



System Thermal Test Report

Model: CTE C750 TG ARGB

Version: 20230411A

NO: RS202304110001

A. Introduction

B. Test Configuration

C. Conclusion

A. Introduction

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



Our objective is to find out if the **CTE C750 TG ARGB** 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 **40°C** while the system is running at full load, with **fourteen** installed fans and a AIO 420 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.

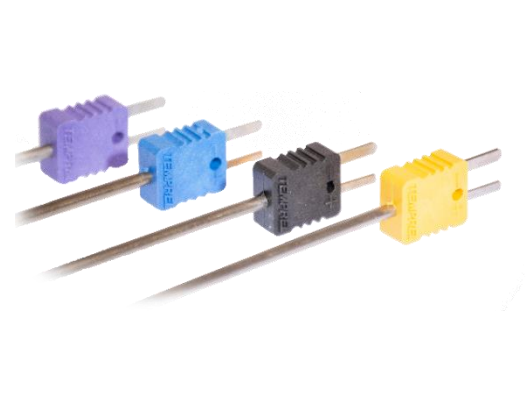
Testing steps:

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

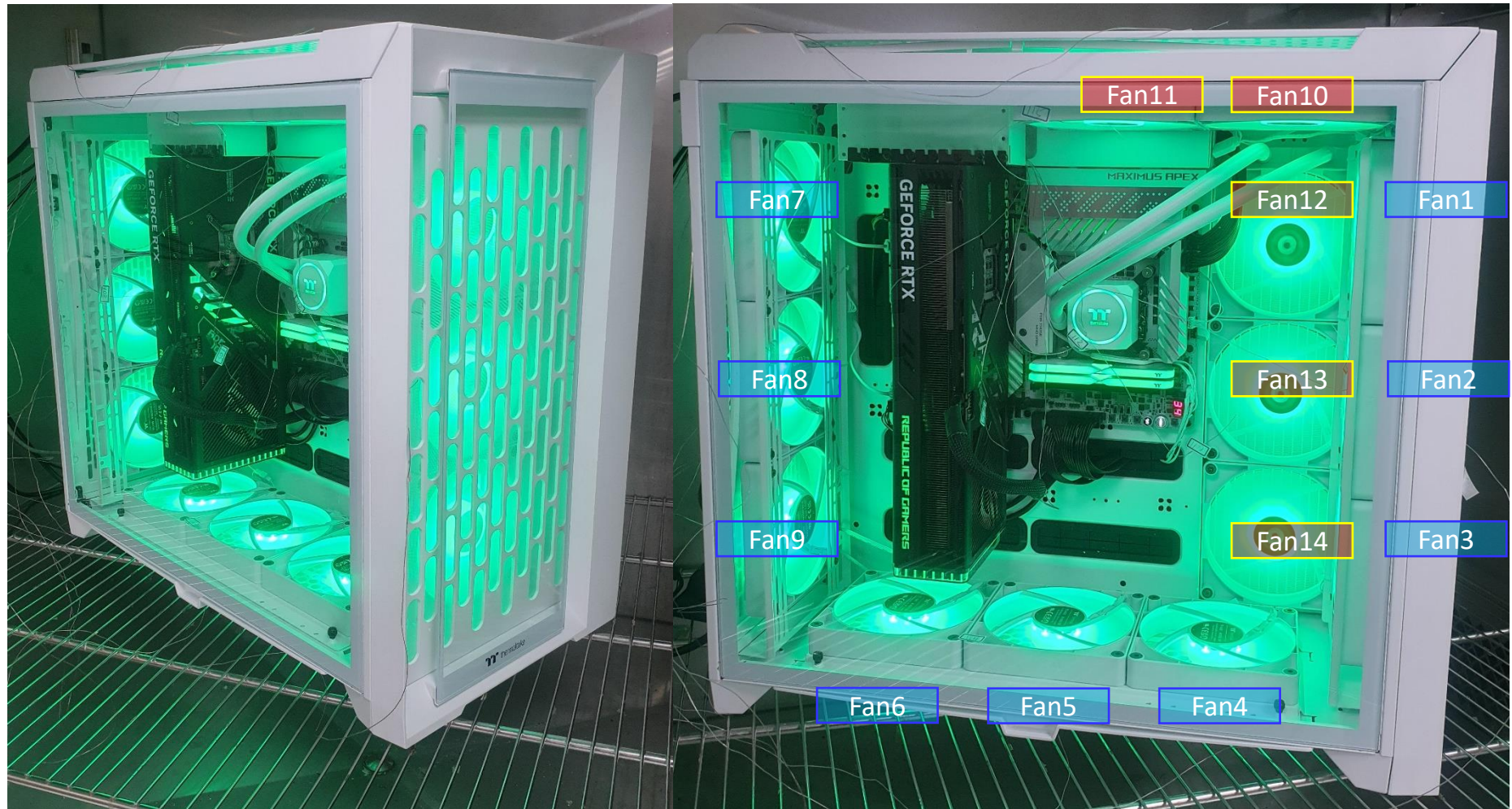


Temperature & Humidity Chamber

2. Chassis Hardware List

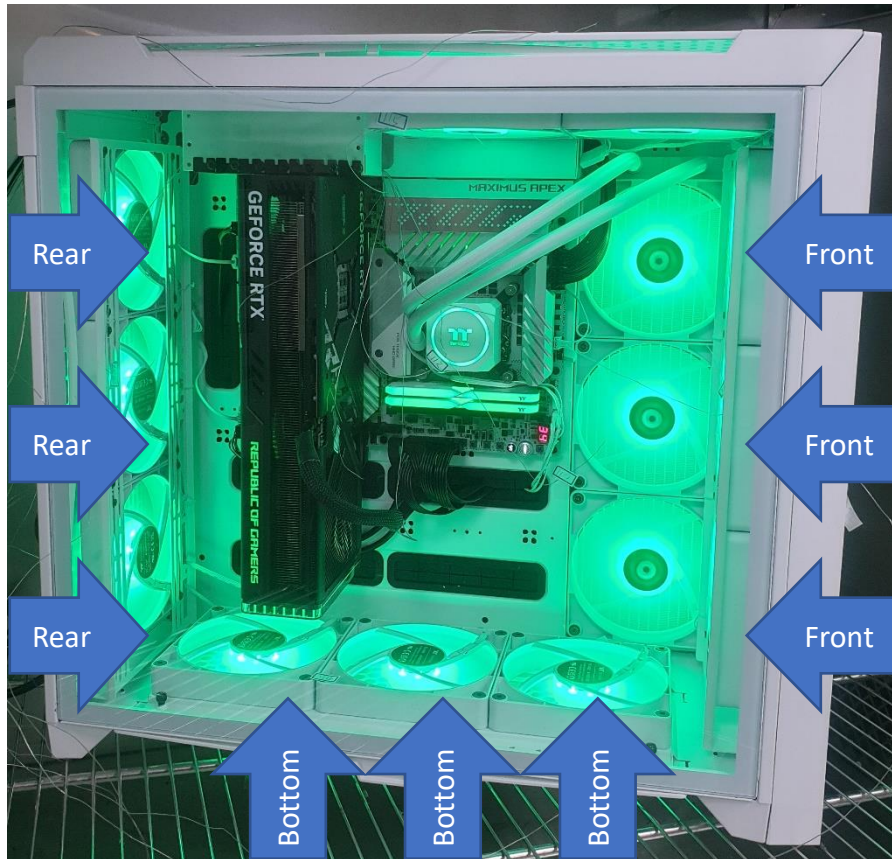
Component	Model
Chassis	CTE C750 TG ARGB Snow
Motherboard	ASUS ROG MAXIMUS Z790 APEX
CPU	Intel® Core™ i9-13900K Processor (TDP 253W)
GPU	ASUS ROG Strix GeForce RTX® 4090 OC 24GB GDDR6X
RAM	TOUGHRAM XG RGB DDR5 32G (16G x 2)
SSD	Seagate SSD 120G
PSU	Toughpower GF3 1200W - TT Premium Edition
CPU Cooler	TH420 ARGB Sync Snow Edition AIO Liquid Cooler
Fans	AIO: CT 140mm x 3 (1800rpm) Chassis: CT 140mm x 11 (1500 rpm) (Front x 3 , Top x 2 , Rear x 3, Bottom x 3)
Software	1. AIDA64 Extreme 2. FurMark ROG Edition V0.8.14.0 3. CPU-Z Ver.2.015 x64 4. Core Temp V1.18
Full load	30 minutes
Camera	Testo 885-2 Thermal Imaging Camera



