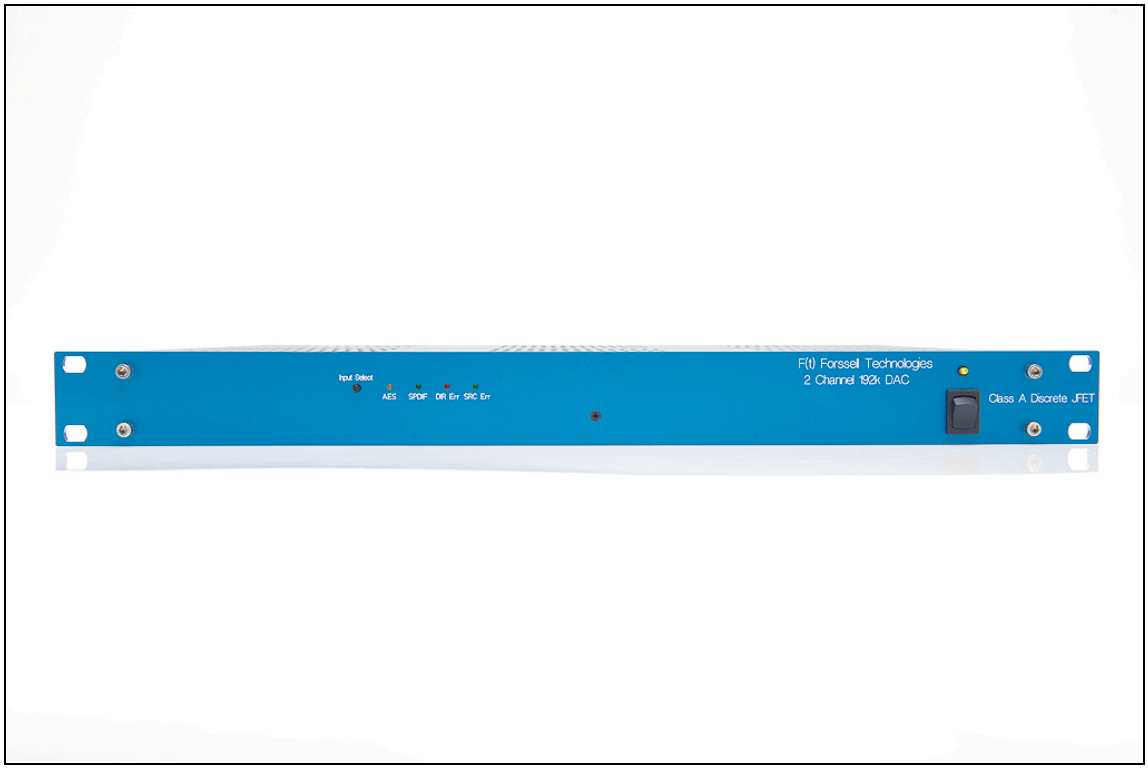
F(*t*) Forssell Technologies Inc

MDAC-2

2 Channel Digital to Analog Converter



User Manual

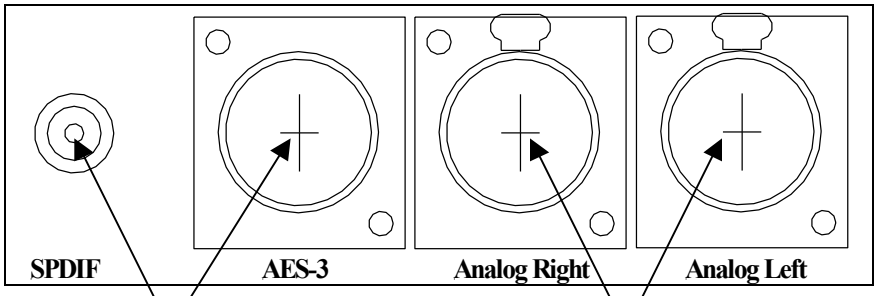
Description:

The Forssell Technologies MDAC-2 is an extremely high quality, bare-bones, two channel Digital to Analog Converter (ADC) housed in a 1U rack mount enclosure. The MDAC-2 is designed for the most demanding applications, where capturing musical performances with accuracy and honesty is required. The MDAC-2 accepts digital inputs with sample rates from 44.1k to 192k Fs. The MDAC-2 has AES3 (AES/EBU) 110 ohm on an XLR connector and SPDIF 75 ohm RCA inputs. Input selection is via a front panel push button switch with LED indicators showing which input is selected. Other front panel LED indicators show input fault and SCR lock status.

Level Calibration
Input level calibration can be adjusted using the two internal multi-turn trim pots. Unless otherwise specified, the MDAC-2 is calibrated so that a -18 dBFS digital input level produces a 0 dBu (775 mV) analog input level.

