

LG.COM Consumer Technical Guide

Speaker Output, Verified Through Measurement, Not Just Numbers

Output, amplifier, power supply, and SPL comparison of LG RNC9 and RNC7 with

Competitor Brand A - Model A-1 and Model A-2 from a Real RMS perspective



Output claims should be assessed together with the power supply, amplifier, measured electrical output, and actual acoustic output.

Scope of Analysis

This guide assesses the reliability of speaker output from four perspectives: measured electrical output, amplifier IC specifications, SMPS power-delivery capability, and actual sound pressure level (SPL). All measurements apply to the tested products and the conditions stated below.

Products tested | Competitor Brand A - Model A-1 · Competitor Brand A - Model A-2 · LG RNC9 · LG RNC7

01 Executive Summary

The wattage printed on a speaker should be interpreted together with the measurement method. The same “W” figure cannot be compared directly when peak values, proprietary marketing definitions, allowable distortion, or load conditions differ. This comparison examines whether each product’s declared output aligns with measured output, and whether the result is supported by the internal amplifier design, power-supply capability, and measured sound pressure level.

Measured Output vs. Declared Output Competitor Brand A - Model A-1 9.8% / LG RNC9 100.5%	Second Product Pair Competitor Brand A - Model A-2 8.2% / LG RNC7 100.8%
Competitor Brand A Amplifier Specification Ceiling Model A-1 approx. 290W / Model A-2 approx. 185W	127V Power Supply and SPL RNC9 594W / RNC7 373W; each recorded 3dB higher SPL

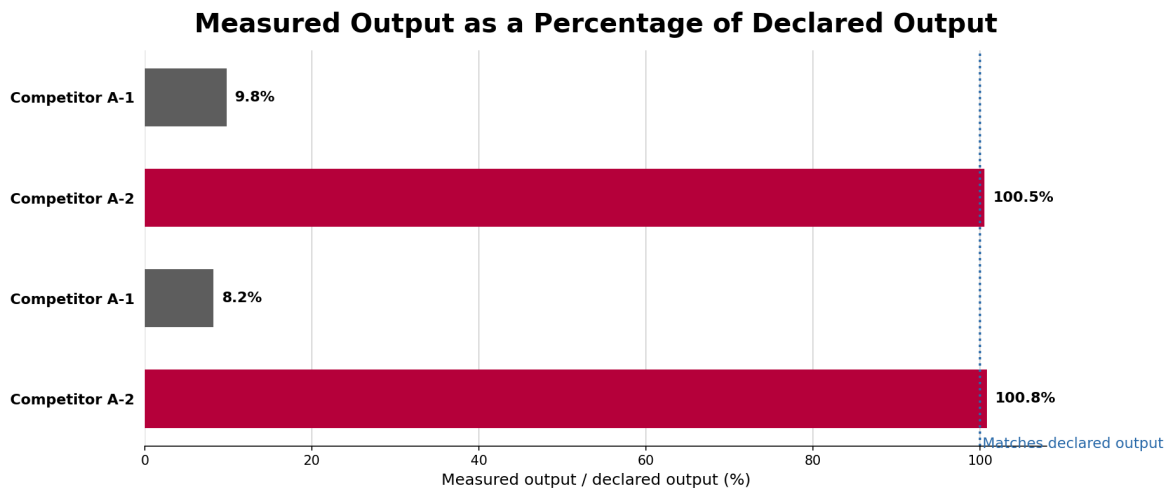


Figure 1. Measured output as a percentage of declared output

Overall Assessment

Declared output for the Competitor Brand A - Model A-1 and Model A-2 is 2,200W and 1,500W, while measured output was 216.5W and 123.3W. For the LG RNC9 and RNC7, measured output was 416W and 308.5W against declared outputs of 414W and 306W. The amplifier IC ceiling and SMPS capability of the Competitor Brand A products do not explain the declared figures as actual continuous output. In the SPL comparison, the RNC models also measured 3dB higher in each pairing.

02 Understanding Output-Related Terms

The most important prerequisite when comparing output is the measurement condition under which the value was obtained. The following terms provide the basic framework for interpreting the graphs and tables in this guide.

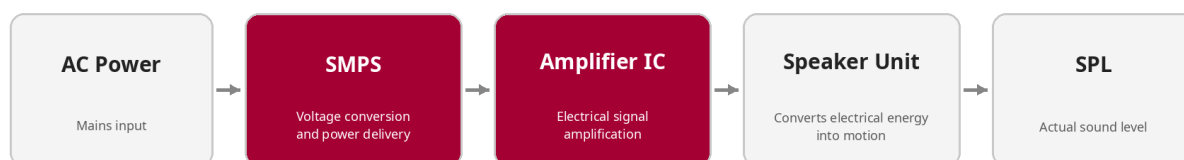
Term	Description
W (watt)	A unit of the rate at which power is transferred. In a speaker, it expresses the electrical power delivered by the amplifier to the load.
RMS	A method of expressing power using the effective value of a time-varying signal. It is more appropriate for evaluating practical drive capability than a momentary peak number.
THD	Abbreviation for Total Harmonic Distortion. It expresses, as a percentage, how much the output signal is distorted relative to the input. A higher numerical output can be obtained from the same product if more distortion is permitted.
Impedance (Ω)	The electrical load presented to the amplifier. Because output changes with impedance, the dummy load must match the actual speaker-unit impedance.
Dummy Load	A precision electrical load connected in place of the speaker unit. It is used to measure amplifier output without the effects of room acoustics, microphones, or speaker efficiency.
Amp IC	The key semiconductor that amplifies the input signal and drives the speaker unit. Its output range is determined by supply voltage, load impedance, and circuit configuration.
SMPS	A switched-mode power supply that converts AC mains power into the DC power used by the product's internal circuits. The SMPS must deliver sufficient, stable power for the amplifier to produce high output.
SPL	Abbreviation for Sound Pressure Level. It expresses actual acoustic level in air in decibels. It is affected not only by electrical output, but also by speaker-unit efficiency, enclosure design, EQ, and other factors.
Protection	A shutdown action that protects the circuit from overcurrent, overload, and related conditions. In the SMPS test, the value immediately before protection was recorded as the maximum power available under that condition.

Key Principle

Actual performance cannot be determined from a large number alone. The definition of output, THD, impedance, measurement duration, input path, and power conditions must be considered together.

03 Output Measurement Method

Electrical output was measured with a dummy load matched to the impedance of the speaker unit used in each product. Each channel was measured separately, and the channel values were then added.



Output claims should be assessed together with the power supply, amplifier, measured electrical output, and actual acoustic output.

