ARCTIC Liquid Freezer III 280 A-RGB

Lab ID ACCLR00064

Type Liquid

Testing Dates: Feb 20, 2024 to Feb 23, 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 Silver · AIO · AMD AM5**	AMD Ryzen 9 7900X (AM5)	Default	30 dB(A)	10,780
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	ARCTIC
Model	Liquid Freezer III 280 A-RGB
Lab ID	ACCLR00064
Testing Dates	Feb 20, 2024 to Feb 23, 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)	ARCTIC
Model	Liquid Freezer III 280 A-RGB
Number of Fans	2
Type	Liquid
Radiator Size	280mm
Radiator Thickness	38mm
Radiator Material	Aluminium
Pump Speed	2800RPM
Tube Length	450mm
Tube Diameter	6mm
Cold Plate Dimensions	40 x 44mm
Weight	1765g

RGB Lighting	Yes
AMD Processors Support	AM5, AM4
Intel Processors Support	LGA1851/1700

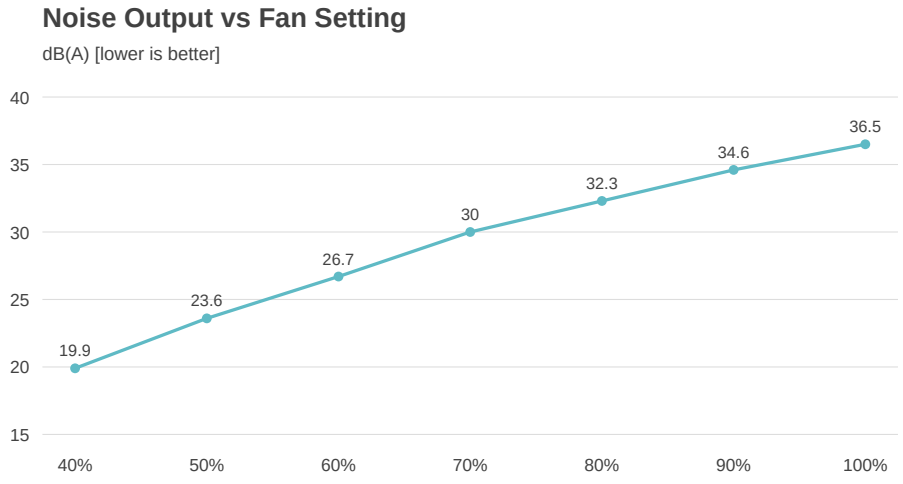
Noise Output and Fan Speed

Table

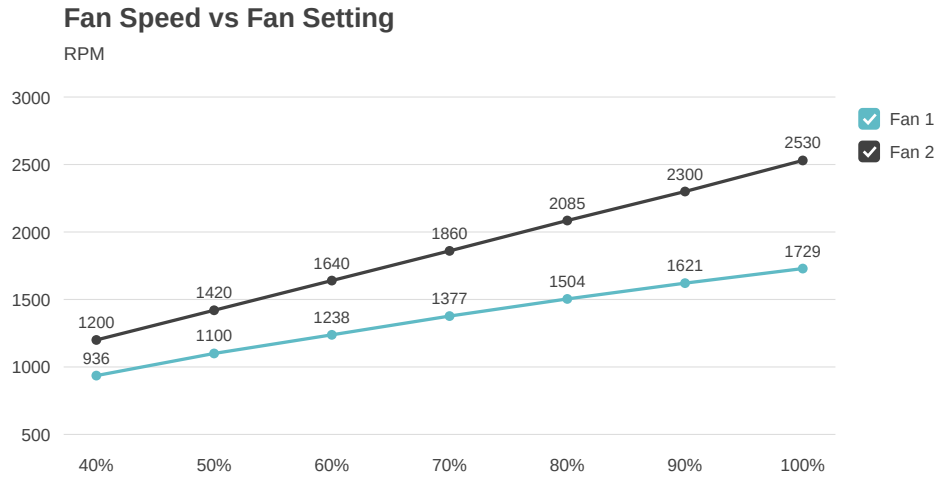
Fan Setting	Noise (dB(A))	Fan 1 (RPM)	Fan 2 (RPM)
40%	19.9	936	1200
50%	23.6	1100	1420
60%	26.7	1238	1640
70%	30.0	1377	1860
80%	32.3	1504	2085
90%	34.6	1621	2300
100%	36.5	1729	2530

Graphs

Noise



Fan Speed



Fan Speed at Fixed Noise Levels

Noise Level	PWM (%)	Fan 1 (RPM)	Fan 2 (RPM)
15 dB(A)	30	775	980
20 dB(A)	41	953	1225
25 dB(A)	55	1169	1520
30 dB(A)	70	1337	1860
35 dB(A)	95	1642	2350