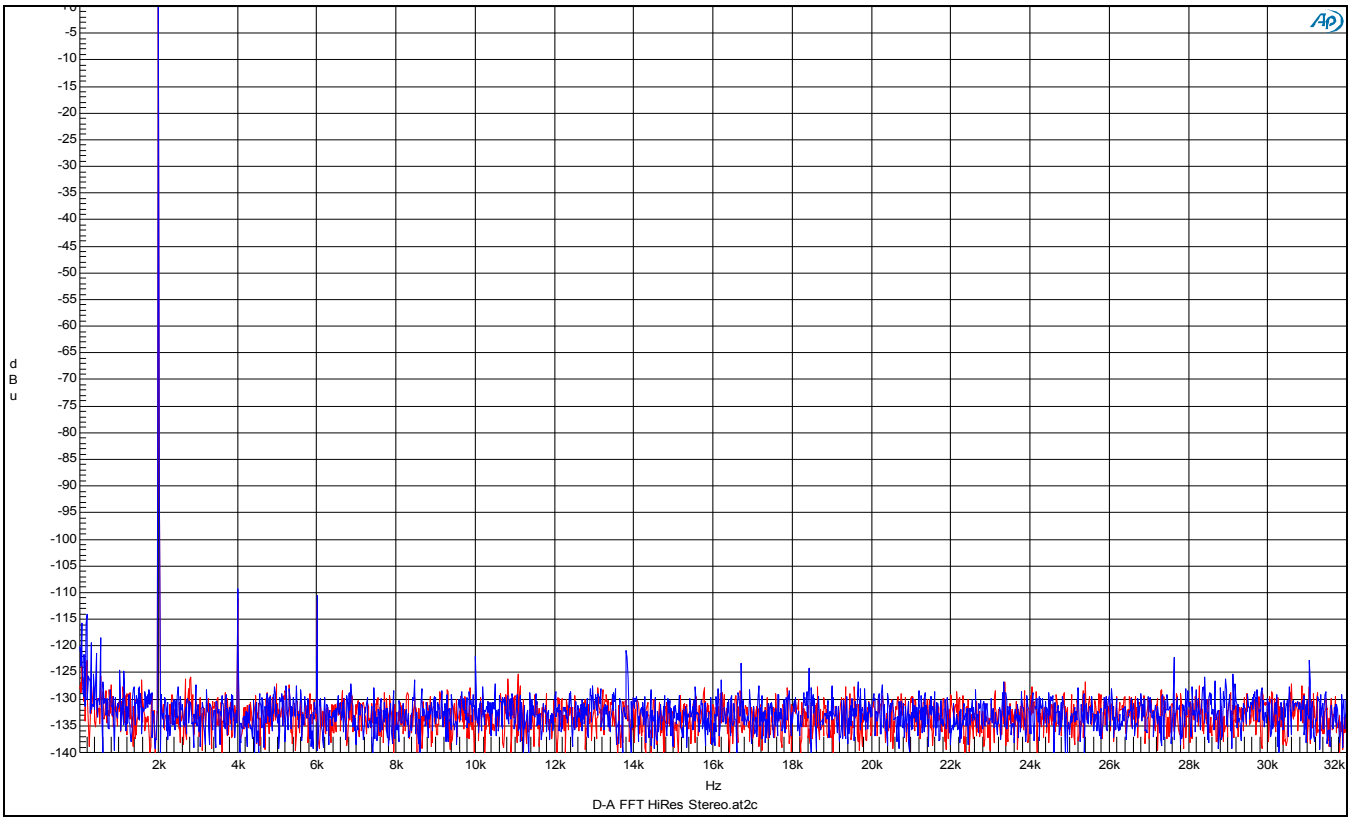
Digital inputs
There are two digital inputs on the MDAC-2. One is configured as an AES-3 or AES/EBU input, and the other is an SPDIF input. The AES-3 input is a 110 ohm, transformer isolated, and balanced XLR input. Pin #1 of this input is connected to chassis ground through a 0.1 mfd capacitor . The SPDIF input is a 75 ohm single-ended RCA input.

Analog Outputs
The analog output of the MDAC-2 are balanced and floating with an output impedance of less than 5 ohms. Either balanced or single-ended loads can be connected to the output of the MDAC-2 without any problem. When a single-ended load (unbalanced) is used, be sure to take the signal between pin #2 (hot) and pin #3 (cold) of the input XLR. Pin #1 can be connected to either of these pins in desired. Connecting pin #1 to pin #2 will produce an output signal that is out of phase, so normally pin #1 is connected to pin #3 for single-ended loads. Pin #1 can be left floating too.

