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## nx2-Amplifier

A 100W CFA High Fidelity Amplifier

*Preliminary*

An updated and improved version of the venerable nx-Amplifier, launched in 2012, the new nx2 features components readily available in 2025, lower distortion, significantly lower noise and a more capable output stage.

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# WARNING DISCLAIMER

This project is intended for experienced DIY constructors.

This project involves wiring up mains voltages.

**Do NOT attempt this project unless you are completely aware of the dangers of mains voltages and fully understand mains voltage wiring safety practices and conventions.**

**A wiring mistake can be lethal. Do not take any risks.**

**Seek professional advice if you are not sure.**

**Always adhere strictly to the electrical regulations in your country.**

# WARNING DISCLAIMER

**Never work on the amplifier wiring with power connected.  
When debugging, always unplug the amplifier from the  
mains**

# The nx2-Amplifier: Some Background

- In 2012, shortly after I published the [sx-Amplifier](#), a very simple pared-down class A CFA, I tweaked the design to come up with the [nx-Amplifier](#) that delivered 100 Watts RMS into an 8 Ohm load and simulated 0.007% distortion at 80 Watts RMS.
- Like the sx-Amp it was based on, the idea was to keep the amplifier simple, and easy to build but still have good overall results and sound.
- The transimpedance stage (aka VAS) was a simple single transistor implementation preceeded by a standard CFA diamond buffer input stage, while the OPS was an EF2.
- Two iterations of the nx-Amp board were made - the initial release in 2012 and then a further small update in 2016. About 150 sets of each release were sold through Jim's Audio\* and from what I can tell, most of those were built.
- Accompanying the amplifier boards was a rather complex and unwieldy power supply and protection board that I called the 'PSU +Prot' that offered +-50V DC rails, DC offset and overload current protection, and power ON/OFF muting. The Zobel network for the amplifier modules was, unusually and not very cleverly, incorporated onto the PSU +Prot Board.
- I received lots of excellent feedback about the sound which builders loved. However, in retrospect, I think some aspects of the design were idiosyncratic as will be made apparent on the next slides.
- Fast forward 12 years to 2024, I've learned a lot, had much feedback, and so it is time for an upgrade . . .
- This can be approached in two ways: start with a blank sheet of paper and a brand-new design or start with what is a good basic amplifier and improve it so that you end up with something altogether better than the original. I decided on the latter course of action, adhering to the 'if it ain't broke, don't fix it, just upgrade it' dictum.

\*Kindly note, I make/made no financial benefit from the sx, nx or kx2 Amplifiers and associated PSU boards. The Gerbers for the PCBs were ceded to Jim's Audio who then sold the PCB's through his online shop. The nx2-Amplifier will however be sold through the [www.hifisonix.com](http://www.hifisonix.com) store. The small profit I make funds new designs and the Hifisonix.com website

# The nx2-Amplifier: Upgrades over the original nx-Amp (1 of 2)

Refer to slides 8 and 9 for the original nx-Amplifier circuit diagrams

1. Output DC Offset adjustment. In the original nx-Amp design, the offset trimming current was injected into the low-impedance inverting input of the CFA Diamond Buffer ('DB'). In badly  $h_{FE}$  and  $V_{be}$  mismatched DB transistors, this would necessitate injecting large offset currents into the inverting input and in extreme cases, changing R1 from 10k to 4.7k. This in turn loaded the +10V Zener references, sometimes exacerbating the problem. On the nx2-Amp, the offset adjust is moved to the high impedance non-inverting input, like the kx2-Amplifier, requiring only +-300 uA to be injected into the offset nulling node to provide up to +- 1V offset adjustment at the amplifier output.
2. On the original amplifier, the diamond buffer transistors Q9 and Q11 collectors were tied directly to the +-50V rails via R33 and R32 leaving each of the transistors with about 45V collector to emitter voltage. Due to the Early effect, these transistor collector currents were higher than the input transistor collector currents by about 30-40uA and larger offsets than necessary arose because the Early voltage ( $V_A$ ) is markedly different between the N and P devices, with LTspice models showing 82V for the BC546 vs 39V for the BC556. In the nx2-Amplifier, these problems are solved by cascoding Q3 and Q4, reducing input offsets and associated drift and keeping the input stage in better thermal balance. Note, this problem is not apparent on the kx2 and its progenitor, the sx-Amp, because of their dramatically lower supply voltages.
3. The DB on the original design used 150 Ohm (R36 and R37) and 120 Ohm (R28 and R29) emitter degeneration resistors to counter the increased current arising from the Early effect in the DB output transistors. The nx2 uses all 100 Ohm resistors because there is minimal Early effect. The upshot of this, and the cascodes, is a very significant improvement in output offset voltage drift (which was already very good on the original).
4. The nx2 is AC coupled, solving another criticism some found with the original direct coupled input, with many builders fitting their own DC blocking caps. Further, the HBR on the original nx-Amp was incorrectly configured although this did not seem to cause any problems in practice – the nx-Amp and sx-Amps were noted for being exceptionally hum-free. The nx2 addresses both these issues as well.
5. The loop gain was low as a consequence of the single-stage TIS (aka VAS). Although this made the amplifier *very* easy to compensate and tolerant of capacitive loading, it meant distortion at full power was not much lower than 0.01% (20 kHz). Loop gain has been increased from <50 dB to ~65 dB (1kHz) by adding a beta helper to TIS transistors Q6 and Q7 and in the process, lowering full power distortion.
6. Compensation. The compensation used on the original nx-Amp used a single 'light touch' 68pF capacitor (C7) from the VAS to the inverting input and exploited most of the available HF loop gain. However, given the additional loop gain from introducing a beta helper in the nx2 as outlined in (5) above, more advanced Transitional Miller Compensation (TMC) can now be employed, dramatically lowering HF distortion. This has also increased the loop gain bandwidth from c. 6 kHz to ~20 kHz. In the compensation design discussion later, we will go into this in more detail.

# The nx2-Amplifier: Upgrades over the original nx-Amp (2 of 2)

7. The Zobel on the original design was off-board on the PSU +Prot board. This meant users were tied to the PSU +Prot board and the solution was in any event sub-optimal. The Zobel loop area has to be as small and tight as possible around the OPS (output stage) for maximum effectiveness. By putting the Zobel on amplifier module board, inter-module wiring is further reduced and builders can opt for their own power supply if they so wish.
8. The speaker protection switched the speaker return and not the output on the amplifier side. While this saved on 2 photovoltaic couplers and allowed very fast protection switching, it did not work if the speaker return was accidentally shorted to the amplifier chassis. Other than that, the protection board worked well.
9. Wiring to the PSU +Prot board was overly complex and the terminal layout sub-optimal, making a neat build and wiring difficult for all but the most persistent builders. The nx2 uses the existing [Hifisonix speaker protection board](#) for easier wiring. Builders can also use their own protection board if they so wish.
10. The OPS bias current adjustment was coarse, allowing the OPS to be turned completely off, through to over 400mA, which was trimmed down to about 200mA in the 2016 update. An adjustment range of 0mA to about 130mA per pair to cater for device spreads would be an improvement and that is what has been done on the nx2.
11. On the original nx Amp, the power supply reservoir capacitors were rated at 50V so the maximum supply voltage was 50V and to get the rated 100W out, the amplifier needed close to +/-50V rails. This meant on some implementations, the capacitors were stressed if mains overvoltages were encountered. On the nx2, all rail-connected caps are rated at 63 volts and the supply voltage can therefore be raised to 55V, giving a little more headroom and tolerance for mains overvoltages.
12. The new nx2 uses SMD components extensively on the front end to keep the PCB compact and future-proof the design.
13. Finally, and very importantly, the nx2 uses 3 pairs of 200W output devices, offering a dramatic improvement in SOA, and allowing the amplifier to drive more difficult loads with ease.

