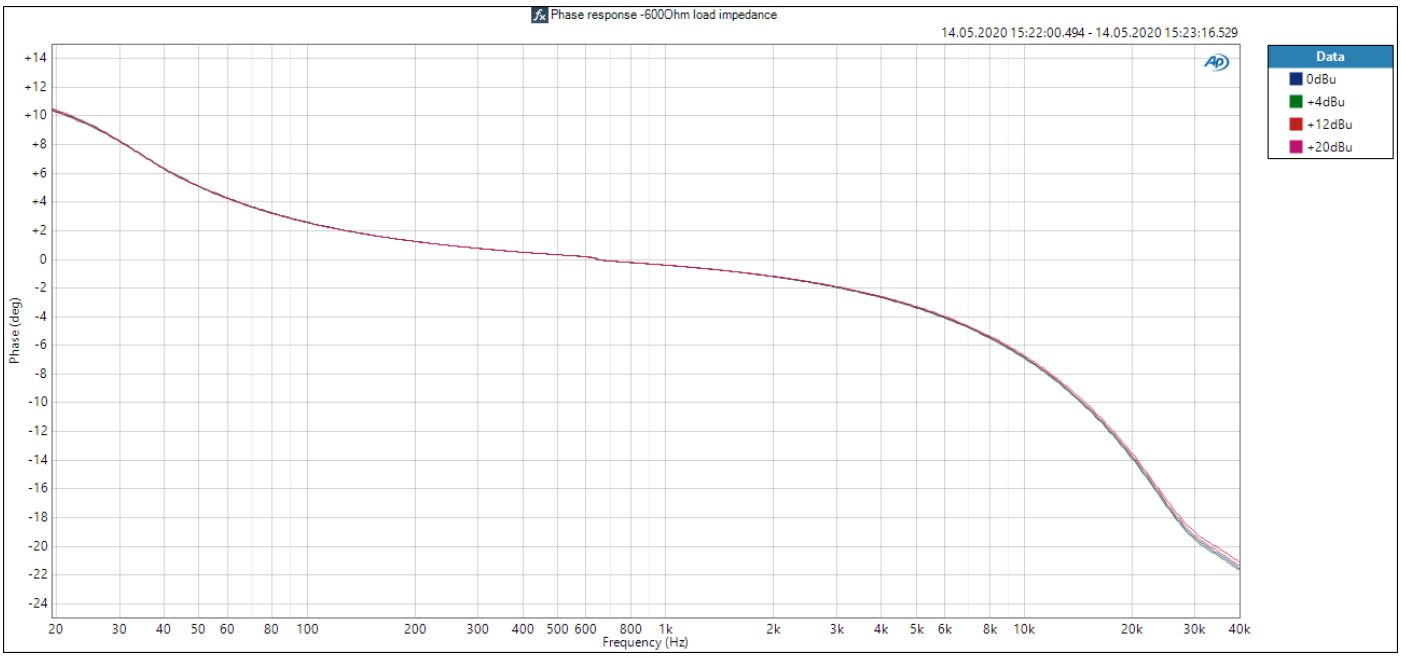
***DI**Verse RED*

**Phase characteristics at levels between 0 – +20 dBu**
**load impedance: 200 kOhm**




Phase characteristics are linear for conventional amplitudes. At higher amplitudes (from +20 dBu), measurements become less accurate due to increase in higher harmonics.

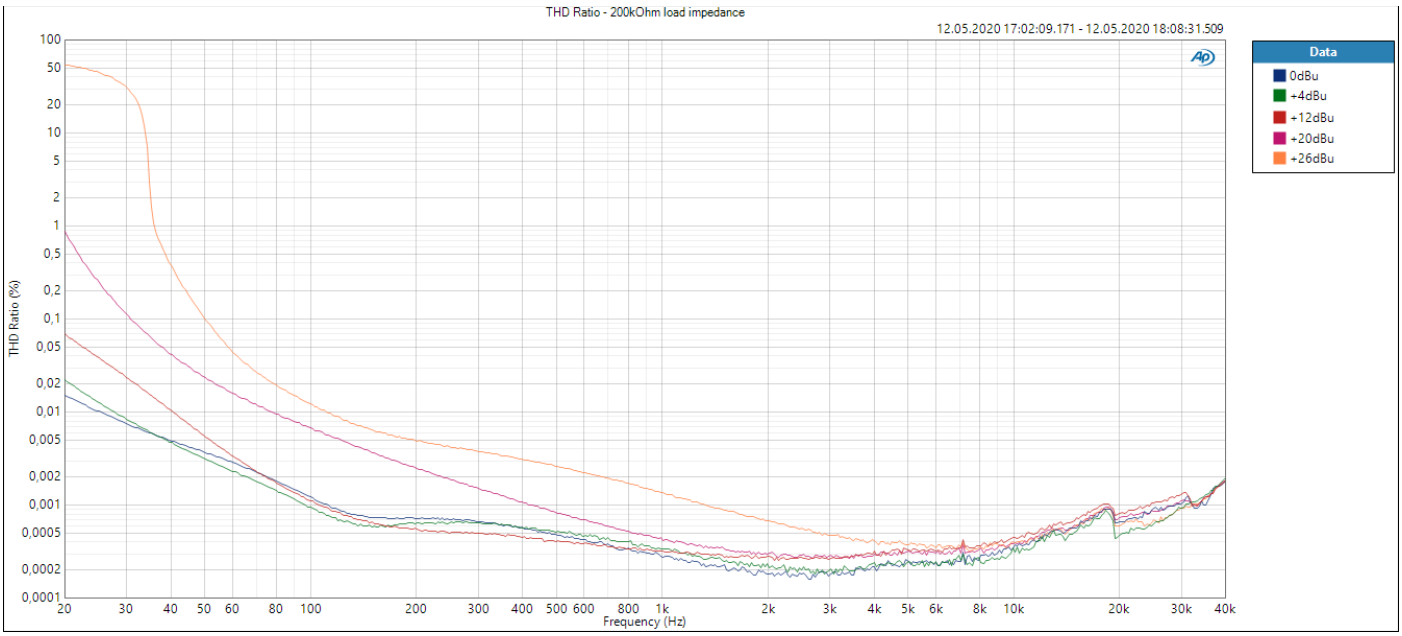
**Phase characteristics at levels between 0 – +20 dBu**
**load impedance: 600 Ohm**




After applying load, a slight linear shift occurs at the edges of the spectrum. By desaturation of the transformer core, production of harmonics is decreased and phase characteristics are comparable even at higher levels (+12 dBu).

