NEUTRINO®

USER MANUAL

MINI NC252MP HYPEX STEREO AMPLIFIER
2x250W 4Ohm(2x150W 8Ohm)

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12.  Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage " within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

NOTICE

All of us at Neutrino take extreme care to ensure that your purchase will remain a prized investment. We are proud to inform you that all Neutrino components have been officially approved for the European Community (CE) mark.

This means that your Neutrino product was subjected to the most rigorous manufacturing and safety tests in the world. CEmark certifies that your purchase meets or exceeds all European Community requirements for manufacturing consistency and consumer safety.

This equipment has been tested and found to comply with the limits for a Class D digital device, pursuant to Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna;
- Increase the separation between the equipment and the receiver;
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected;
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Changes or modifications to this equipment not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The information contained in the manual is subject to change without notice. The most current version of this manual will be posted on our web site at http://neutrinoaudio.eu

Neutrino marks the "CE" symbol indicating compliance of this device with the EMC (Electromagnetic Compatibility) and LVD (Low Voltage Directive) standards of the European Community.

Neutrino complies with the European Parliament and Council Directive 2002/96/EC concerning Waste Electrical and Electronic Equipment (WEEE). This product must be appropriately recycled or processed in accordance with these directives. Consult your local waste disposal authority for guidance.

Neutrino products are designed and manufactured to comply with the Restriction of Hazardous Substances (RoHS) Neutrino as stated in the European Parliament and Council Directive 2002/95/EC.

CONTENTS

Unpacking and Placement

unpacking your amplifier

Carefully unpack your power amplifier according to the supplied instructions, and remove all accessories from the carton.

Important!

Keep all packing materials for future transport of your Neutrino amplifier. Shipping your new component in anything other than its purpose-designed packing material may result in damage that is not covered by the warranty.

placement

Many installations will utilize an equipment rack, although a shelf, a cabinet or the floor near the speaker(s) are acceptable alternatives. In any case, take care to position it well away from source components and preamp/processors, which may be sensitive to the amplifier's electromagnetic fields.

Note that adequate clearance for the AC cord and connecting cables must be left behind the amplifier. We suggest leaving six inches (15 cm) of free space behind your power amplifier to allow all cables sufficient room to bend without crimping or undue strain.

ventilation

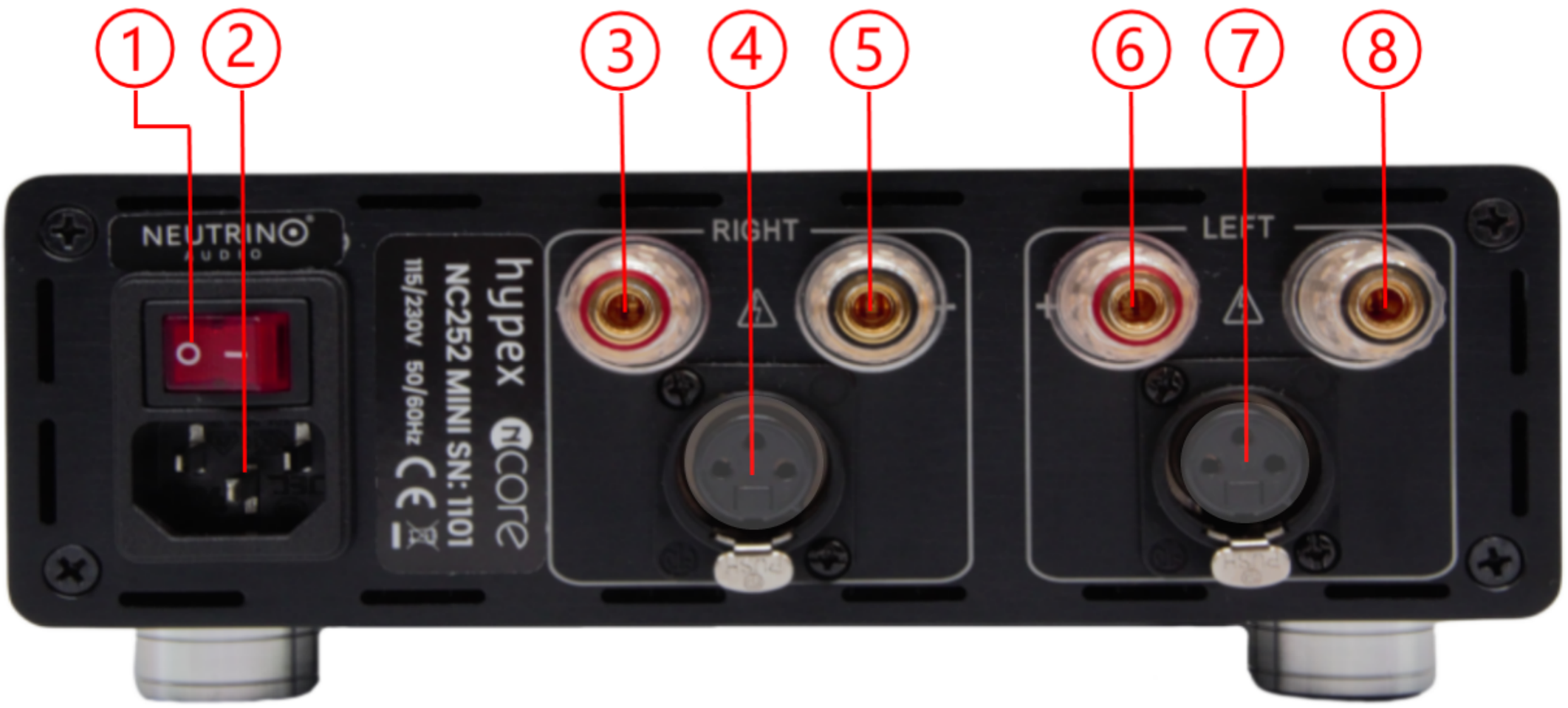
Your Neutrino power amplifier generates a certain amount of heat in the course of normal operation. Avoid placement on soft surfaces that would restrict airflow around the unit (such as plush carpeting).

custom installations

Drawings are included in this manual to facilitate special installations and custom cabinetry

Front and Rear Panel

Front Panel



Rear Panel

1. AC power switch
2. AC main input
3. Right speaker
4. XLR input left
5. Right speaker
6. Left speaker
7. XLR input left
8. Left speaker

INSTALLATION

Your new Neutrino amplifier is quite simple to set up and enjoy. Please follow the steps outlined below in order to safely set up and use your new amplifier.

The AC mains connection should be the last connection you make on your new power amplifier. In addition, it is always a good idea to power up your power amplifier(s) last, after everything else has been powered up and has stabilized.

Conversely, it is good practice to power the amplifier(s) down first when shutting down the system, as this prevents any transients from other components from getting through to your loudspeakers.