Figure 2. Signal path from AC power input to acoustic output

Measurement Item	Applied Condition
Load Condition	A dummy load matching the impedance of the actual speaker unit in each product was connected.
THD Condition	Output was first measured at THD 10% or below. Measurement then continued beyond THD 10% until the saturation point at which output no longer increased.
Channel Summation	The woofer, midrange, and tweeter channels were measured one at a time and then added.
EQ and Frequency	The EQ setting producing the highest output was selected, and each channel was measured at the frequency that produced its highest output.
Power Condition	Because the tested models do not use a battery, measurements were performed with AC mains power applied.
Hold Time	Each measured output level was sustained for one minute.

Input Path	Input was increased from AUX 10mV to 3V for Competitor Brand A - Model A-1/Model A-2 and from -55 dB to 0 dB Bluetooth generator level for LG RNC9/RNC7.
EQ Setting	Maximum output was identified with Boost on / custom EQ Max for Competitor Brand A products and BASS EQ for RNC products.

Meaning of the Summed Channel Output

In this guide, “total output” is the sum of measurements taken one channel at a time, with each channel tested at its own optimum frequency. It is different from power consumption or simultaneous output measured with all channels driven by the same signal at the same time.

04 Declared Output vs. Measured Output

The comparison evaluates how closely the declared output matches the measured output within each product group. The measured values follow the channel-by-channel measurement and summation method described above.

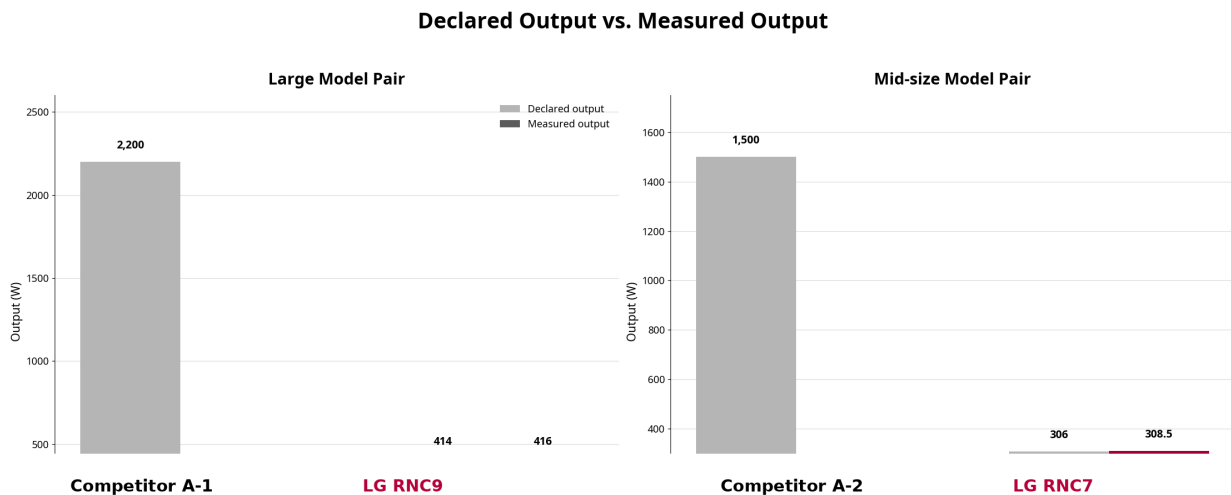


Figure 3. Declared and measured output by product

Product	Declared	Measured	Measured / Declared	Source THD	Dummy Load	Channel Measurements
Competitor Brand A - Model A-1	2,200W	216.5W	9.8%	THD 20% listed	WF 5Ω / MID 8Ω / TW 8Ω	WF 87.7W×2 / MID 20.0W / TW 19.28W

LG RNC9	414W	416W	100.5%	THD 10%	WF 6Ω / TW 8Ω	WF 302W / TW 57W×2
Competitor Brand A - Model A-2	1,500W	123.3W	8.2%	THD 20% listed	WF 5Ω / MID 8Ω / TW 8Ω	WF 83.05W / MID 21.13W / TW 19.09W
LG RNC7	306W	308.5W	100.8%	THD 10%	WF 6Ω / TW 4Ω	WF 170.5W / TW 69W×2

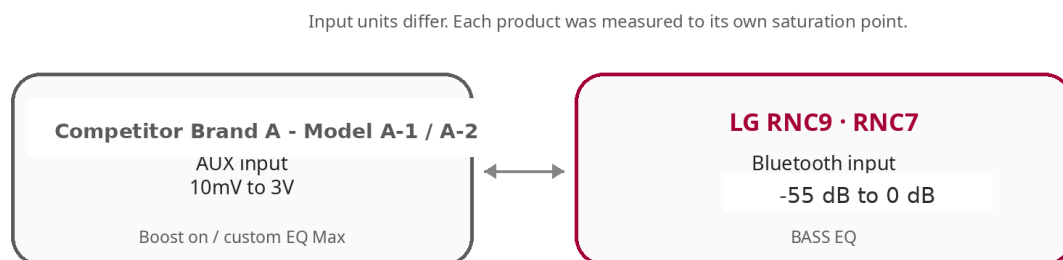
The Competitor Brand A - Model A-1 measured output equals approximately 9.8% of its declared output, while the LG RNC9 measured output equals approximately 100.5%. Based on measured output alone, the RNC9 delivers approximately 1.9 times the output of the Model A-1.

The Competitor Brand A - Model A-2 measured output equals approximately 8.2% of its declared output, while the LG RNC7 measured output equals approximately 100.8%. Based on measured output alone, the RNC7 delivers approximately 2.5 times the output of the Model A-2.

In the source data, the Competitor Brand A totals are identified at THD 20%, while the RNC values are identified at THD 10%. Even though the Competitor Brand A values were measured up to a saturation point that permits higher distortion, they remained below the measured output of the RNC models.

Note: The Competitor Brand A - Model A-1 channel values and stated total are reproduced exactly as listed in the engineering source data.

Important Considerations When Comparing Input Paths and Graphs



Do not compare absolute X-axis positions across products. Interpret how output rises and reaches saturation within each graph.

Figure 4. Input path and input-level notation by product group

The horizontal axis of the Competitor Brand A graphs is AUX input voltage (10 mV to 3 V), whereas the horizontal axis of the RNC graphs is Bluetooth generator level (-55 dB to 0 dB). Because the input paths and units differ, positions on the X-axes must not be compared directly between products. Instead, each graph should be read for the pattern in which output rises with input and then reaches saturation, together with the output value on the Y-axis at the saturation point.