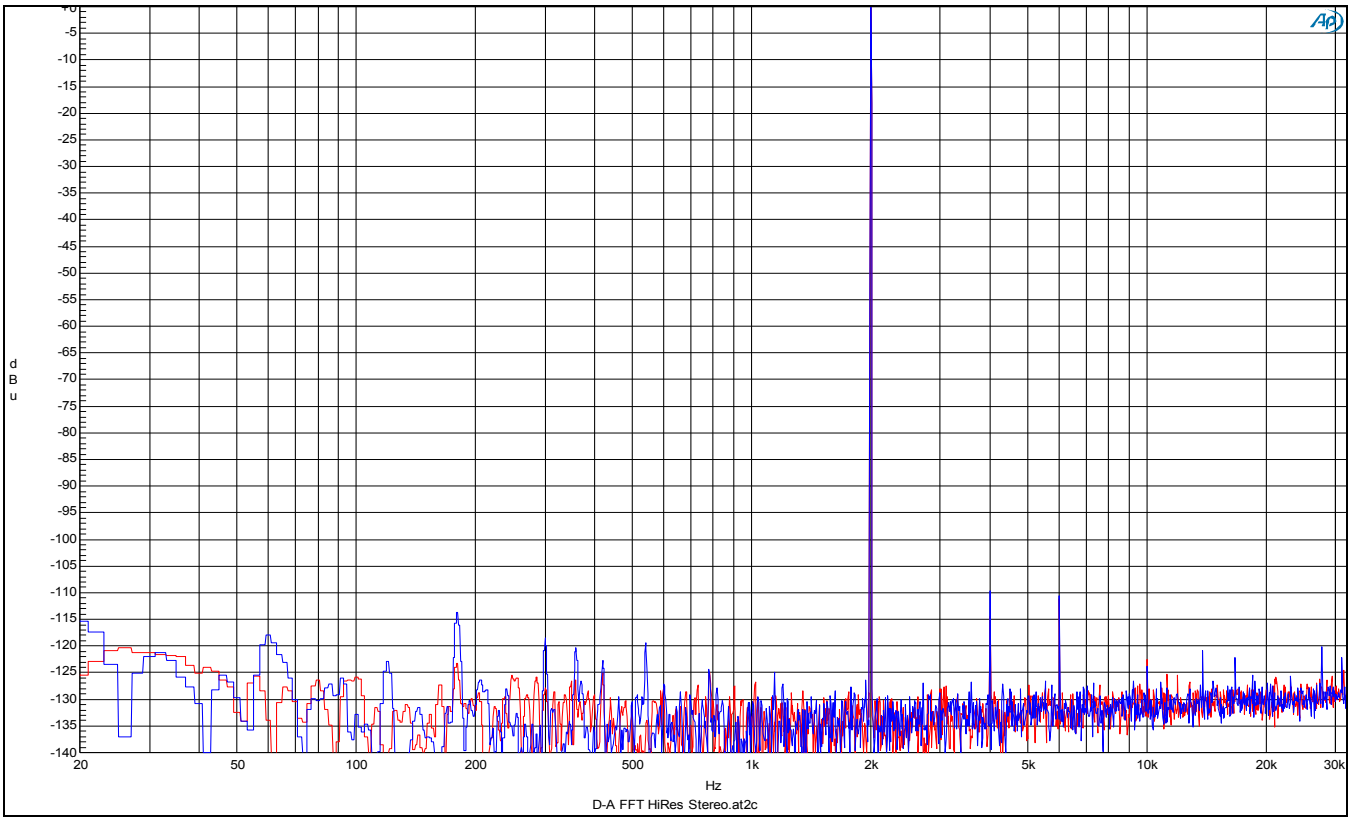


AC Line Voltage
The MDAC-2 has a selectable AC line voltage power supply. The MDAC-2 will come configured for either 115 or 230 VAC line voltage as indicated on a rear panel label and on the red line voltage switch located inside the unit. If you need to configure your MDAC-2 for a different line voltage, the switch located on the power supply PCB must be changed. **You must make sure that the appropriate fuse in used for the line voltage selected.** For 115 VAC operation use a 100 ma TD fuse. For 230 VAC operation use a 50 ma TD fuse.

DAC Measurements



DA FFT (linear scale) of 5 KHz signal at 0 dBu output level with a 600 load. Red = Ch1 Blue= Ch2