Note: Link out R41 and R42

Remove R41 and R42

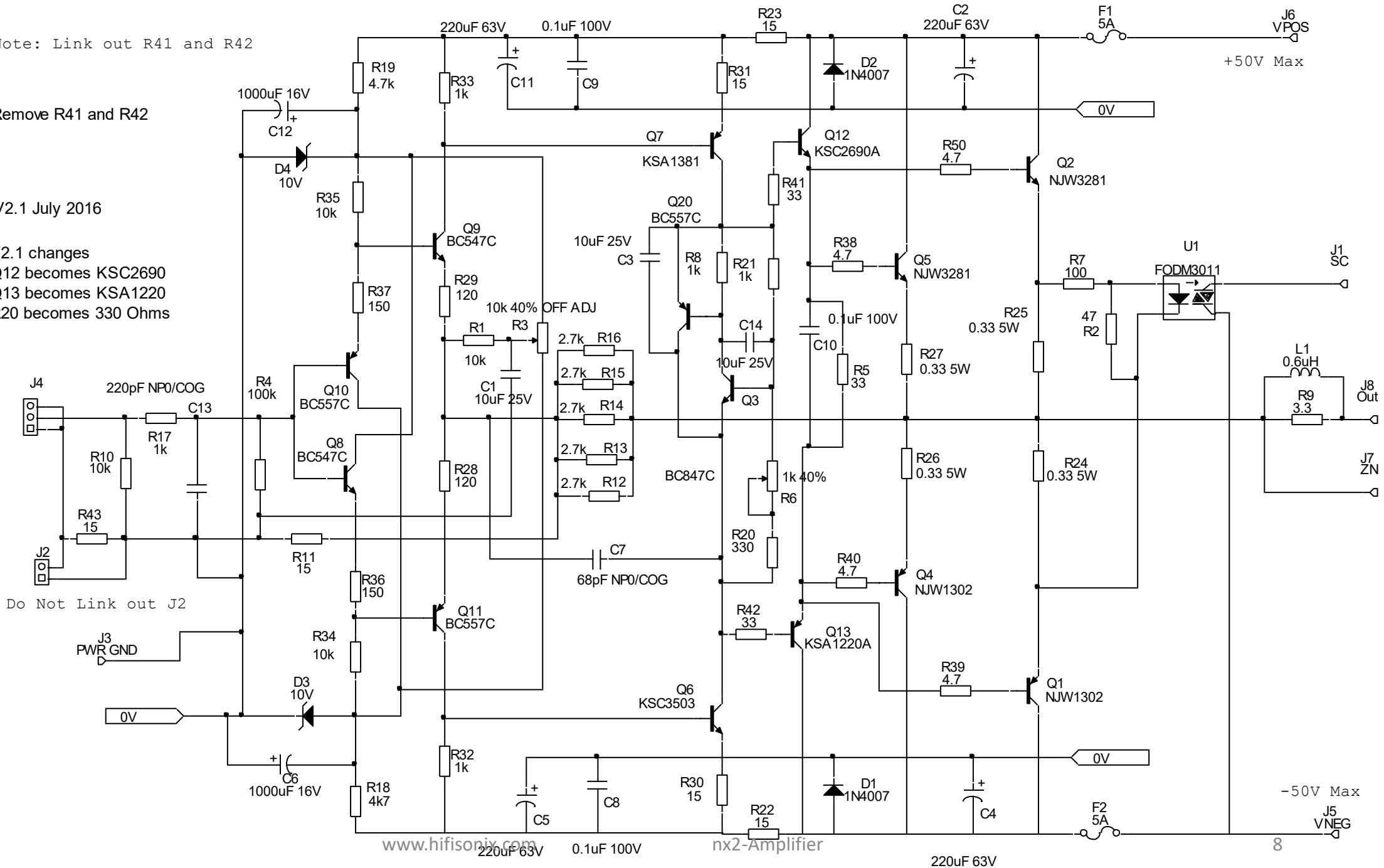
V2.1 July 2016

V2.1 changes

Q12 becomes KSC2690

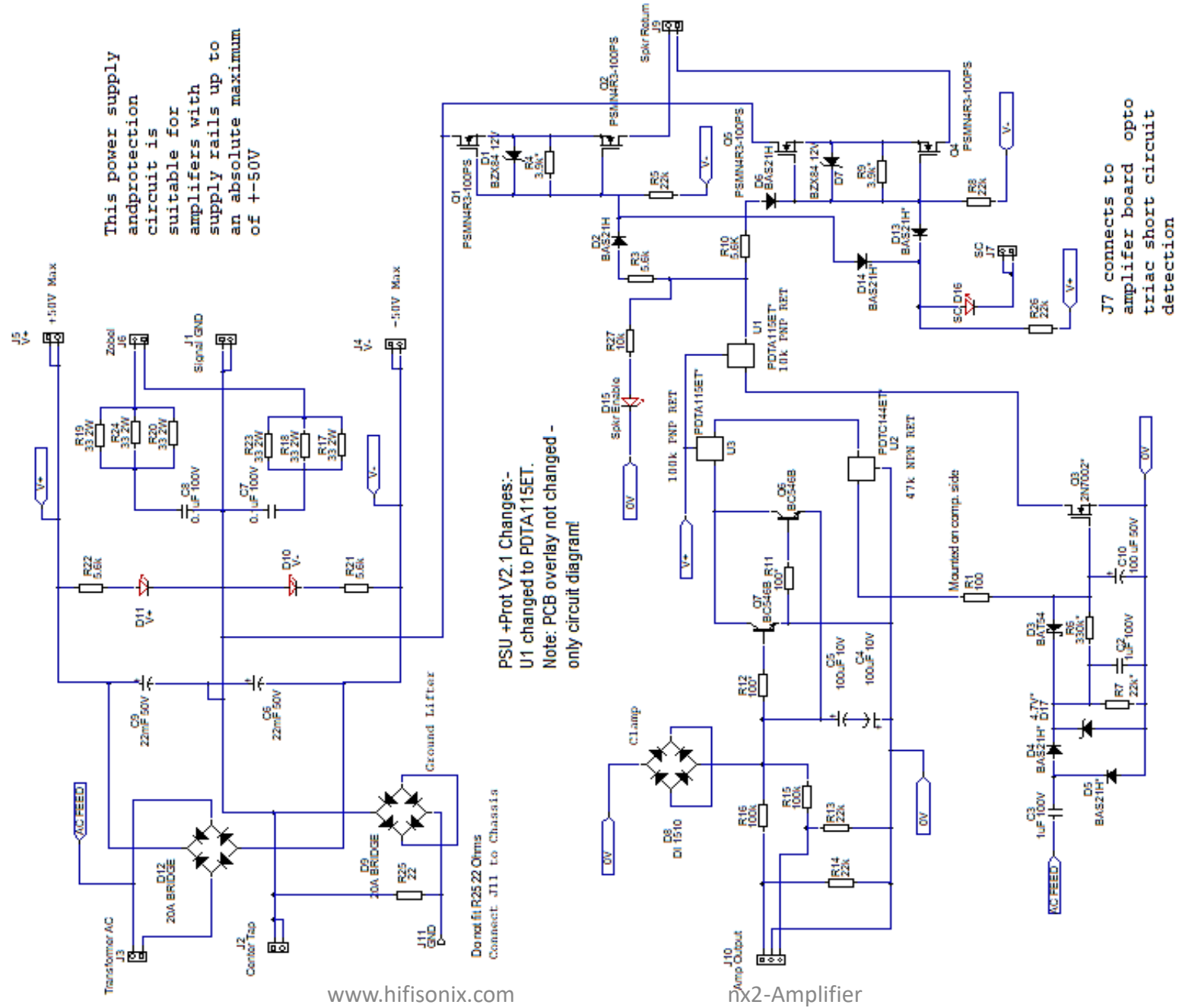
Q13 becomes KSA1220

R20 becomes 330 Ohms





## Original nx-Amplifier PSU + Protect Circuit Diagram (2012)



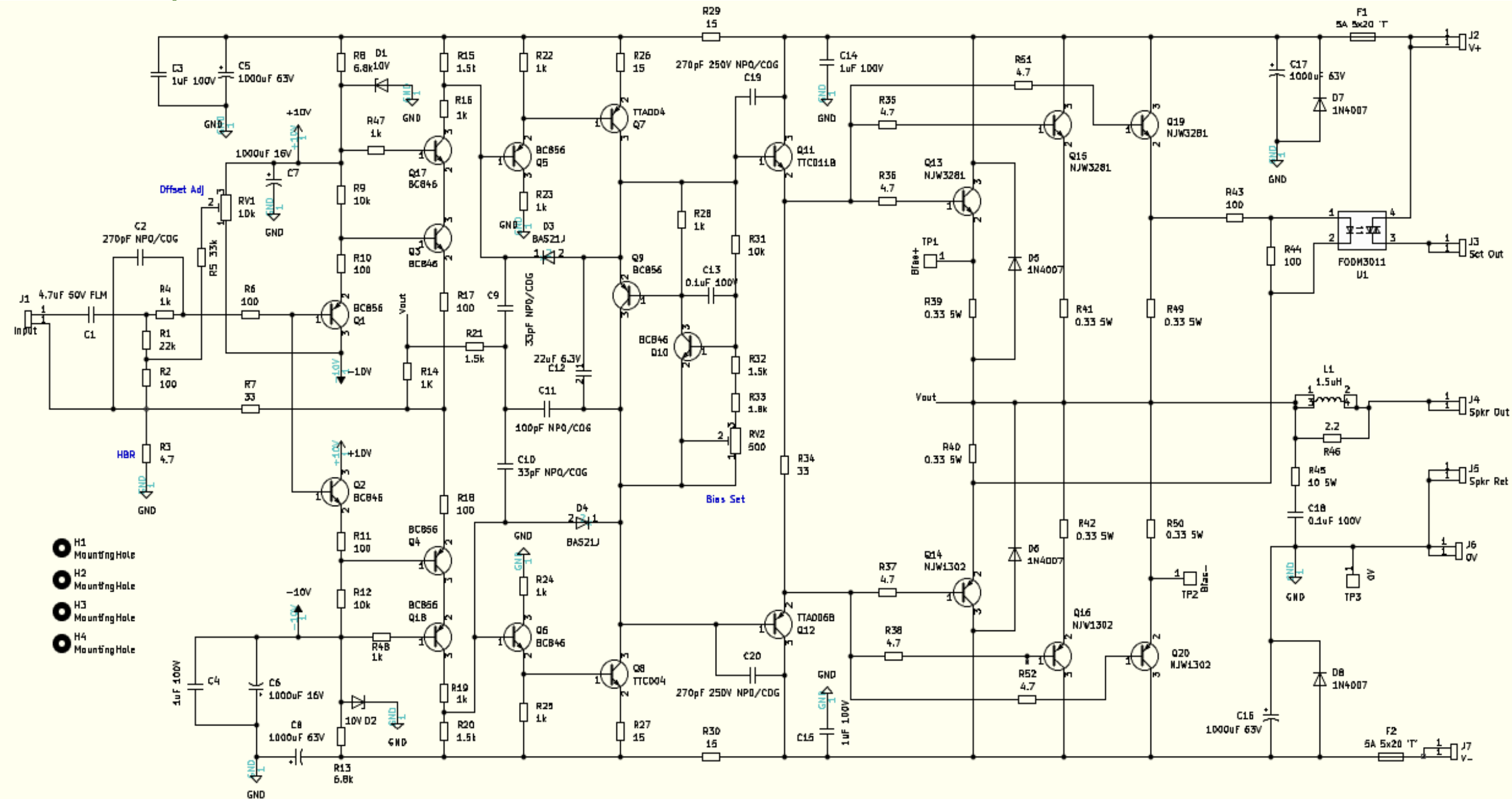
All Components marked with asterisk (\*) are SMD and mounted on BOTTOM of PCB

## nx2-Amplifier specifications - preliminary

Output power and distortion	100 W RMS into 8 ohms at <0.004% distortion; 200 W RMS into 4 ohms at 0.007% distortion (1 kHz)
Maximum short term power	300 W into 2 ohms for 2 minutes or less, single channel driven; 280 W into 2 Ohms both channels driven
Peak output current	>20 Amps for 50 ms
Output stage standing current	50 mA per OPS pair
OPS configuration	3 pairs 200 W 15A transistors in Locanthi 'T' EF2
Frequency response	3 Hz to 180 kHz +0 dB -3 dB; 20 Hz to 20 kHz +0 dB -0.1 dB
Rise/fall time	~700 ns in both directions at 75 V pk~pk into 8 ohms; equivalently ~100 V/us slew rate*
Gain	31x or 29.9 dB
Input sensitivity	1.3V for rated output power into 8 ohms
Input Impedance	22k at 1 kHz
Capacitive load stability	Any capacitance up to 2.2 uF in parallel with any resistance from 2 ohms to $\infty$ (~2 Vpk~pk 3kHz square wave test signal)
Output offset	+20 mV worst case over temperature; typically +/-5 mV
PSRR	Peak mains fundamental and harmonic components better than -102 dBr at all rated powers
Damping factor 1 kHz	130 at 1kHz
Loop gain	65 dB at 1kHz
Loop gain bandwidth	-3 dB at 20 kHz; ULGF 2.19 MHz
Compensation	Transitional Miller Compensation (TMC)
Weight	15 kg
Dimensions	Modushop Mini Dissipante housing 300 mm wide x 300 mm deep x 190 mm high (including feet)

