



KEEP IT SLEEK KEEP IT COOL

# System Thermal Test Report

Model: TR100

Version: 20241216A

NO: RS202412160001

**A. Introduction**

**B. Test Configuration**

**C. Conclusion**

## **A. Introduction**

- 1. Objective**
- 2. Equipment**
- 3. Procedure**



Our objective is to find out if **TR100** can efficiently extract the heat generated by the latest components, so we built a system with an Intel i9-13900K and a ASUS ROG Strix GeForce RTX® 4090 OC and put it to the test. The passing criteria we set was to keep the internal temperature under **41°C** while the system is running at full load, with a AIO 280 installed.

The equipment we used in the thermal testing includes:

1. Temperature & Humidity Chamber
2. Data Acquisition Device
3. Thermocouple

**The Temp. & Humidity Chamber** ensures consistency in the testing environment, particularly temperature and humidity. The **temperature** was set at **25°C** and the **humidity** at **50%** in the chamber.

**The Data Acquisition Device** helps us to directly collect the data through **thermocouples**, which is the most important equipment for our testing. We set up the thermocouple inside the case at various points to measure the temperature.

We used **AIDA64 Extreme** and **FurMark ROG Edition** to push 100% load on the CPU and GPU and tested for 30 minutes.

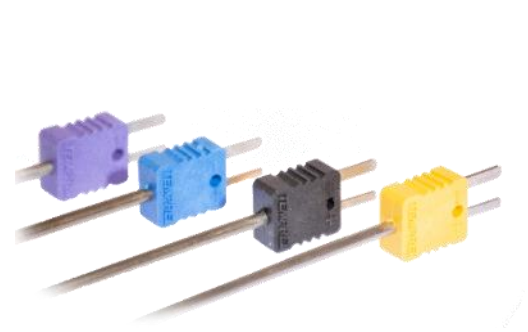
### Testing steps:

1. Ready the systems
2. Place the chassis into the Temp. & Humidity Chamber
3. Set the thermocouple at the specified places
4. Set up the Temp. & Humidity Chamber - temperature at 25 °C and the humidity at 50%
5. Turn on the Temp. & Humidity Chamber and start testing (for 30 minutes)
6. Check the data acquired from the Data Acquisition device
7. End testing

## **B. Test Configuration**

- 1. Laboratory Equipment**
- 2. Chassis Hardware List**
- 3. Chassis Fan Allocation**
- 4. Chassis Thermal Airflow**
- 5. Chassis Measured Points**
- 6. Thermal Stress Test**
- 7. AIDA64 & FurMark Test**
- 8. Graphics Performance Testing**
- 9. Acoustic Test**

# 1. Laboratory Equipment



Thermocouple



Sound Level Meter



Thermal Imaging Camera



Temperature Data Acquisition



Temperature & Humidity Chamber



Component	Model
Chassis	TR100
Motherboard	ASUS ROG STRIX Z790-i Gaming WIFI
CPU	Intel® Core™ i9-13900K Processor (TDP 253W)
GPU	ASUS ROG Strix GeForce RTX® 4090 OC 24GB GDDR6X
RAM	TOUGHRAM XG RGB D5 DDR5 6200 MT/s 32GB (16G x 2)
SSD	Seagate SSD 120G
PSU	Toughpower SFX 1000W- TT Premium Edition
CPU Cooler	TH280 V2 Ultra EX ARGB Sync
Fans	AIO:CT EX 140mm x 2 (1800rpm)
Software	<ol style="list-style-type: none"> <li>1. AIDA64 Extreme</li> <li>2. FurMark ROG Edition V0.9.3.0</li> <li>3. CPU-Z Ver.2.08.0 x64</li> <li>4. Core Temp V1.18.1</li> </ol>
Full load	30 minutes
Camera	FLIR E86 Thermal Imaging Camera