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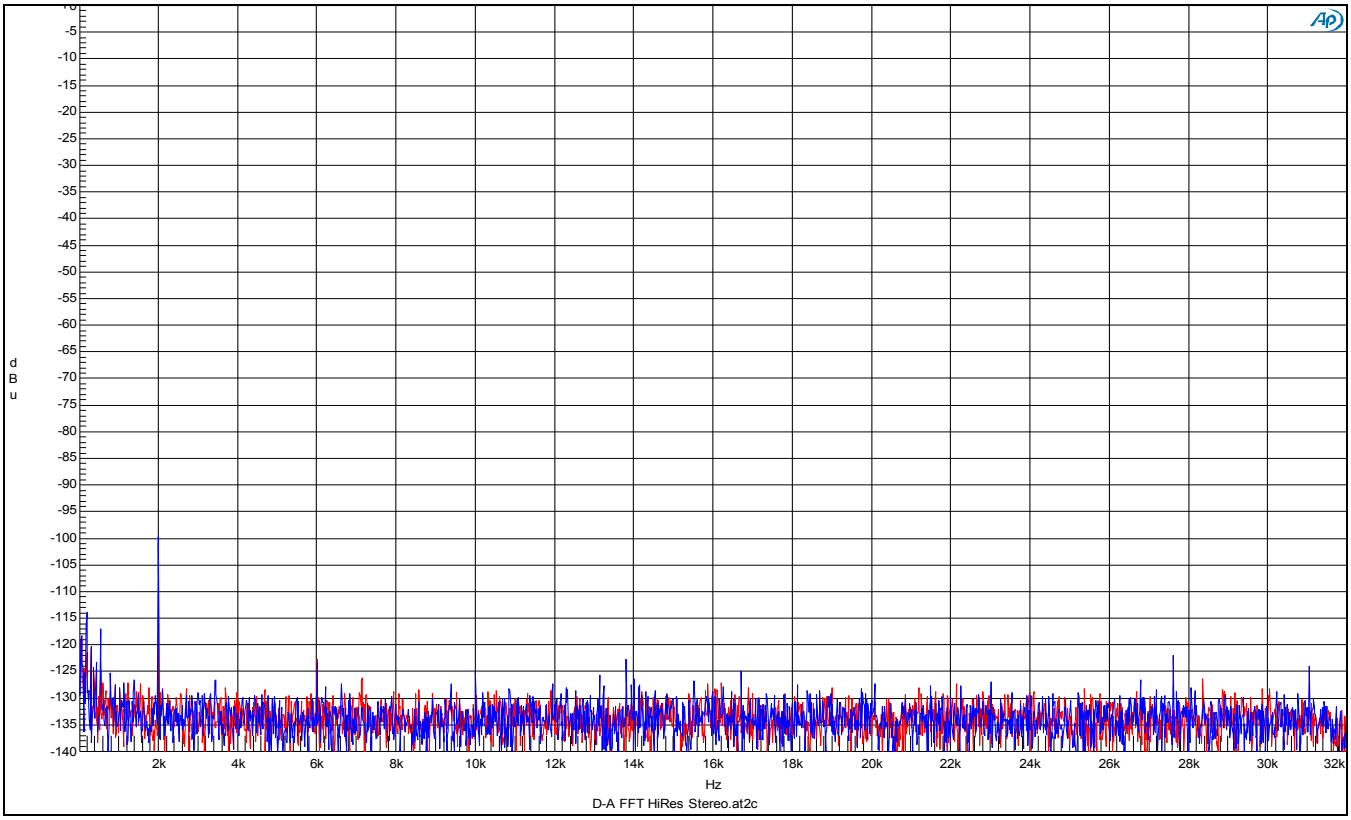