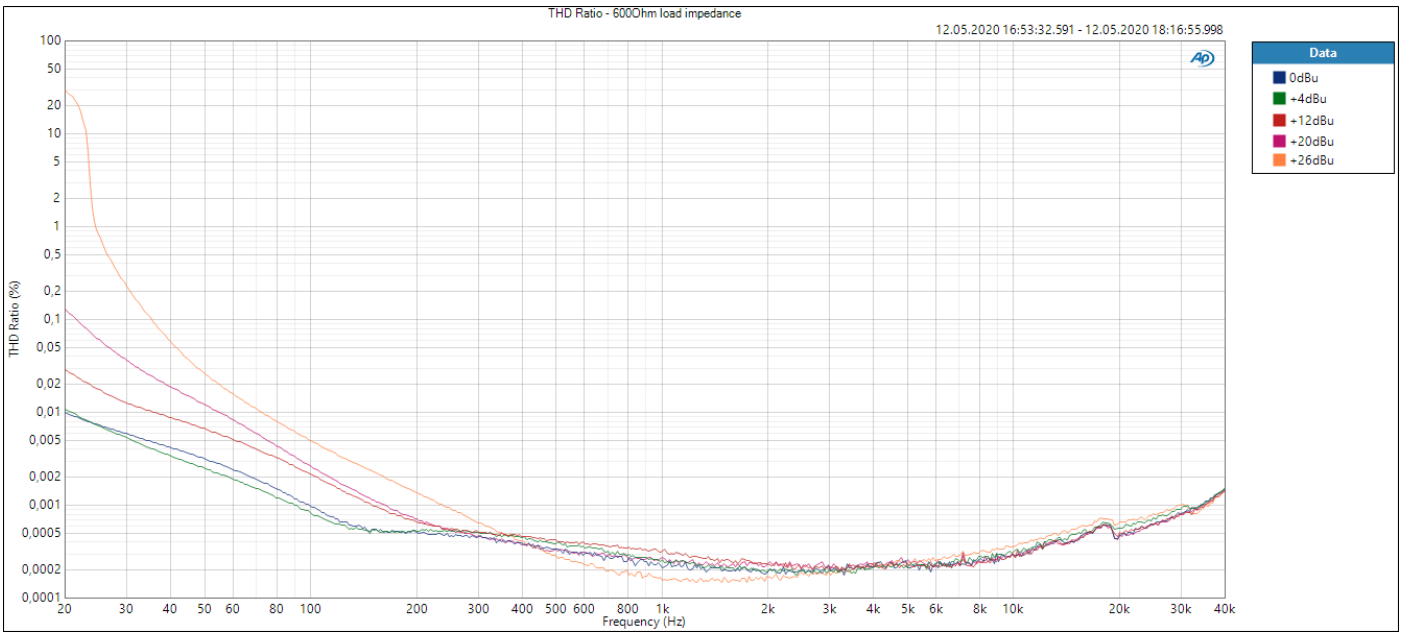
***DI**Verse RED*

## Total harmonic distortion (THD) at levels between 0 – +26 dBu
## load impedance: 200 kOhm




At +20 dBu, a slight production of lower harmonics in the low frequencies starts to occur due to saturation of the transformer core. At high levels of +26 dBu, there is a noticeable steep increase in distortion.

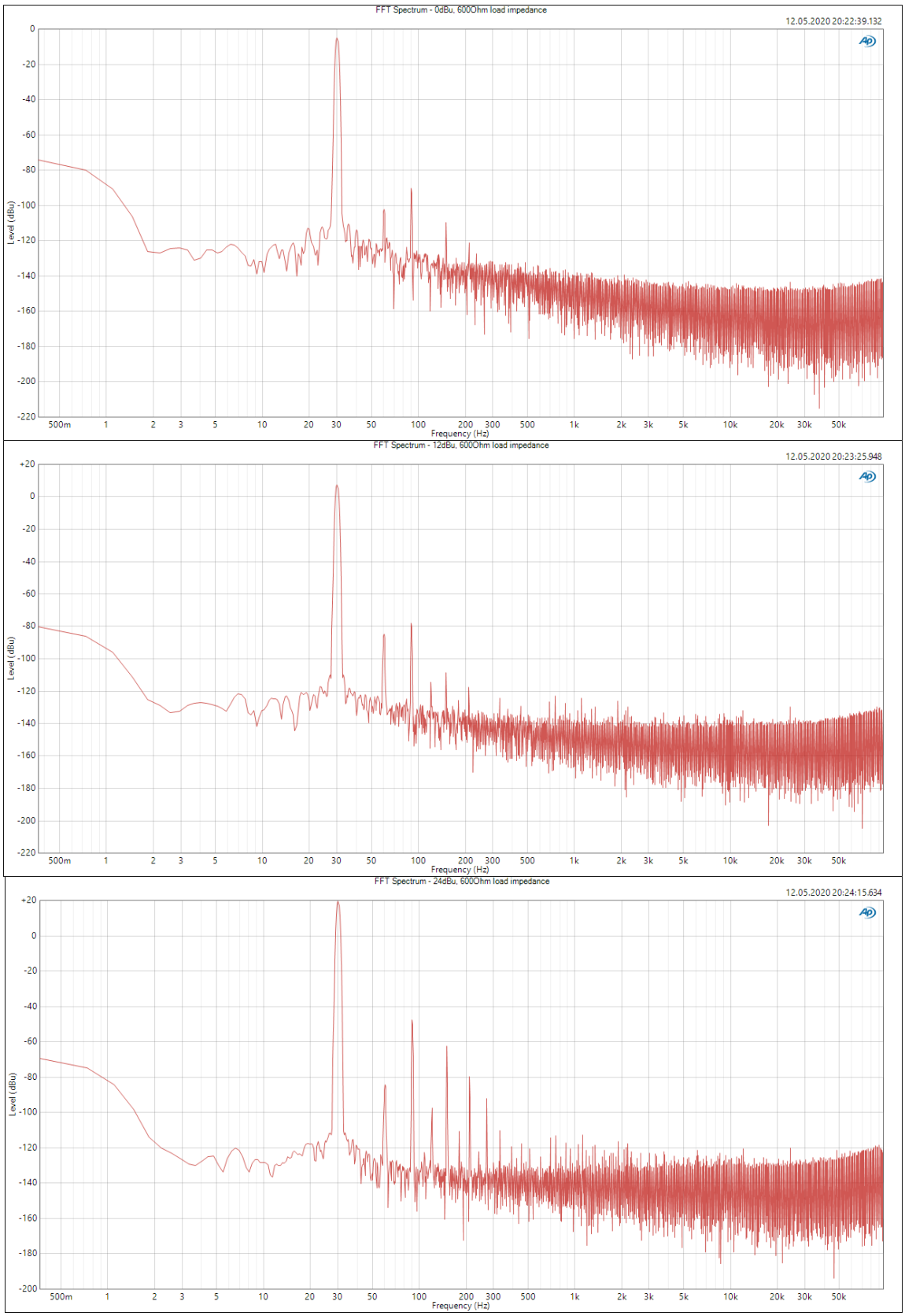
## Total harmonic distortion (THD) at levels between 0 – +26 dBu
## load impedance: 600 Ohm




