

ES9017

ES9017 Output Stage Opamp Comparison





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Background

This document illustrates the trade-off compromise between performance and cost for the output stage opamps. The tests were performed on an ES9017 Evaluation Board 1v1 with the output schematic shown in Figure 1. Using this document, the customer can select the suitable opamp for their application with some performance targets and associated cost.

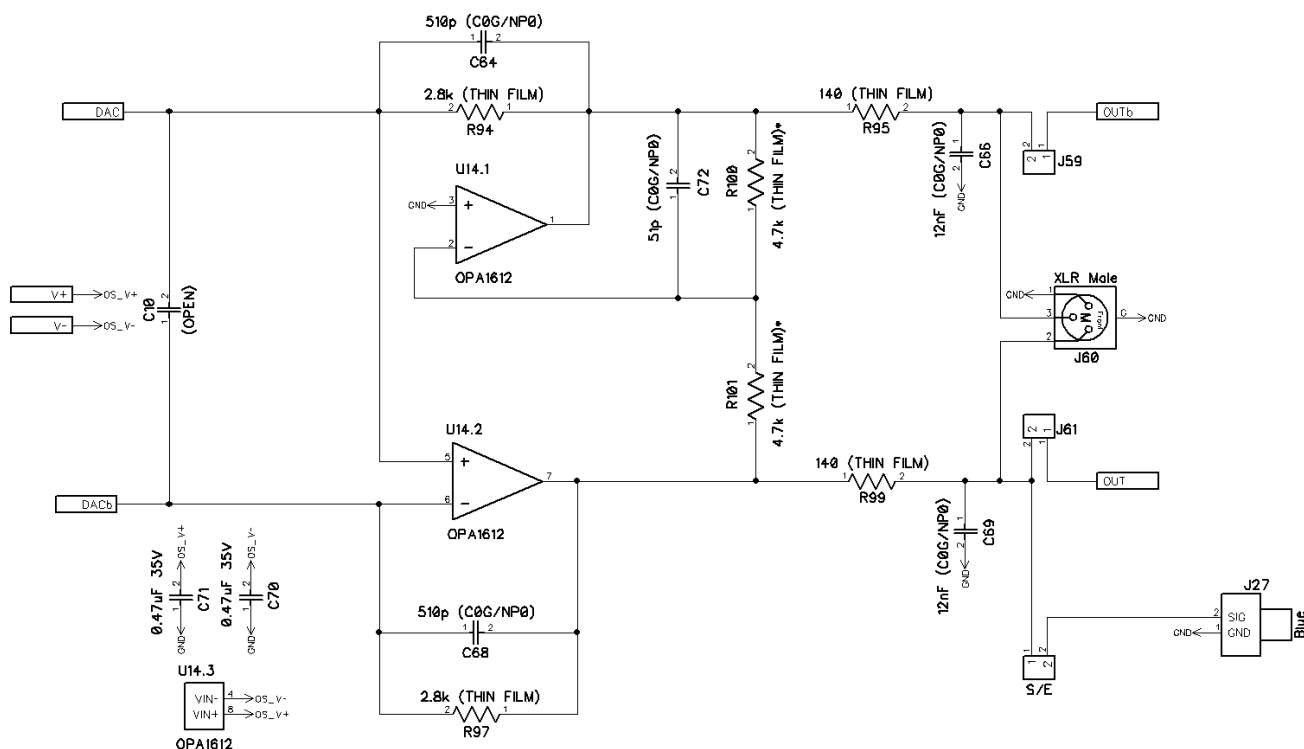


Figure 1 – Output Reference Schematic

Table 1 below shows the summary of performance results (THD+N ratio and DNR) and the cost per 1k units (sourced from Texas Instruments website on 9/15/2022). The DNR was measured with a 20Hz to 20kHz A-weighting filter and the THD+N was measured at a 4Vrms output signal.

Table 1 – Summarized performance measurements and price per opamp

Opamp	DNR (A weighted)	THD+N ratio	Price Per 1k (USD)
OPA1612	123.6 dB	-118.5 dB	\$2.662
LM833	122.3 dB	-117.4 dB	\$0.337
NE5532	121.3 dB	-116.9 dB	\$0.123
OPA1662	123.2 dB	-116.4 dB	\$0.741
OPA1602	123.3 dB	-118.4 dB	\$1.065
OPA1678	122.4 dB	-117.2 dB	\$0.247

Performance Results

Figures 2 and 3 show the THD+N performance comparisons of the opamps with respect to the measured level (at 1kHz signal frequency) and frequency (at 4 Vrms output level). The THD+N was measured with a 20Hz to 20kHz input filter.