\* CFA amplifiers do not slew rate limit, so its better to characterise them in terms of rise/fall time; For a practical amplifier, this is primarily set by the input bandwidth limiting filter; nevertheless, an indicative slewrate figure has been included in the nx2-Amp spec of ~100 V/us

## nx-2 Amplifier Schematic



# nx-2 Amplifier Circuit Description

- **Input Stage.** The nx2-Amplifier is a Current Feedback Amplifier (CFA). The unbalanced (aka 'single-ended') input is fed in via J1 with pin 1 (signal HOT) going to C1, the DC blocking capacitor (4.7uF Film). R1 and R2 (22k and 100 Ohms respectively) provide DC bias for the input transistors Q1 and Q2 (BC856B and BC846B). R4 and C2 form a low pass filter with a cut-off frequency of c. 340 kHz. This acts to limit RFI, and bandwidth limits the input signal – a point that will be discussed further under 'Compensation'. R6 (100 Ohms) acts as a base stopper since the input pair are emitter followers which can under some circumstances suffer from instability. About  $\pm 1V$  of output voltage offset adjustment is provided by injecting a small current of up to 300uA into the junction of R1 and R2 via R5 (33k) which is connected to the wiper of RV1 (10k 25 turn trimmer) which in turn taps off the  $\pm 10V$  front-end supply created by 10V Zener diodes D1 and D2. This offset technique is much more elegant and more reliable than the original nx-Amp where the offset was injected into the low-impedance input at the output of the diamond buffer (DB).
- **Input diamond buffer stage.** Q1, Q4 (BC856B), and Q2 and Q3 (BC846B) form the input stage diamond buffer. The bases of Q1 and Q2 are the high-impedance non-inverting input, whilst the junction of R17 and R18 (100 Ohms) coming from the emitters of Q3 and Q4 is the low-impedance inverting input. Bias for the DB is provided via R9 and R12 (10k) which are connected to D1 and D2 which form the front-end regulated supply. R10, R11, R17, and R18 are all set at 100 Ohms and thus in conjunction with the reference current derived from the  $\pm 10V$  supply through R9 and R12, provide an emitter stand-off voltage of around 100mV on all four DB devices. This stabilizes all the DB DC operating currents at  $\sim 990\mu A$ . Further, since there may be substantial differences of up to 20mV in the transistor  $V_{be}$ 's due to normal device production spreads, the 100mV stand-off swamps these, ensuring all the devices operate at around the same current, give or take a few 10's of  $\mu A$ . If the 100 mV stand-off resistors are omitted, it would require all four of the front-end transistors to be very closely  $V_{be}$  and  $h_{FE}$  matched to ensure correct operation, something that can really only be achieved on an IC. The output of the diamond buffer is a complementary current at the collectors of Q3 and Q4, with a nominal DC level of  $\sim 990\mu A$ . Note that the zener references D1 and D2 are heavily decoupled with 1000uF capacitors C7 and C6. In conjunction with R8 and R13, this ensures that on power-up, the amplifier comes up slowly, minimizing output thumps.
- **Transimpedance aka Voltage amplifier stage.** The current output of the DB front end is loaded with 1.5k resistors R15 and R20, developing  $\sim 1.5V$  across them which provides the DC bias for the complementary, or balanced, transimpedance stage (TIS) also referred to in some texts as the VAS. Q5 beta helper (BC856B) and Q7 (KSA1381) form the upper amplifier stage with the lower stage formed by Q6 beta helper (BC846B) and Q8 (KSC3503). The volt drops across R15 and R20, in conjunction with R22 and R27 (15 Ohms) set up the TIS standing current in Q7 and Q8 at 20mA and maintain thermal stability of the 20mA operating current. R22 and R27 also provide local AC feedback (aka degeneration), improving the open-loop linearity of the TIS. Since this is an EF2 amplifier and not an EF3 or MOSFET OPS, the current demanded by the output stage is higher, hence the higher TIS operating current. R22 and R25 (1k) load the beta helpers to their respective rails, while R23 and R24 (1k) are included to ensure the beta helpers cannot suffer from any HF instability, a problem mentioned earlier with emitter followers. Diodes D3 and D4 (very low reverse capacitance BAS21J 300V devices) form Baker clamps and prevent rail sticking and limit the peak current in the VAS on gross overdrive to just a few mA above the standing current. Without them, the TIS transistor current can peak at over 300mA, almost certainly failing in the process.