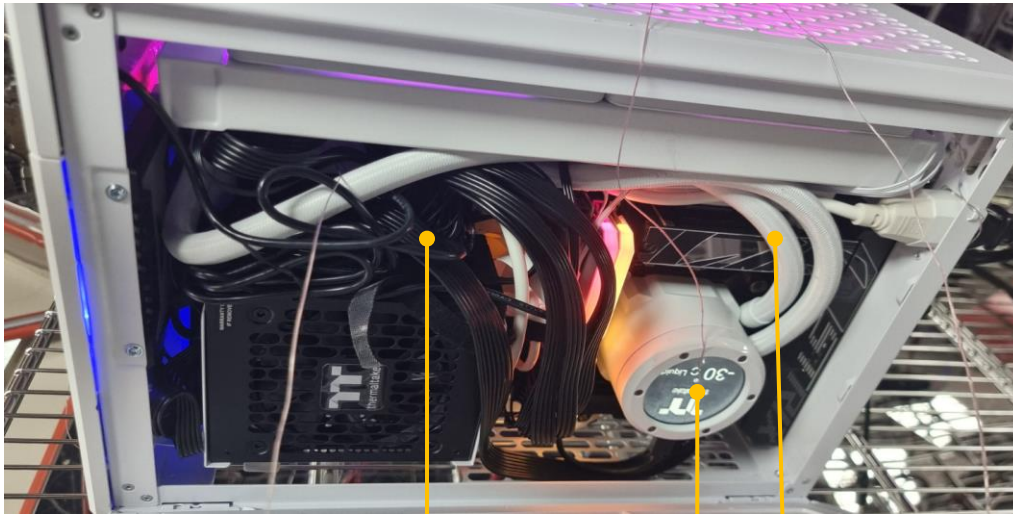




## Cool Airflow Inlets



# 5. Chassis Measured Points



3

6

9

Measure Point	Description	Airflow	Thermocouple Number
1	Chassis Left Exhaust	Intake	101
2	GPU Right Fan	Exhaust	102
3	Chassis Top Internal	Intake	103
4	Chassis Top Exhaust	Intake	104
5	Chassis Right Exhaust	Intake	105
6	AIO Top Cover	Nature	106
7	Chassis Front Internal	Exhaust	107
8	Chassis Front Exhaust	Exhaust	108
9	Chassis Rear Internal	Exhaust	109
10	Chassis Rear Exhaust	Exhaust	110
11	PSU Bottom	Intake	111
12	PSU Rear	Exhaust	112



1

7

4



8

2



11

5

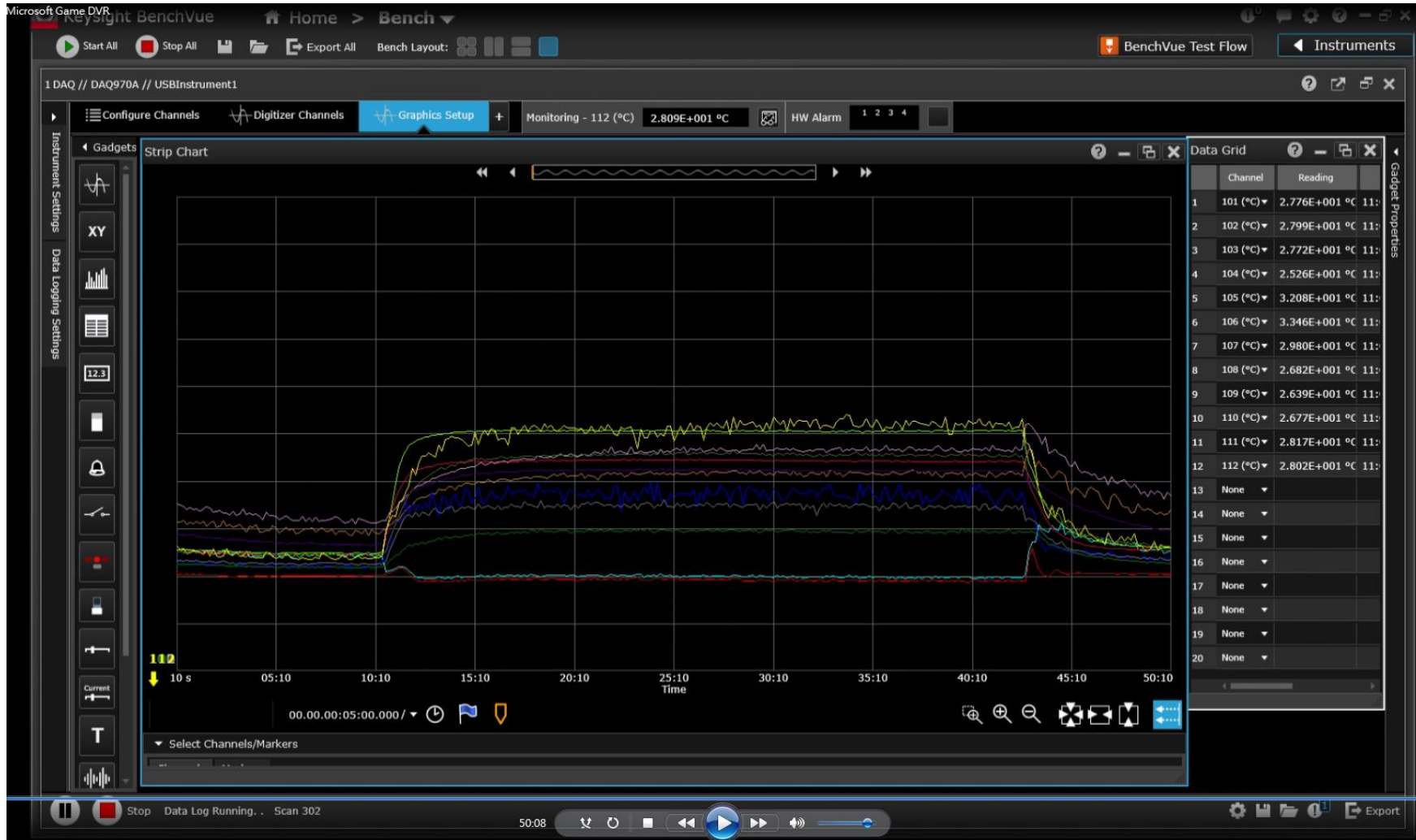
# 5. Chassis Measured Points



Measure Point	Description	Airflow	Thermocouple Number
1	Chassis Left Exhaust	Intake	101
2	GPU Right Fan	Exhaust	102
3	Chassis Top Internal	Intake	103
4	Chassis Top Exhaust	Intake	104
5	Chassis Right Exhaust	Intake	105
6	AIO Top Cover	Nature	106
7	Chassis Front Internal	Exhaust	107
8	Chassis Front Exhaust	Exhaust	108
9	Chassis Rear Internal	Exhaust	109
10	Chassis Rear Exhaust	Exhaust	110
11	PSU Bottom	Intake	111
12	PSU Rear	Exhaust	112



