

Figure 1 Part of the original filter, there are two 8.2 nF capacitors to ground at the DAC PCB. bohrok2610 used OPA1678 for U5.

Original filter, with OPA1678 rather than NE5532, without the last stage (posts #2080 and #2206, bohrok2610):

THD at 10 kHz, -1 dBFS: -92.7 dB, mostly third harmonic (-93.6 dB), measured on both channels

Intermodulation original filter:

With OPA1678's, input tones 19 kHz and 20 kHz, -6.02 dBFS each (post #2114 and #2204, bohrok2610):

IM3 products at 18 kHz and 21 kHz around -108 dB and -106 dB with respect to the tones at 19 kHz and 20 kHz <sup>(1)</sup>.

IM2 product at 1 kHz about -132 dB with respect to the tones at 19 kHz and 20 kHz.

IM2 product at 39 kHz about -96 dB with respect to the tones at 19 kHz and 20 kHz.

Products around 60 kHz are some 82 dB below the tones.

<sup>1</sup> As an RF designer, I always compare the intermodulation products to the level of each tone. Apparently there is a different convention in IEC 60268 - 3, see post #2217: comparing them to the RMS sum of the tones, leading to 3.01 dB lower numbers.

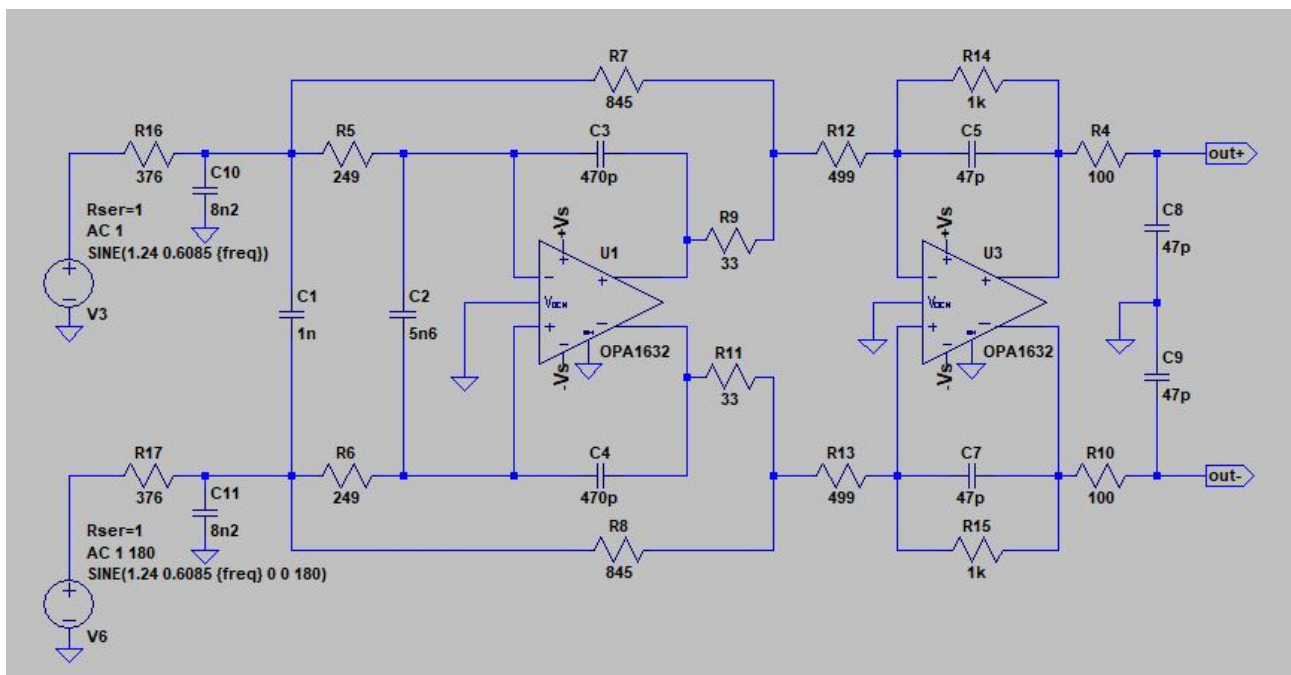
IM3 at -112.77 dB and -102.93 dB with respect to each tone using NE5532's according to Hans Polak, attachment of post #764 figure 2 and post #2205, sum of the tones at 0 dBFS, so the tones are also -6.02 dBFS each.

Common-mode loop disconnected, positive inputs of the op-amps grounded via 10 k $\Omega$  (post #2080, #2206 and PM, bohrok2610), that is, R46 and R89 removed, R45 and R89 to 10 k $\Omega$ :

THD at 10 kHz, -1 dBFS: -110.2 dB, mostly third (-112.4 dB) and fourth (-116 dB) harmonic

Common-mode loop connected, R45 removed, R46 shorted, R36 and R48 to 390  $\Omega$ , C18 to 100 pF: 2 dB worse than the original filter, so THD at 10 kHz, -1 dBFS around -90.7 dB (PM)

OPA1632-filter of post #2148 (bohrok2610):



THD at 10 kHz, -1 dBFS: -105.4 dB, mostly second harmonic (-106.5 dB)

Original filter except that the common-mode loop op-amp is OPA992 (higher slew rate, about the same gain-bandwidth product), with OPA1678's (post #2176, bohrok2610): almost identical to the original filter

Original filter except that the first stage's filter op-amps are OPA1612 instead of OPA2210 (faster and higher gain-bandwidth product, post #2180, bohrok2610): distortion a bit worse than with the original filter