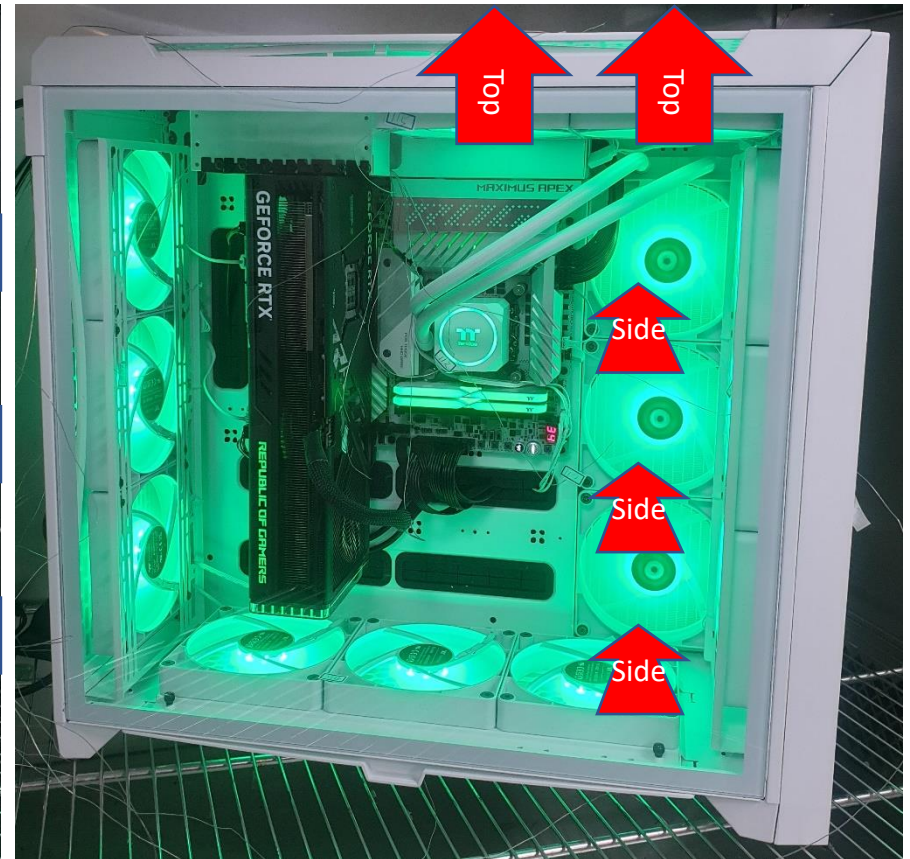


4. Chassis Thermal Airflow

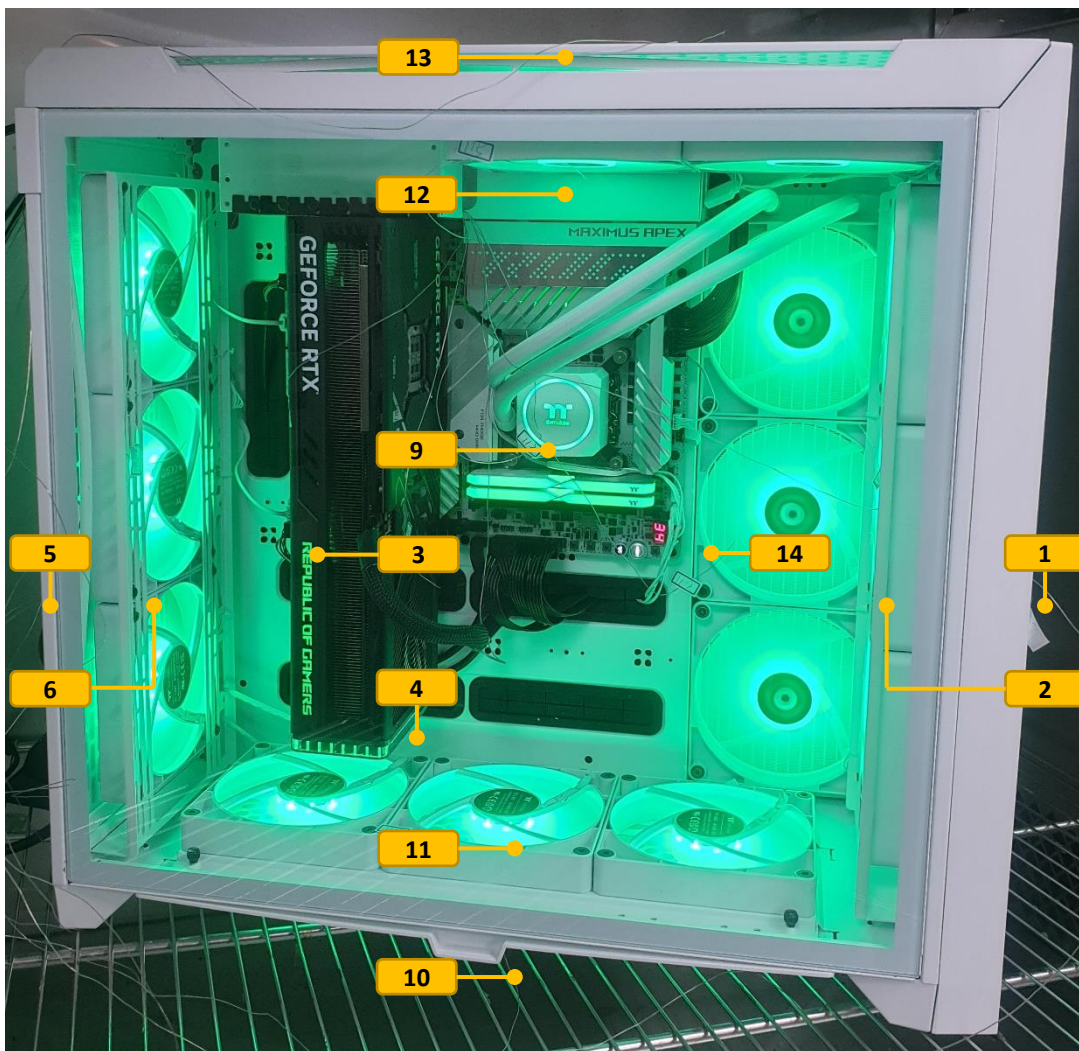
Cool Airflow Inlets



Hot Airflow Exhausts

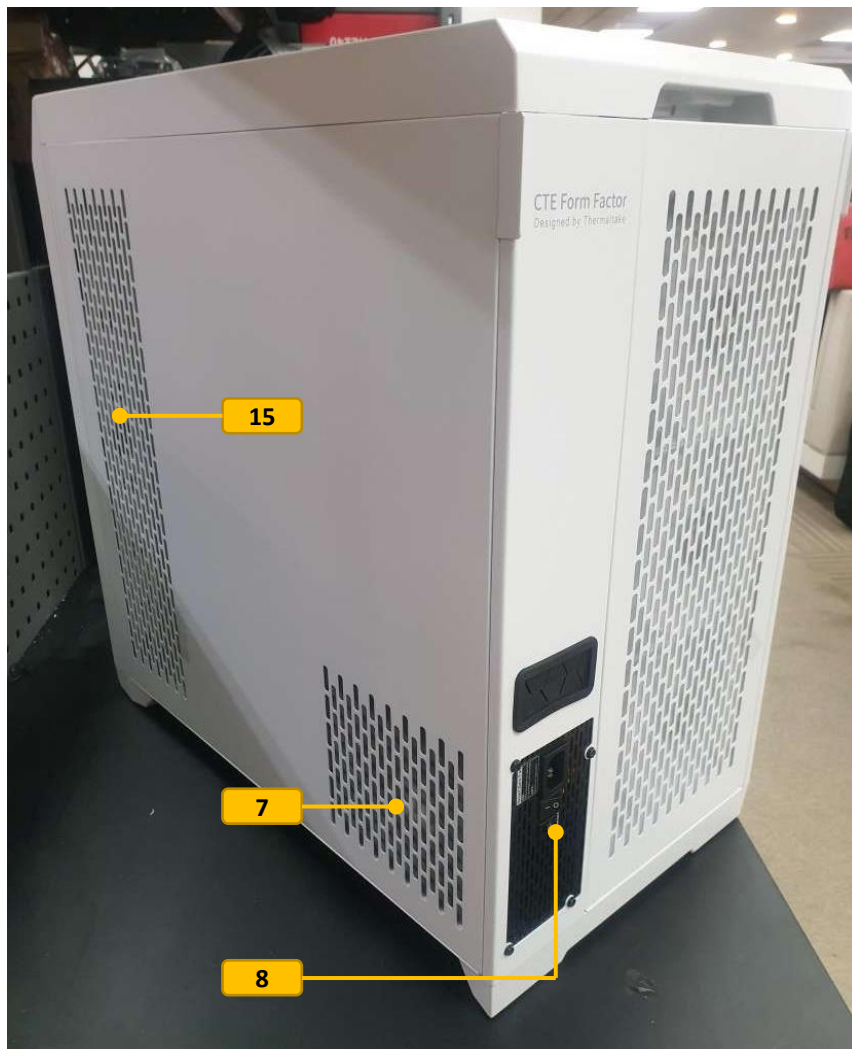


5. Chassis Measured Points

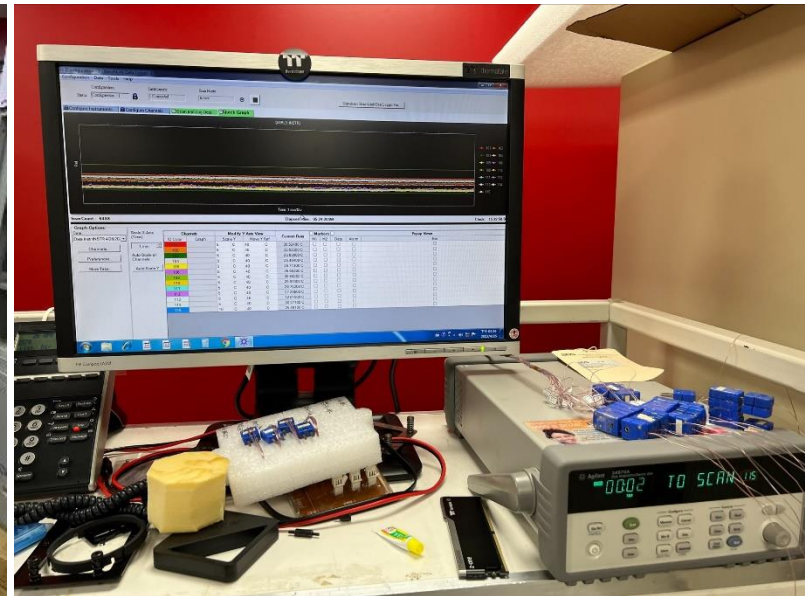


Measure Point	Description	Airflow	Thermocouple Number
1	Chassis Front External	Intake	101
2	Chassis Front Internal	Intake	102
3	GPU Left Fan	Intake	104
4	GPU Right Fan	Exhaust	105
5	Chassis Rear Internal	Intake	106
6	Chassis Rear External	Intake	108
7	PSU Bottom	Intake	110
8	PSU Rear	Exhaust	111
9	AIO Top Cover		112
10	Chassis Bottom External	Intake	113
11	Chassis Bottom Internal	Intake	114
12	Chassis Top Internal	Exhaust	115
13	Chassis Top External	Exhaust	116
14	Chassis Right Internal	Exhaust	117
15	Chassis Right External	Exhaust	118