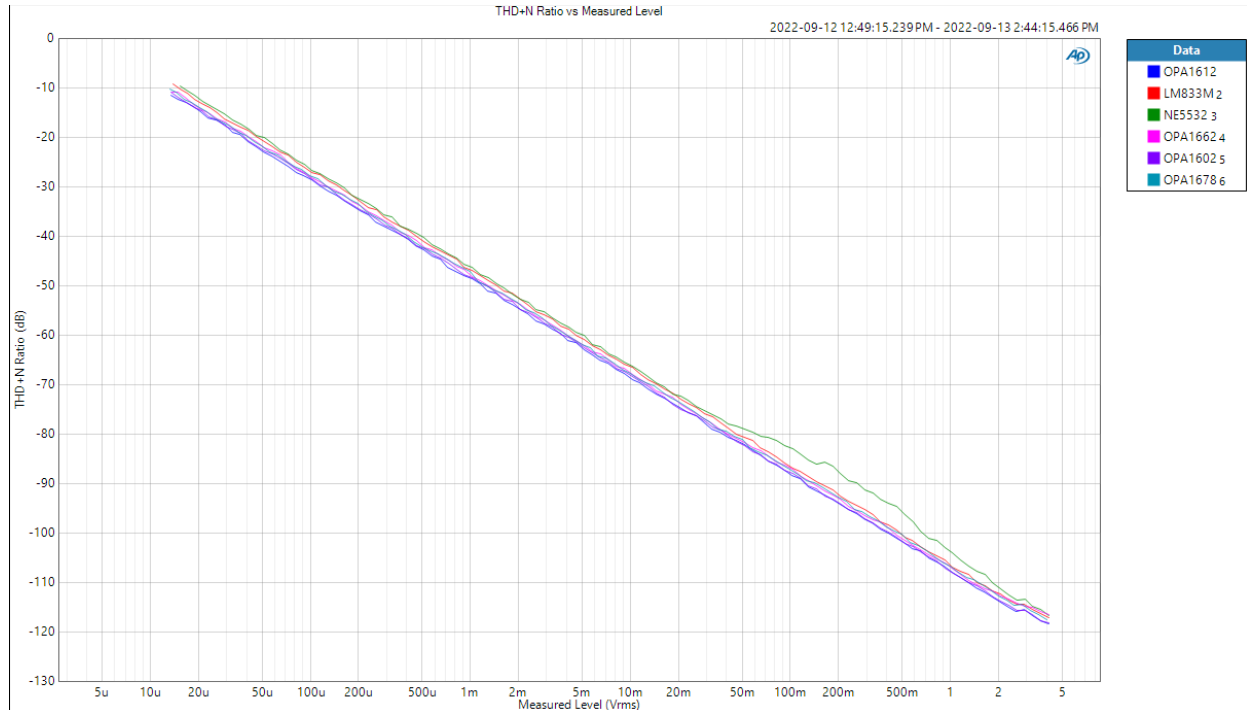


Figure 2 – THD+N vs Measured Level with 1kHz $F_s=48\text{kHz}$ input

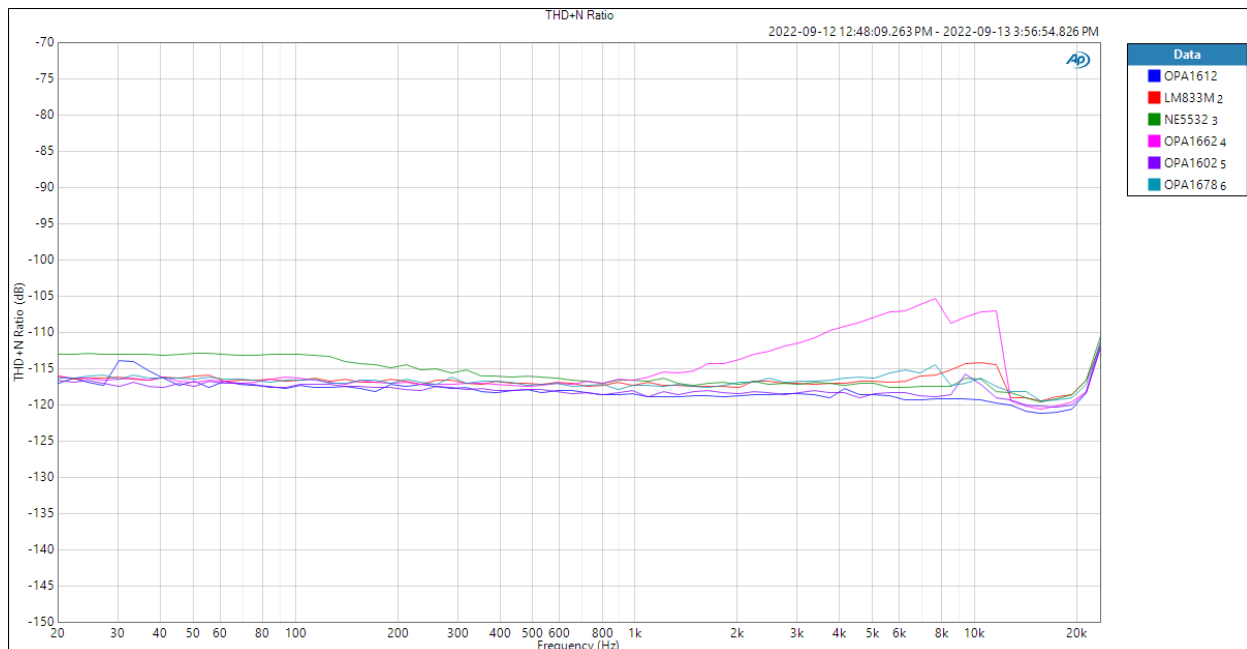


Figure 3 – THD+N vs Frequency with 0dBFS $F_s=48\text{kHz}$ input, 4Vrms output signal amplitude