Selecting the Frequency That Produces the Highest Output

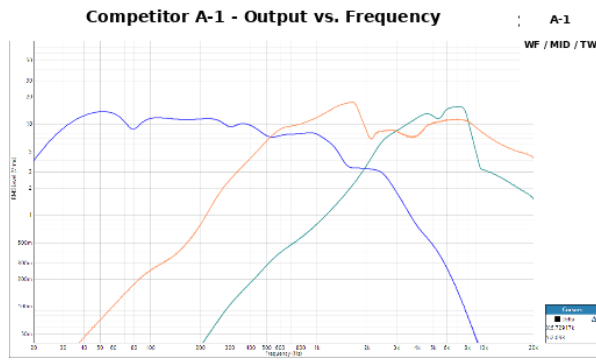


Figure 5-1. Competitor Brand A - Model A-1 channel output by frequency and selected test points

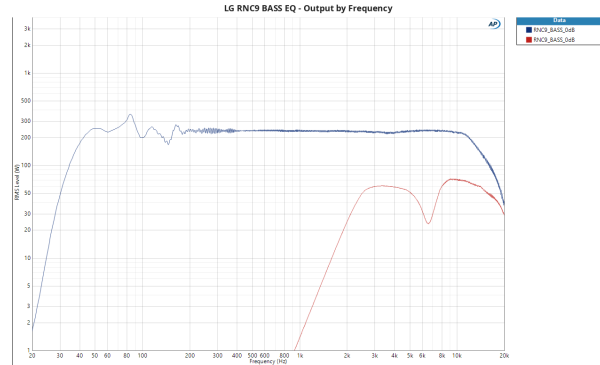


Figure 5-2. LG RNC9 BASS EQ output by frequency

On the frequency plots, the horizontal axis represents frequency (Hz) and the vertical axis represents RMS output (W). The frequency at which each channel reaches its highest output was identified first; the input level was then increased at that frequency to measure maximum output.

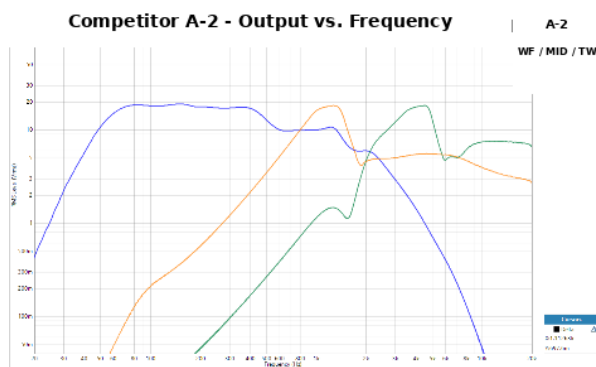


Figure 5-3. Competitor Brand A - Model A-2 channel output by frequency and selected test points

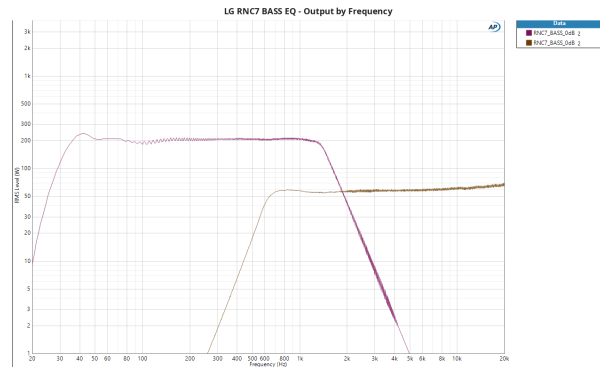


Figure 5-4. LG RNC7 BASS EQ output by frequency

The same procedure was applied to the Competitor Brand A - Model A-2 and LG RNC7. These plots are not frequency-response measurements intended to evaluate overall tonal balance. They are used to identify the channel-specific test frequencies for output measurement.

Graph Interpretation Principle

Each product was tested using the EQ and frequency that produced its highest output. A common frequency that might disadvantage a specific product was not imposed. The comparison therefore uses the maximum-output condition available to each product.

05 Interpreting Input Level vs. Output Graphs

The vertical axis shows output power (W). For Competitor Brand A products, the horizontal axis is AUX input voltage; for RNC products, it is Bluetooth generator level (-55 dB to 0 dB). The graphs should be interpreted primarily by observing the rise in output and the point at which further input no longer produces a meaningful increase in output.

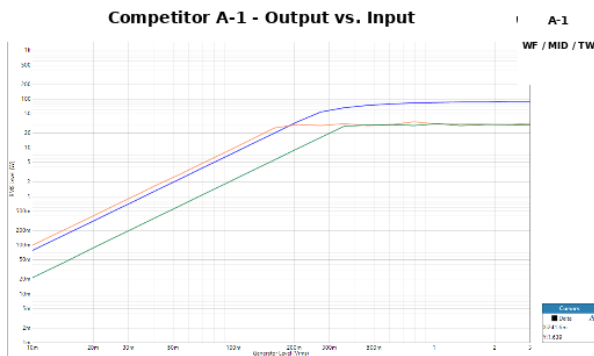


Figure 6-1. Competitor Brand A - Model A-1 channel output vs. input level

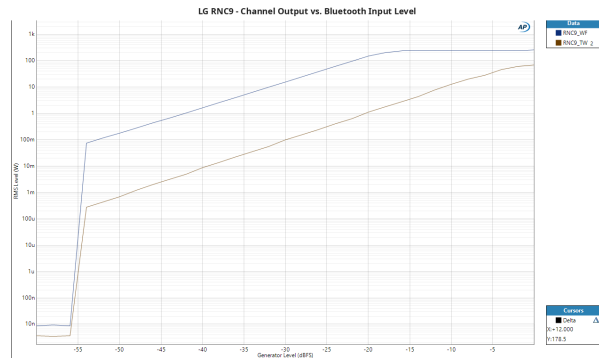


Figure 6-2. LG RNC9 channel output vs. input level

For both products, output rises in the initial region as the input is increased. The region where the curve becomes flat indicates that increasing the input level no longer produces a meaningful increase in output. Beyond this point, distortion increases while output remains essentially unchanged. Based on the source data, the Competitor Brand A - Model A-1 channel saturation values total 216.5W. The LG RNC9 totals 416W, comprising 302W for the woofer and 57W × 2 for the tweeters.

On the RNC9 graph, the woofer curve levels off at approximately 302W, while each tweeter curve levels off at approximately 57W. Raising the input further produces little additional usable output. The output figure is therefore determined at the saturation point.