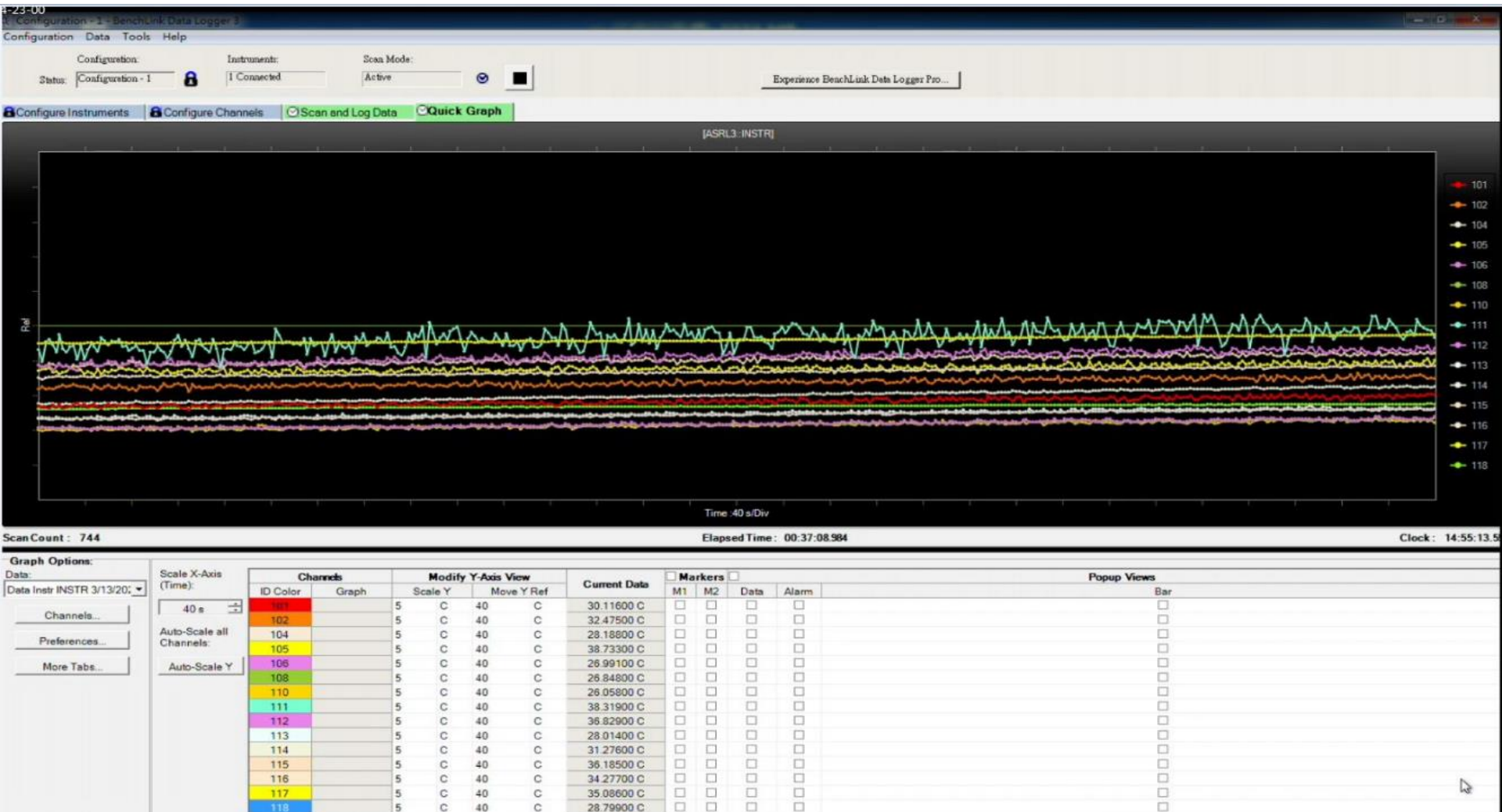
5. Chassis Measured Points



Measure Point	Description	Airflow	Thermocouple Number
1	Chassis Front External	Intake	101
2	Chassis Front Internal	Intake	102
3	GPU Left Fan	Intake	104
4	GPU Right Fan	Exhaust	105
5	Chassis Rear Internal	Intake	106
6	Chassis Rear External	Intake	108
7	PSU Bottom	Intake	110
8	PSU Rear	Exhaust	111
9	AIO Top Cover		112
10	Chassis Bottom External	Intake	113
11	Chassis Bottom Internal	Intake	114
12	Chassis Top Internal	Exhaust	115
13	Chassis Top External	Exhaust	116
14	Chassis Right Internal	Exhaust	117
15	Chassis Right External	Exhaust	118



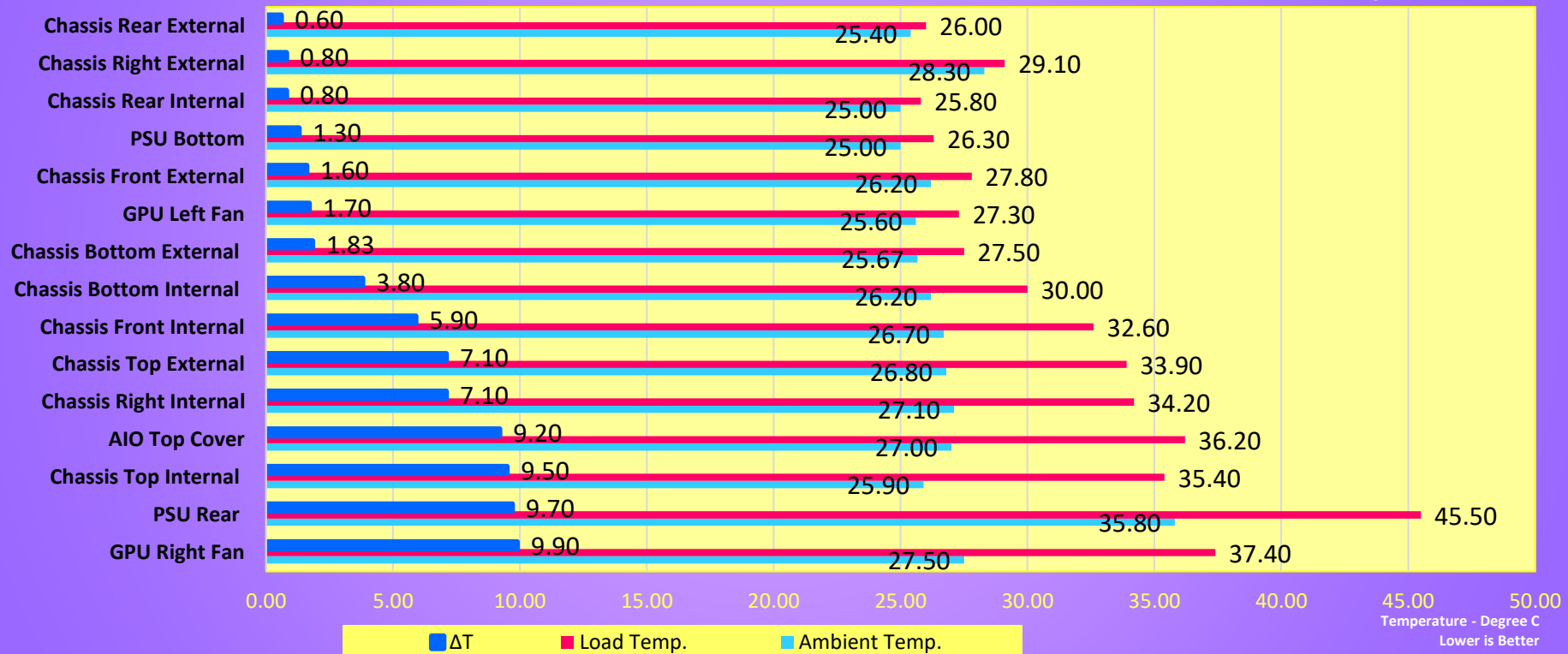
- Setting up the chamber temperature and humidity
- Temperature: 25°C
- Humidity: 50%
- Recording Data