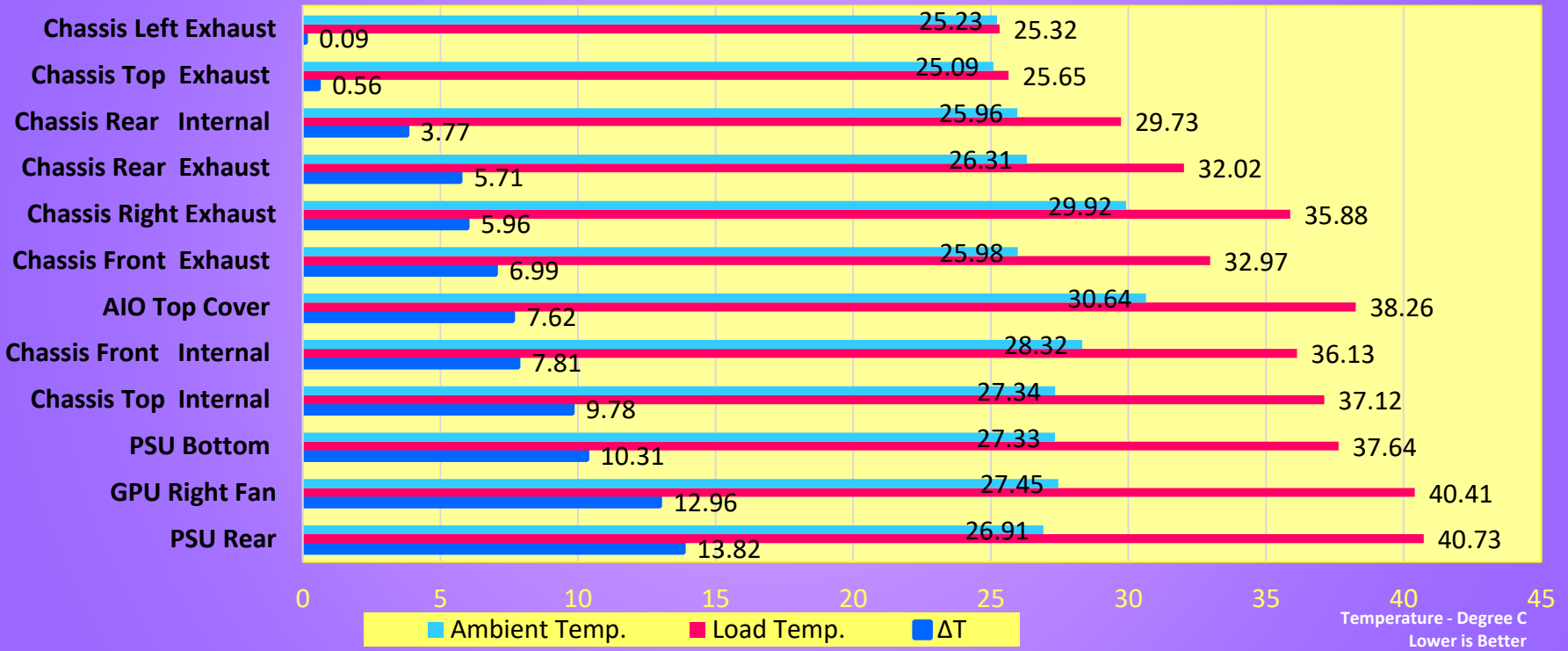
- Setting up the chamber temperature and humidity
- Temperature: 25°C
- Humidity: 50%
- Recording Data



Temperature Data Recoding

## System Thermal Stress Test TR100

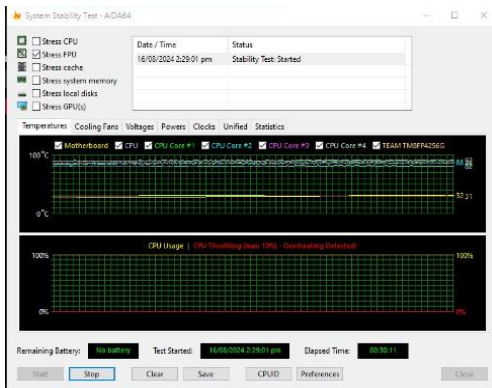
CPU- Intel Core i9-13900K  
 GPU-ASUS ROG-STRIX-RTX4090  
 Ambient Temperature: 25°C  
 Humidity: 50%



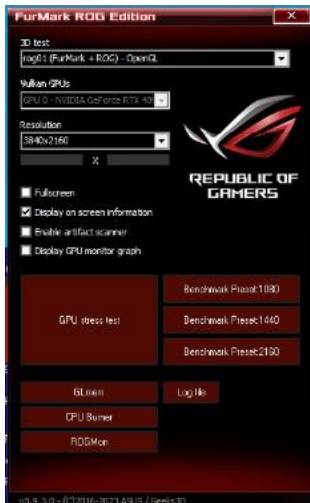
We expected to see higher temperature at the exhaust points and relatively lower temperature at the intake positions. The highest temperature was found at the AIO exhaust, which is reasonable given the CPU was running at full load. Most of the intake positions recorded a temperature lower than 41°C since they were drawing air from environment. Two critical positions we were looking at are **NO. 102 GPU Right Fan** and **NO. 106 AIO Top Cover**, which were drawing internal air to cool two of the most important components.