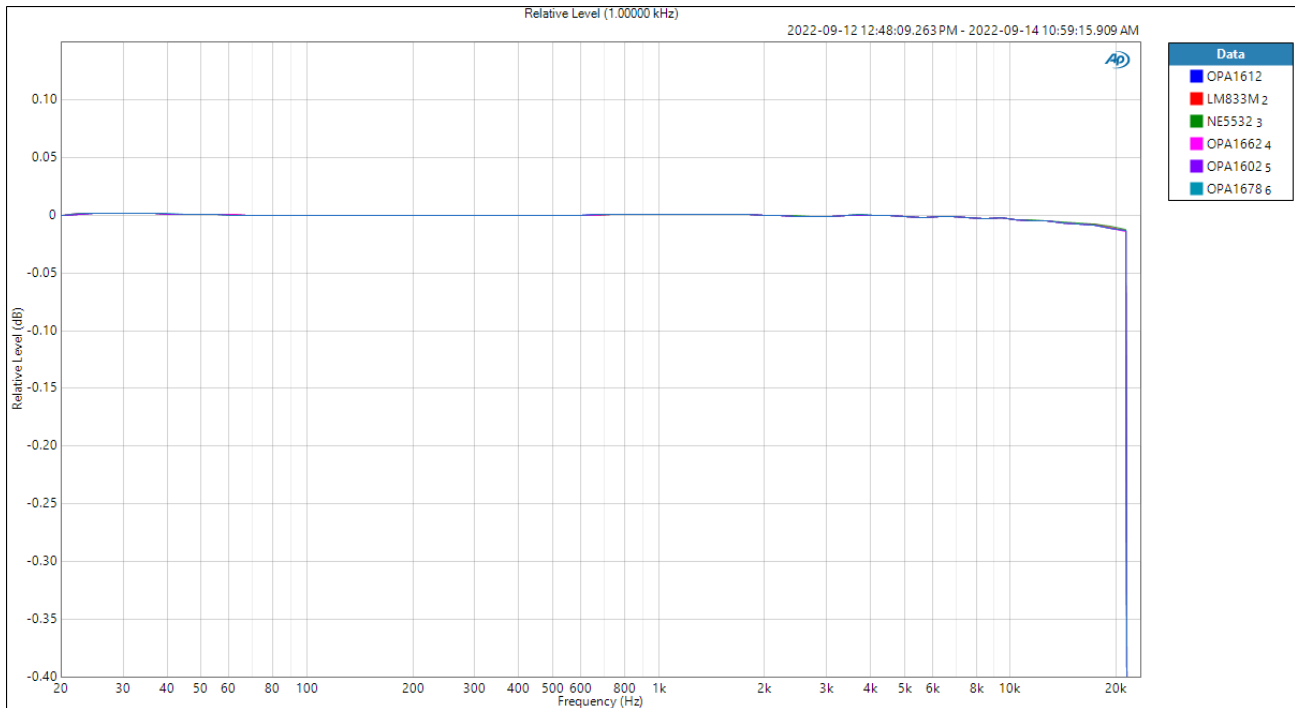


Figure 4 – Relative Level to 1kHz

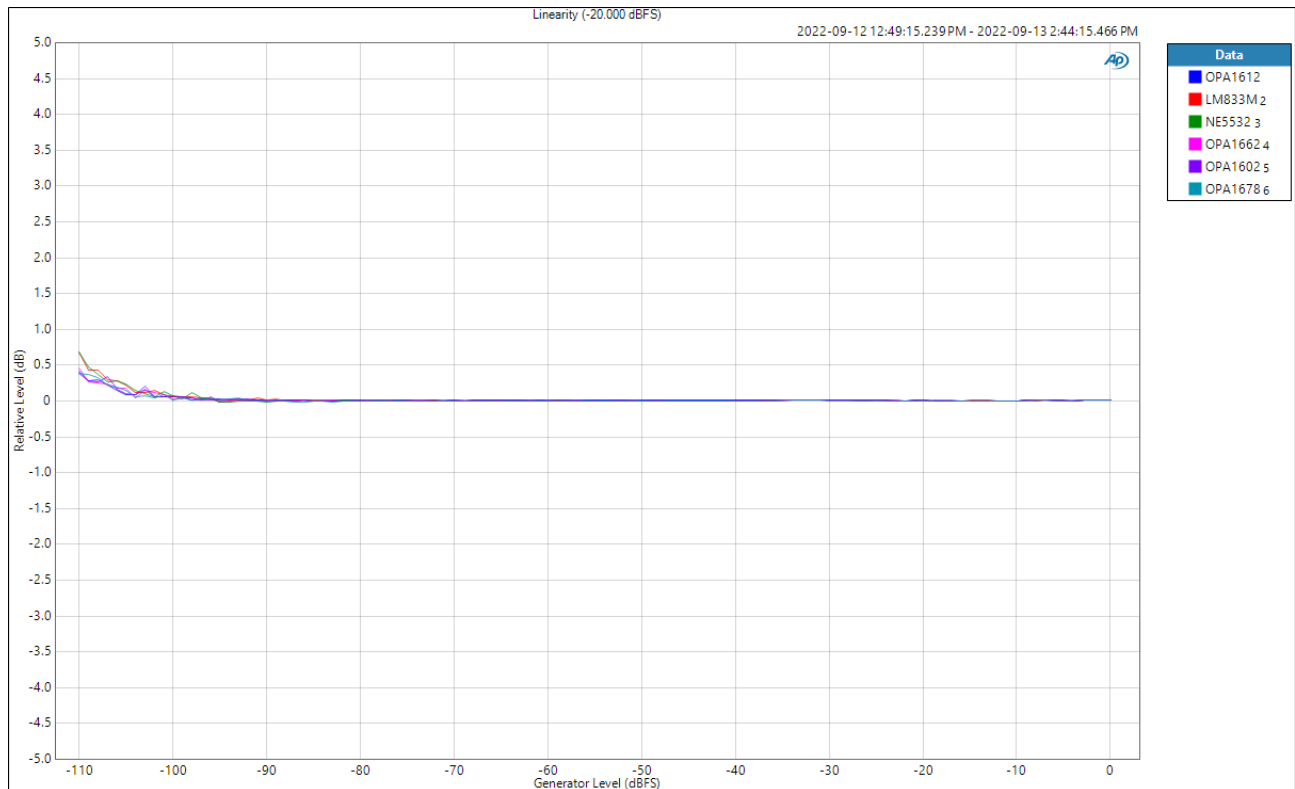


Figure 5 – Linearity Relative to -20dBFS



Revision History

Current Version 1.0

Rev.	Date	Author Initials	Notes
1.0	September 15, 2022	NF	Initial release

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