Temperature Data Recoding

System Thermal Stress Test - CTE C750 TG ARGB

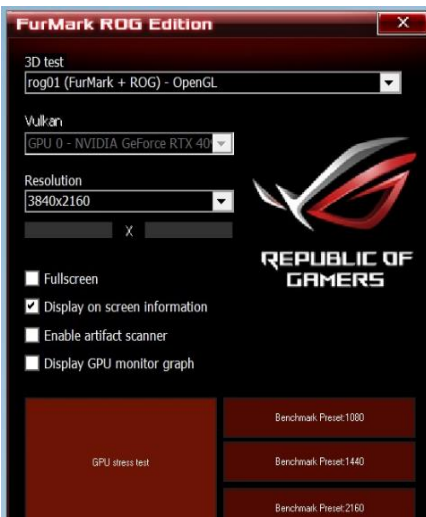
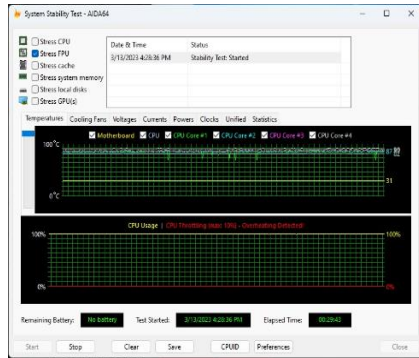
CPU- Intel Core i9-13900K
GPU-ASUS ROG-STRIX-RTX4090
Ambient Temperature: 25°C
Humidity: 50%
Loading with AIDA64 & FurMark



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 40°C since they were drawing air from environment. Two critical positions we were looking at are **NO. 105 GPU Fan** and **NO. 112 AIO Cover**, which were drawing internal air to cool two of the most important components.

7. AIDA64 & FurMark Test

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.



FurMark

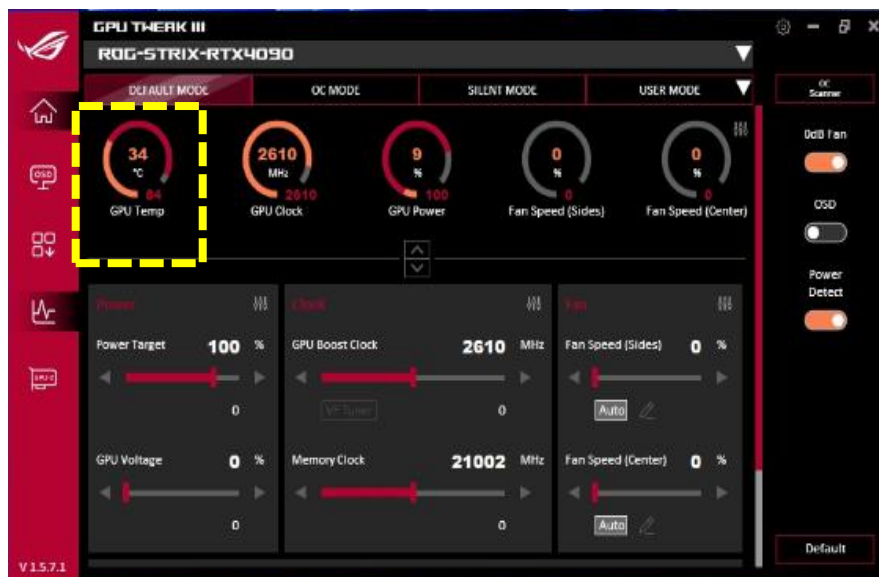
Date	3/13/2023
Time (HH:MM)	4:26 PM
CPU Clock	5500 MHz
Motherboard	Asus ROG Maximus Z790 Apex
BIOS Version	0812
Free Memory	26479 MB
GPU Clock	2610 MHz
Motherboard	28°C
CPU	34°C
CPU Package	41°C
GPU Diode	34°C
GPU Hotspot	42°C
CPU	1819 RPM
AIO Pump	3006 RPM
Chassis #3	1644 RPM
GPU	0 RPM
GPU	0%
CPU Core	1.332 V
GPU Core	0.880 V
CPU Package	41.00 W
GPU	28.05 W
GPU TDP%	6%

Idle

Date	3/13/2023
Time (HH:MM)	4:58 PM
CPU Clock	5200 MHz
Motherboard	Asus ROG Maximus Z790 Apex
BIOS Version	0812
Free Memory	26385 MB
GPU Clock	2760 MHz
Motherboard	31°C
CPU	82°C
CPU Package	92°C
GPU Diode	79°C
GPU Hotspot	89°C
CPU	1785 RPM
AIO Pump	2980 RPM
Chassis #3	1610 RPM
GPU	2464 RPM
GPU	79%
CPU Core	1.190 V
GPU Core	1.010 V
CPU Package	253.36 W
GPU	482.64 W
GPU TDP%	97%

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.