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1. **Unpack everything according to the included instructions.**
   Be careful when doing so, as this amplifier is heavier than it appears.

2. **Place your amplifier and connect it to the AC mains.** This includes deciding on the location, making sure you have adequate ventilation, and adequate clearance for all the wires behind the amplifier. Once accomplished, connect the amplifier directly to the AC mains. Do not use extension cords, as most are not suitable for the current sometimes required by your amplifier.

3. **Make your preamp/processor connections.**
   With the amplifier in *standby* (or disconnected from the AC mains), using a high quality interconnecting cable, make the appropriate connection with the balanced or single-ended connector.

hypex electronics

ncore audio power conversion

NC252MP

High Efficiency Self Contained Amplifier Module

Image is for illustrative purposes only. Please refer to product description.

Highlights

- High efficiency
- Universal mains operation
- Flat, fully load-independent frequency response
- Low output impedance
- Very low, frequency-independent THD
- Very low noise

Features

- Two channel amplifier
- 5W standby SMPS
- Advanced over current protection
- External controlled operation
- Auto-switching (115/230V)

Introduction

The NC252MP amplifier module incorporates a low power standby power supply (meets 2013 ERP Lot 6 0.5W requirements), a highly efficient switch mode power supply and a high-performance Class D amplifier in one compact and easily applicable power brick.

The amplifier used in the NC252MP is a self-contained high-performance class D amplifier intended for a wide range of audio applications, ranging from public address systems to ultrahigh-fidelity replay systems for studio and home use. Chief distinguishing features are flat frequency response irrespective of load impedance, nearly frequency independent distortion behaviour and very low radiated and conducted EMI. Control is based on a phase shift controlled self-oscillating loop taking feedback only at the speaker output.

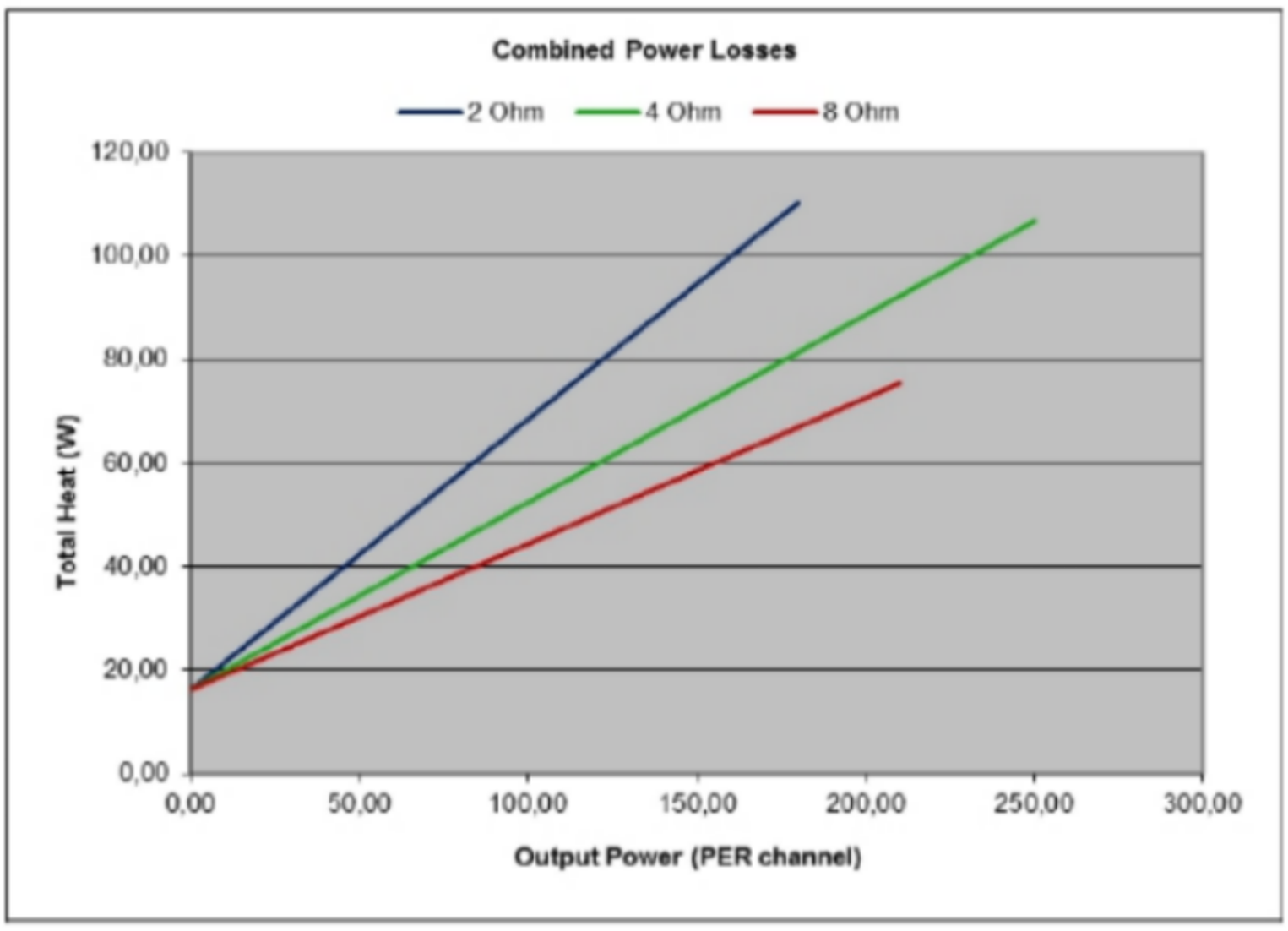
The main SMPS providing the power for the amplifier is a compact, high power, highly efficient, regulated half bridge converter with synchronous rectification on the main output rails. These properties make this technology ideal for powering Class D audio amplifiers.