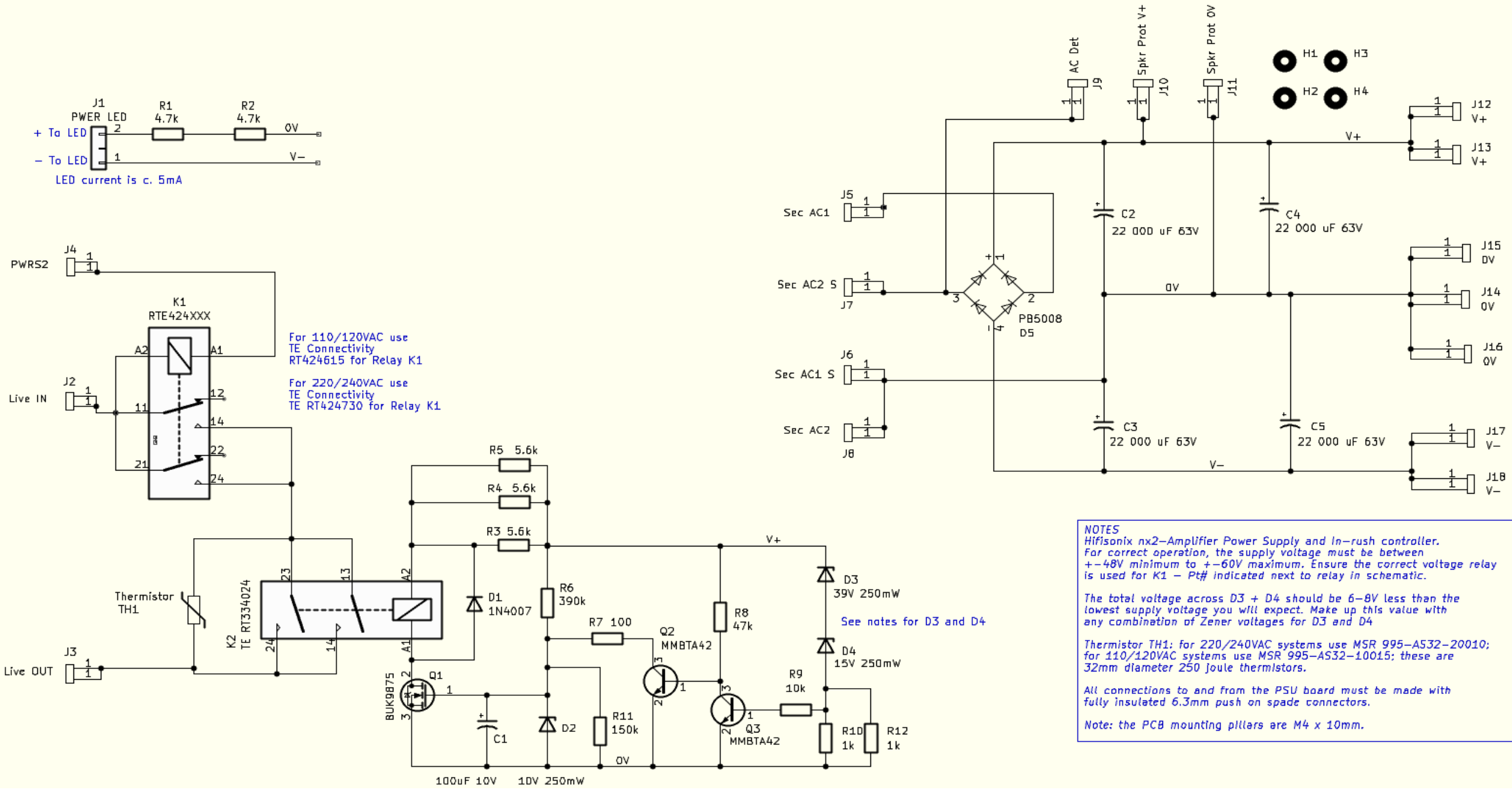
# nx-2 Amplifier Circuit Description

- **Voltage Amplifier Stage (cont.)** The TIS output appears at the collectors of Q7 and Q8 which are tied together by the Vbe multiplier bias control circuit formed by Q9 (BC856B) and Q10 (BC846B) and associated components. Under normal operating conditions, the volt drop across the bias controller is around 2.4V – so -1.2V measured with respect to 0V with the amplifier input shorted. C12 (10 uF) provides decoupling for the stage, while C13 (0.1uF) provides compensation, ensuring the Vbe multiplier circuit is free from oscillation. Q10 is mounted in close thermal proximity to one of the output devices (Q9) collector and this provides fast accurate bias control compensation over the amplifier's operating temperature range.
- **Output Stage.** Q13, Q15 and Q19 form the top half of the class AB push-pull output stage, and Q14, Q15 and Q20 form the bottom half of the output stage. Q11 (TTC011B) and Q12 (TTA006B) are the drivers whose emitters are tied together by R34 (33 Ohms), setting the driver standing current at 36mA. 4.7 Ohm resistors (R35, R36, R51 and R37, R38 and R52) act as base stoppers to ensure there is no chance of any OPS instability. The emitters of all 6 devices are coupled to the output via 0.33 Ohm 5W resistors (R39, R41, R40, R42, R49 and R50) which provide local AC feedback to the output devices and in conjunction with the bias controller circuit, help stabilize the output stage standing current. The junction of these 6 resistors is coupled to the output at J4 by L1, a 0.8uH inductor, in parallel with a 3.3 Ohm damping resistor R46. This network very effectively isolates the output stage from any speaker + cable capacitive load. R45 (10  $\Omega$  5W) and C18 (0.1uF 100V film) form a Zobel network (sometimes called a 'Boucherot cell') that ensures at HF the amplifier load impedance (which typically rises with frequency above a few kHz) as seen from Vo, remains fairly flat and resistive. Without it, the amplifier could break into HF parasitic oscillation with (typically) reactive speaker loads. D5 and D6 (1N4007) provide a path to the supply rails for inductive energy dump from the speaker and cabling.
- **Short circuit protection.** A random phase opto-triac (U1) is used to implement output current overload detection. R43 and R44 measure the voltage across emitter degeneration resistors R49 and R40 and if exceeding 7A peak (so >20A for all 3 output transistor pairs), the triac is triggered and pulls J3 ('Sct Out') to the V+ rail. This output is used by the Hifisonix speaker protection PCB to rapidly disable the speakers. Note that the amplifier will have to be powered fully down and the main reservoir capacitors fully discharged before the triac and the speaker protection board will reset. If this ever does happen, it is a good opportunity while the amplifier is resetting to check speaker wiring etc or any short circuits. The response time to a gross overload is in the region of 10-20 milliseconds to disengage the speakers.
- **Power and Power Rail decoupling** The power rails are generously decoupled with 1000uF 63V capacitors (C16, C17) which are further paralleled by 1uF 50V MLCC capacitors (C14, C15) to ensure the power rail impedance at HF remains low. R29 and R30 (15  $\Omega$ s) with C5 and C8 (1000uF 63V) form power rail low pass filters with a corner frequency of c. 10 Hz, isolating the voltage gain stage from the main power rails and further improving HF PSRR. C3 and C4 (1uF 100V) provide HF bypassing for the large electrolytics. The Amplifier PSRR with this set-up is in excess of 75 dB at 100Hz, and drops so that between 1 kHz and 20 kHz it is better than 85 dB, rising again so that at 1 MHz it approaches 50 dB. Diodes D7 and D8 (1N4007) ensure that if one of the fuses blows, none of the semiconductor junctions becomes excessively reverse-biased, causing possible damage. The rails are fused with 5 x 20 mm 8A 'T' fuses – these will safely allow short term peak currents in excess of the rated 20A peak current outputs and are incorporated as a final protection mechanism in case of a catastrophic failure, for instance of both output halves go short (highly unlikely).

# Notes about matching the transistors

- It is recommended you  $h_{FE}$  and  $V_{be}$  match to within 10% the following device pairs
  - Q1 and Q2
  - Q3 and Q4
  - Q7 and Q8
- Please note, if you do not match the transistors, your amplifier will still work, but matching them will give you a little lower distortion, and it will make a big improvement to the offset adjustment range and output offset drift.
- If you cannot get tight matching, a good option is to simply measure the  $V_{be}$  and  $h_{FE}$  and then use the closest matched pairs in each amplifier module.

# nx-2 Amplifier PSU Schematic





# nx2-Amplifier Compensation

The nx2 uses Transitional Miller Compensation aka TMC. On the next slide, the uncompensated (red trace) and compensated loop (teal trace) gains are plotted.

There are two feedback networks. The first is the main feedback network via  $R_f$  (1k  $R_{14}$  in the schematic) and  $R_g$  (33 Ohm  $R_7$  in the schematic). The second is the TMC network comprising  $C_9$ , 10, 11 and  $R_{21}$ .

At LF, the output stage is enclosed by both the overall feedback network via  $R_{14}$  and  $R_{21}$  and  $C_9$  and  $C_{10}$  (33pf each) with  $R_{21}$  at 1.5k effectively bypassing high reactance of  $C_{100}$  (100pF). The combination of these two feedback paths results in a -40 dB/decade slope along with the associated phase increase in the loop response which manifests between about 15kHz and 200kHz in the plot on the next slide. As frequency rises, the reactance of  $C_{11}$  reduces, shunting  $R_{21}$  and transitioning the OPS out of the TMC network. This has the effect of returning the amplifier to straight MC compensation by transitioning the gain slope from -40 dB/decade to -20 dB decade, along with the attendant phase margin back towards 90 degrees. This transition takes place from about 400kHz up 1MHz after which the slope is -20dB/decade up to the ULGF at 2.1 MHz.

Thus, compared to straight MC, TMC allows an additional 15 dB loop gain to be extracted at 20 kHz in this design, resulting in lower HF distortion. Looking at 1 kHz distortion, the advantages of TMC are not readily apparent in a CFA because the loop gain is usually flat across the audio band. However, IMD tests using 19+20 kHz tones readily highlight the HF distortion reduction improvement over MC

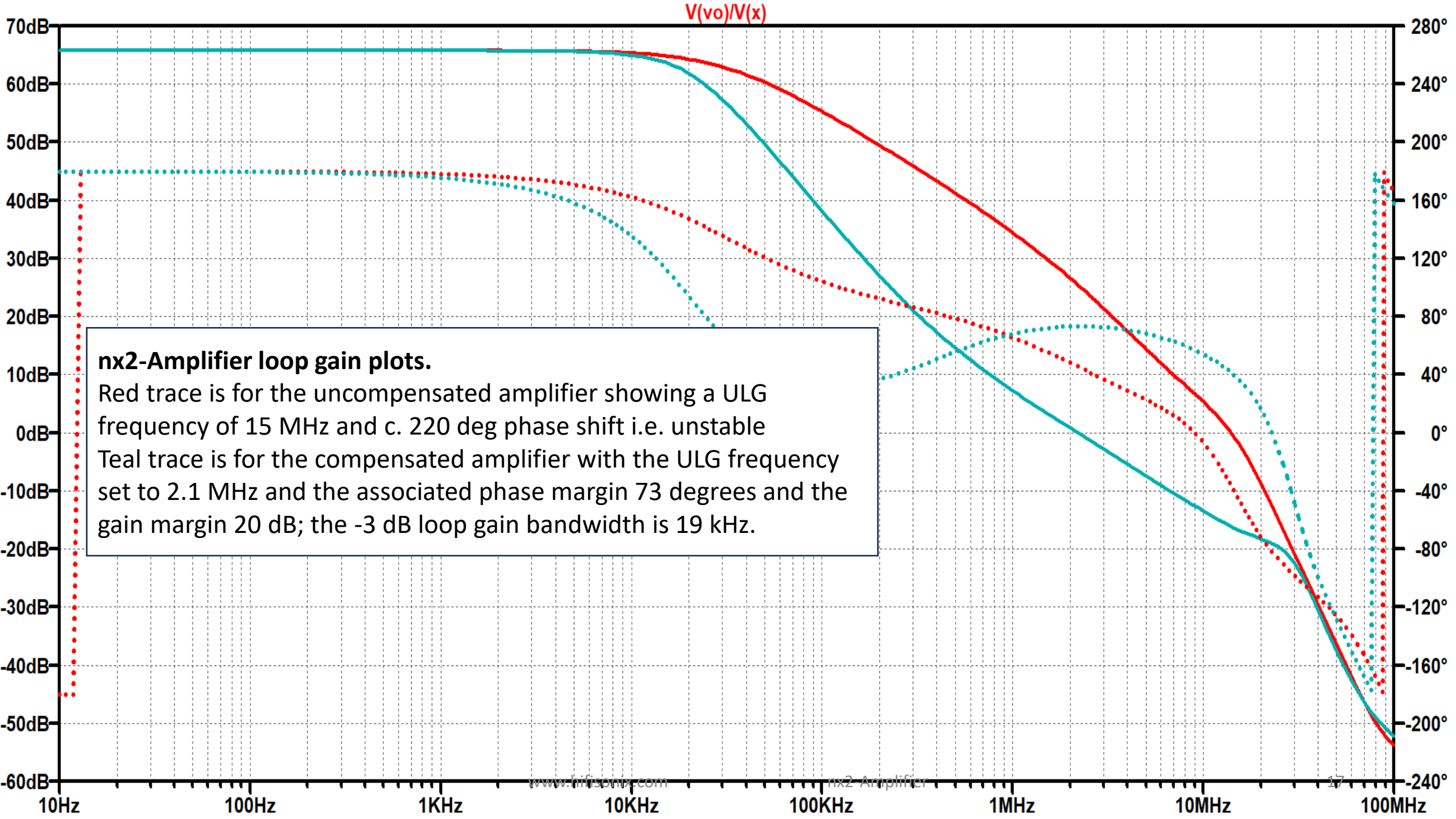
A further advantage of TMC compared to Two Pole Compensation, which offers similar distortion reduction levels, is that it does not suffer from the closed loop gain HF peaking that TPC does, often requiring aggressive bandwidth filtering before the amplifier to prevent overshoot on square wave stimulus tests.

The input filter( $R_4$  and  $C_2$  at 1k and 270pF) set the input bandwidth to about 600 kHz and with 1us rise fall times (much faster than any possible music transient) always ensures the diamond buffer remains in class A. It usefully also blocks any RF ingress to the input stage.