We used **AIDA64 Extreme** (stress FPU) and **FurMark ROG Edition** (resolution: 3840 x 2160) to push **100% load** on the CPU and GPU for 30 minutes.



AIDA64 Extreme



FurMark

Date	12/13/2024
Time (HH:MM)	10:19 AM
CPU Clock	5500 MHz
Motherboard Name	Asus ROG Strix Z790-I Gaming WiFi
BIOS Version	0703
Free Memory	26096 MB
GPU Clock	210 MHz
Motherboard	34°C
CPU	35°C
CPU Package	45°C
GPU	31°C
CPU	1802 RPM
AIO Pump	3284 RPM
GPU	0 RPM
CPU Core	1.341 V
GPU Core	0.880 V
CPU Package	47.53 W
GPU	13.63 W
GPU TDP%	3%

Idle

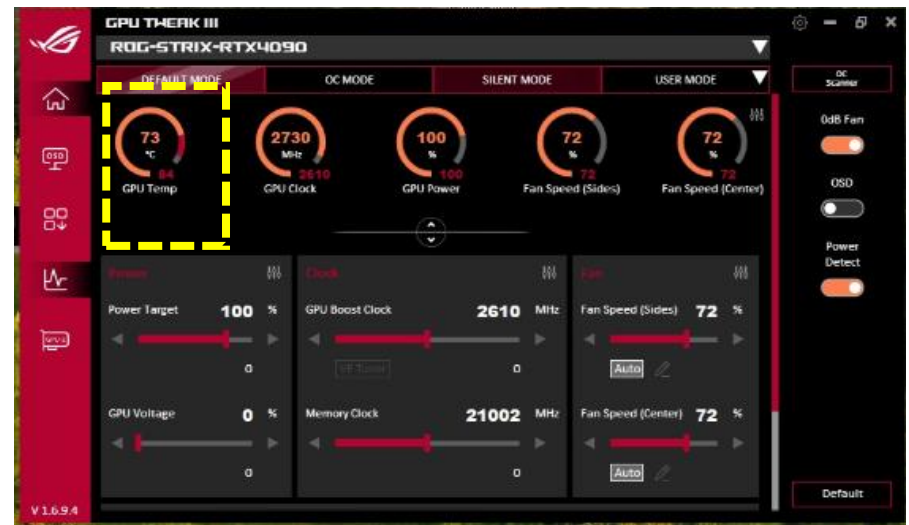
Date	12/13/2024
Time (HH:MM)	10:51 AM
CPU Clock	5200 MHz
Motherboard Name	Asus ROG Strix Z790-I Gaming WiFi
BIOS Version	0703
Free Memory	25719 MB
GPU Clock	2715 MHz
Motherboard	45°C
CPU	85°C
CPU Package	97°C
GPU	73°C
CPU	1802 RPM
AIO Pump	3206 RPM
GPU	2262 RPM
CPU Core	1.270 V
GPU Core	0.995 V
CPU Package	253.18 W
GPU	499.21 W
GPU TDP%	100%

Full load

We used **AIDA64 Extreme** (stress FPU) and **FurMark ROG Edition** (resolution: 3840 x 2160) to push **100% load** on the CPU and GPU for 30 minutes.