By desaturating the core, distortion of the lowest frequencies is decreased (except for extreme amplitudes around +26 dBu).

***DI**Verse RED*

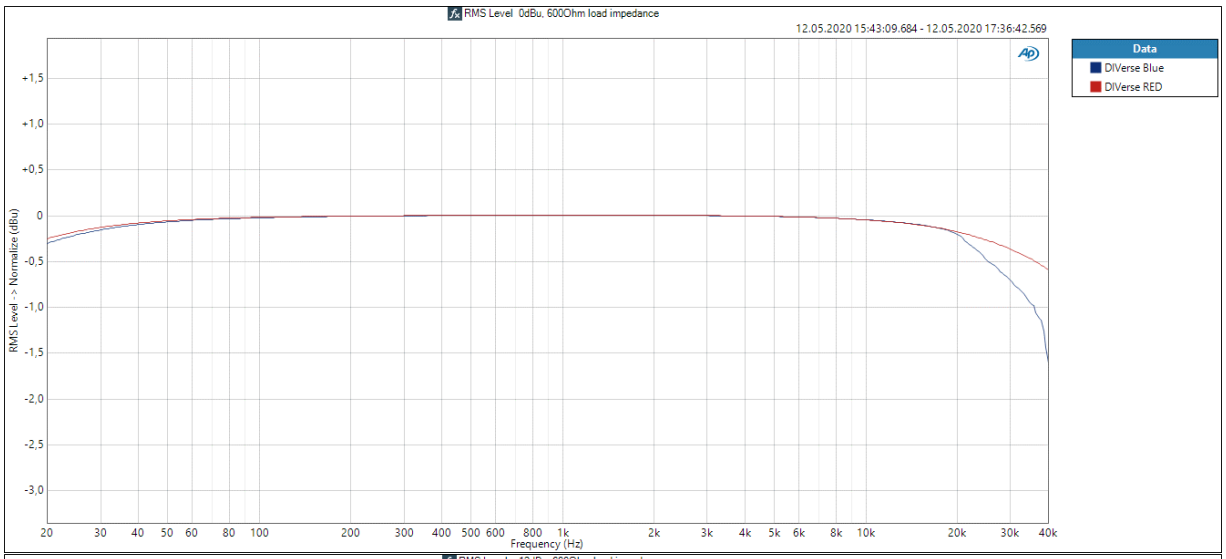
**FFT spectrum for 30 Hz at levels between 0 – +24 dBu**
**load impedance: 600 Ohm**

