Noctua NH-D12L chromax.black

Lab ID NCCLR00079

Type Air

Testing Dates: Apr 9, 2024 to Apr 14, 2024

Scheme: THETA

AMD AM5

No THETA level Intel LGA1851



Aristeidis Bitziopoulos, Certification Body General Manager

THETA Cooler Performance

THETA is a Cybenetics performance rating. It is not part of our ISO/IEC 17065 certification schemes and is outside our accreditation.

Overall Performance (OP) = W × F / T, where W is the average CPU power at the EPS connectors (W), F the average CPU frequency (MHz) and T the average CPU temperature (°C). A cooler is rated on its measured OP at 30 dB(A) normalized noise output; a cooler that cannot reach 30 dB(A) is rated on its own measured 25 dB(A) point. Air and AIO coolers have separate ladders on each test platform.

Evaluated before Revision 2.0 of the Cooling Solutions Test Protocol: the THETA level was assigned from the published results measured under Revision 1.8 (20 minutes per noise level, 10-minute cool-down). The cooler was not measured again, and the earlier procedure is not identical to the procedure of Revision 2.0.

Platform	THETA level	Test CPU	Mount	Rated at	Overall Performance (OP)
AMD AM5	**THETA Bronze · Air · AMD AM5**	AMD Ryzen 9 7900X (AM5)	Default	30 dB(A)	9,426
Intel LGA1851	**No THETA level**	Intel Core Ultra 9 285K (LGA1851)	Default	-	-

General Information

Test Equipment

Noise Test Environment	Hemi Anechoic Chamber with 6dB(A) noise floor
Sound Analyzer	Bruel & Kjaer 2270 G4
Microphone	Bruel & Kjaer Type 4955-A
Temperature Logger	Picoscope TC-08
Climate Chamber	Giant Force GTH-800-20-CP-AR
Testing Methodology	Cybenetics Cooling Solutions Test Protocol

DUT Information

Brand	Noctua
Model	NH-D12L chromax.black
Lab ID	NCCLR00079
Testing Dates	Apr 9, 2024 to Apr 14, 2024
Engineer	Aris Bitziopoulos

Climate Chamber

Noise Test Environment	Hemi Anechoic Chamber with 6dB(A) noise floor
Manufacturer	Giant Force
Model Number	GTH-800-20-CP-AR
Temperature Range	-20℃ ~ +100℃
Humidity Range	20% ~ 98% RH
Temperature/Humidity Constancy	±0.2℃; ±2.5%RH
Temperature/Humidity Uniformity at center	±0.5℃; ±4%RH
Internal Dimensions (WHD)	100 x 100 x 80 cm

External Dimensions (WHD)	145 x 190 x 135 cm
Net Weight (approximately)	450 Kg
Heat-up Time (No load, no linear)	(from 20°C to +100°C) 30min
Pull-down Time (No load, no linear)	(from 20°C to -20°C) 50min
Cooling System	Airtight compressor + evaporator fins + air-cooling condenser
Power Source	3Φ AC 380V ±5%, 50Hz±1% 10KW
Based on Standards	ISO 5801-2007, AMCA 210-0, ASHRAE 51-2007, IEC 61591-2005, GB/T 1236-200

AMD Test System

Mainboard	Asus TUF GAMING X670E-PLUS
CPU	AMD Ryzen 9 7900x
GPU	Embedded
NVMe	XPG GAMMIX S50 Lite 1TB
RAM	XPG Lancer DDR5 (2 x 16GB) 6000MHz
Power Supply	Seasonic Vertex 1200W (Cybenetics Platinum)
CPU Cooler	Device Under Test
Case	Cooler Master Test Bench

Technical Specifications

Manufacturer (OEM)	Noctua
Model	NH-D12L chromax.black
Number of Fans	2
Type	Air
Heatpipes	5
Heatpipe Diameter	6mm
Length	113mm
Width	125mm
Height	145mm
Block Material	Copper
Weight	890g
AMD Processors Support	AM5, AM4