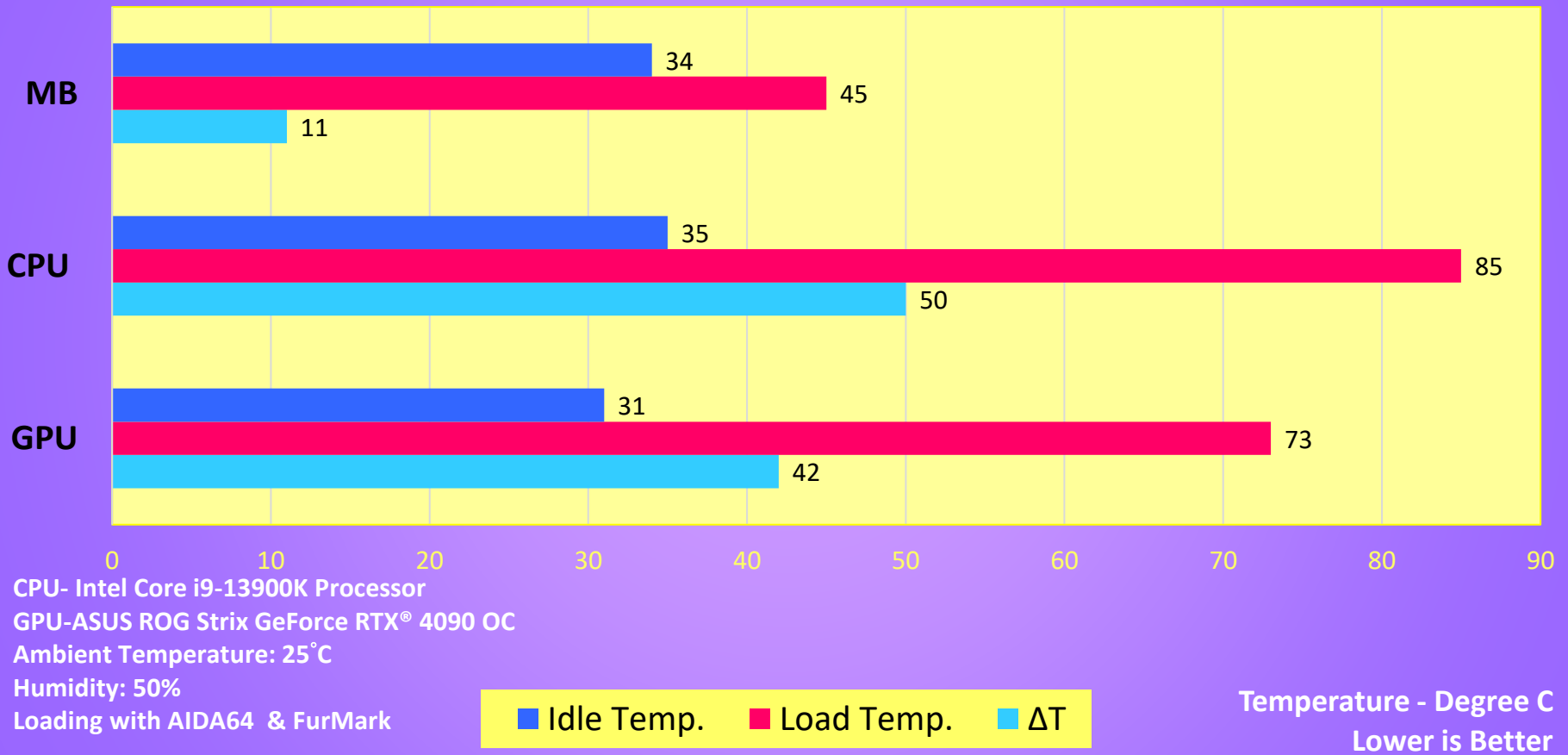


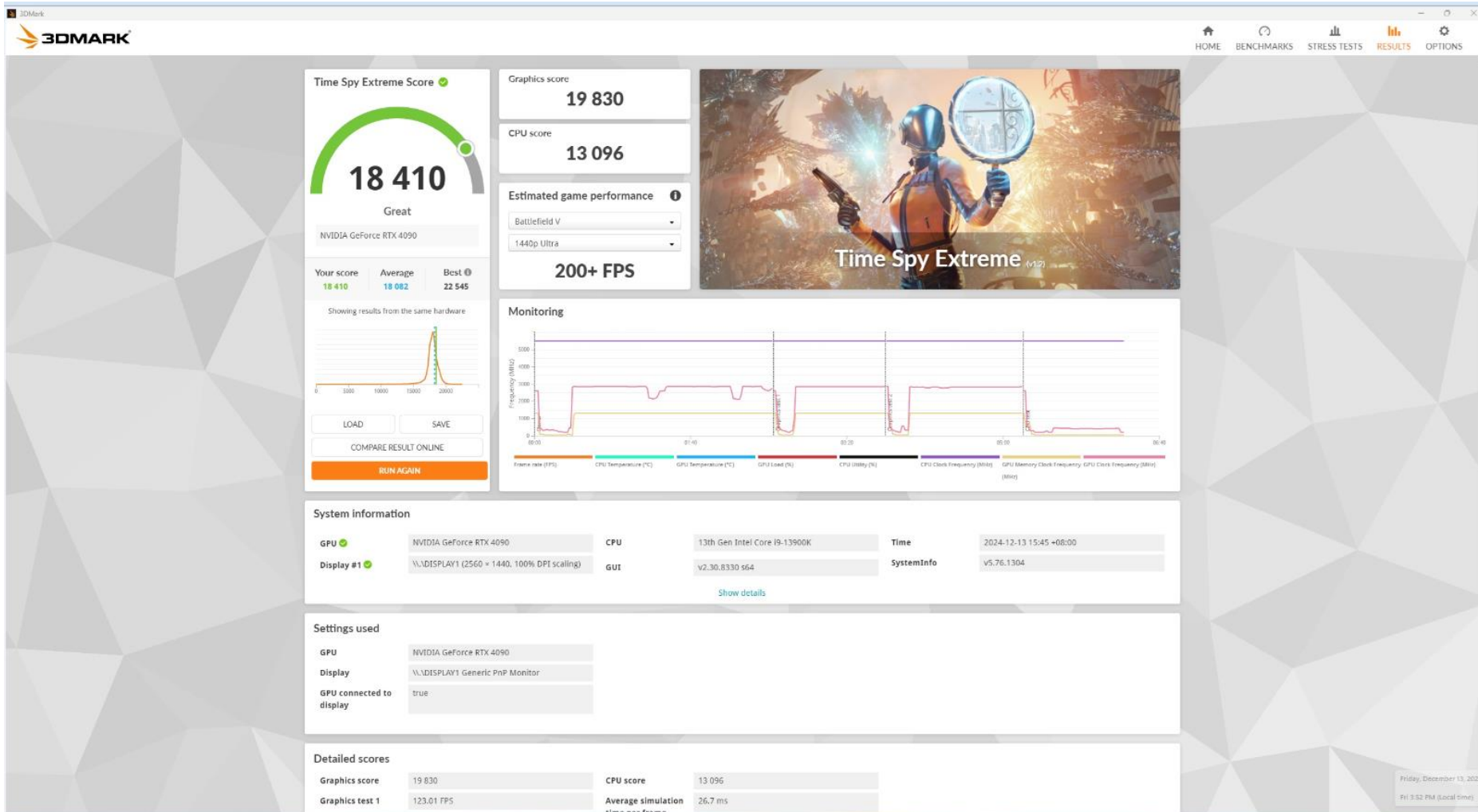
Idle



Full load

## CPU & GPU Thermal Stress Test TR100





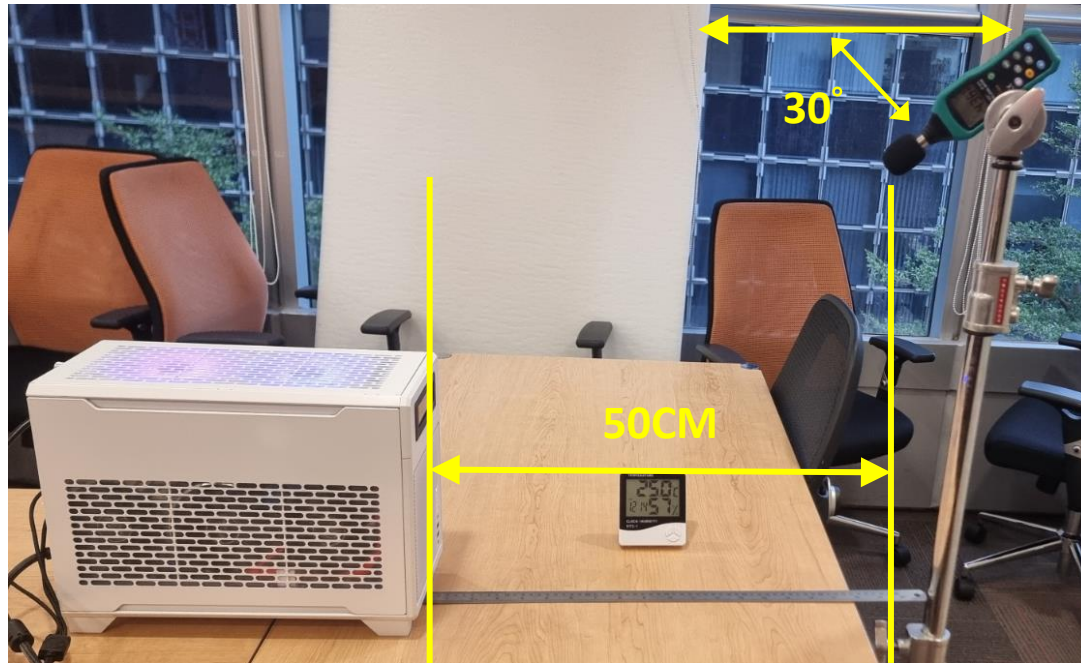
Test Environment : **Thermaltake Taipei Office**

Test Model: **TR100**

Test Ambience: **25.0°C(Temperature) / 57% R.H.(Relative Humidity)**

Microphone position: **50 cm / in front of PC system**

Background Noise : **35.4 dBA.**



Microphone position



Test Ambience

# 9. Acoustic Sound Pressure Level Test

Fan Speed 600rpm – 35.6dBA