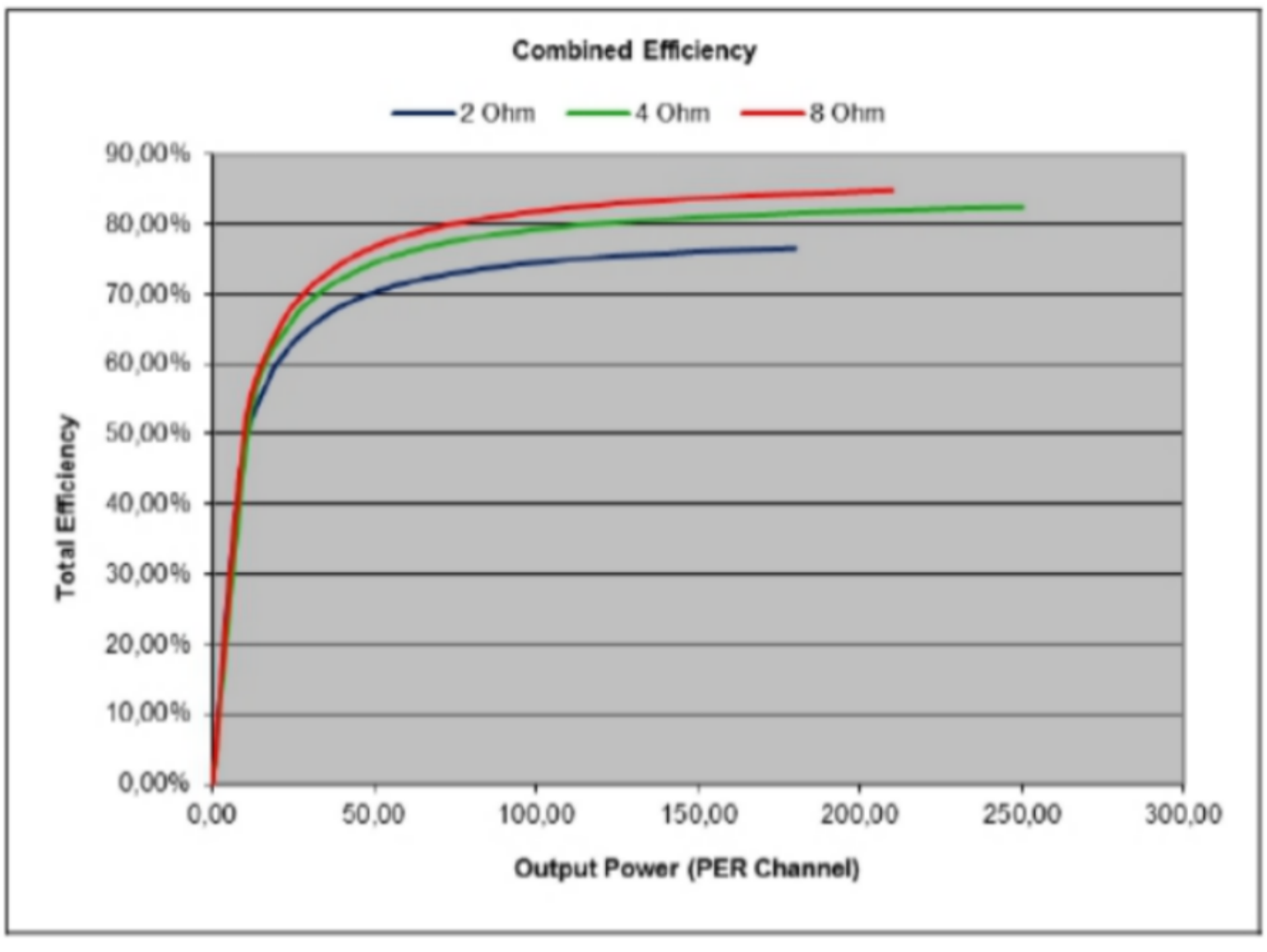
Environmental Specifications

Parameter	Remarks	Symbol	Min	Typ	Max	Unit	Note
Ambient Temperature	Storage		-25	-	70	ºC	
	Operation	T_{amb}	0	-	50	ºC	
Heat-sink Temperature		$T_{h,max}$			95	ºC	
Humidity	Max 85 percent relative humidity, non-condensing.						

Heat dissipation

The following graphs provide an indication of the heat (in Watts) generated at different output levels.