Intel Processors Support	LGA1851/1700/1200/1156/1155/1151/1150

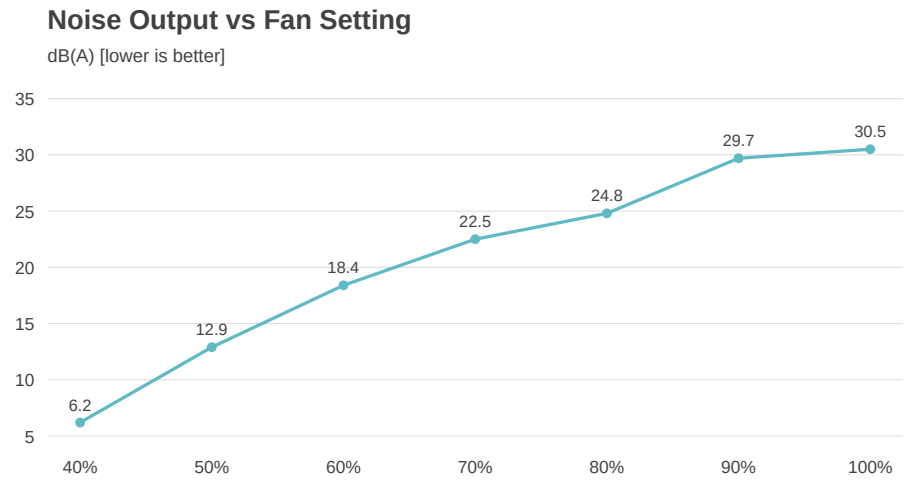
Noise Output and Fan Speed

Table

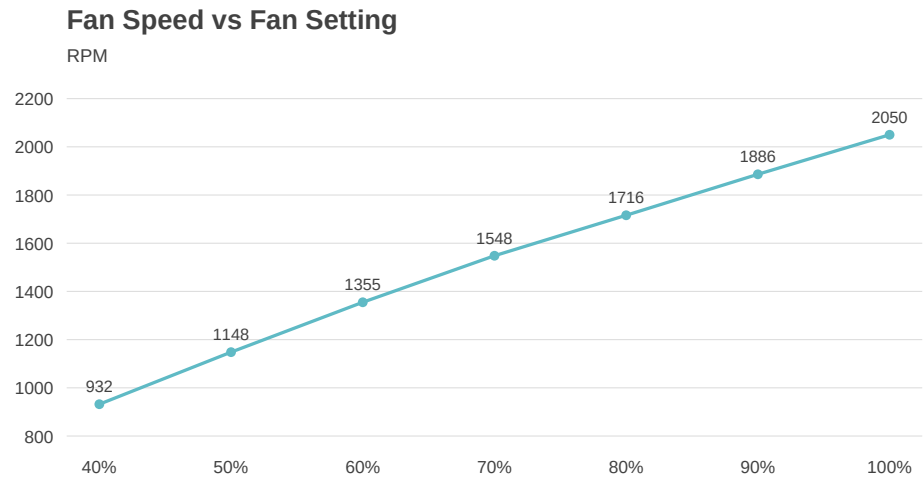
Fan Setting	Noise (dB(A))	Fan 1 (RPM)
40%	6.2	932
50%	12.9	1148
60%	18.4	1355
70%	22.5	1548
80%	24.8	1716
90%	29.7	1886
100%	30.5	2050