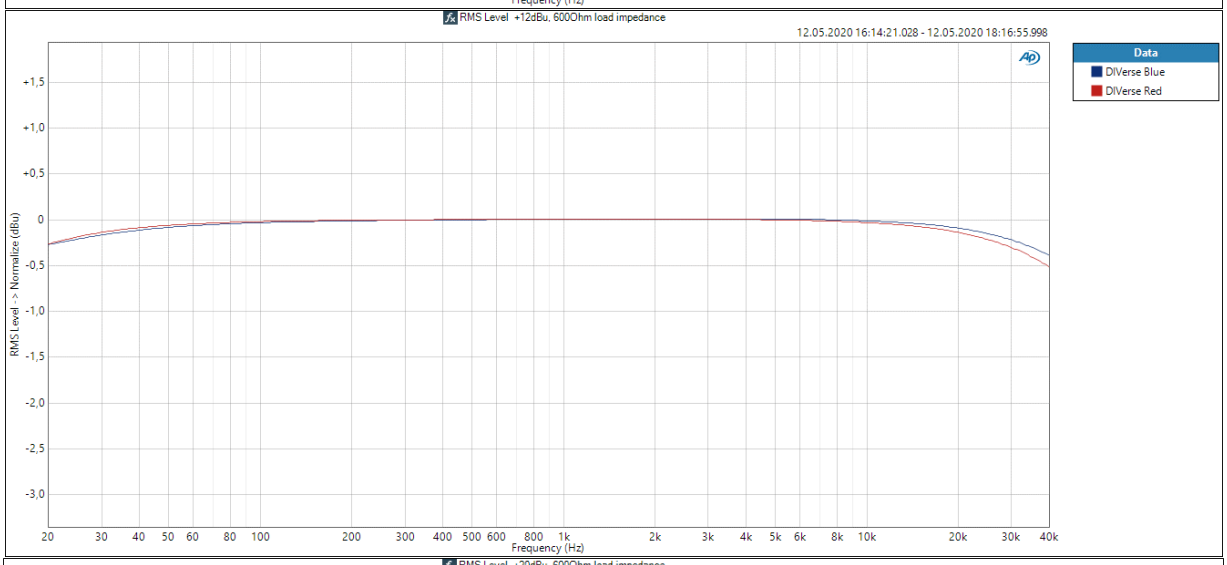


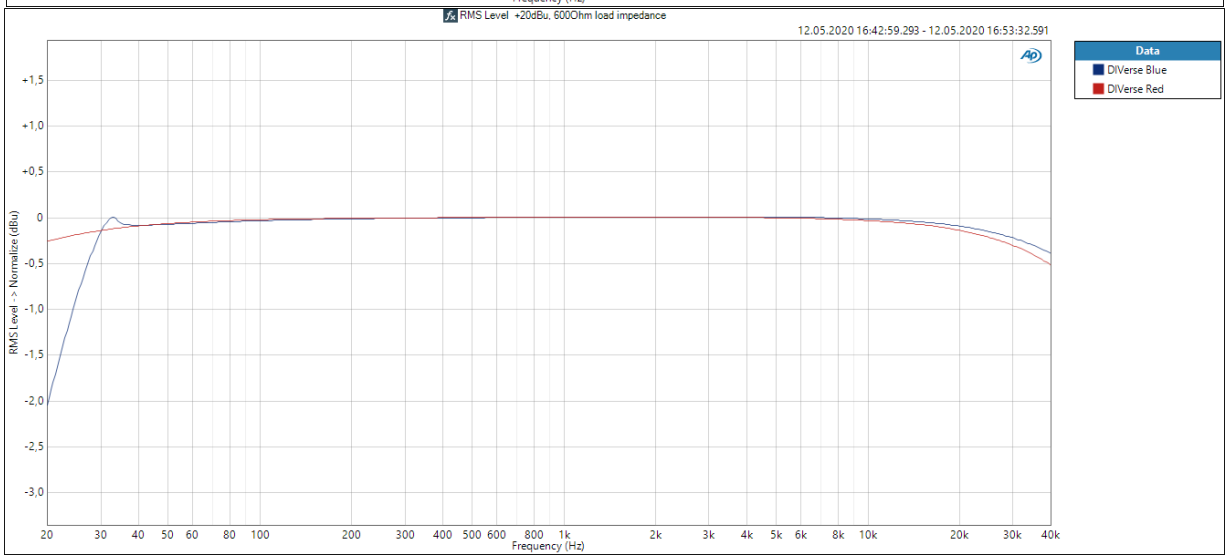

The THD curve differently interprets attributes described in previous charts. Subjectively positive distortion of the signal is characterized mostly by production of lower harmonics (3rd harmonic is dominant). By further increasing the amplitude, the production of higher harmonics (5th - 7th) is increased.

# ***DI**Verse RED vs BLUE*

**Comparison of frequency characteristics of *DIVerse Blue* and *DIVerse Red* at levels of 0, +12, +20 dBu load impedance: 600 Ohm**