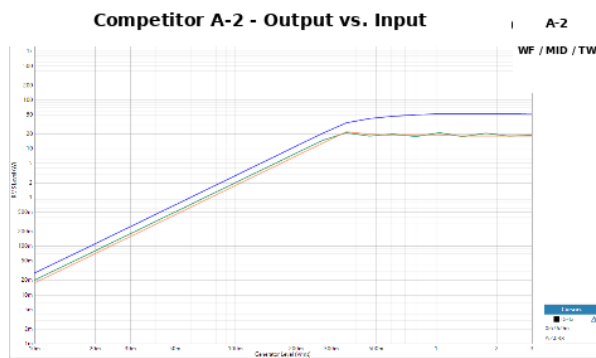


Figure 6-3. Competitor Brand A - Model A-2 channel output vs. input level

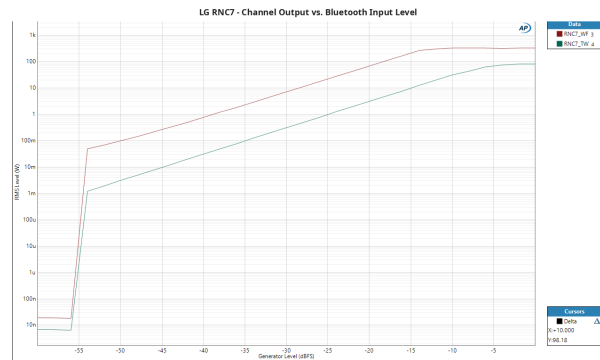


Figure 6-4. LG RNC7 channel output vs. input level

The Competitor Brand A - Model A-2 measured 83.05W for the woofer, 21.13W for the midrange, and 19.09W for the tweeter, for a total of 123.3W. The LG RNC7 measured 170.5W for the woofer and 69W × 2 for the tweeters, for a total of 308.5W.

Meaning of the Trend Lines

The rising section is the region where increasing input produces increasing output. The flat section is the region where the output limit has been reached. Additional input beyond the plateau increases distortion and thermal stress rather than usable output.

06 Amplifier IC Specification Analysis

An amplifier IC amplifies the electrical signal used to drive the speaker units. Reviewing the official IC datasheet and circuit configuration makes it possible to estimate the theoretical output ceiling of the completed product. This component analysis examines whether the declared output of the Competitor Brand A products can be explained by their internal design.

Competitor Brand A - Model A-1 Amplifier Configuration



Figure 7-1. Amplifier section on the Competitor Brand A - Model A-1 main board



Figure 7-2. Woofer, midrange, and tweeter amplifier sections

A TI TPA3116-series amplifier IC was identified in the woofer channels. The amplifier supply voltage is 24V, and the woofer channels were analyzed as a PBTL mono configuration. Under the TI datasheet condition of 24V and a 3Ω PBTL load, maximum output is approximately 105W.

The actual Model A-1 woofer dummy load is 5Ω. Therefore, the 105W figure at 3Ω does not guarantee the product's actual output; it represents a favorable datasheet condition used to estimate the component-level upper limit.

How to Read the Datasheet Graphs

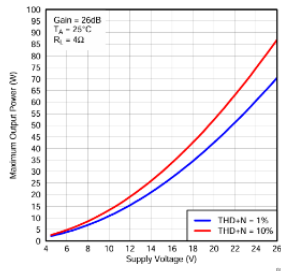


Figure 14. Maximum Output Power (BTL) vs Supply Voltage

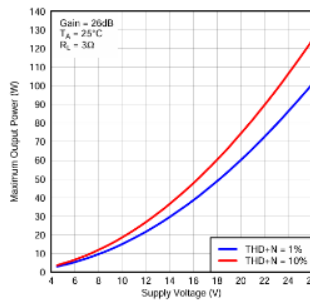
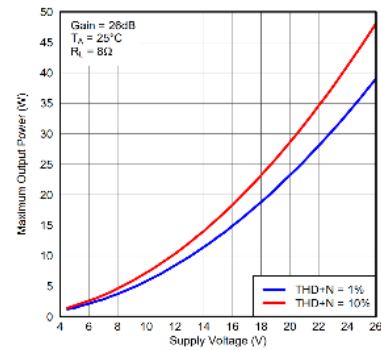


Figure 26. Maximum Output Power (PBTTL) vs Supply Voltage



BTL 4Ω: Maximum output vs. supply voltage PBTTL 3Ω: Maximum output vs. supply voltage 8Ω, 40W class: Maximum output vs. supply voltage

The horizontal axis of all three graphs is supply voltage, and the vertical axis is maximum output power. The red line represents THD 10%, and the blue line represents THD 1%. At the same supply voltage, the THD 10% line shows a higher output figure because it permits greater distortion.

Relationship Between the Theoretical Specification Limit and Measured Output

Product	Woofer	Midrange	Tweeter	IC Specification Ceiling	Measured Output	Declared Output
Competitor Brand A - Model A-1	Woofer 105W×2	MID approx. 40W	TW approx. 40W	Approx. 290W	216.5W	2,200W
Competitor Brand A - Model A-2	Woofer 105W×1	MID approx. 40W	TW approx. 40W	Approx. 185W	123.3W	1,500W

The exact IC part numbers for the Model A-1 midrange and tweeter channels could not be identified. Each was therefore estimated as a 40W-class amplifier based on the 24V supply voltage, 8Ω load, IC package size, and circuit configuration. Adding these estimates to the datasheet ceiling of the woofer channels gives approximately 290W.

The Model A-2 uses a main-board design from the same family as the Model A-1, but has one woofer channel. Its specification-based combined ceiling is therefore approximately 185W.

The 290W and 185W figures are not guaranteed output ratings for the completed products. They are theoretical ceilings obtained by adding the individual IC outputs under favorable datasheet conditions. In an actual product, SMPS capacity, circuit losses, thermal limits, protection circuits,

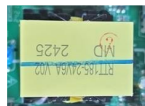
and real load impedance reduce the achievable output. The measured results of 216.5W and 123.3W are consistent with this design structure.

Analysis Conclusion

Declared outputs of 2,200W and 1,500W for the Competitor Brand A - Model A-1 and Model A-2 differ substantially from the ceilings calculated from the amplifier IC datasheets and circuit configurations. The component specifications alone do not explain these figures as actual continuous output.

07 SMPS Maximum Power Analysis

The SMPS converts AC mains power into the DC power used by the amplifier. If the amplifier does not receive sufficient power, even output permitted by the amplifier datasheet cannot be realized in the completed product.