Fan Speed 700rpm – 35.8dBA

Fan Speed 900rpm – 36.3dBA

Fan Speed 1800rpm – 43.4dBA



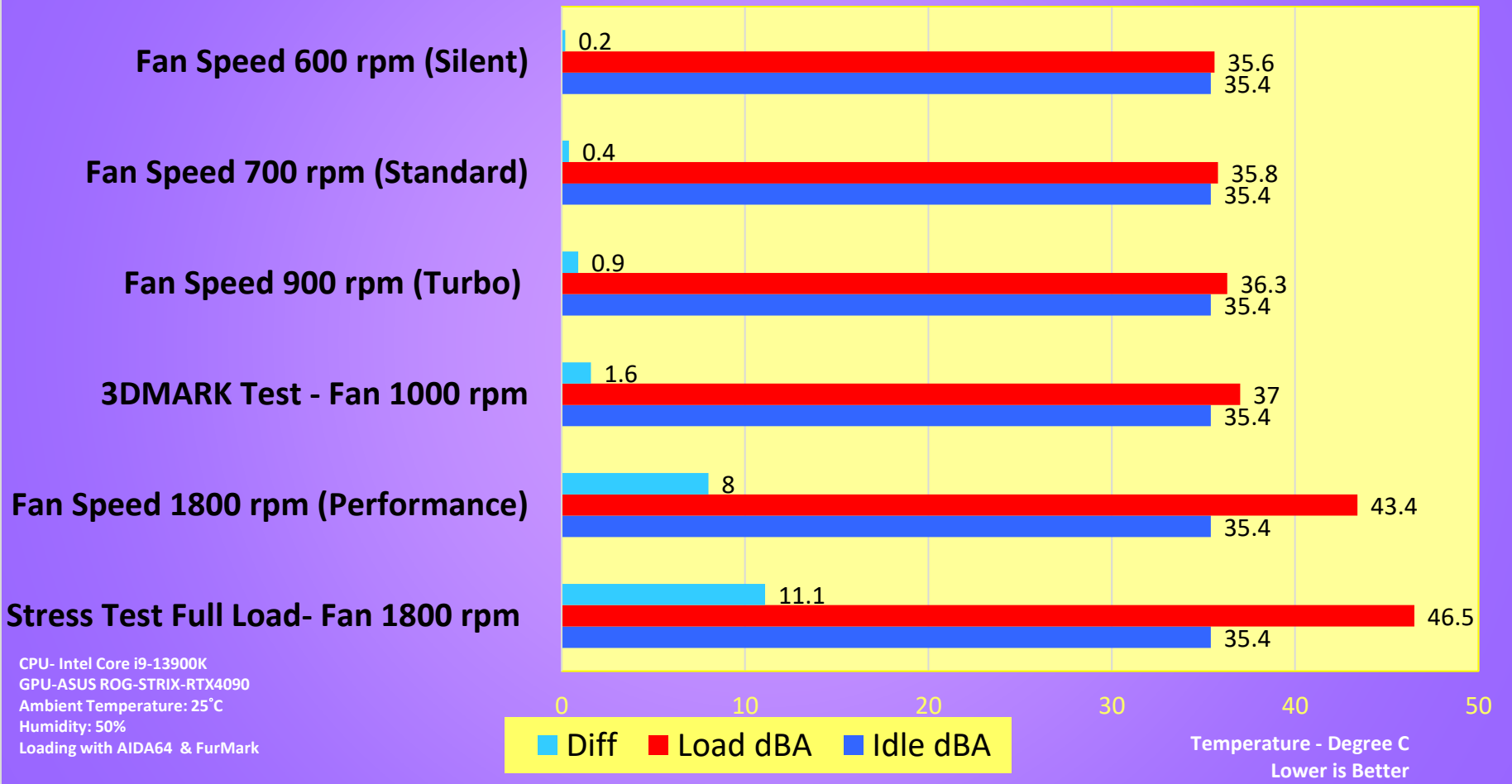
Date	12/13/2024
Time (HH:MM)	4:02 PM
CPU Clock	5500 MHz
Motherboard Name	Asus ROG Strix Z790-I Gaming WiFi
BIOS Version	0703
Free Memory	25439 MB
GPU Clock	210 MHz
Motherboard	45°C
CPU	44°C
CPU Package	52°C
GPU	44°C
CPU	601 RPM
AIO Pump	2898 RPM
GPU	0 RPM
CPU Core	1.350 V
GPU Core	0.870 V
CPU Package	54.63 W
GPU	12.38 W
GPU TDP%	2%