Graphs

Noise



Fan Speed



Fan Speed at Fixed Noise Levels

Noise Level	Fan 1 (RPM)
15 dB(A)	1210
20 dB(A)	1450
25 dB(A)	1720
30 dB(A)	1900

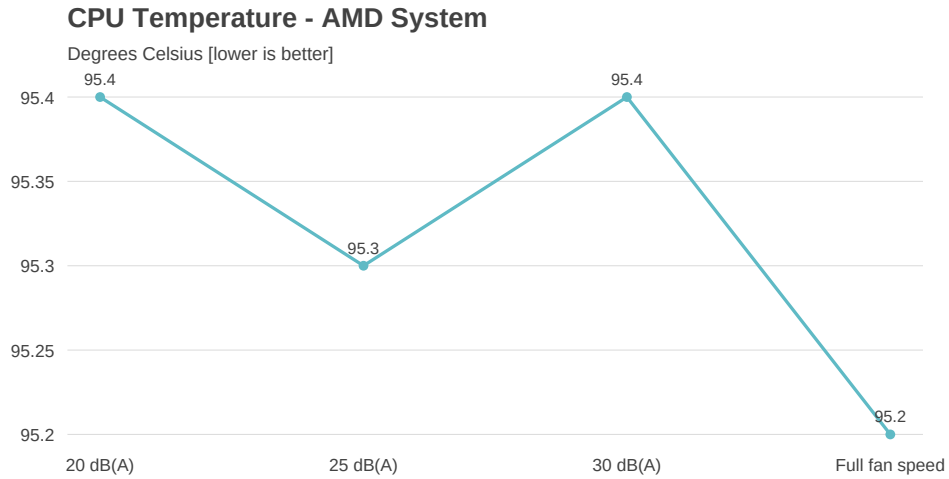
AMD System Test Results

Table

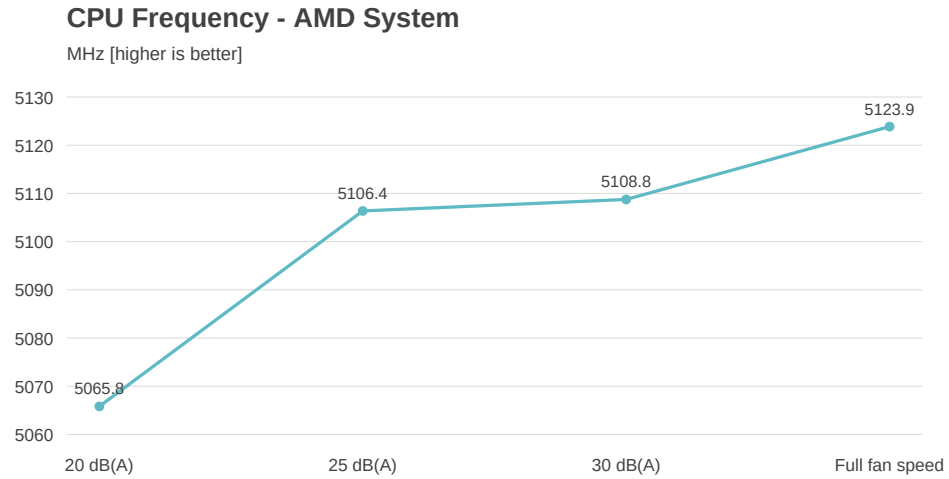
Condition	CPU Temperature (°C)	CPU Frequency (MHz)	CPU Power (W)	Overall Performance
20 dB(A)	95.4	5066	167.8	8911
25 dB(A)	95.3	5106	173.7	9309
30 dB(A)	95.4	5109	176.0	9426
Full fan speed	95.2	5124	178.6	9615

Graphs

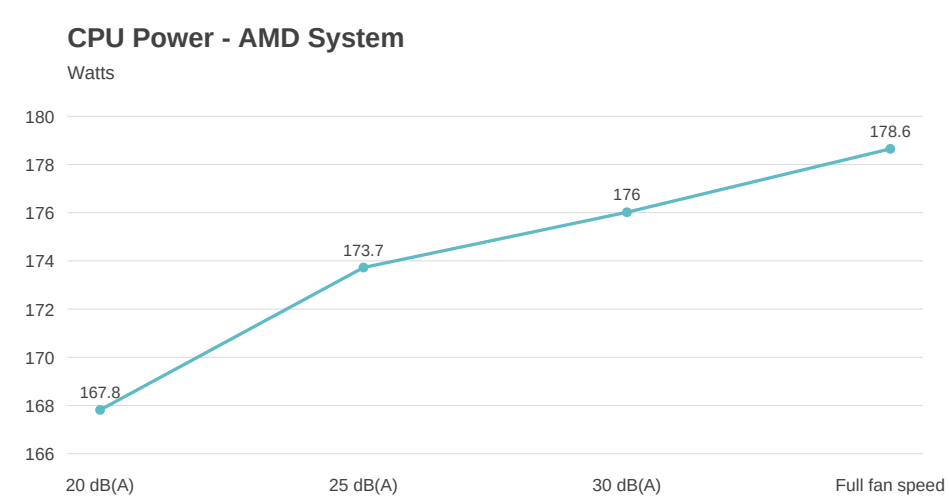
CPU Temperature



CPU Frequency



CPU Power



Overall Performance