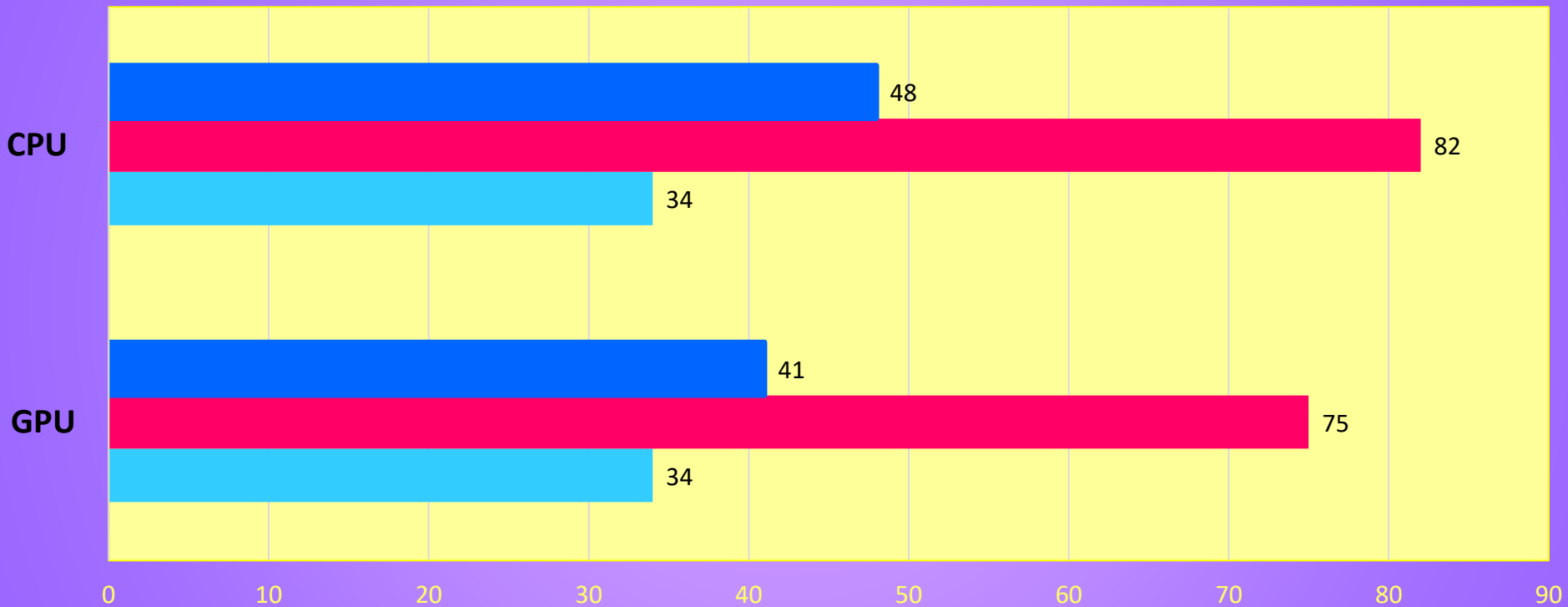
Idle



Full load

CPU & GPU Thermal Stress Test

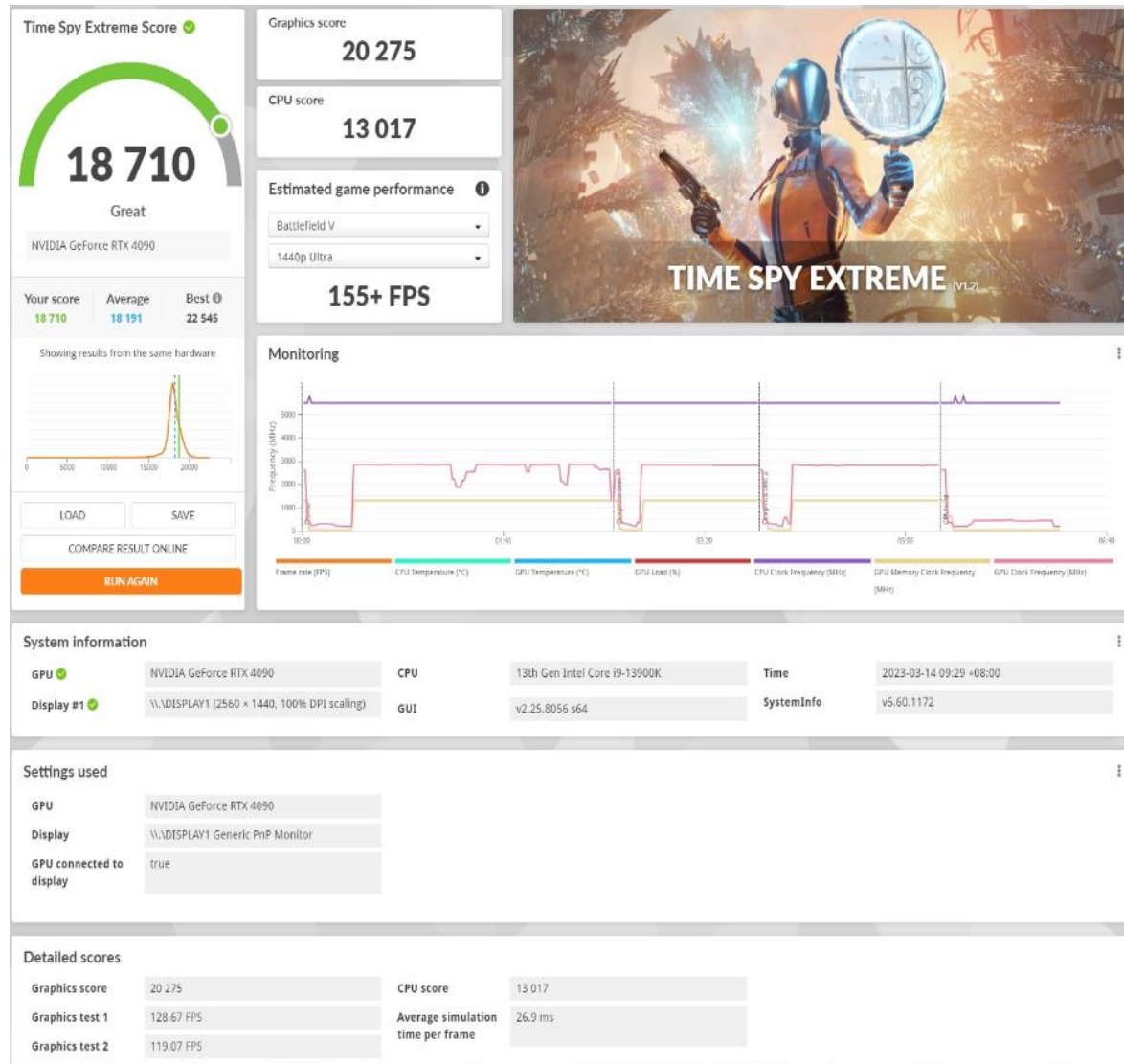
CTE C750 TG ARGB



CPU- Intel Core i9-13900K
 GPU-ASUS ROG-STRIX-RTX4090
 Ambient Temperature: 25°C
 Humidity: 50%
 Loading with AIDA64 & FurMark

■ ΔT ■ Load Temp. ■ Idle Temp.