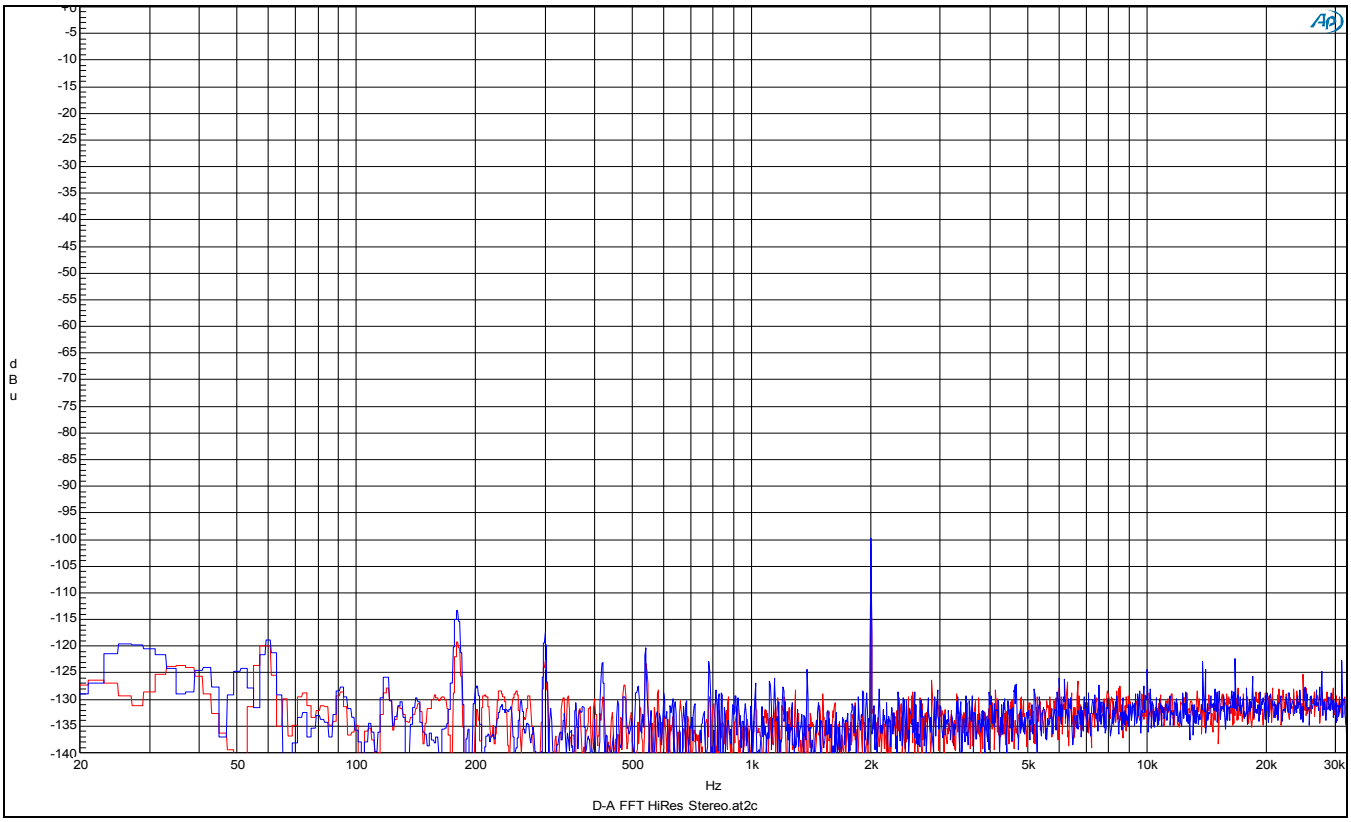
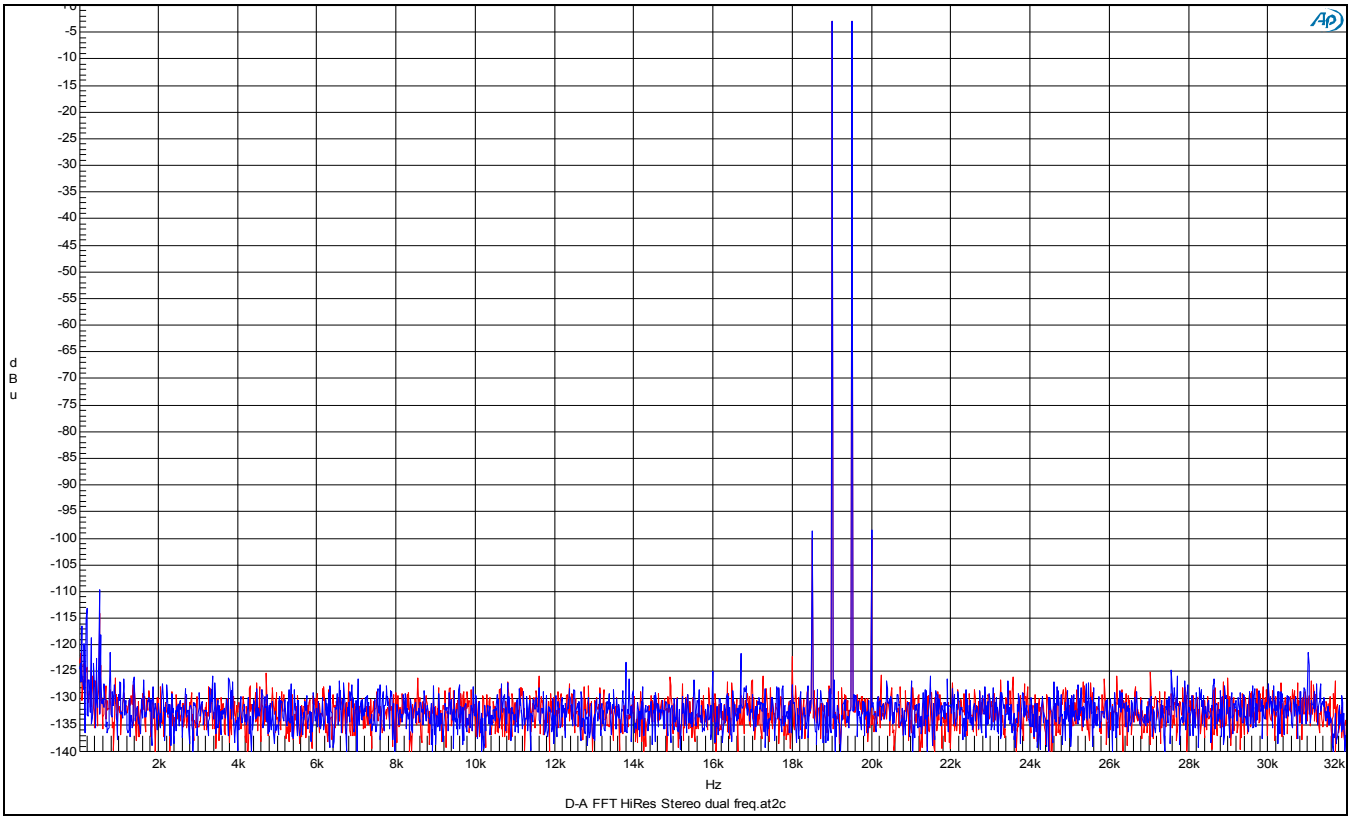