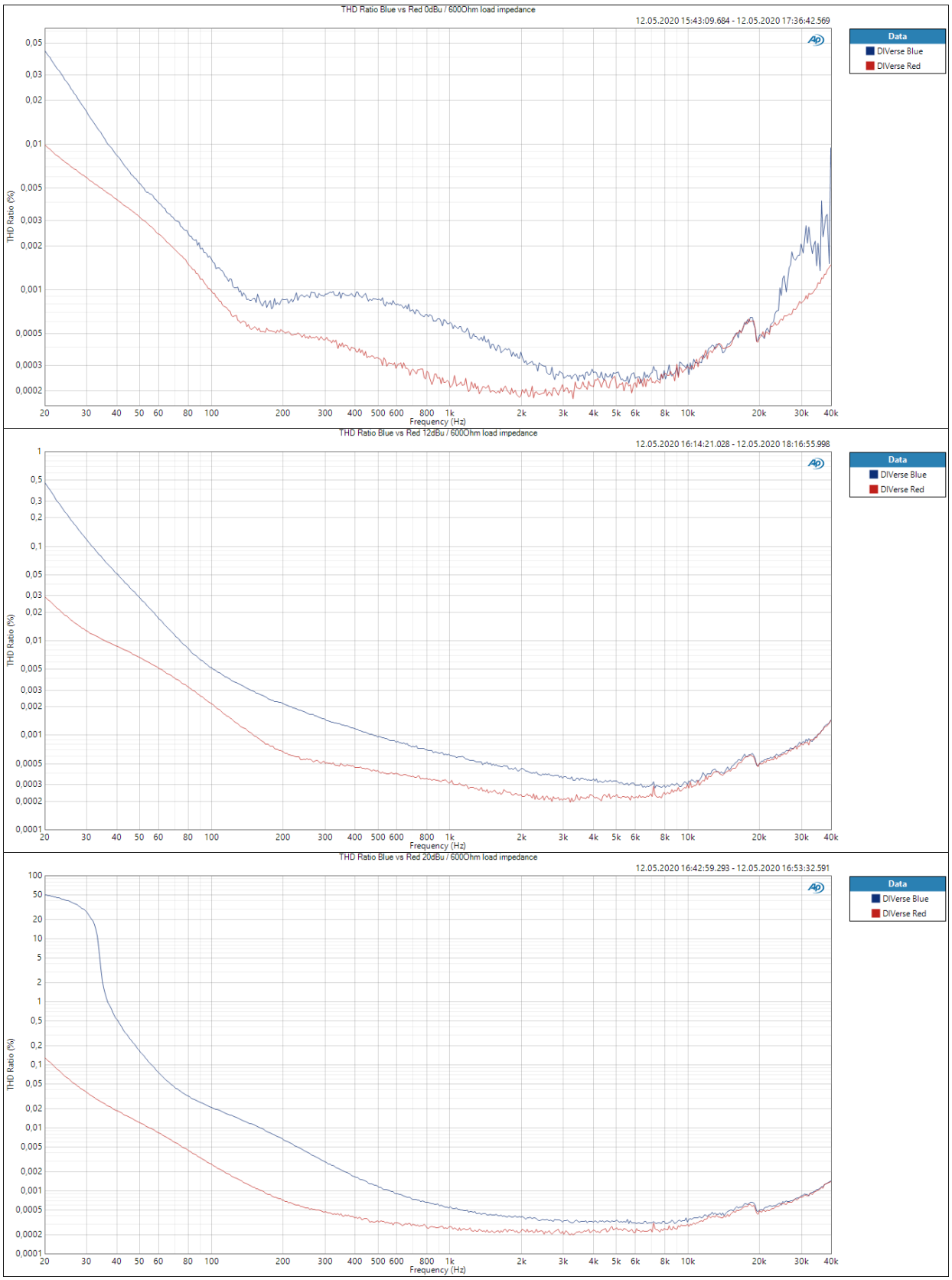


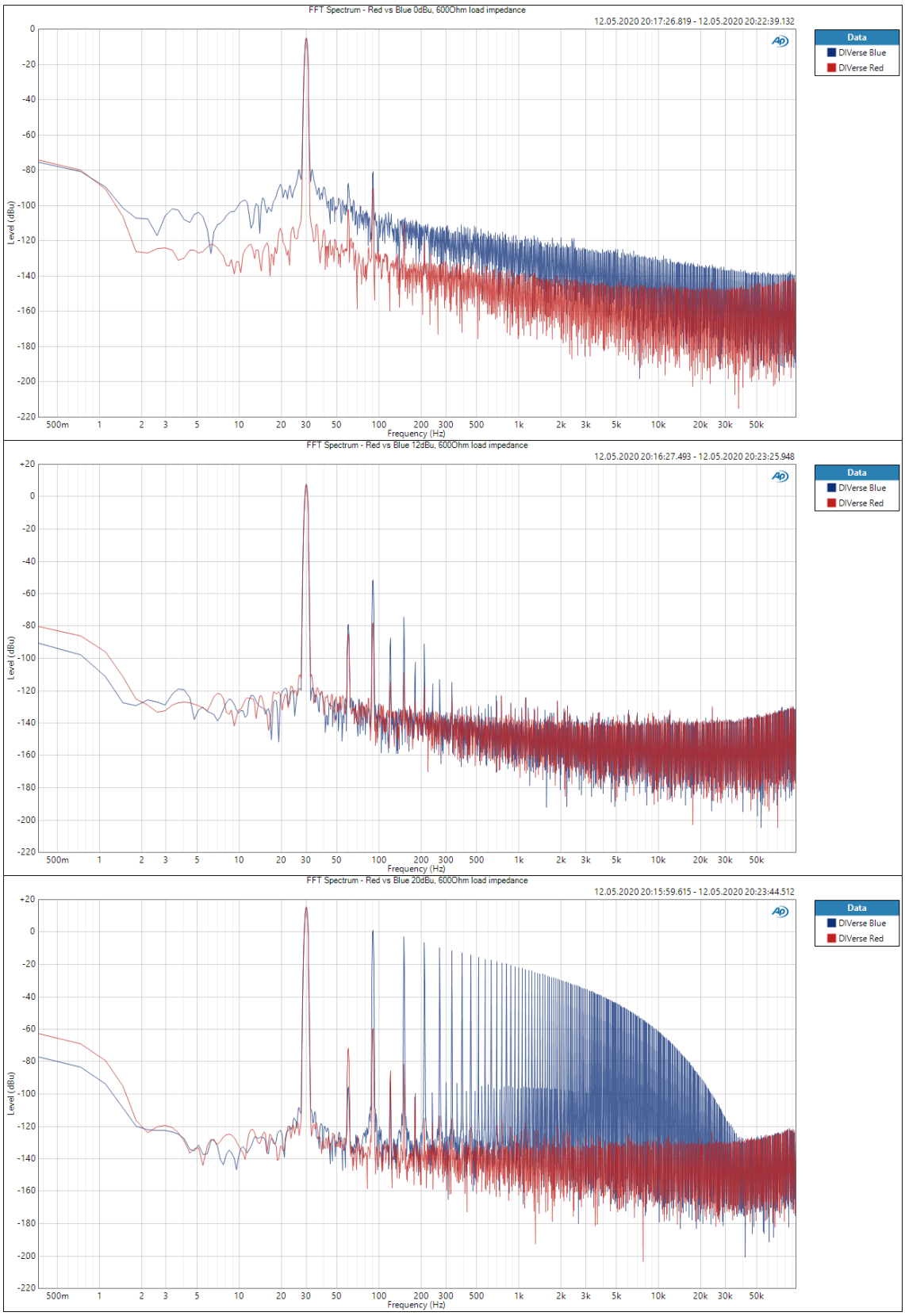
# ***DI**Verse RED vs BLUE*

**Comparison of total harmonic distortion (THD) of *DIVerse Blue* and *DIVerse Red* at levels of 0, +12, +20 dBu load impedance: 600 Ohm**



# ***DI**Verse RED vs BLUE*

**Comparison of the FFT spectrum of *DIVerse Blue* and *DIVerse Red* for 30 Hz at levels of 0, +12, +20 dBu load impedance: 600 Ohm**