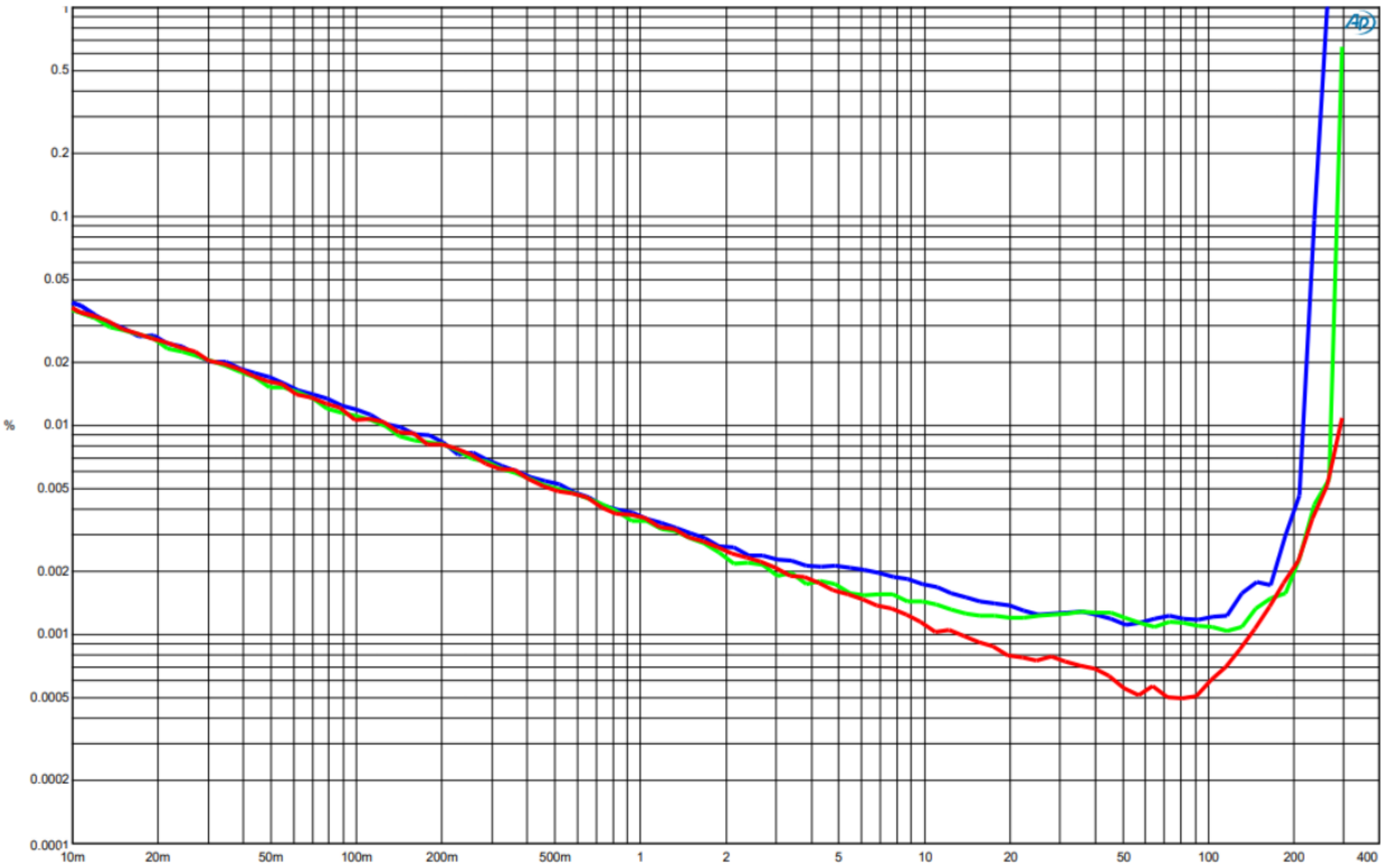


Ncore Amplifier Specifications

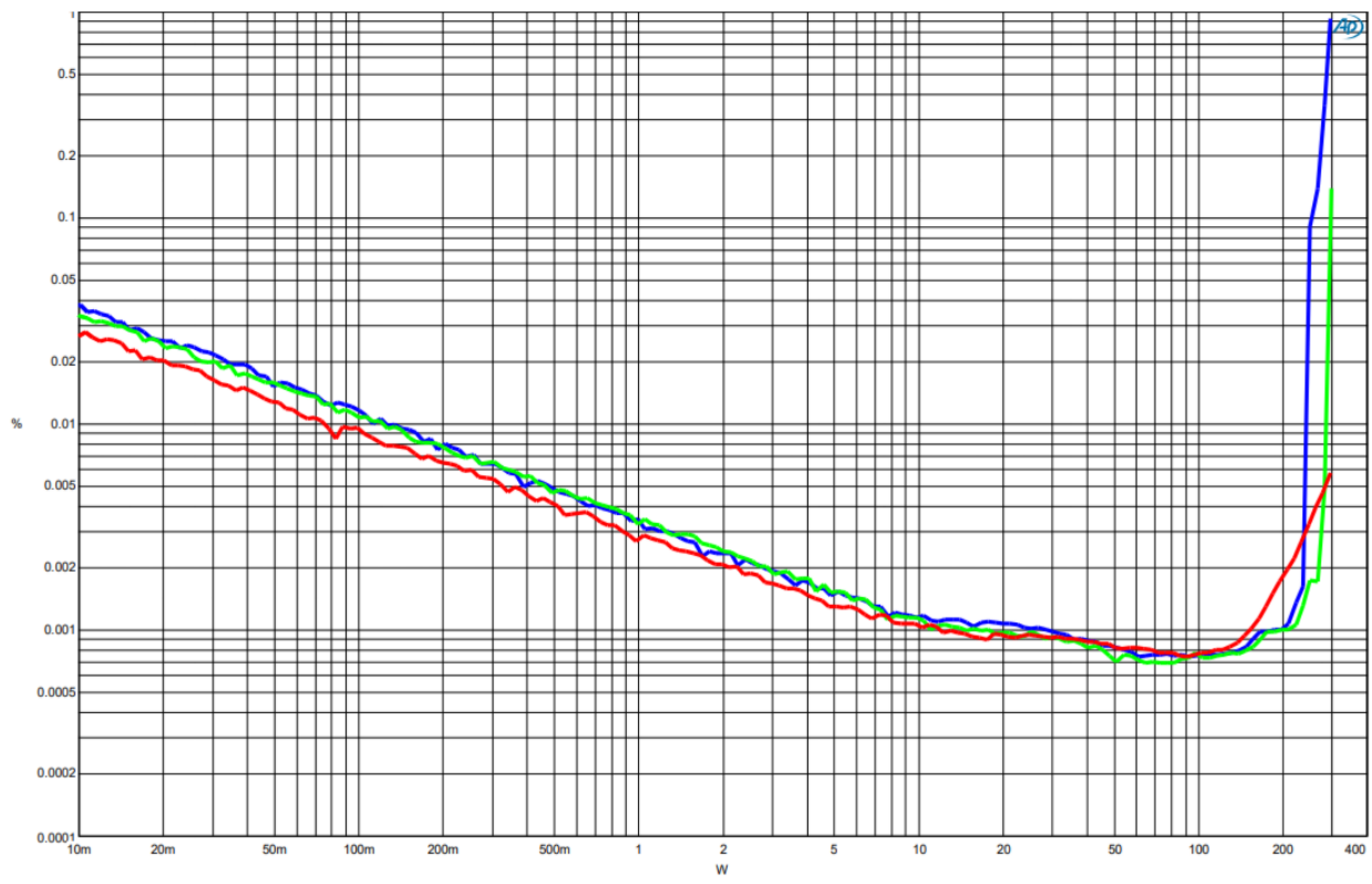
Parameter	Remarks	Symbol	Min	Typ	Max	Unit	Note
Max Output Power	1KHz, THD=1%, All channels driven. Per channel.	$P_{R,\ 2\Omega}$	-	-	180	W_{rms}	1)4)
		$P_{R,\ 4\Omega}$	-	-	250	W_{rms}	1)
		$P_{R,\ 8\Omega}$	-	-	150	W_{rms}	1)5)
Continuous Output Power	Per channel, 25°C ambient temperature.	$P_{R,cont}$	-	50	-	W_{rms}	2)
Distortion	<10Hz-20kHz AES17 Pout<P_R/2	THD+N	-	0.0015	0.0024	%	3)
	<10Hz-20kHz AES17 Pout=1W		-	-	0.002	%	3)
CMRR			-	71	-	dB	
Signal-to-Noise Ratio	<10Hz-20kHz AES17		-	121	-	dB	
Output Noise	Unwtd, <10Hz-20kHz AES17, 0Ω termination	U_N	-	-	40µ	V	
Crosstalk	1KHz, Pout 10W / 4Ω, 0dB rel.			-105		dB	
Output Impedance	f<1kHz	Z_{OUT}	-	-	2.5	mΩ	
	f<20kHz		-	-	5.0	mΩ	
Power Bandwidth		PBW		20-35k		Hz	6)
Frequency Response	+0/-3dB. All loads.		10	-	50k	Hz	
Voltage Gain Buffered		A_V	25	25.5	26	dB	7)
Voltage Gain Unbuffered		A_V	11.5	12	12.5	dB	7)
Efficiency	Full power	η		92	-	%	
Idle Losses	Per channel	P_0	-	3.5		W	
Current Limit per Ch	Hiccup after limiting 40ms		-	17.5	-	A	

Note 1: The stimulus signal is a continuous 1 kHz sine wave. The true rms output voltage is measured across a load resistor. Max output power is time limited due to thermal properties.
Note 2: Typically, this is 1/5 of the peak output power. Apply sufficient cooling.
Note 3: An Audio Precision AES17 20 kHz is used during this measurement.
Note 4: Current limited.
Note 5: Voltage limited
Note 6: Dielectric losses in the output capacitor limit long term (>30s) full-power bandwidth to 5kHz.
Note 7: The factory default is a buffered input with a gain of 13.5 dB. This can be bypassed as explained in section 3.5 “Input buffer and gain”