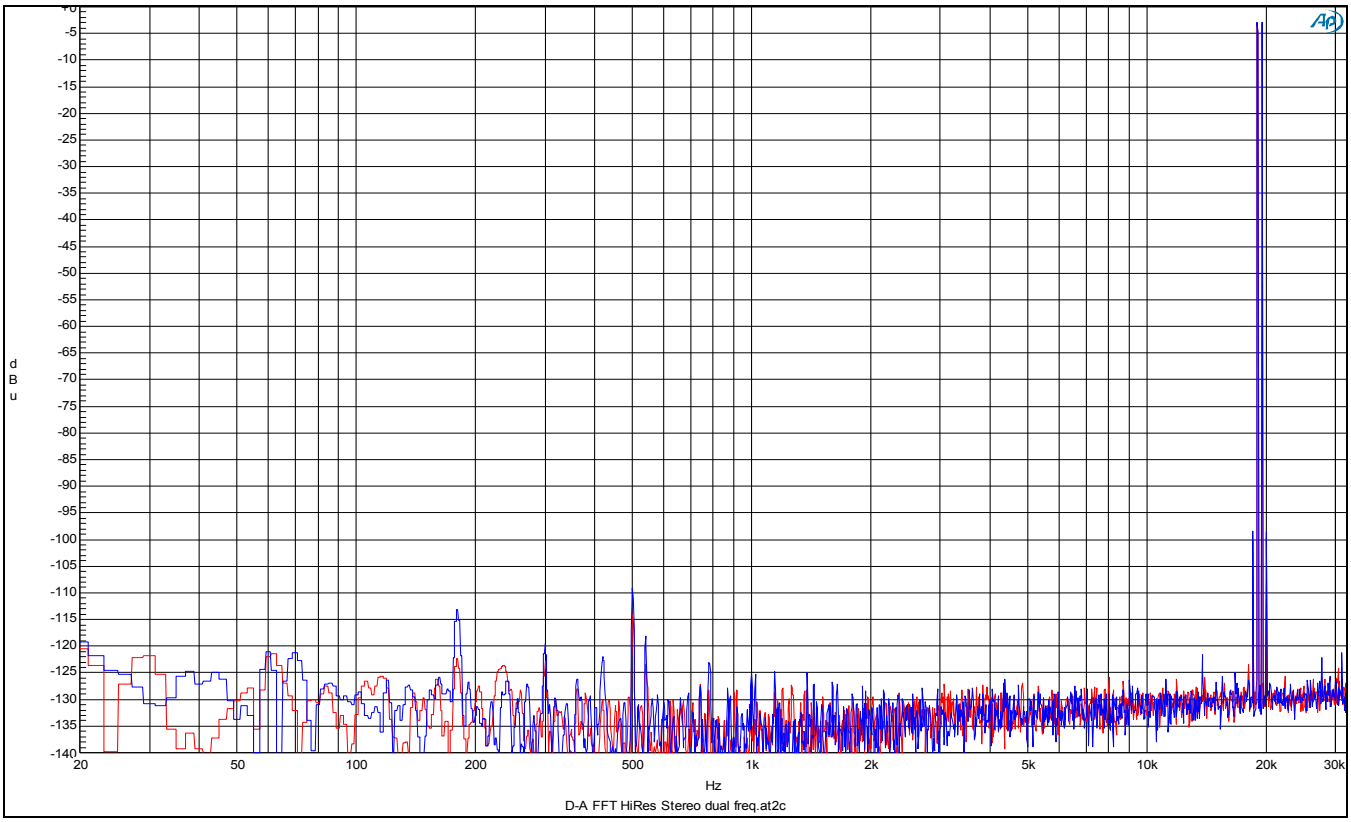
DA FFT (linear scale) 2 KHz signal at -100 dBu output level. Red = Ch1 Blue= Ch2