Competitor Brand A SMPS Board 24V / 6A Transformer Marking

DC Electronic Load

Figure 8. Competitor Brand A SMPS board, 24V/6A transformer marking, and DC electronic load

The Competitor Brand A - Model A-1 and Model A-2 use the same SMPS. The internal transformer is marked 24V/6A, equivalent to 144W. This is the transformer's rated specification. The maximum power momentarily delivered by the complete SMPS immediately before protection was measured separately for each AC input condition.

What 144W, 180W, and 203W Represent

Value	Meaning
144W	The rated 24V × 6A specification marked on the Competitor Brand A SMPS transformer.
180W	The maximum power measured immediately before protection at 127V AC, the representative comparison condition for the Brazilian market.
199~200W	The maximum power measured for the Competitor Brand A

	products at 220V AC input.
203W	The maximum power measured for the Competitor Brand A products at 264V AC input.
Protection	The state in which the protection circuit activated and output was shut down when the load current was increased by one additional step.

The table contains different values, including 203W, 200W, 180W, 174W, and 138W, because the AC input voltage differs. As the input voltage increased, the maximum power delivered immediately before protection also increased.

The 180W figure is used as the representative value because 127V was selected as the representative comparison condition for the Brazilian market. Approximately 199–200W was measured at 220V, but every measured condition remains far below 1,500W or 2,200W.

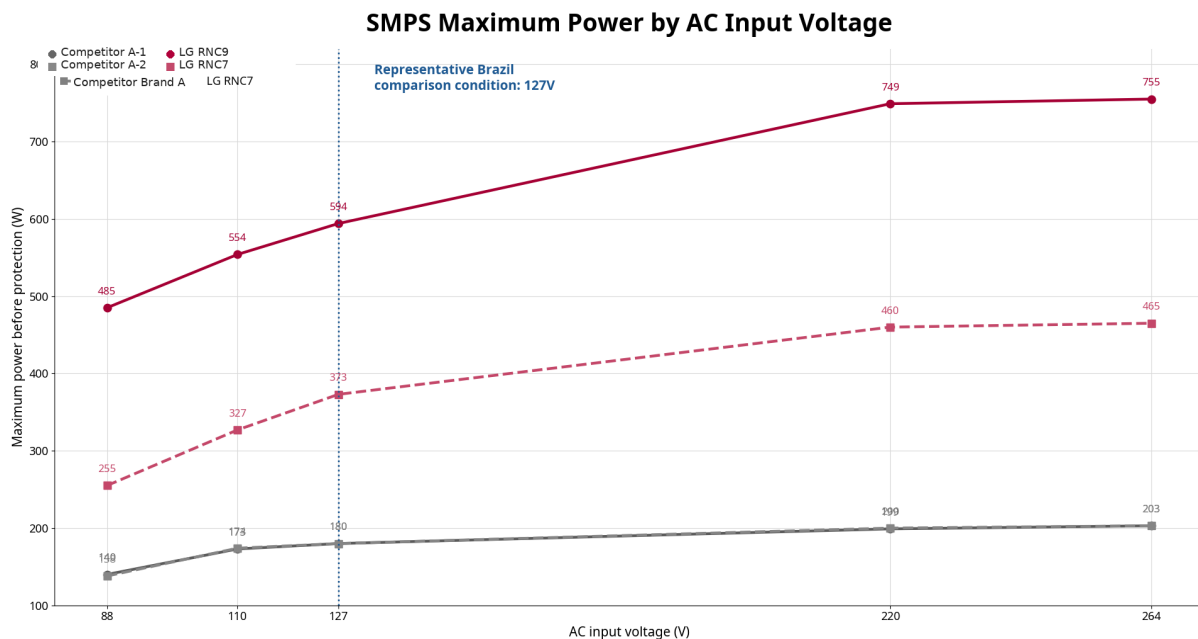


Figure 9. SMPS maximum power by AC input voltage

Key Findings from the Graph

- The Competitor Brand A - Model A-1 and Model A-2 use the same SMPS, so their measurement lines nearly overlap across the full voltage range.
- LG RNC9 measured 485–755W across AC 88–264V, while LG RNC7 measured 255–465W.
- The Competitor Brand A products measured approximately 138–203W across the same range.
- For every product, increasing the load current by one additional step activated protection. The graph connects the maximum power values measured immediately before that point.

Power Supply Comparison at 127V

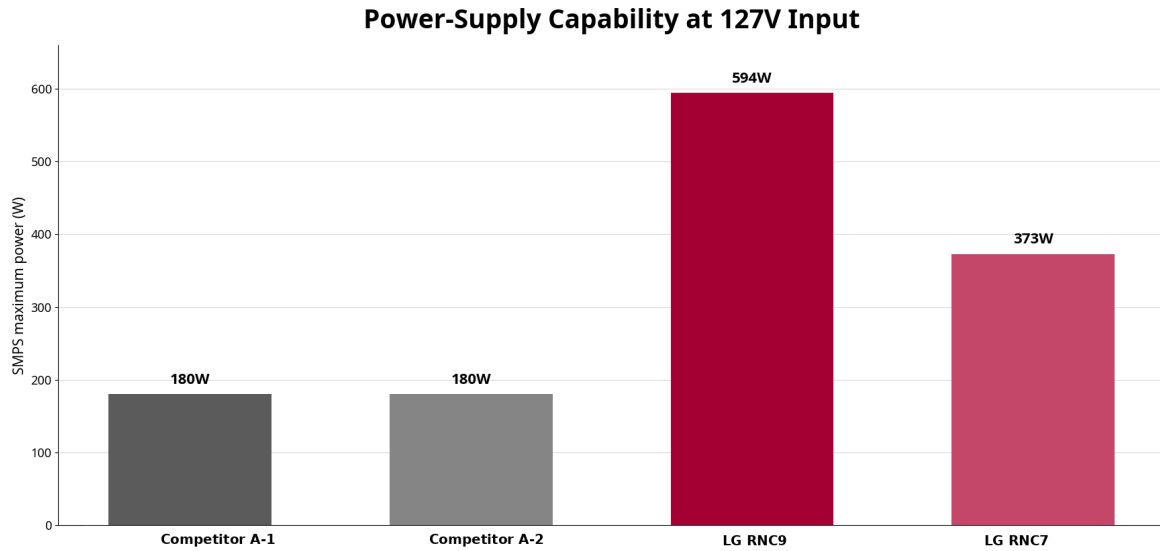


Figure 10. SMPS maximum power immediately before protection at 127V

Product	Supply Rail	DC Output Voltage	DC Output Current	Maximum Power	Next Load Step
Competitor Brand A - Model A-1	24V	23.1V	7.8A	180W	Protection at 7.9A
Competitor Brand A - Model A-2	24V	23.1V	7.8A	180W	Protection at 7.9A
LG RNC9	58.8V	57.7V	10.3A	594W	Protection at 10.4A
LG RNC7	47V	46.0V	8.1A	373W	Protection at 8.2A

At 127V, the LG RNC9 SMPS reached 594W and the LG RNC7 reached 373W. These values exceed the declared outputs of 414W and 306W, respectively, under the same 127V comparison condition. By contrast, the Competitor Brand A - Model A-1 and Model A-2 SMPS measured approximately 180W under 127V input.