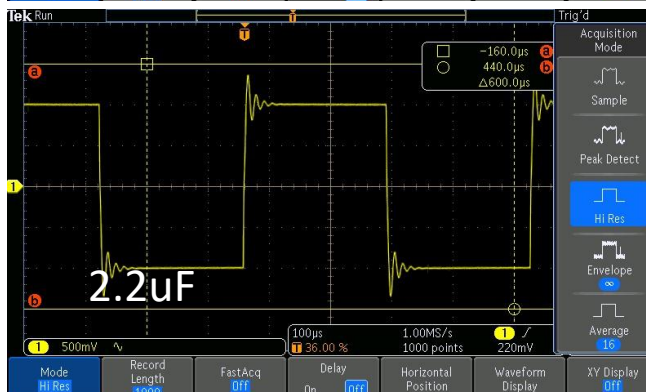
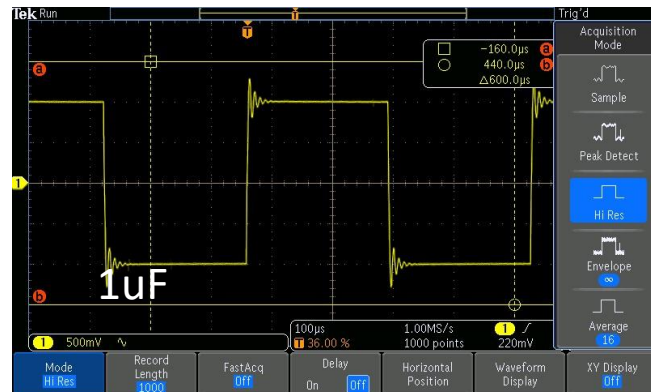
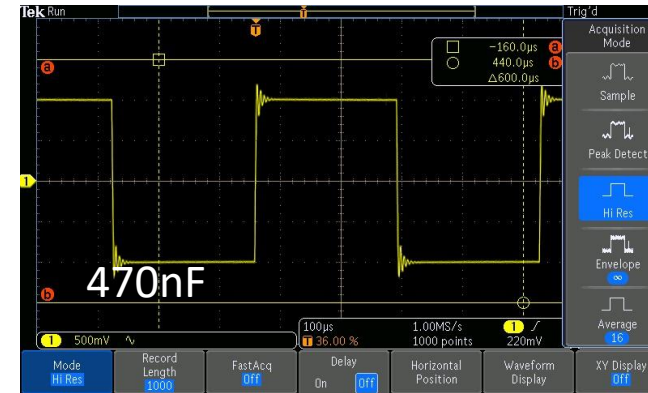
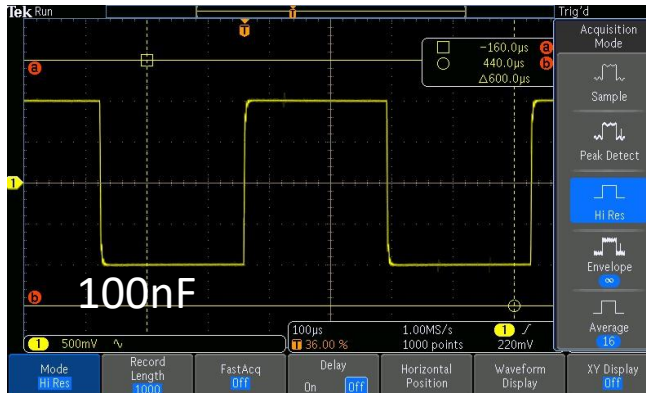
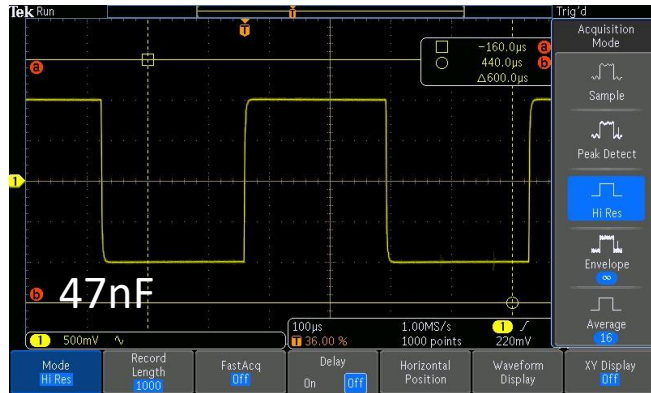
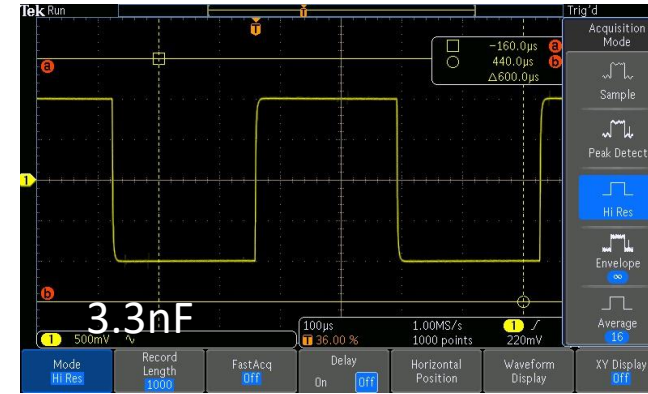
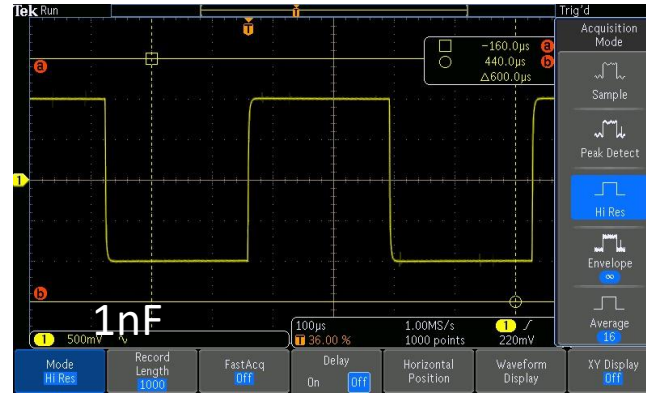
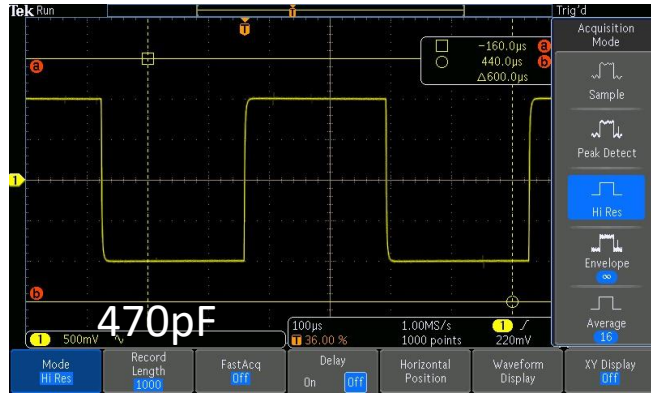
Although  $L_1$  in parallel with  $R_{46}$  does not form part of the compensation scheme proper, it nevertheless plays a vital role in ensuring the amplifier output stage is not exposed to capacitive loads at HF which would cause the OPS pole to migrate down in frequency but increase in magnitude with the attendant phase lag, leading to oscillation. In other words, the compensation scheme described above works contingent upon the amplifier output not being exposed directly to excessive capacitive loading, which is the function of the  $L_1//R_{46}$  network.

The nx2-Amp can drive any load from 2 ohms and up in parallel with any capacitance up to 2.2uF. Slides 18 and 19 depict the amplifier stability performance into capacitive and resistive loads.



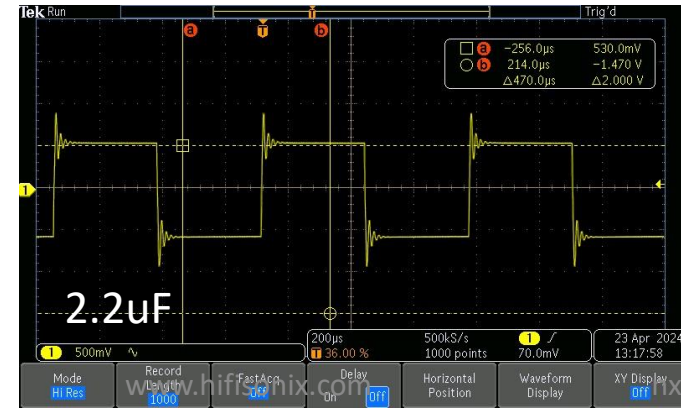
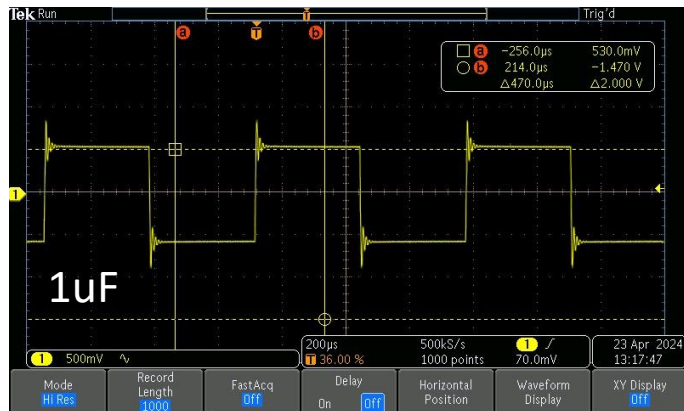
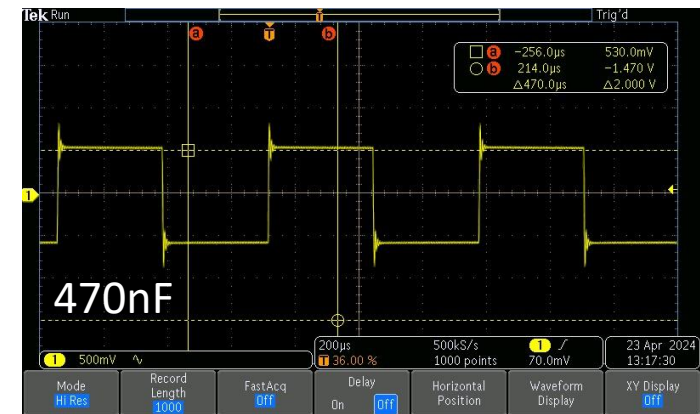
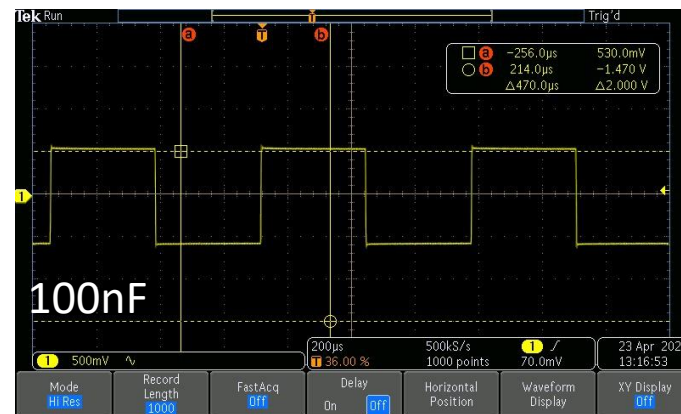
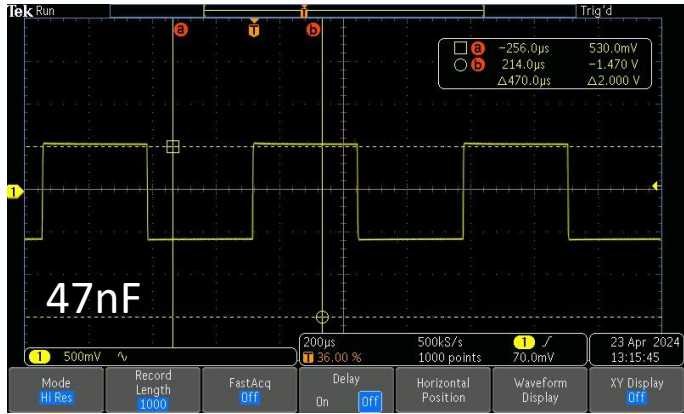
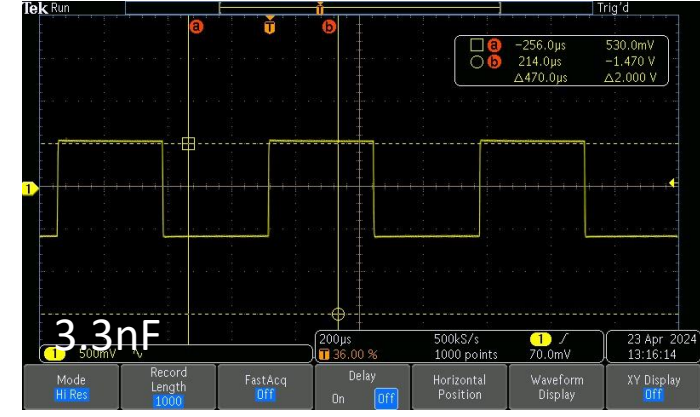
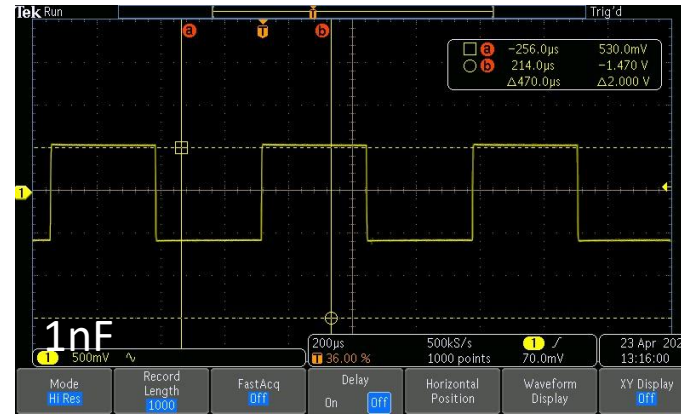
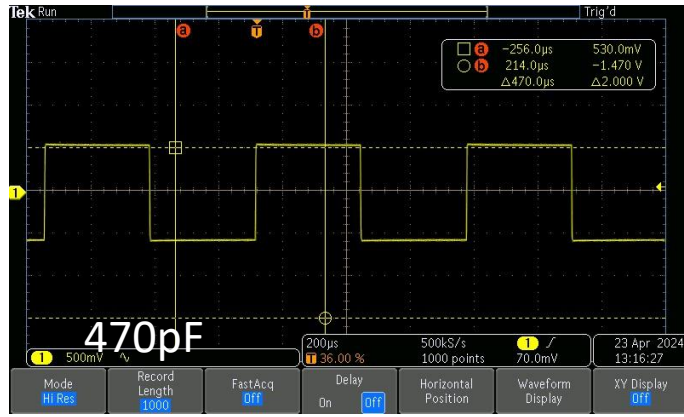