THD+N vs Power

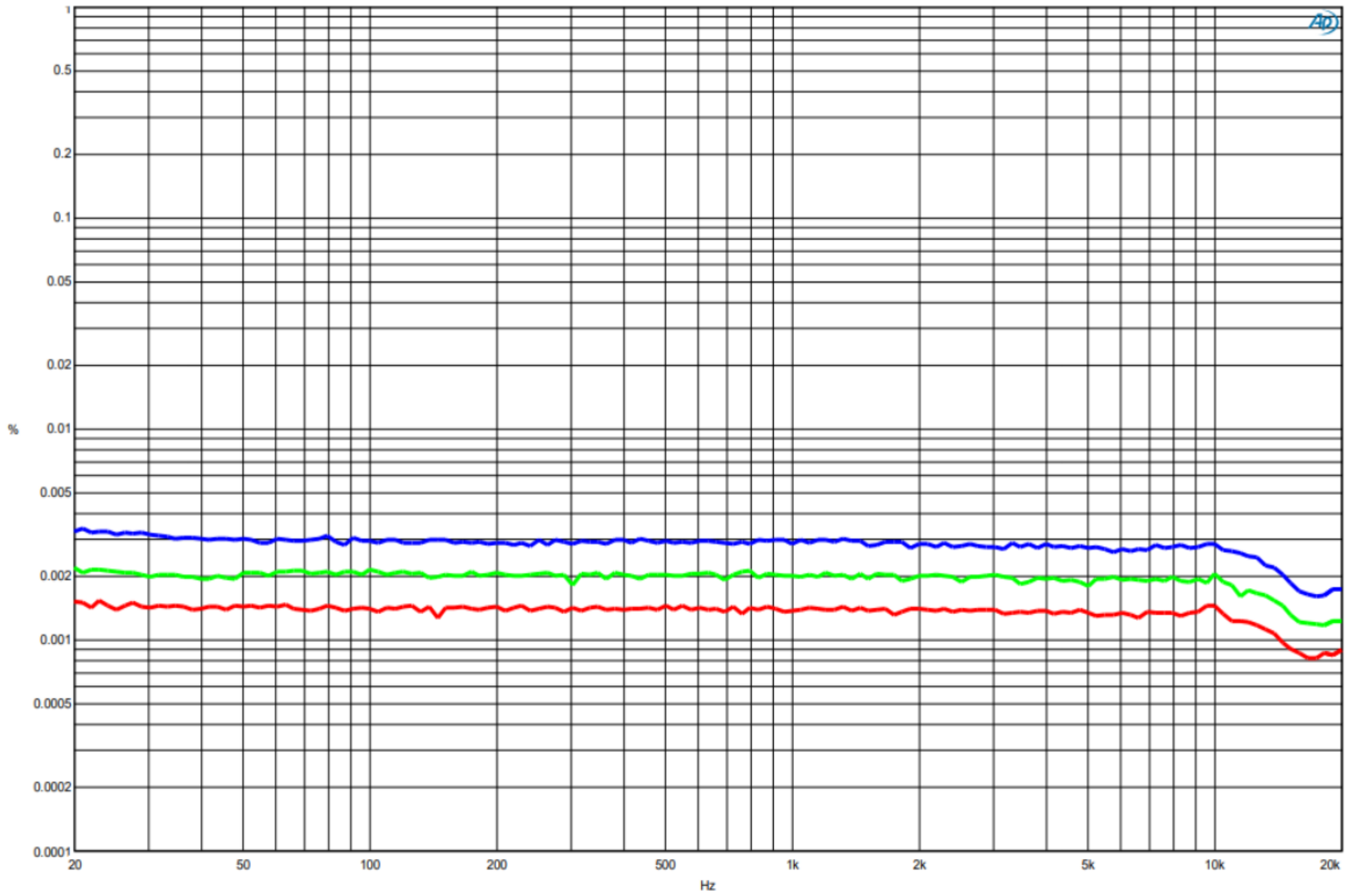


THD+N vs. power at 100Hz (blue), 1kHz (green) and 6kHz (red) (4Ω).