Complete SMPS Measurement Data by AC Input Voltage – Competitor Brand A

The following tables summarize voltage, current, and power immediately before protection at each AC input condition, together with protection activation at the next load step.

Competitor Brand A - Model A-1

AC Input	DC Voltage	DC Current	Maximum Power	Next Load Step
264V	22.8V	8.9A	203W	9.0A → Protection
220V	22.9V	8.7A	199W	8.8A → Protection
127V	23.1V	7.8A	180W	7.9A → Protection
110V	23.1V	7.5A	173W	7.6A → Protection
88V	23.3V	6.0A	140W	6.1A → Protection

Competitor Brand A - Model A-2

AC Input	DC Voltage	DC Current	Maximum Power	Next Load Step
264V	22.8V	8.9A	203W	9.0A → Protection
220V	23.0V	8.7A	200W	8.8A → Protection
127V	23.1V	7.8A	180W	7.9A → Protection
110V	23.2V	7.5A	174W	7.6A → Protection
88V	23.4V	5.9A	138W	6.0A → Protection

Why Can Summed Audio Output Differ from SMPS Power?

The Competitor Brand A - Model A-1's summed channel output is 216.5W, while its maximum SMPS power at 127V input is 180W. The former adds measurements taken one channel at a time at different optimum frequencies; the latter is the limit of the DC power the supply can deliver simultaneously. Because the measurement definitions differ, the two values must not be compared as though they represent the same quantity.

Complete SMPS Measurement Data by AC Input Voltage – LG RNC

LG RNC9

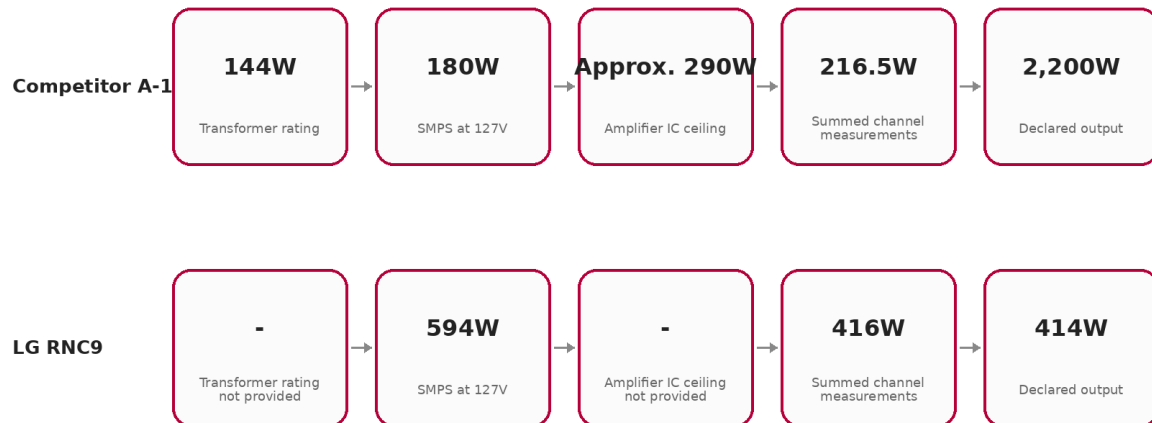
AC Input	DC Voltage	DC Current	Maximum Power	Next Load Step
264V	57.2V	13.2A	755W	13.3A → Protection
220V	57.2V	13.1A	749W	13.2A → Protection
127V	57.7V	10.3A	594W	10.4A → Protection
110V	57.7V	9.6A	554W	9.7A → Protection
88V	57.7V	8.4A	485W	8.5A → Protection

LG RNC7

AC Input	DC Voltage	DC Current	Maximum Power	Next Load Step
264V	46.0V	10.1A	465W	10.2A → Protection
220V	46.0V	10.0A	460W	10.1A → Protection
127V	46.0V	8.1A	373W	8.2A → Protection
110V	46.0V	7.1A	327W	7.2A → Protection
88V	46.3V	5.5A	255W	5.6A → Protection

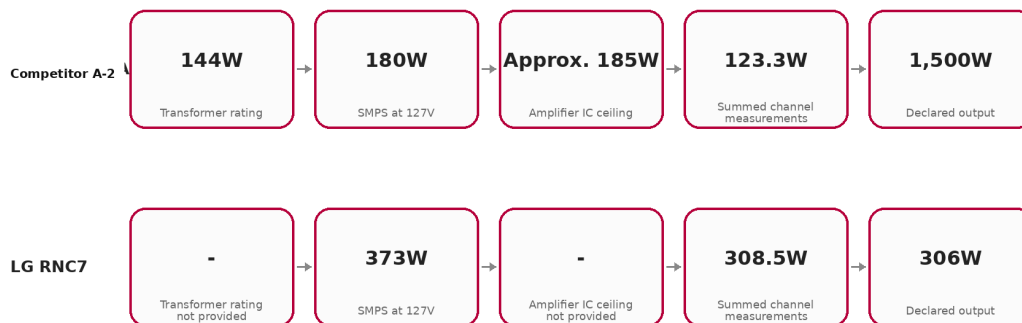
The RNC9 uses a 58.8V power rail, while the RNC7 uses a 47V power rail. At 127V AC input, 594W was measured for the RNC9 and 373W for the RNC7. Protection activated at the next current step in each case.

How the Key Figures Relate



These figures measure different elements and are not directly interchangeable. The key question is whether the declared output is supported by measured output and power-supply capability.

Figure 11-1. Key output-related figures for Competitor Brand A - Model A-1 and LG RNC9



These figures measure different elements and are not directly interchangeable. The key question is whether the declared output is supported by measured output and power-supply capability.