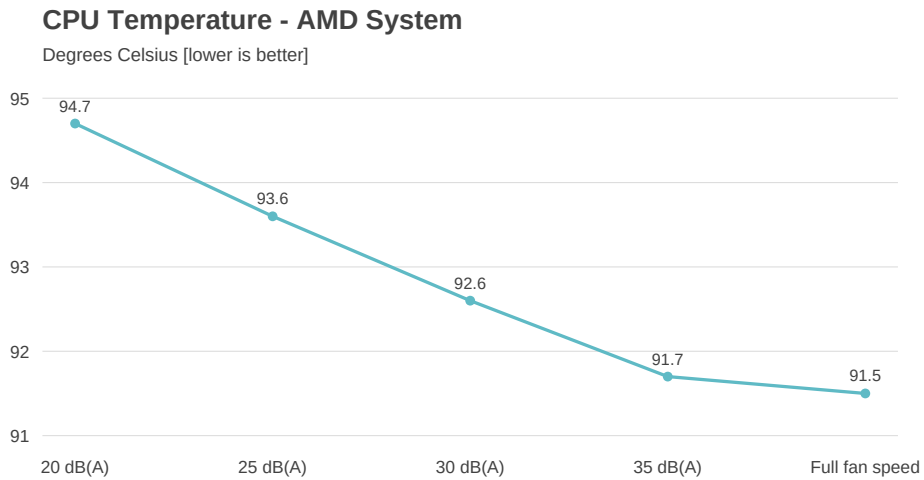
AMD System Test Results

Table

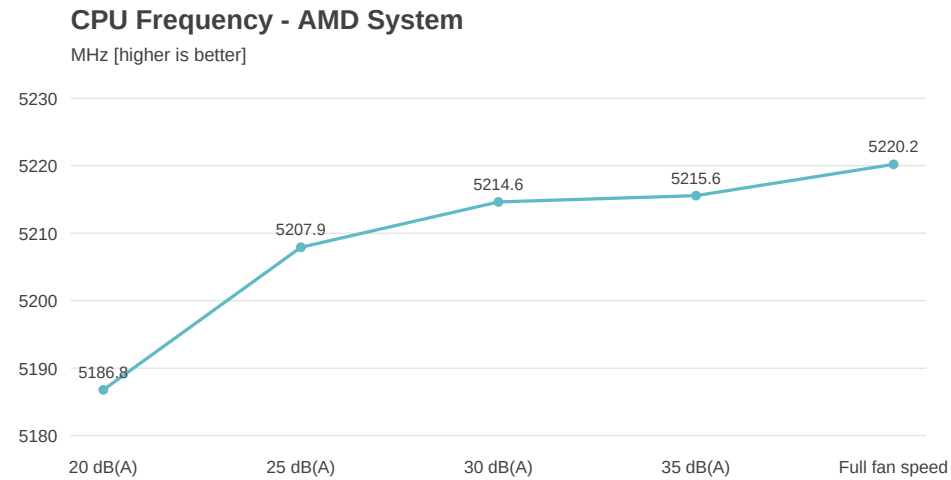
Condition	CPU Temperature (°C)	CPU Frequency (MHz)	CPU Power (W)	Overall Performance
20 dB(A)	94.7	5187	187.3	10259
25 dB(A)	93.6	5208	190.1	10577
30 dB(A)	92.6	5215	191.4	10780
35 dB(A)	91.7	5216	191.8	10908
Full fan speed	91.5	5220	192.7	10995

Graphs

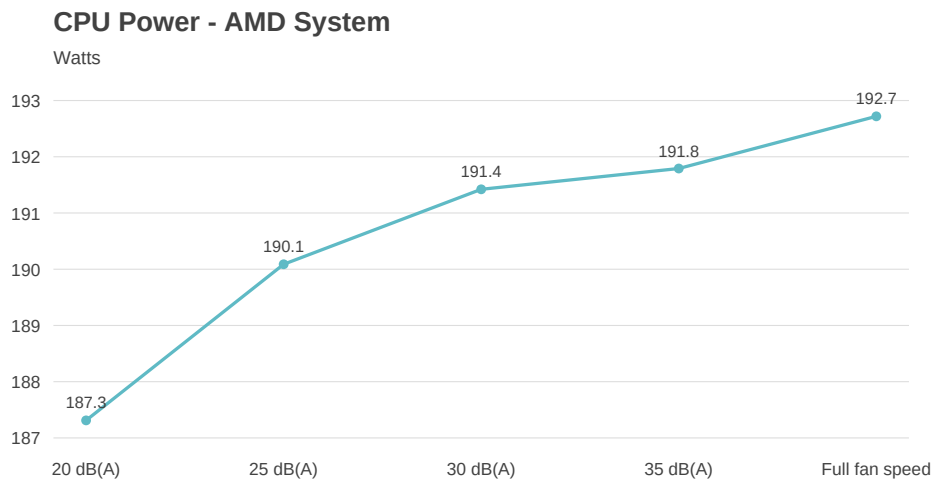
CPU Temperature



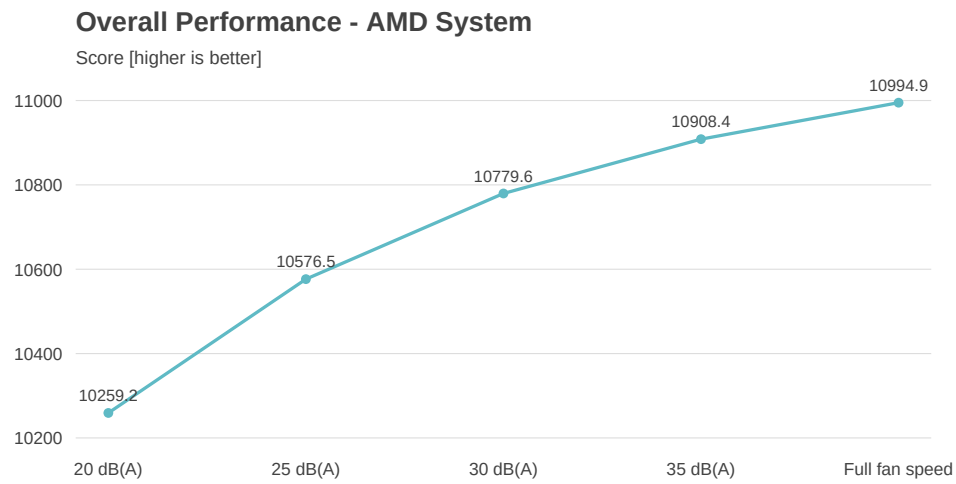
CPU Frequency



CPU Power



Overall Performance



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