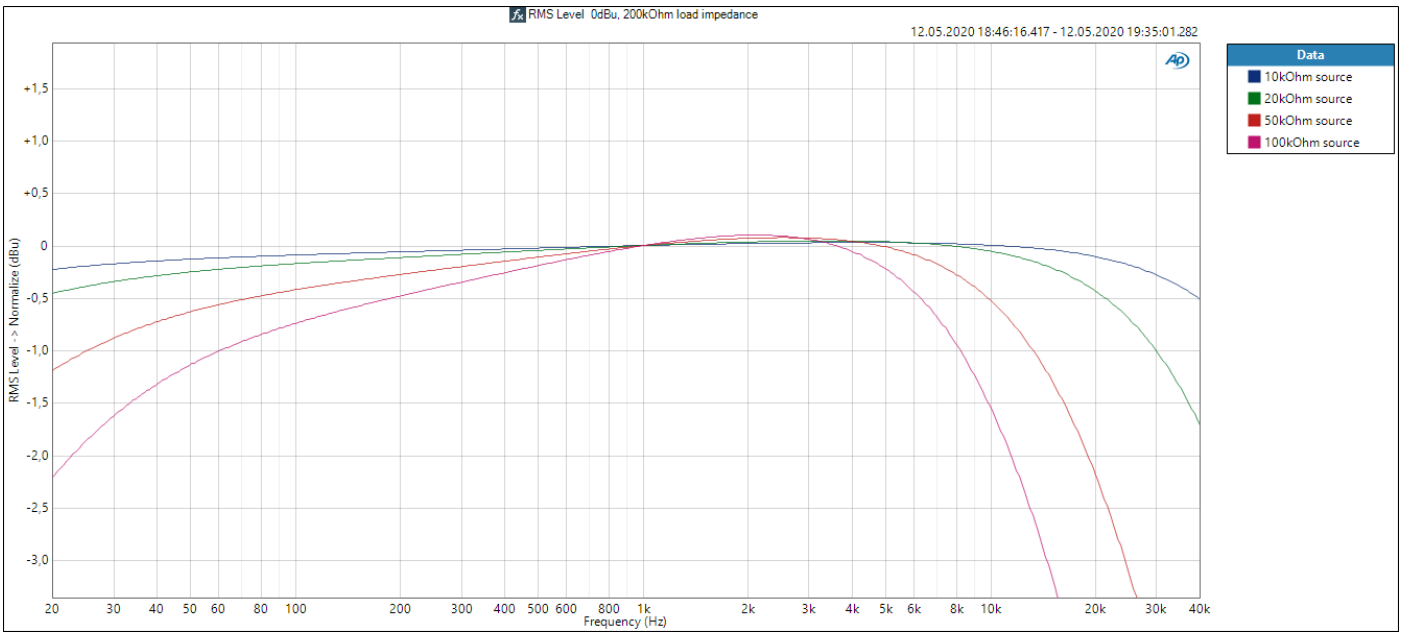



(Pay attention – different scales of display (!))

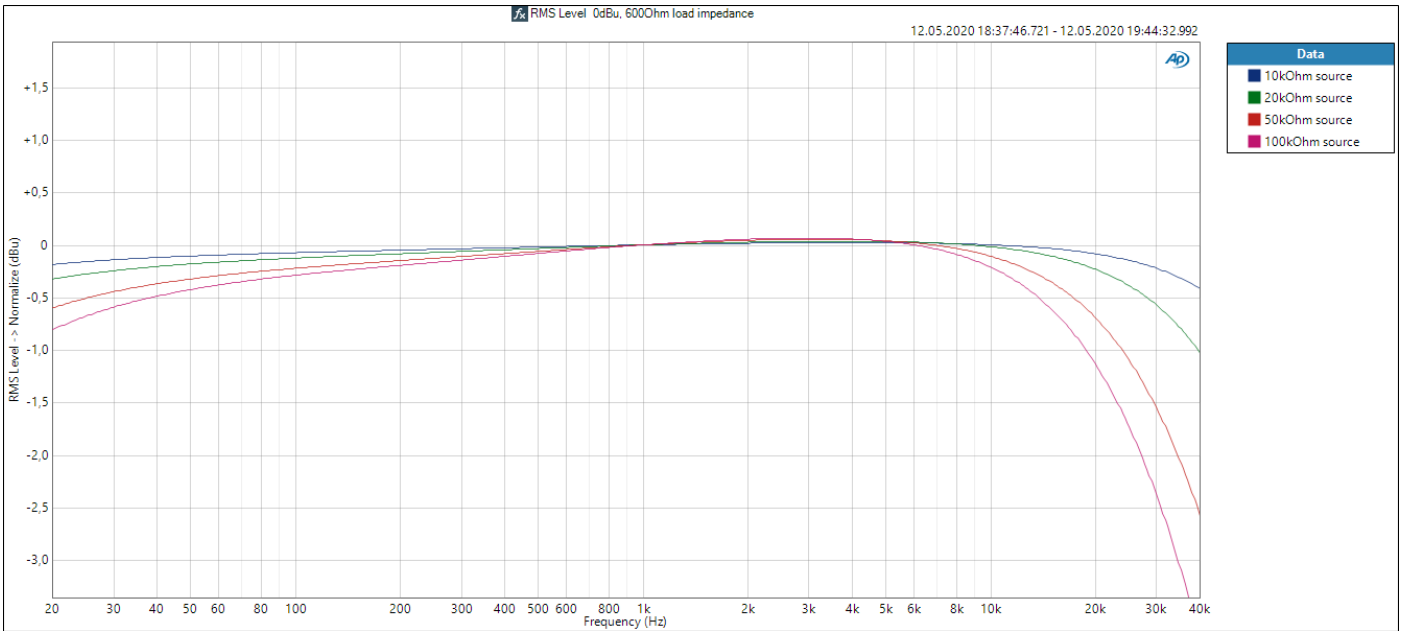
The chart clearly displays the difference in transfer capabilities of extremely high amplitudes; ***DIVerse*** Red performs without unwanted distortion, while DIverse Blue produces high levels of distortion at +20 dBu. <u>It is necessary to carry out measurements at problematic **low frequencies** (under 100 Hz), where the effect of transformer core saturation manifests the most. Measurements at 1 kHz, for example, which is a frequency that is regularly used, would not reveal the difference between properties of the transformers that were used.</u>