# nx-2 Amplifier - stability measurements



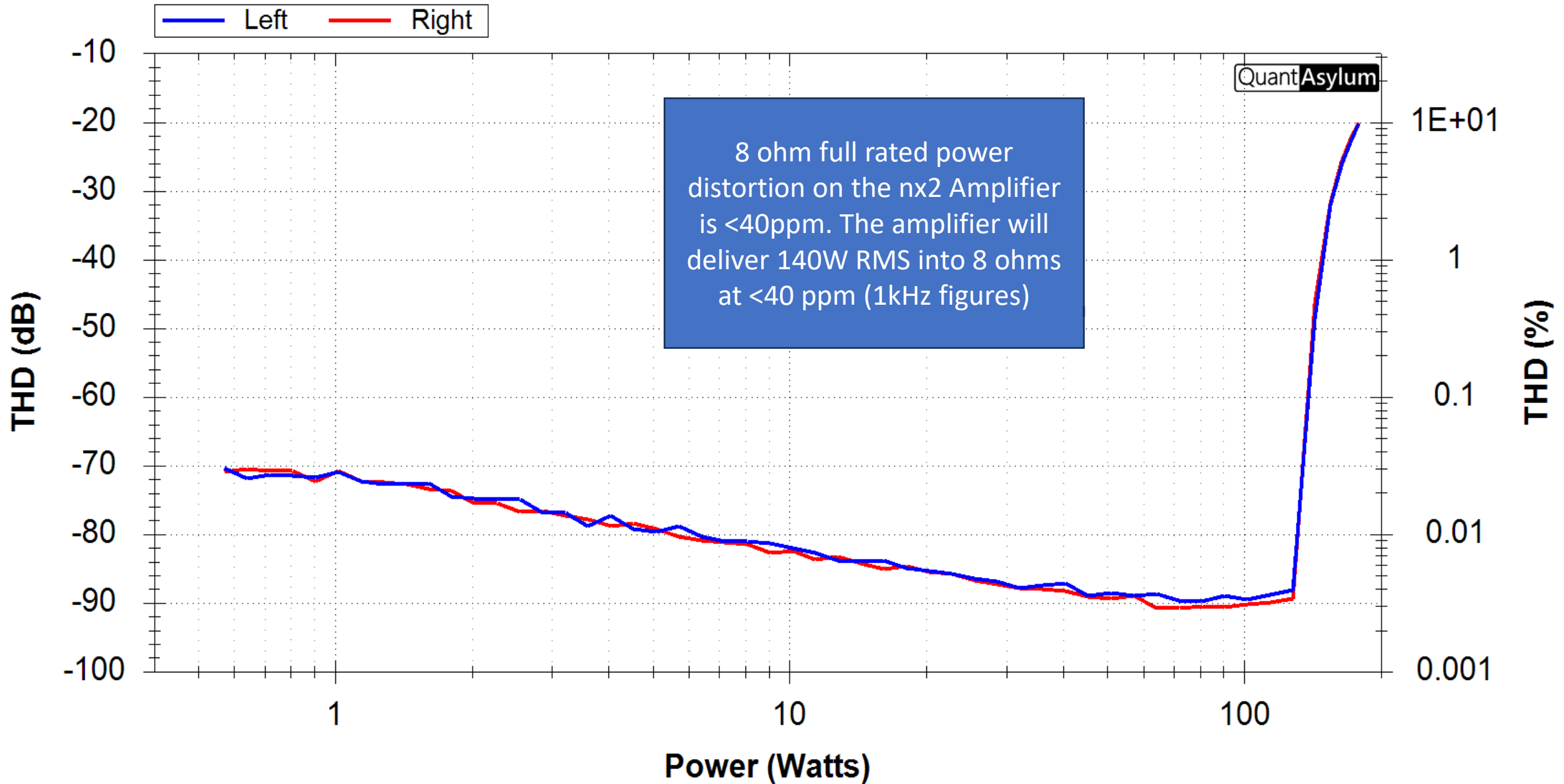
Load is 2 Ohms in // with capacitor

# nx-2 Amplifier - stability measurements on Prototype #1



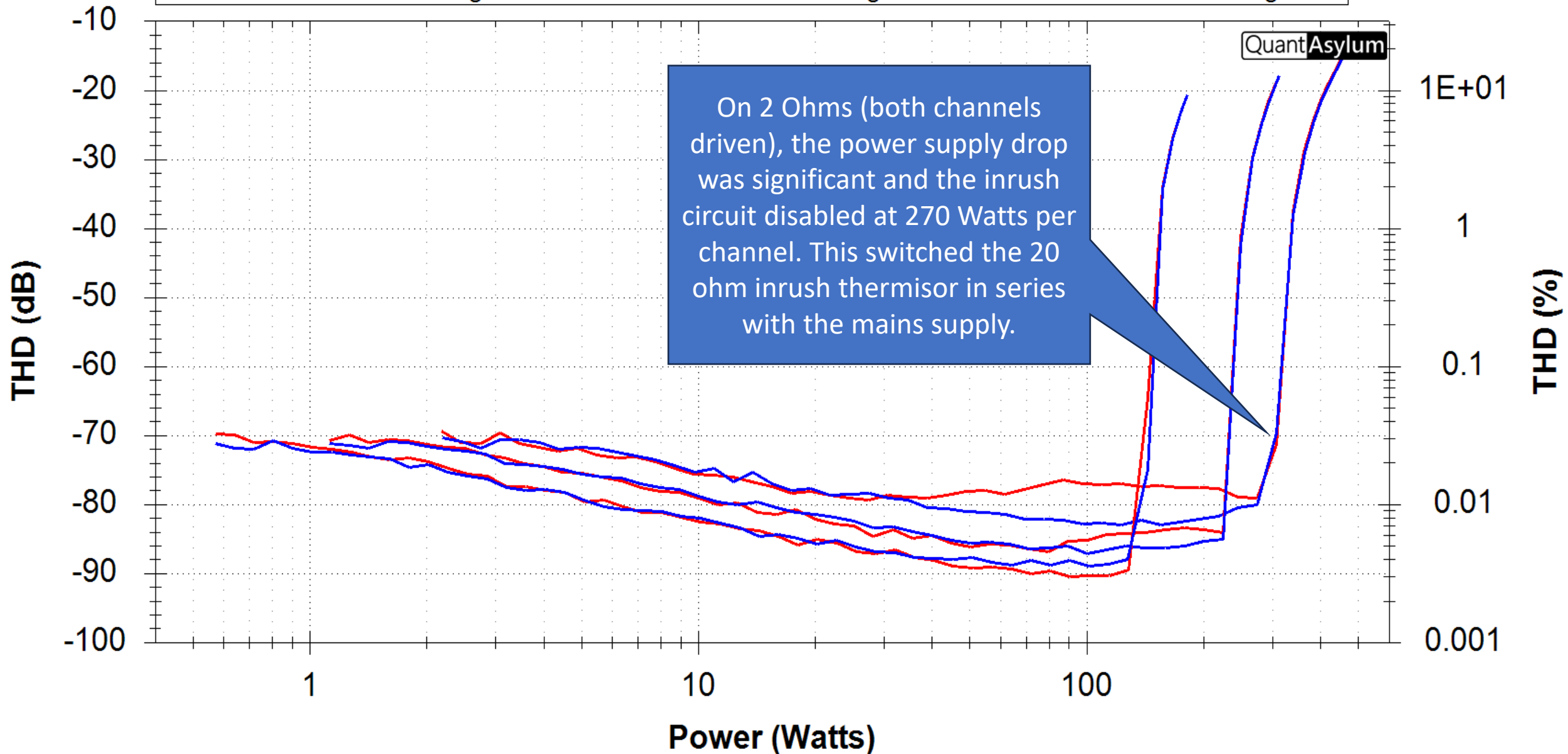
Load is  $\infty$  Ohms in // with capacitor