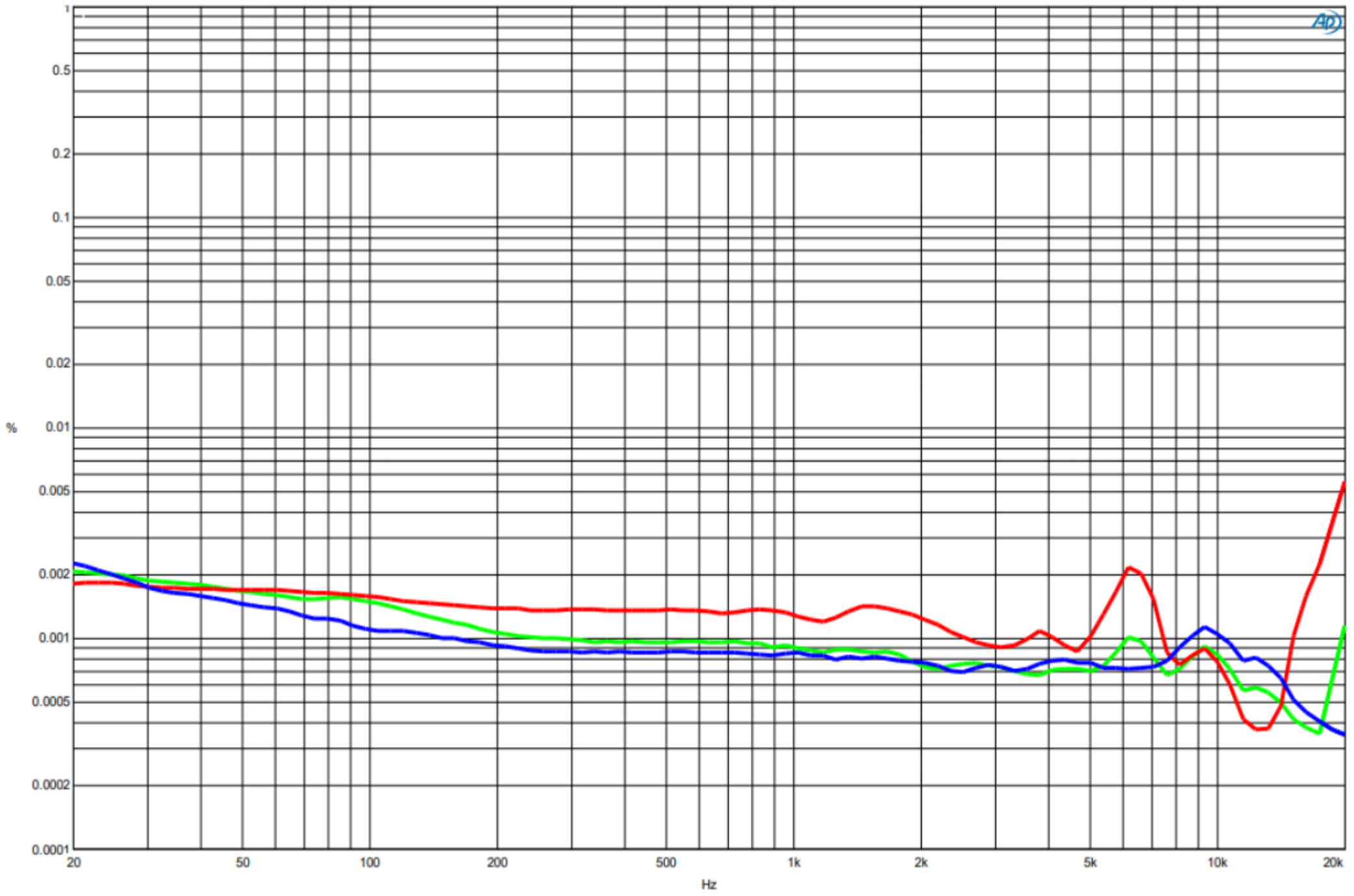


THD+N vs. power at 100Hz (blue), 1kHz (green) and 6kHz (red) (8Ω).

THD+N vs Frequency

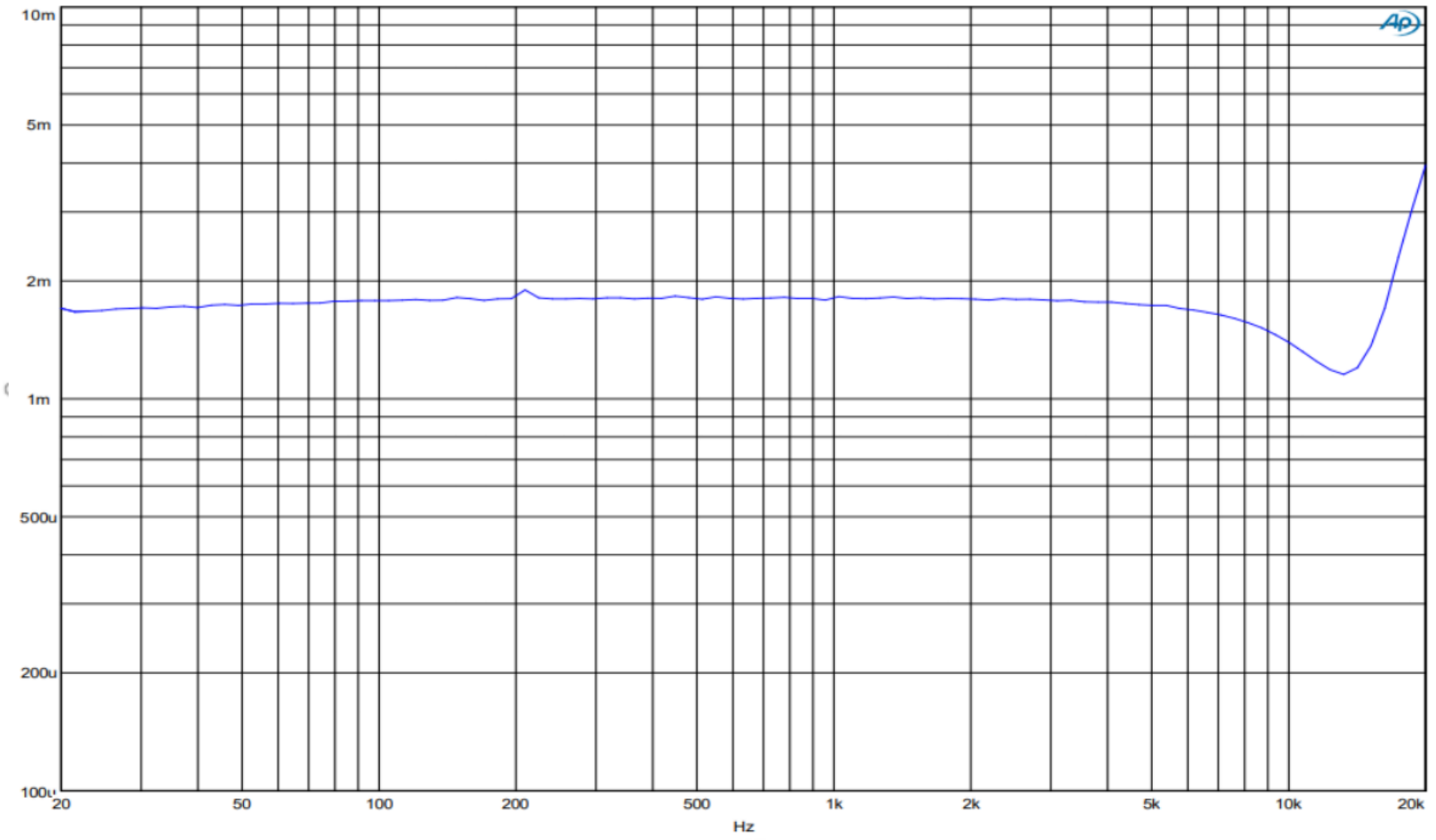


THD+N vs. Frequency at 1W in 2Ω (blue), 4Ω (green) and 8Ω (red).