# *DI*Verse GREEN

## Frequency characteristics at levels of 0 dBu and source impedance between 10 – 100 kOhm
## load impedance: 200 kOhm



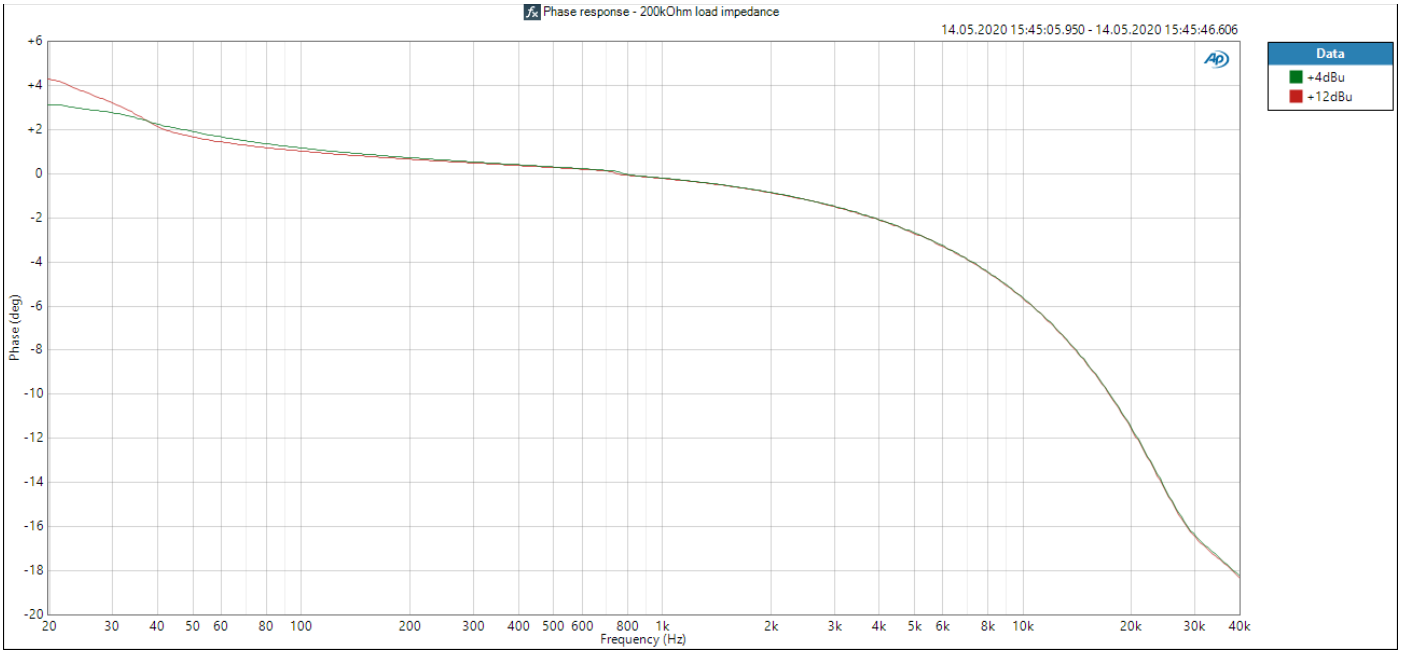

## Frequency characteristics at levels of 0 dBu and source impedance between 10 – 100 kOhm
## load impedance: 600 Ohm



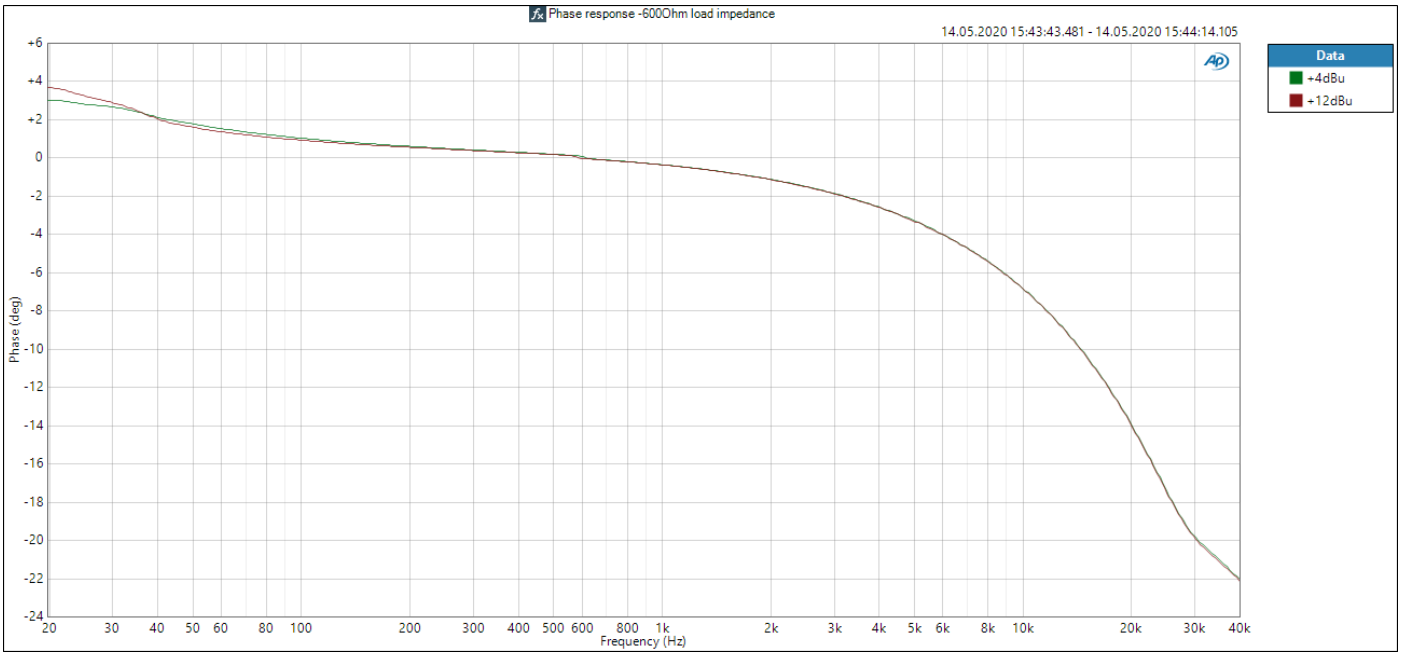

DIVerse Green is designed for instruments in which the quality of output signal is dependent on the highest possible load impedance. Frequency characteristics are dependent on source impedance (for example the type of pickup). Adequate load impedance helps to linearize the frequency characteristics.
Frequency characteristics with the attenuator engaged (-20 dB) correspond to results of 10 kOhm at input impedance of 100 kOhm.