## nx2-Amplifier Power vs Distortion 8 ohms



# nx2-Amplifier Power vs Distortion 8, 4 and 2 ohms both channels driven

Left Right Left44 Right80 Left44 Right28





FFT: 128k  
Avg: 34 of 50  
Res: 1.46 Hz  
Fs: 192 KHz  
Win: Hann  
Weight: None

Meas Start: 20.0 Hz  
Meas Stop: 20.0 KHz  
RMS L: 0.0 dBr  
RMS R: 0.0 dBr

Peak L: 0.00 dBr  
Peak R: 0.01 dBr  
Peak L: 104 W (8.0  $\Omega$ )  
Peak R: 104 W (8.0  $\Omega$ )  
THD L: -87.7 dB/ 0.00411%  
THD R: -91.5 dB/ 0.00266%

Gen 1: 1.000488 KHz @ 30.4 dBr  
Gen 2: 1.999511 KHz @ -29.2 dBr

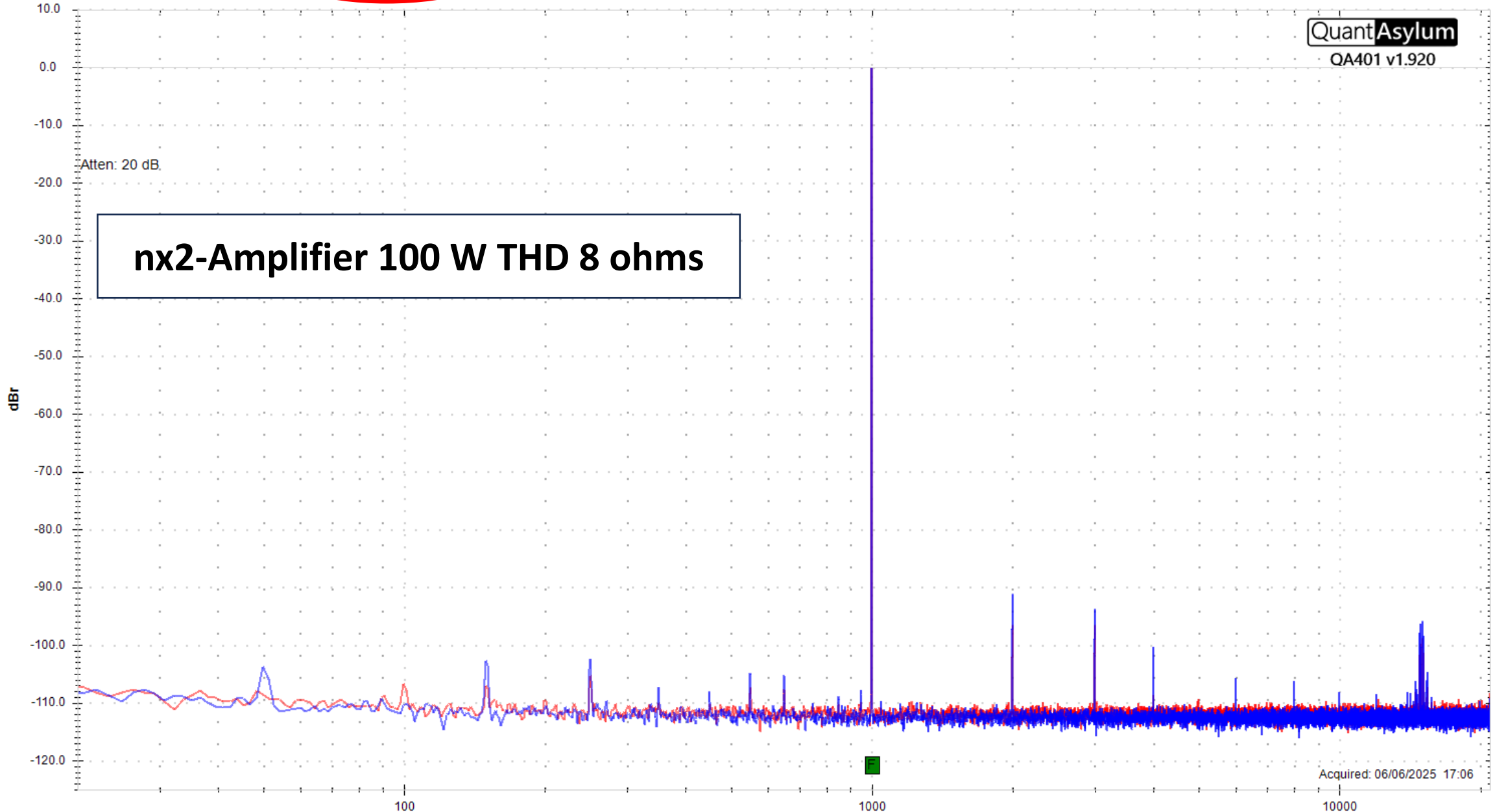
THD+N L: -72.9 dB/ 0.02269%  
THD+N R: -72.5 dB/ 0.02366%

Phase L: -0.22 deg  
Phase R: -0.23 deg  
Delay L: 10.7 uSec  
Delay R: 10.7 uSec  
Gain L: 29.62 dB  
Gain R: 29.62 dB

QuantAsylum  
QA401 v1.920

Atten: 20 dB

**nx2-Amplifier 100 W THD 8 ohms**



Acquired: 06/06/2025 17:06

FFT: 128k  
Avg: 21 of 50  
Res: 1.46 Hz  
Fs: 192 KHz  
Win: Hann  
Weight: None

Meas Start: 20.0 Hz  
Meas Stop: 20.0 KHz  
RMS L: -0.1 dBr  
RMS R: -0.1 dBr

Peak L: -0.06 dBr  
Peak R: -0.07 dBr  
Peak L: 205 W (4.0  $\Omega$ )  
Peak R: 205 W (4.0  $\Omega$ )  
THD L: -83.4 dB/ 0.00674%  
THD R: -83.8 dB/ 0.00648%

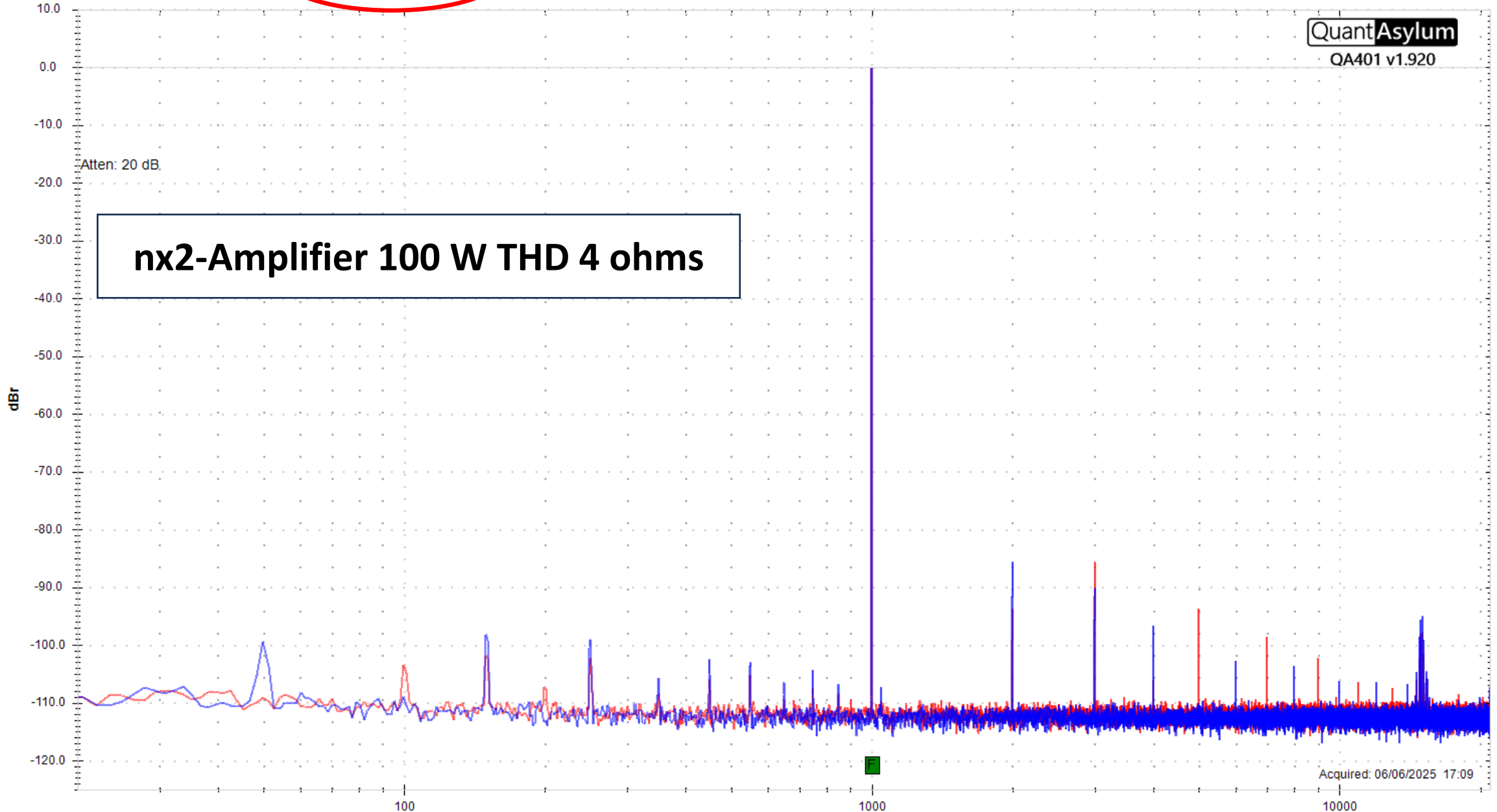
Gen 1: 1.000488 KHz @ 30.4 dBr  
Gen 2: 1.999511 KHz @ -29.2 dBr