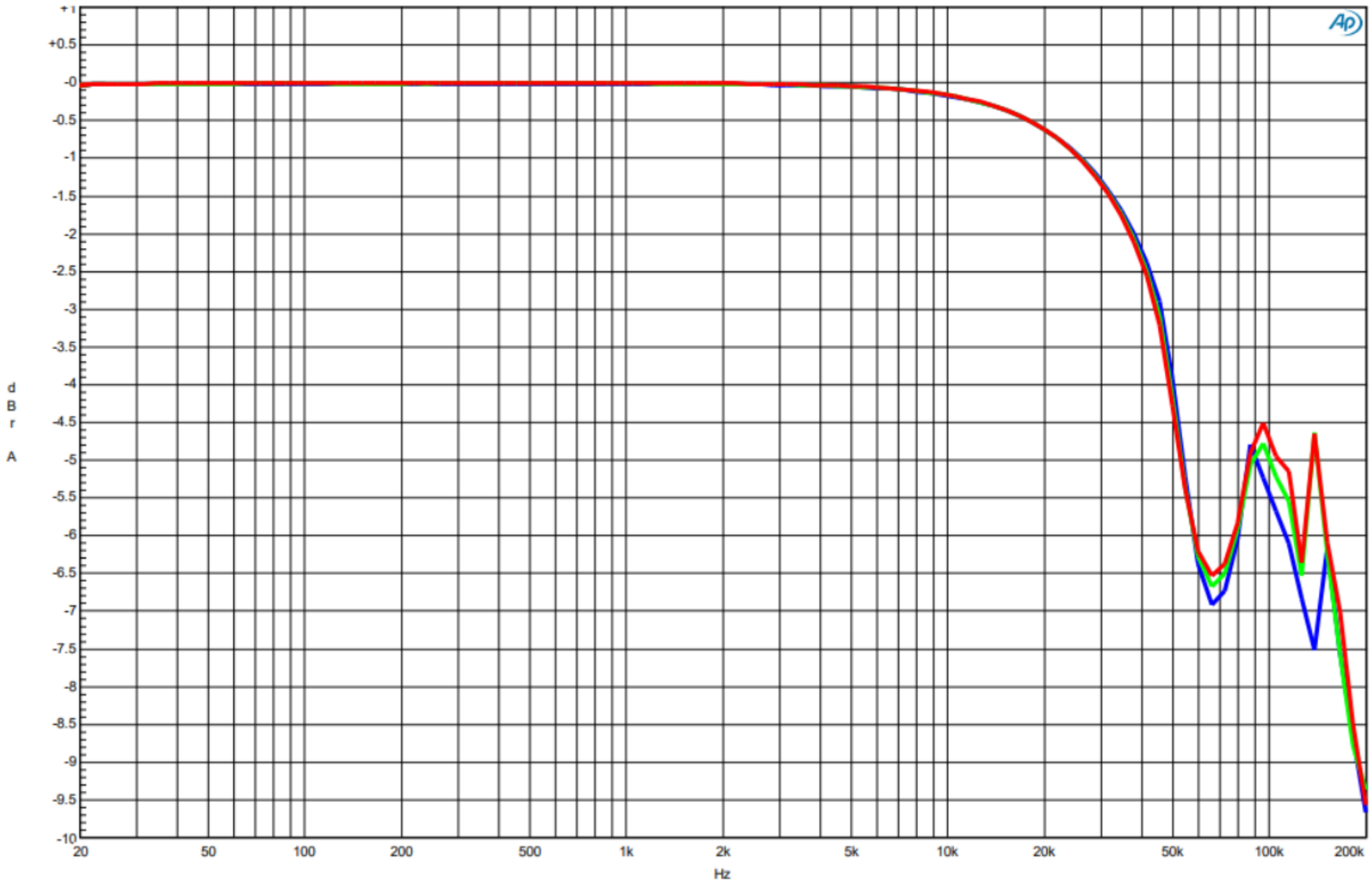


THD+N vs. Frequency at $P_R/2$ in 2Ω (blue), 4Ω (green) and 8Ω (red).