***DI**Verse GREEN*

**Phase characteristics at source impedance of 10 kOhm**
**load impedance: 200 kOhm**



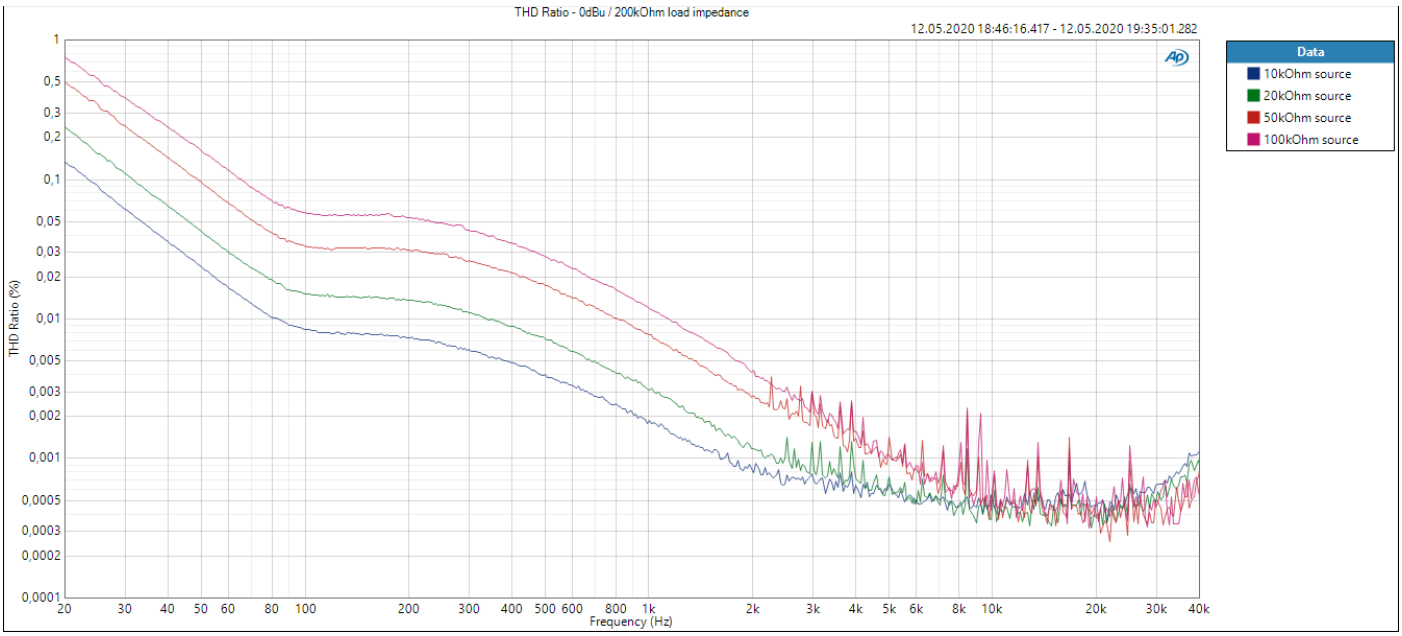

**Phase characteristics at source impedance of 10 kOhm**
**load impedance: 600 Ohm**



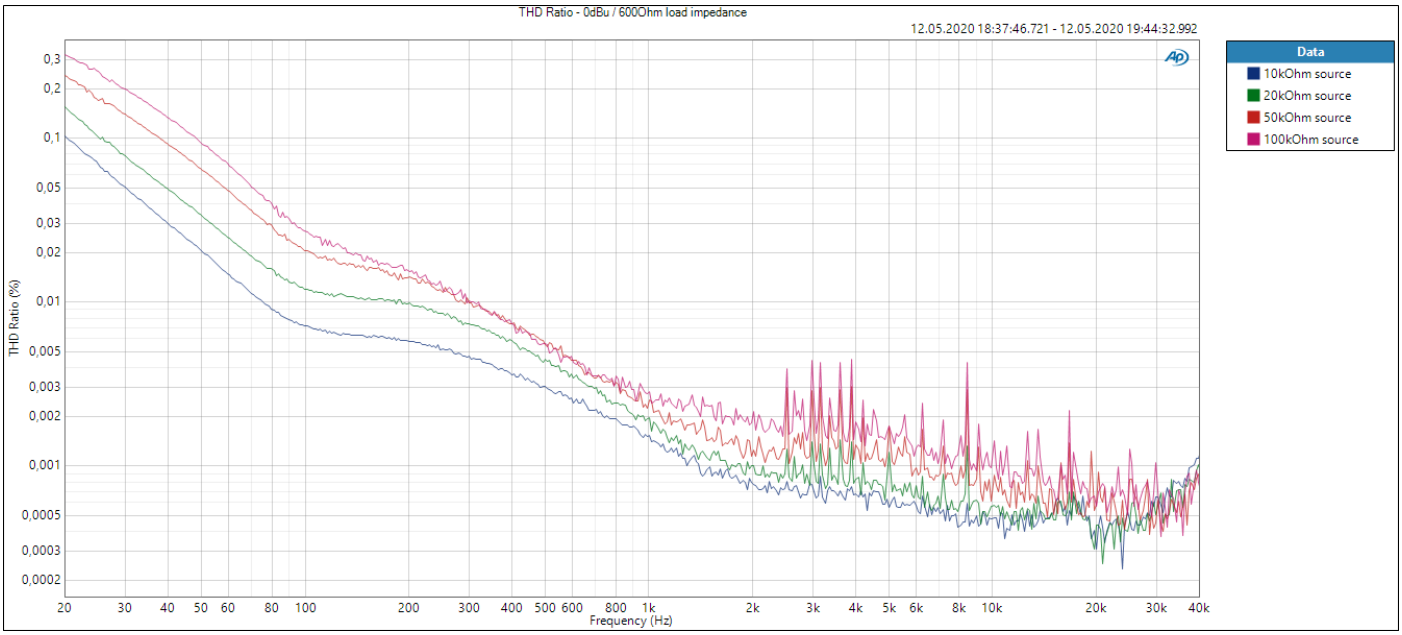

After applying load, a slight linear shift occurs at the edges of the spectrum. By desaturation of the transformer core, production of harmonics is decreased and phase characteristics are comparable even at higher levels.

***DI**Verse GREEN*

**Total harmonic distortion (THD) at levels of 0 dBu and source impedance between 10 – 100 kOhm**
**load impedance: 200 kOhm**




**Total harmonic distortion (THD) at levels of 0 dBu and source impedance between 10 – 100 kOhm**
**load impedance: 600 Ohm**




By desaturating the core, distortion of the lowest frequencies is decreased

***DI**verse GREEN*

**FFT spectrum for 30 Hz at levels between 0 – +24 dBu**
**load impedance: 600 Ohm**