Date	12/13/2024
Time (HH:MM)	4:03 PM
CPU Clock	5500 MHz
Motherboard Name	Asus ROG Strix Z790-I Gaming WiFi
BIOS Version	0703
Free Memory	25366 MB
GPU Clock	210 MHz
Motherboard	45°C
CPU	44°C
CPU Package	53°C
GPU	45°C
CPU	691 RPM
AIO Pump	2947 RPM
GPU	0 RPM
CPU Core	1.350 V
GPU Core	0.870 V
CPU Package	53.42 W
GPU	13.99 W
GPU TDP%	3%

Date	12/13/2024
Time (HH:MM)	4:08 PM
CPU Clock	5500 MHz
Motherboard Name	Asus ROG Strix Z790-I Gaming WiFi
BIOS Version	0703
Free Memory	25424 MB
GPU Clock	210 MHz
Motherboard	46°C
CPU	45°C
CPU Package	52°C
GPU	46°C
CPU	935 RPM
AIO Pump	3110 RPM
GPU	0 RPM
CPU Core	1.350 V
GPU Core	0.870 V
CPU Package	54.43 W
GPU	15.59 W
GPU TDP%	3%

Date	12/13/2024
Time (HH:MM)	4:10 PM
CPU Clock	5500 MHz
Motherboard Name	Asus ROG Strix Z790-I Gaming WiFi
BIOS Version	0703
Free Memory	25440 MB
GPU Clock	210 MHz
Motherboard	45°C
CPU	43°C
CPU Package	55°C
GPU	45°C
CPU	1802 RPM
AIO Pump	3116 RPM
GPU	0 RPM
CPU Core	1.323 V
GPU Core	0.870 V
CPU Package	59.13 W
GPU	13.30 W
GPU TDP%	3%

## Acoustic Sound Pressure Level Test - TR100

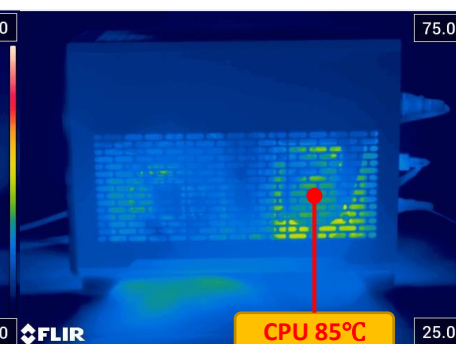
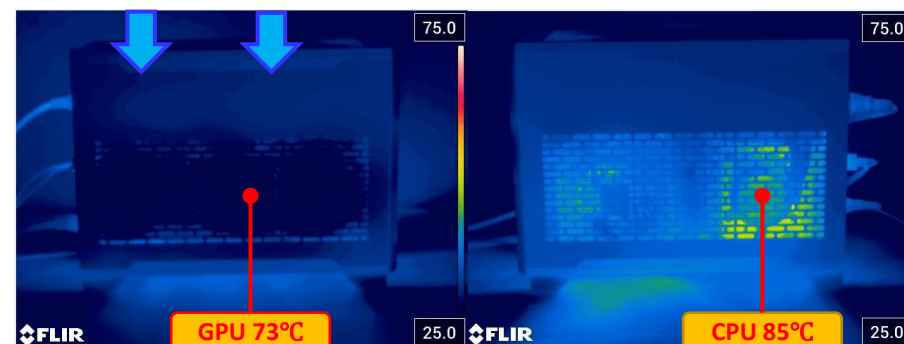
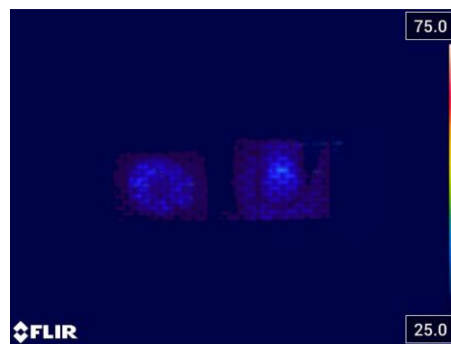