Figure 11-2. Key output-related figures for Competitor Brand A - Model A-2 and LG RNC7

Transformer rating, SMPS maximum power, amplifier IC ceiling, and summed channel output measure different elements and use different definitions. They must not be treated as interchangeable figures. However, whether a declared output is supported by measured output and power-supply capability can be assessed by reviewing these indicators together.

08 Sound Pressure Level (SPL) Comparison

On the SPL graphs, the horizontal axis is frequency (Hz) and the vertical axis is sound pressure level (dB SPL). At a given frequency, the higher curve indicates a higher measured sound level under the test conditions. The comparison was conducted at maximum volume and using the EQ setting that produced the highest output for each product.

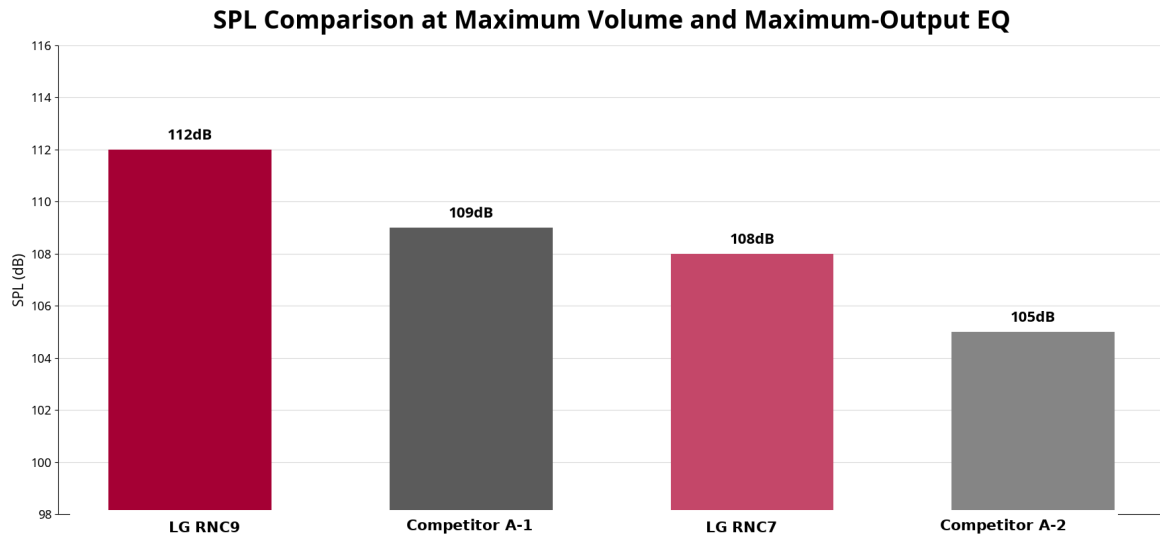


Figure 12. Representative SPL measurements by product

Product Pair	LG	Competitor Brand A	Difference
LG RNC9 vs Competitor Brand A - Model A-1	112dB	109dB	LG +3dB
LG RNC7 vs Competitor Brand A - Model A-2	108dB	105dB	LG +3dB

Although the Competitor Brand A products carry higher declared wattage figures, the measured sound pressure comparison shows the LG RNC9 and RNC7 each 3dB higher. This demonstrates that the wattage figure alone does not predict actual sound level.

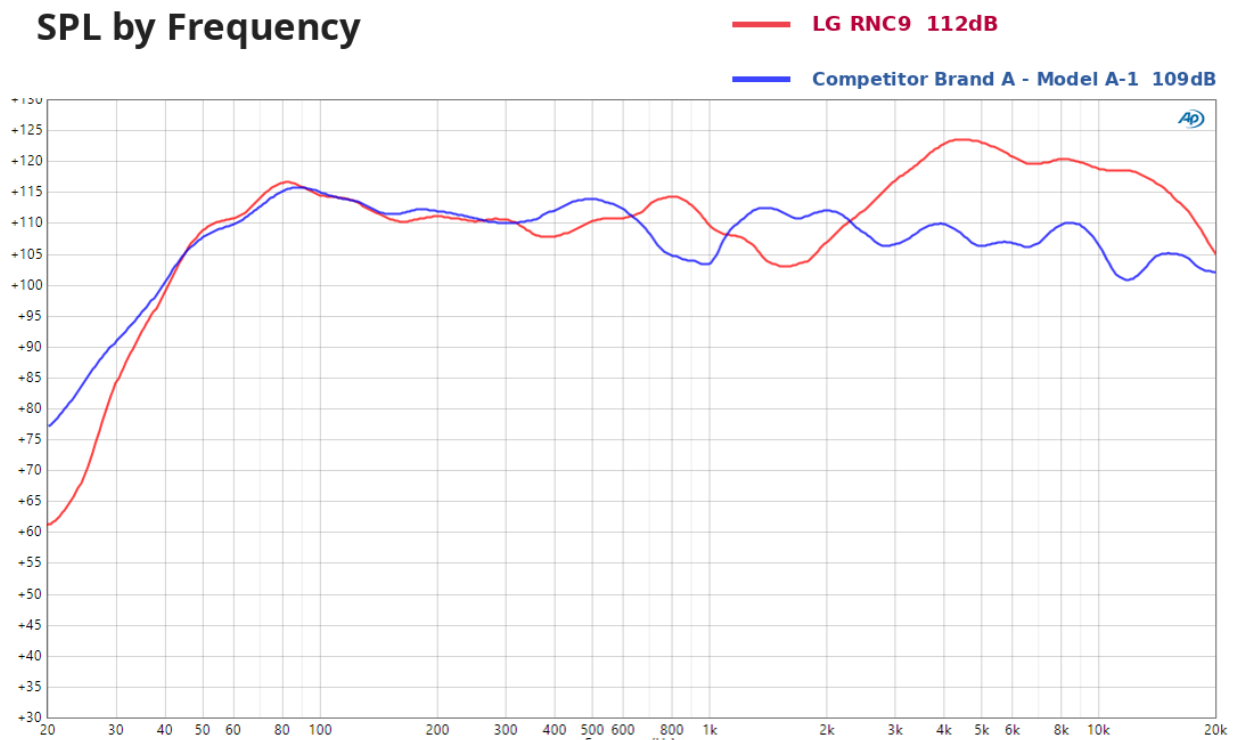


Figure 13. Frequency-by-frequency SPL curves: LG RNC9 vs. Competitor Brand A - Model A-1

The RNC9 and Model A-1 curves are similar in portions of the low-frequency range. Across a broad section of the mid and high frequencies, however, the RNC9 curve remains higher. The representative values shown are 112dB for the RNC9 and 109dB for the Competitor Brand A - Model A-1.