Phase L: -0.36 deg  
Delay L: 11.0 uSec  
Delay R: 11.1 uSec  
Gain L: 29.55 dB  
Gain R: 29.55 dB

QuantAsylum  
QA401 v1.920

Atten: 20 dB

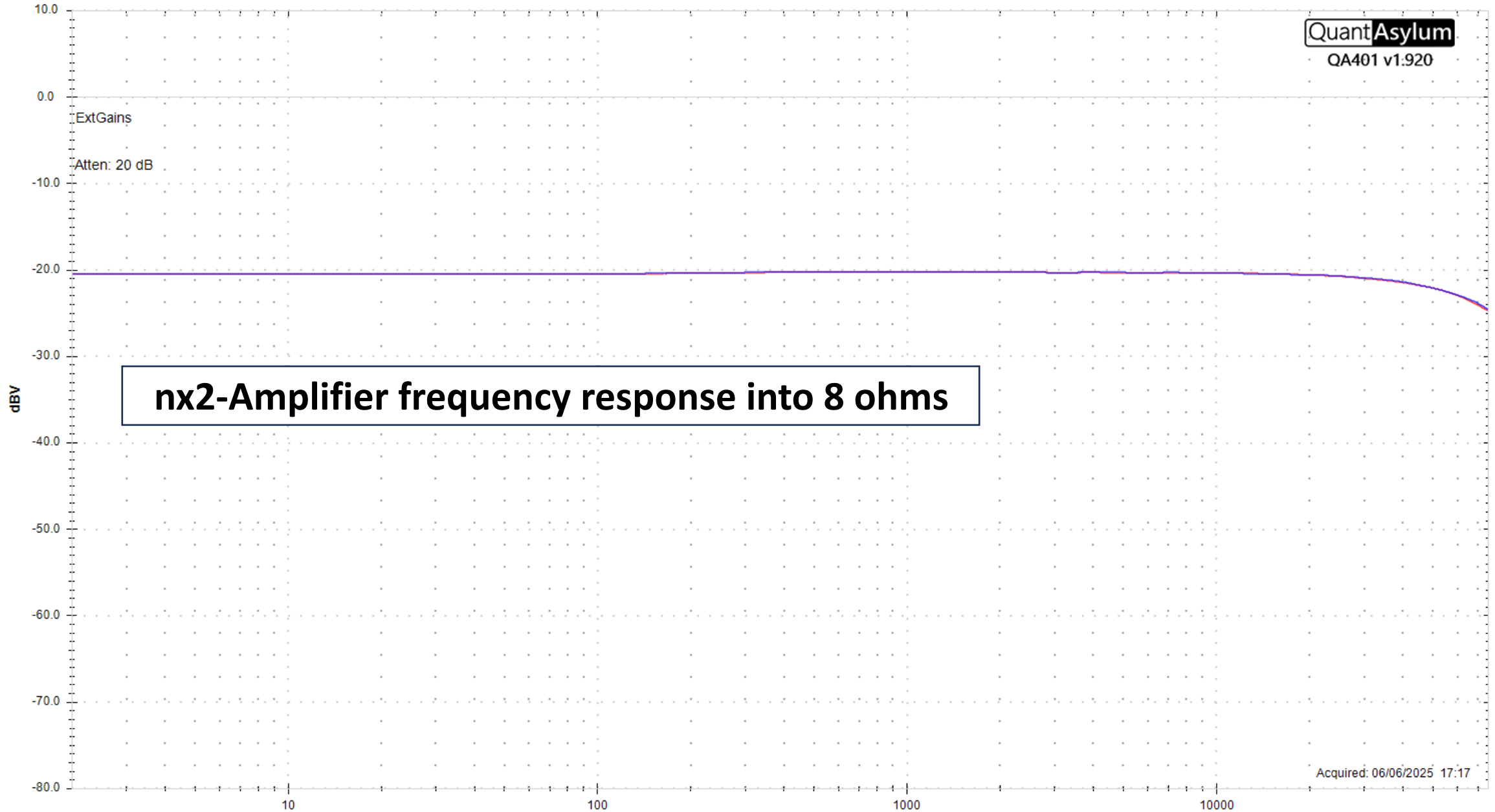
**nx2-Amplifier 100 W THD 4 ohms**



Acquired: 06/06/2025 17:09

FFT: 128k Meas Start: 20.0 Hz Peak L: -20.36 dBV FR Gen: -50.0 dBV  
Avg: 14 of 50 Meas Stop: 20.0 KHz Peak R: -20.37 dBV  
Res: 1.46 Hz Peak L: 1.14 mW (8.0  $\Omega$ )  
Fs: 192 KHz Peak R: 1.14 mW (8.0  $\Omega$ )  
Win: Hann FR Window: 3.0mS  
Weight: None FR Smoothing: 1/6 Oct

QuantAsylum  
QA401 v1.920





FFT: 128k  
Avg: ---  
Res: 1.46 Hz  
Fs: 192 KHz  
Win: Hann  
Weight: None

Meas Start: 20.0 Hz  
Meas Stop: 20.0 KHz

Peak L: 0.00 dBr  
Peak R: -0.01 dBr  
Peak L: 27.0 W (8.0  $\Omega$ )  
Peak R: 26.9 W (8.0  $\Omega$ )

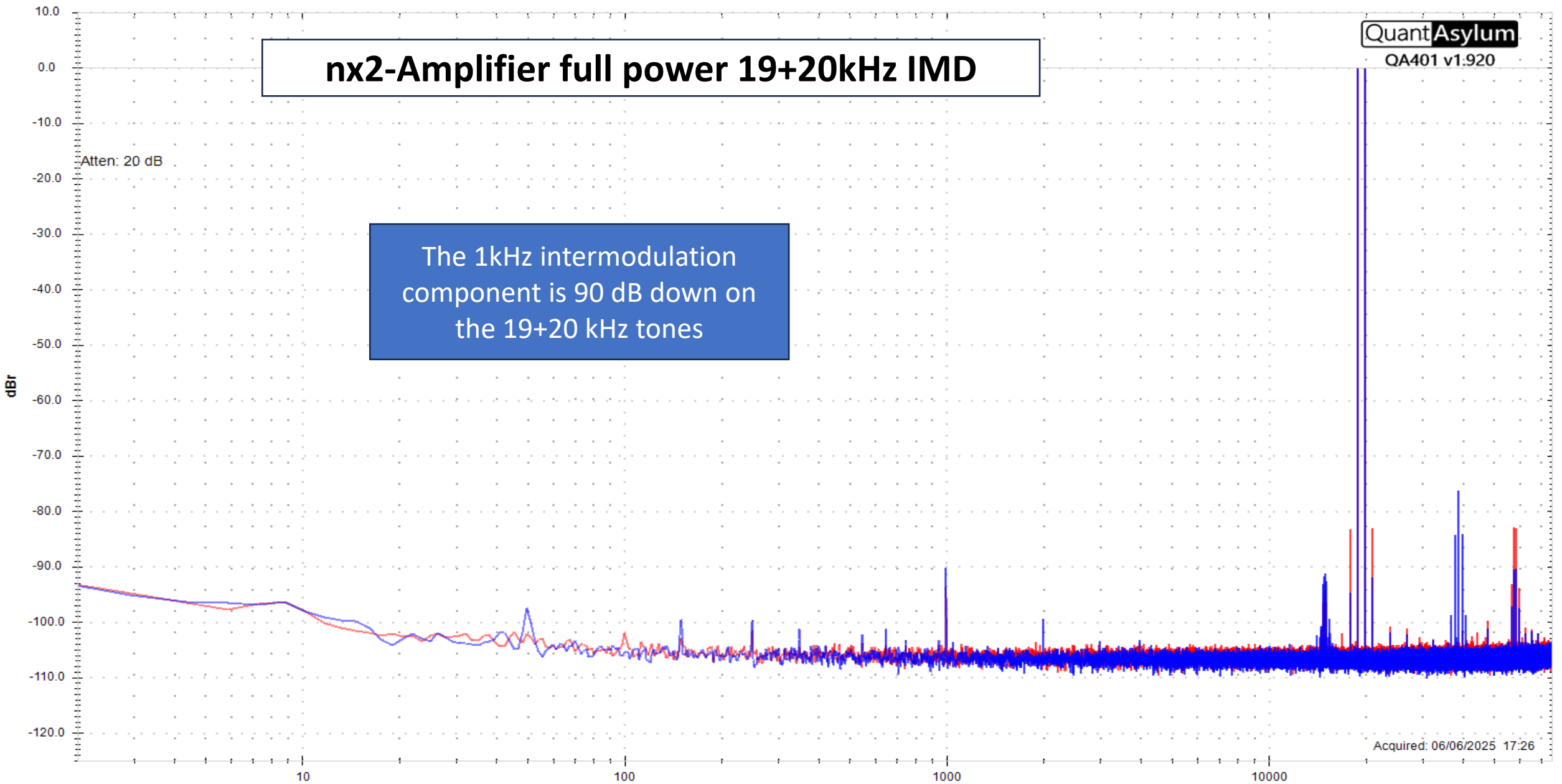
Gen 1: 19.00048 KHz @ 30.6 dBr  
Gen 2: 19.99951 KHz @ 30.6 dBr

**nx2-Amplifier full power 19+20kHz IMD**

QuantAsylum  
QA401 v1.920

Atten: 20 dB

The 1kHz intermodulation component is 90 dB down on the 19+20 kHz tones



## nx2-Amplifier output impedance