Temperature - Degree C
 Lower is Better



9. Acoustic Sound Pressure Level Test

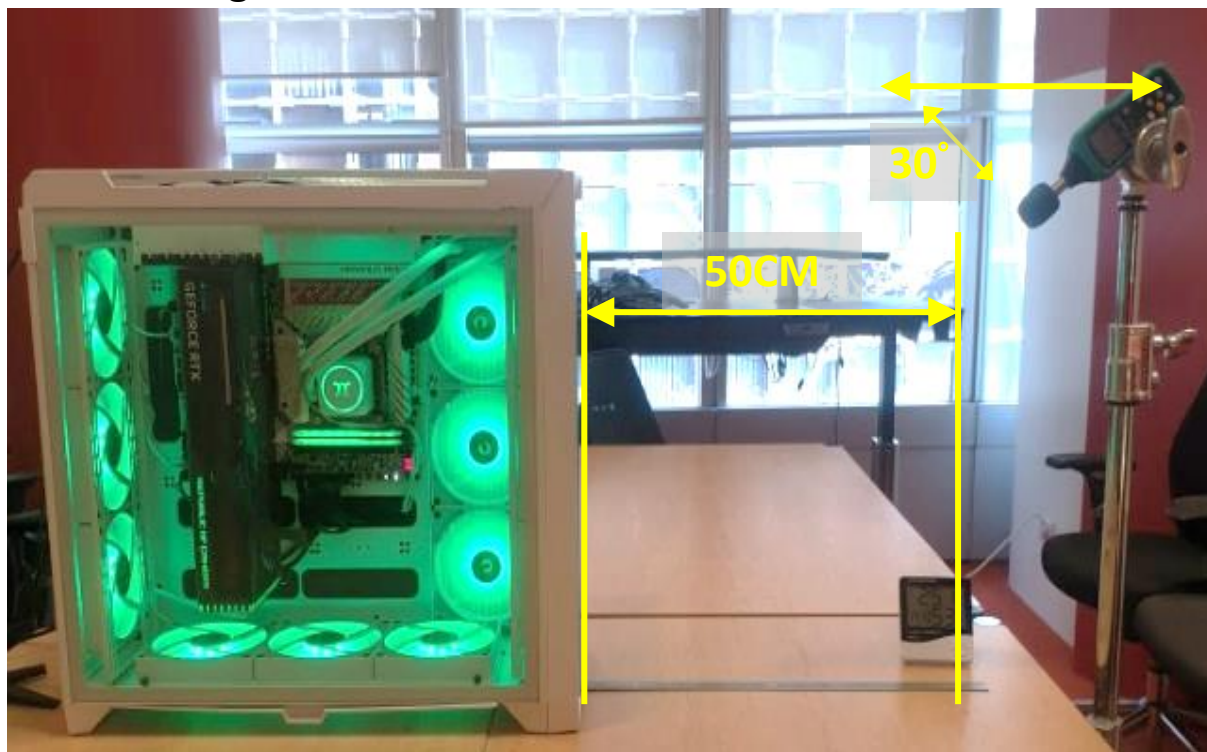
Test Environment : Thermaltake Taipei Office

Test Model: **CTE C750 TG ARGB**

Test Ambience: **25.1 °C(Temperature) / 53% R.H.(Relative Humidity)**

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

Background Noise : **36.7 dBA.**



Microphone position



Test Ambience

9. Acoustic Sound Pressure Level Test

Fan Speed 600rpm – 37.3dBA



Fan Speed 800rpm – 37.9dBA



Fan Speed 1000rpm – 39.3dBA



Fan Speed 1800rpm – 55.1dBA



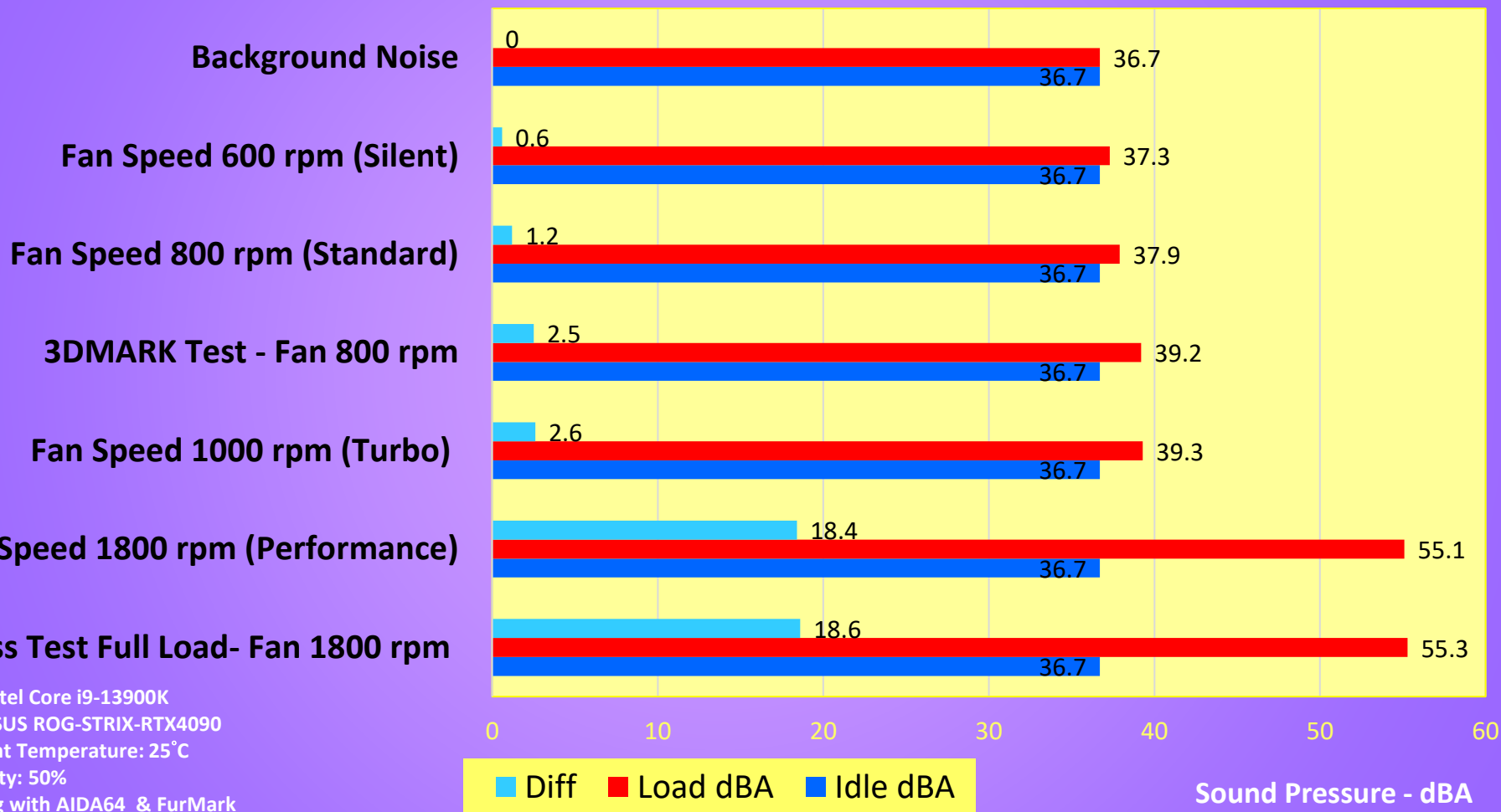
Date	3/15/2023
Time (HH:MM)	2:14 PM
CPU Clock	5500 MHz
Motherboard	Asus ROG Maximus Z790 Apex
BIOS Version	0812
Free Memory	26360 MB
GPU Clock	210 MHz
Motherboard	29°C
CPU	33°C
CPU Package	38°C
GPU Diode	39°C
GPU Hotspot	47°C
CPU	684 RPM
AIO Pump	2678 RPM
Chassis #3	552 RPM
GPU	0 RPM
GPU	0%
CPU Core	1.296 V
GPU Core	0.875 V
CPU Package	31.30 W
GPU	17.13 W
GPU TDP%	3%