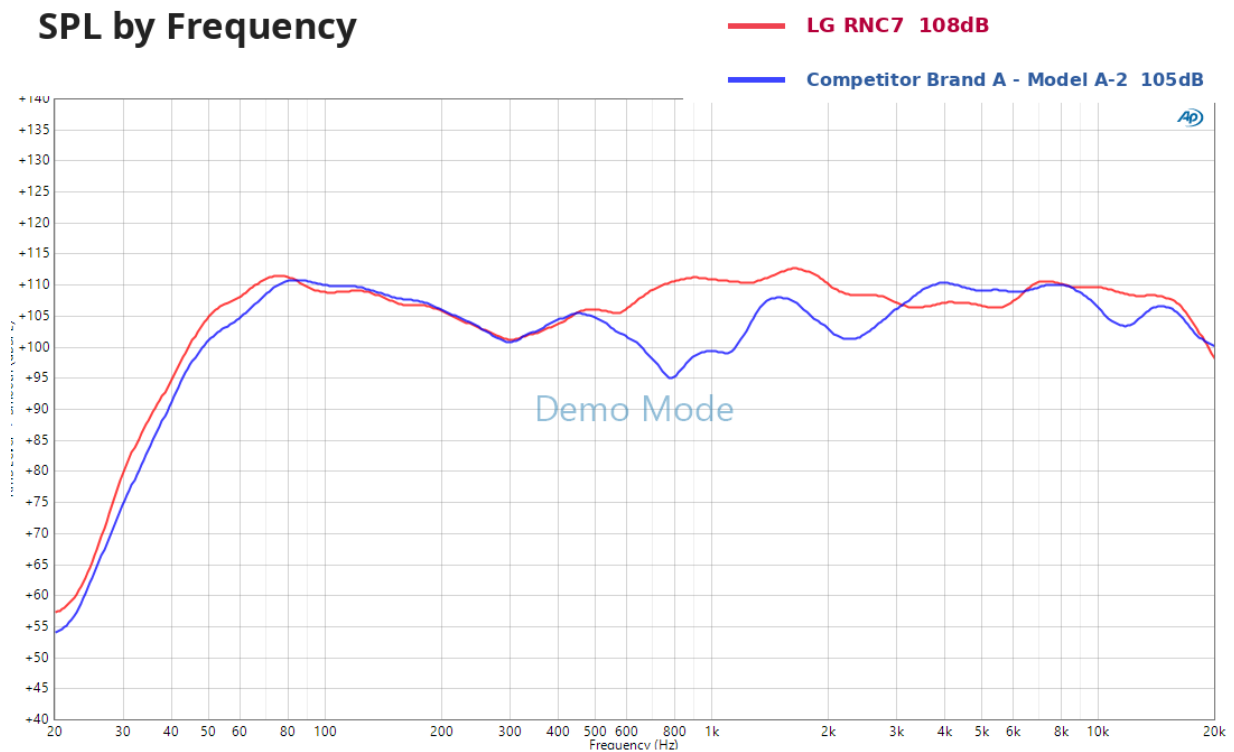


Figure 14. Frequency-by-frequency SPL curves: LG RNC7 vs. Competitor Brand A - Model A-2

In the RNC7 and Model A-2 comparison, the curves cross in certain frequency regions. The representative maximum SPL values were 108dB for the RNC7 and 105dB for the Competitor Brand A - Model A-2.

Important Note on SPL Interpretation

SPL is influenced not only by electrical output, but also by speaker-unit efficiency, enclosure design, port design, EQ, and signal processing. A larger wattage figure therefore does not necessarily produce higher actual sound pressure.

09 Overall Assessment

Product	Declared Output	Measured Output	Amp IC Ceiling	SMPS 127V	SPL
Competitor Brand A - Model A-1	2,200W	216.5W	Approx. 290W	180W	109dB
LG RNC9	414W	416W	-	594W	112dB
Competitor Brand A - Model A-2	1,500W	123.3W	Approx. 185W	180W	105dB
LG RNC7	306W	308.5W	-	373W	108dB

1. Alignment Between Declared and Measured Output

Measured output for the LG RNC9 and RNC7 was approximately 100.5% and 100.8% of the declared output, respectively. The Competitor Brand A - Model A-1 and Model A-2 measured approximately 9.8% and 8.2%, respectively, showing a substantial difference.

2. Output Capability Indicated by Component Specifications

Based on the Competitor Brand A woofer amplifier IC datasheet, estimated MID/TW amplifier specifications, and the 24V supply condition, the combined theoretical ceiling is approximately 290W for the Model A-1 and approximately 185W for the Model A-2. These figures differ substantially from the declared outputs.

3. Actual Power Available from the Power Supply

The shared Competitor Brand A SMPS activated protection at approximately 180W with 127V input, approximately 199–200W with 220V input, and 203W with 264V input. At 127V, the LG RNC9 and RNC7 measured 594W and 373W, respectively.

4. Actual Sound Pressure Experienced by the Listener

At maximum volume and the EQ setting that produced the highest output, the LG RNC9 recorded 3dB higher SPL than the Competitor Brand A - Model A-1, and the LG RNC7 recorded 3dB higher SPL than the Competitor Brand A - Model A-2.

Final Conclusion

Speaker output cannot be evaluated from the largest number printed on the product alone. Measured output under clearly defined conditions, the achievable range of the amplifier IC, SMPS delivery capability, and actual SPL must be reviewed together. In the tested samples, the LG RNC9 and RNC7 measured close to their declared outputs, and their power-supply capacity and SPL results supported those figures. The declared outputs of the Competitor Brand A - Model A-1 and Model A-2 differed substantially from the measured values and internal component specifications.

What Consumers Should Check

Item to Check	Evaluation Criterion
Output Definition	Confirm whether the figure is RMS or continuous output, a momentary peak, or a value based on another definition.
THD Condition	Confirm the distortion level at which the output figure was measured.
Load and Channel Conditions	Confirm the impedance and whether channels were measured individually or simultaneously.
Input and EQ Conditions	Confirm the input path, EQ setting, and test frequency used.
Power-Supply Capability	Confirm whether the SMPS and amplifier can support the declared output in actual operation.
Actual SPL	Review SPL results under equivalent conditions in addition to the wattage figure.

Data and Measurement Scope

This guide is based on LG Electronics engineering tests of the Competitor Brand A - Model A-1 and Model A-2 and the LG RNC9 and RNC7, including product teardown analysis, amplifier IC datasheet review, SMPS testing with a DC electronic load, and SPL measurements. The results are limited to the tested samples and the stated conditions.