OUTPUT IMPEDANCE & FREQUENCY RESPONSE

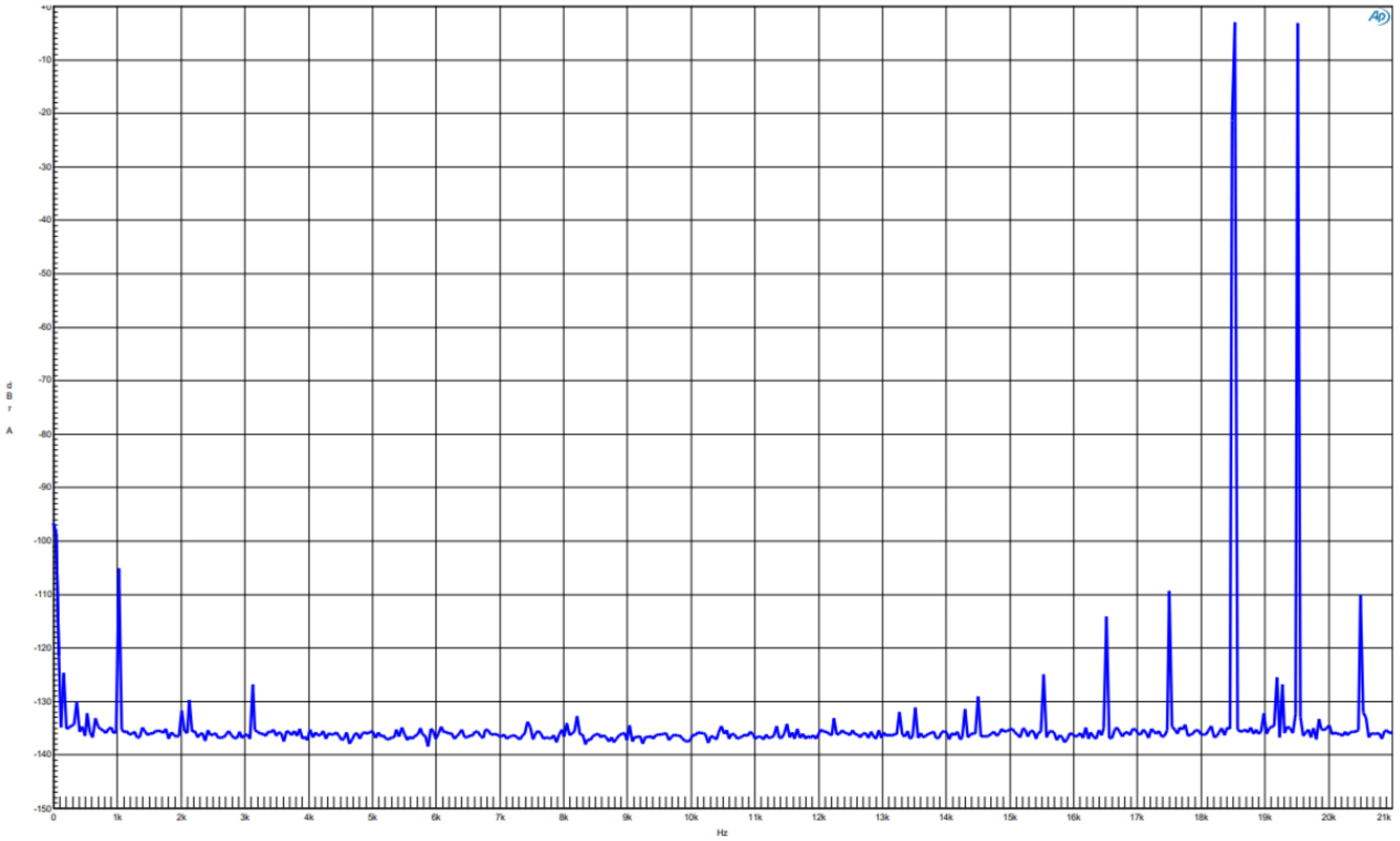


Output impedance



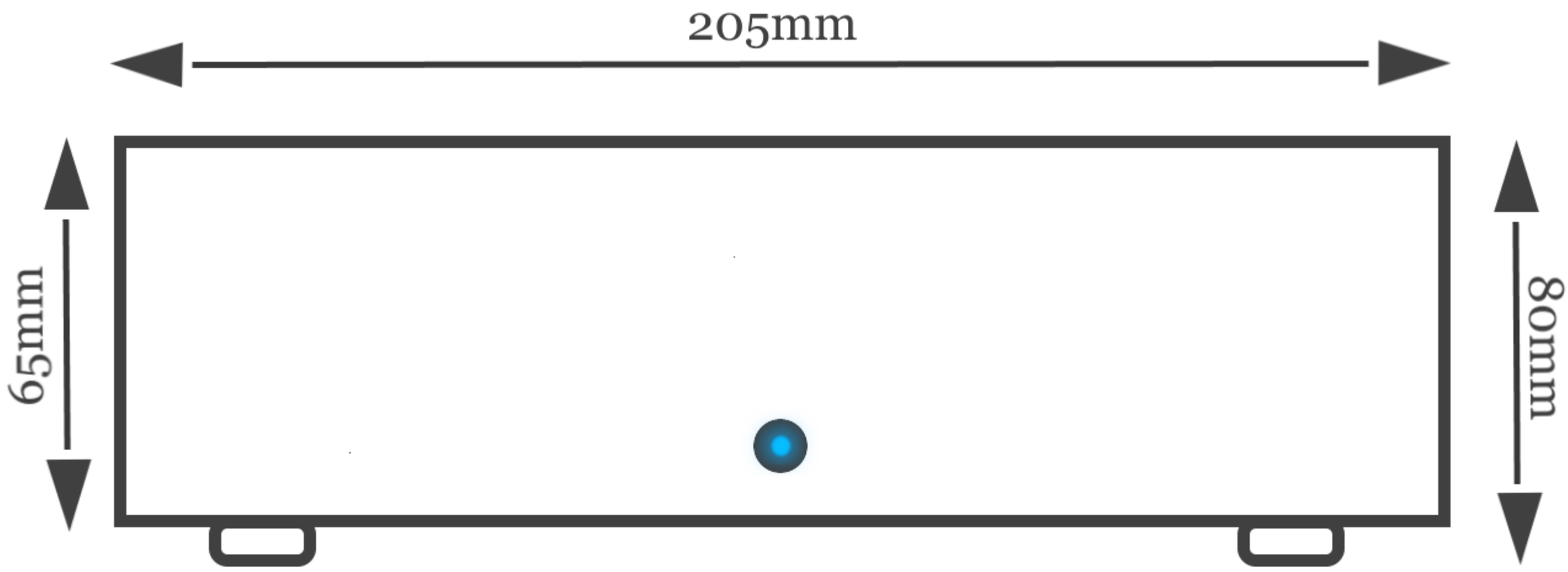
Frequency response in 2Ω (blue), 4Ω (green) and 8Ω (red).

IMD Spectrum

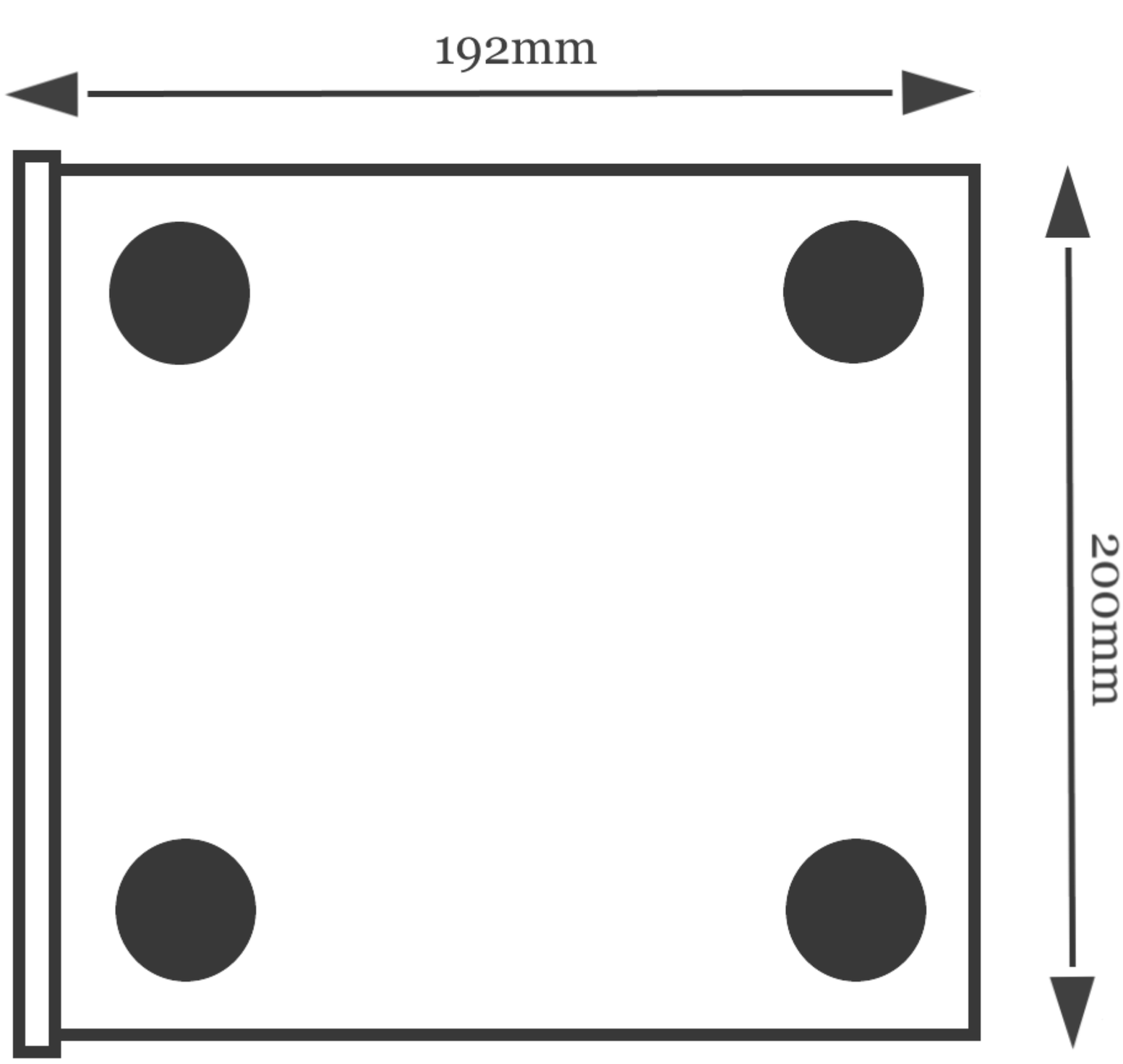


IMD spectrum at 18.5kHz + 19.5kHz, $P_R/2$ in 4Ω (blue).

DIMENSIONS



FRONT



BOTTOM

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