Date	3/15/2023
Time (HH:MM)	2:15 PM
CPU Clock	5500 MHz
Motherboard	Asus ROG Maximus Z790 Apex
BIOS Version	0812
Free Memory	26444 MB
GPU Clock	210 MHz
Motherboard	29°C
CPU	33°C
CPU Package	38°C
GPU Diode	39°C
GPU Hotspot	47°C
CPU	829 RPM
AIO Pump	2700 RPM
Chassis #3	669 RPM
GPU	0 RPM
GPU	0%
CPU Core	1.154 V
GPU Core	0.875 V
CPU Package	35.31 W
GPU	17.86 W
GPU TDP%	4%

Date	3/15/2023
Time (HH:MM)	2:16 PM
CPU Clock	5500 MHz
Motherboard	Asus ROG Maximus Z790 Apex
BIOS Version	0812
Free Memory	26387 MB
GPU Clock	210 MHz
Motherboard	29°C
CPU	34°C
CPU Package	39°C
GPU Diode	39°C
GPU Hotspot	47°C
CPU	1021 RPM
AIO Pump	2848 RPM
Chassis #3	843 RPM
GPU	0 RPM
GPU	0%
CPU Core	1.296 V
GPU Core	0.875 V
CPU Package	46.32 W
GPU	18.73 W
GPU TDP%	4%

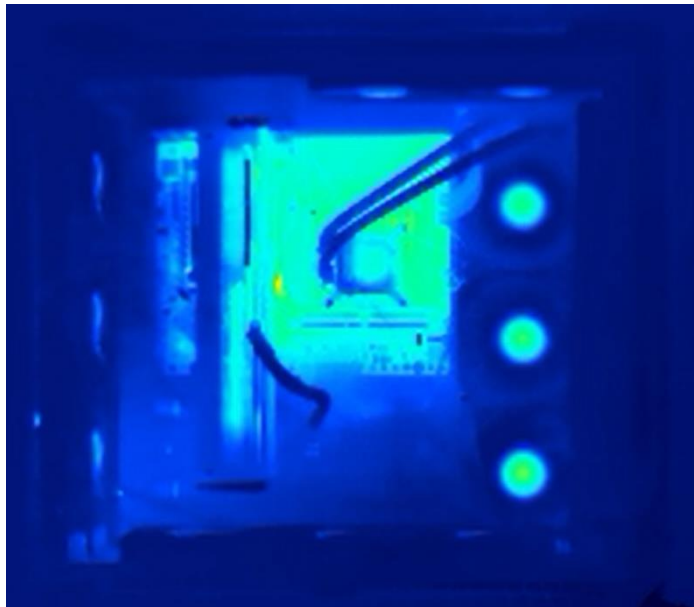
Date	3/15/2023
Time (HH:MM)	2:17 PM
CPU Clock	5500 MHz
Motherboard	Asus ROG Maximus Z790 Apex
BIOS Version	0812
Free Memory	26401 MB
GPU Clock	210 MHz
Motherboard	27°C
CPU	33°C
CPU Package	36°C
GPU Diode	36°C
GPU Hotspot	44°C
CPU	1812 RPM
AIO Pump	3000 RPM
Chassis #3	1590 RPM
GPU	0 RPM
GPU	0%
CPU Core	1.296 V
GPU Core	0.875 V
CPU Package	29.29 W
GPU	17.72 W
GPU TDP%	4%

Acoustic Sound Pressure Level Test - CTE C750 TG ARGB



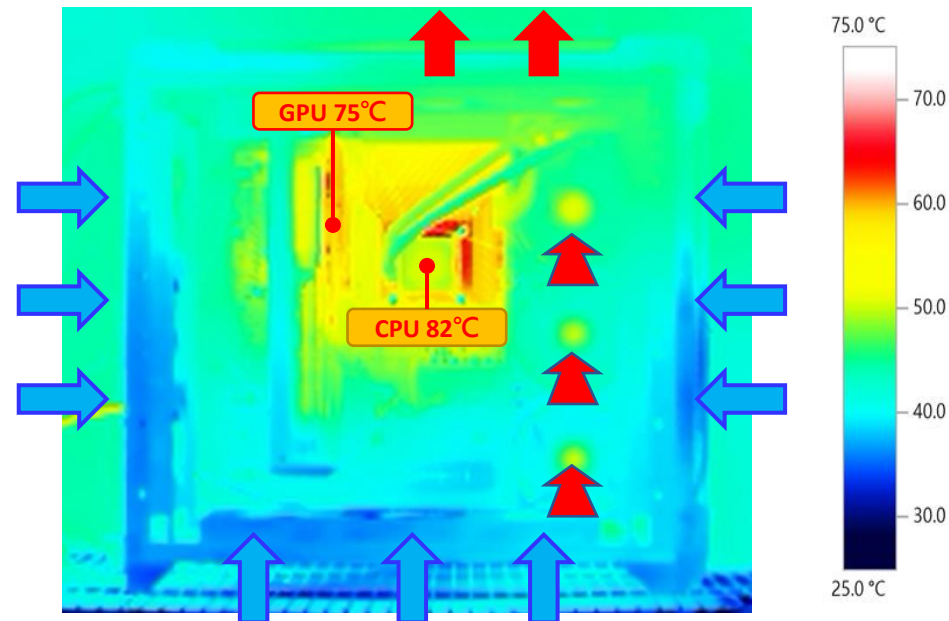
C. Conclusion

Idle



Left View

Full Load



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) : **82°C (TDP 253W)**

-ASUS ROG Strix GeForce RTX® 4090 OC / GPU Temp. (Max) : **75°C**

Through the thermal image, we found that the internal heat was effectively directed to designated exhaust vents, keeping the system operating at a cooler temperature. This finding validates how efficient CTE C750 TG ARGB is regarding cooling performance.



thermaltake

Thank you!