DA FFT (log scale) of 2 KHz signal at -100 dBu output level with a 600 load. Red = Ch1 Blue= Ch2



DA FFT (linear scale) of Dual Freq (19 and 19.5 KHz) signal at 0 dBu Output Level.



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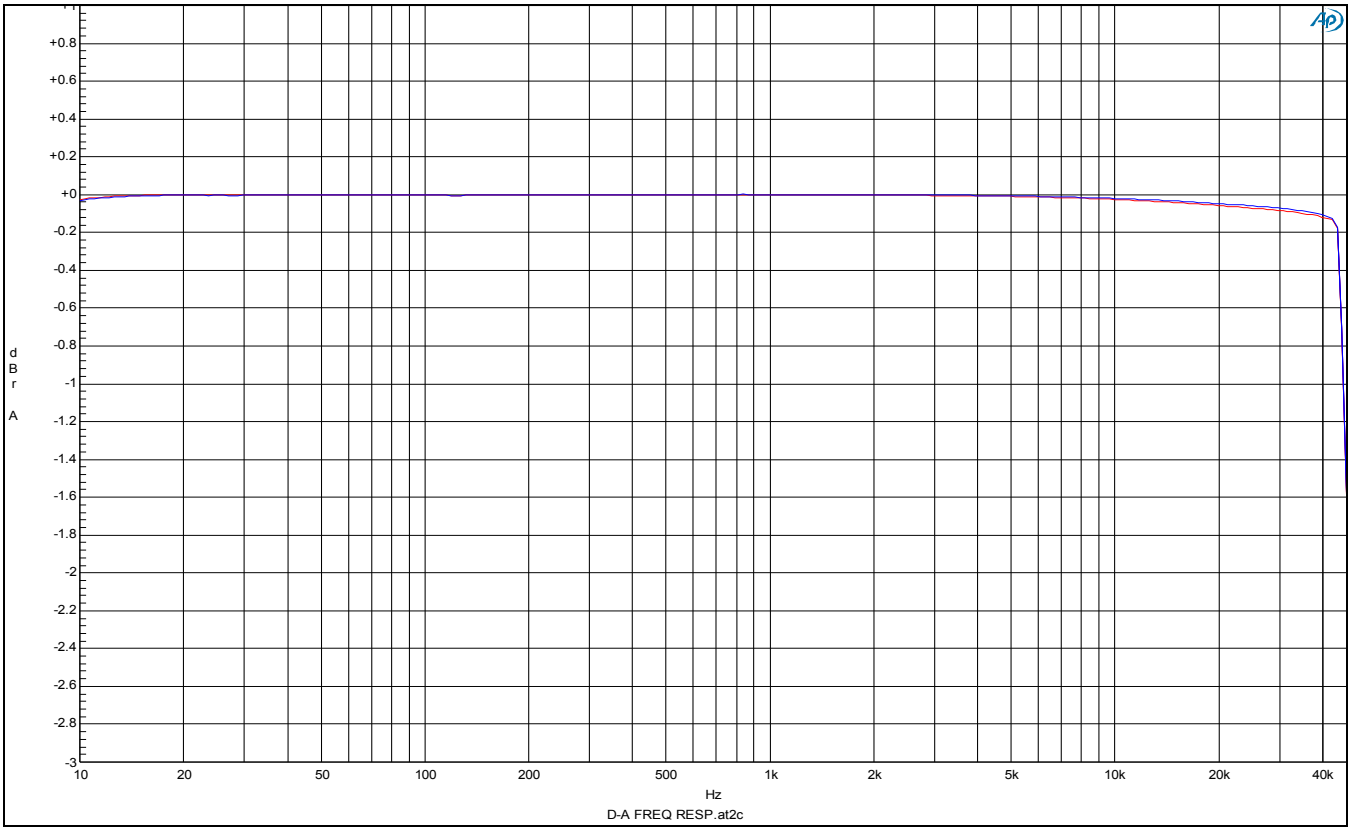
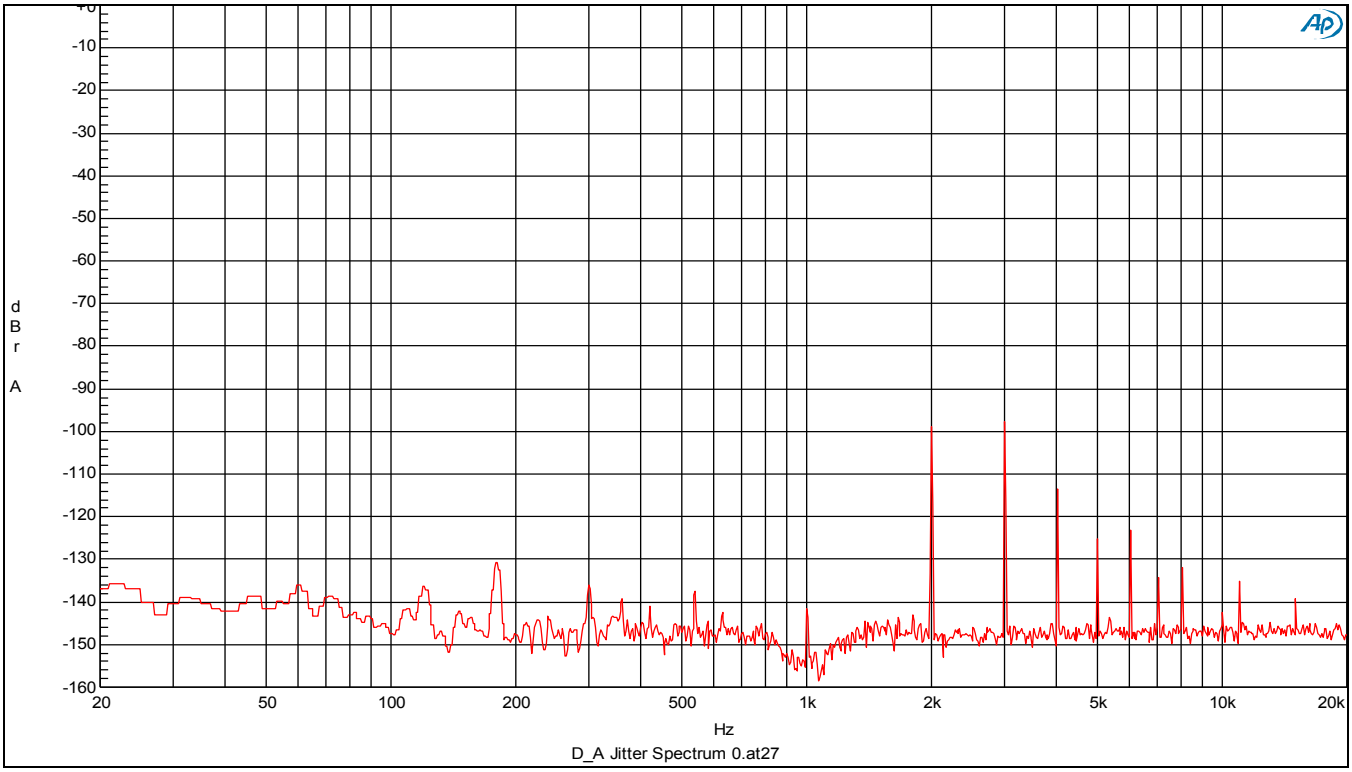
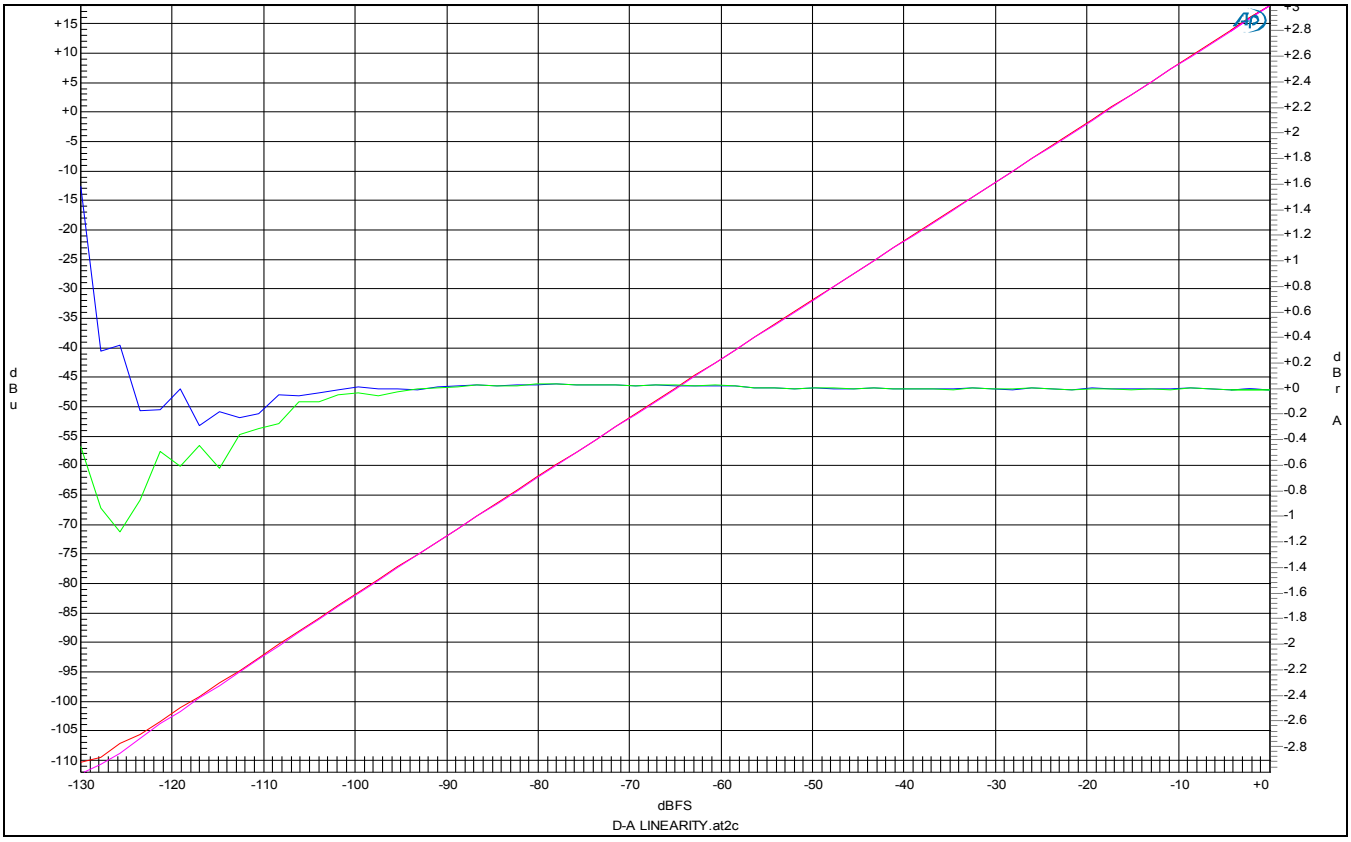


DA Frequency Response at 96 KHz sample Rate



DA Jitter FFT (44.1k Fs) with 1 KHz 0 dBFs sine wave signal and 500 Hz sine wave jitter at 1 UI (177 ns) amplitude



Deviation from Linearity (Right scale) with 0 dBFs to –130 dBFs (Input).

Misc DAC measurements

DAC Latency

Fs	**Time**
44.1k	1.97 ms
48k	1.8 ms
88.2k	1.13 ms
96k	665 us
176k	712 us
192k	678 us

DAC Noise <= -120 dBFs A-weighted
Quantization Noise <= -117 dBFs 400 to 22 KHz unweighted
Dynamic Range > = 123 dB
THD+N (%) = 0.0009% @ 1Khz 0 dBu output (-18 dBFs input) 600 ohm load
THD+N (%) = 0.001% @ 1Khz +18 dBu output (0 dBFS input) 600 ohm load
IMD (SMPTE) = 0.001% @ 0 dBu output (-18 dBFs input) 600 ohm load
IMD (SMPTE) = 0.003% @ +18 dBu output (0 dBFs input) 600 ohm load