## C. Conclusion



Idle

Full Load



Left View

Right View

Left View

Right View

AIDA64 Extreme (stress FPU) and FurMark ROG Edition (resolution: 3840 x 2160) to push **100% load** on the CPU and GPU for 30 minutes.

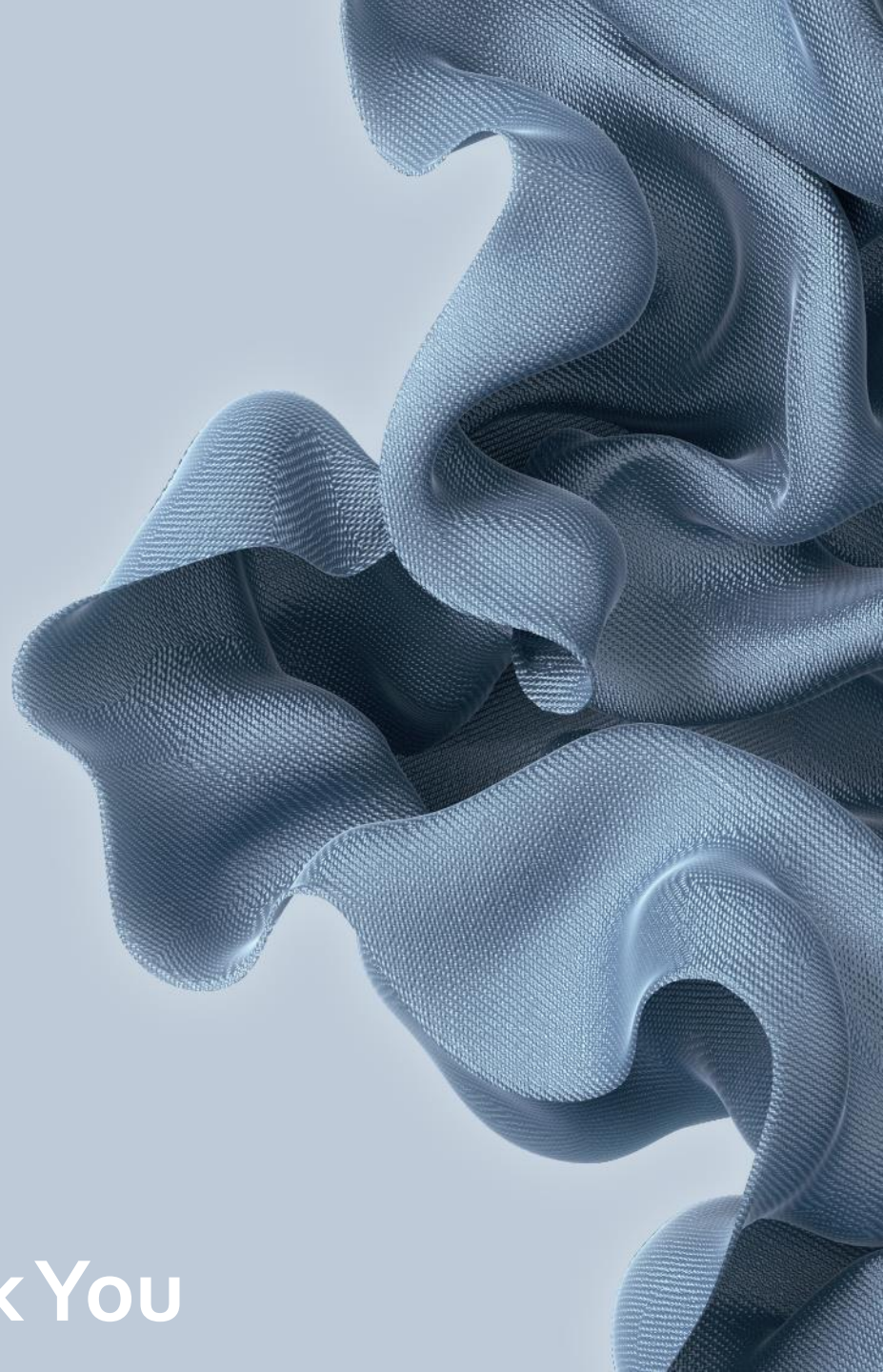
-INTEL i9 13900K / CPU Temp. (Max) : **85°C (TDP 253W)**

-ASUS ROG Strix GeForce RTX® 4090 OC / GPU Temp. (Max) : **73°C**

Through the thermal image, we found that the internal heat was effectively directed to designated exhaustion vents, keeping the system operating at a cooler temperature. This finding validates how efficient TR100 is regarding cooling performance.



KEEP IT SLEEK  
KEEP IT COOL



Thank You