

#### **System Thermal Test Report**

Model: CTE C700 TG ARGB

Version: 20230626A



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#### A. Introduction

- **B.** Test Configuration
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## A. Introduction

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

#### **1.** Objective





Our objective is to find out if the **CTE C700 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<sup>®</sup> 4090 OC and put it to the test. The passing criteria we set was to keep the internal temperature under **42°C** while the system is running at full load, with **ten** installed fans and a AIO 420 installed.

## 2. Equipment

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**



Temperature & Humidity Chamber

Thermal Imaging Camera

Temperature Data Acquisition

2	Chassis	Hard	ware	lict
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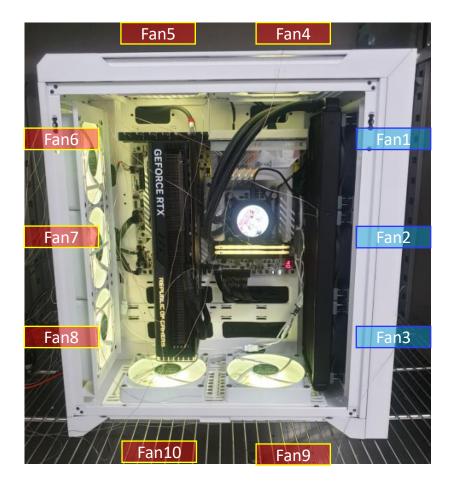
Component	Model
Chassis	CTE C700 TG ARGB Snow
Motherboard	ASUS ROG MAXIMUS Z790 APEX
CPU	Intel <sup>®</sup> Core <sup>TM</sup> i9-13900K Processor (TDP 253W)
GPU	ASUS ROG Strix GeForce RTX <sup>®</sup> 4090 OC 24GB GDDR6X
RAM	TOUGHRAM Z-ONE RGB D5(16G x 2)
SSD	Seagate SSD 120G
PSU	Toughpower GF3 1200W - TT Premium Edition
CPU Cooler	TOUGHLIQUID Ultra 420 AIO Liquid Cooler
Fans	AIO:TOUGHFAN 140mm x 3 (2000rpm) Chassis: CT 140mm x 7 (1500 rpm) (Top x 2 , Rear x 3, Bottom x 2 )
Software	<ol> <li>AIDA64 Extreme</li> <li>FurMark ROG Edition V0.8.14.0</li> <li>CPU-Z Ver.2.015 x64</li> <li>Core Temp V1.18</li> </ol>
Full load	30 minutes
Camera	Testo 885-2 Thermal Imaging Camera





## **3.** Chassis Fan Allocation

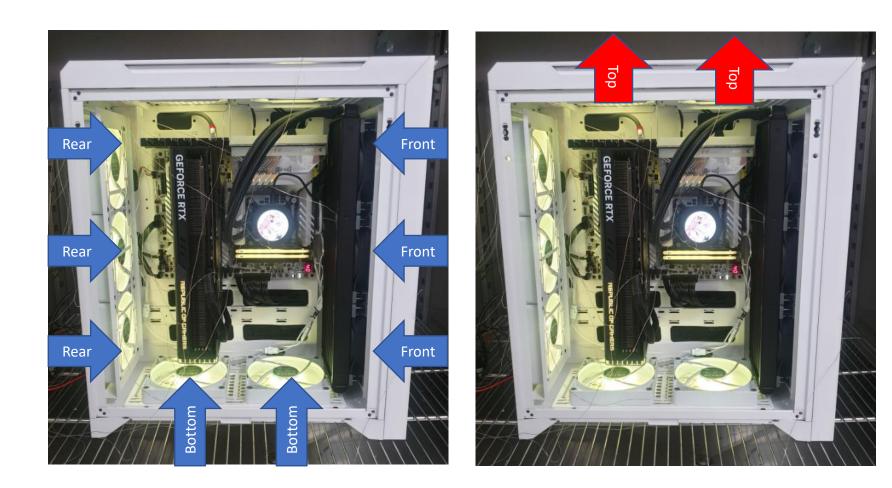




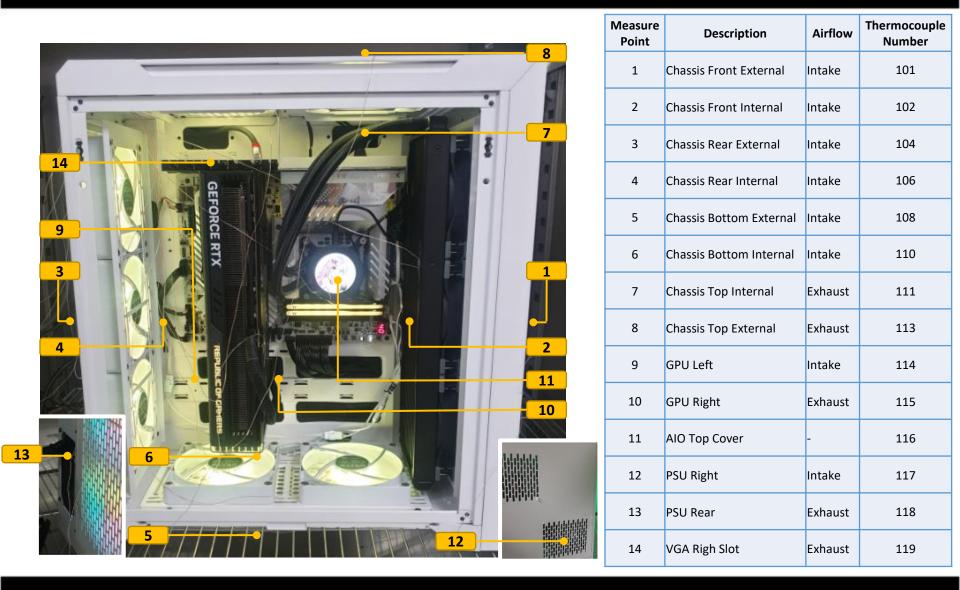
## 4. Chassis Thermal Airflow

#### **Cool Airflow Inlets (Active)**

#### **Hot Airflow Exhausts**



## **5.** Chassis Measured Points



#### 6. Thermal Stress Test



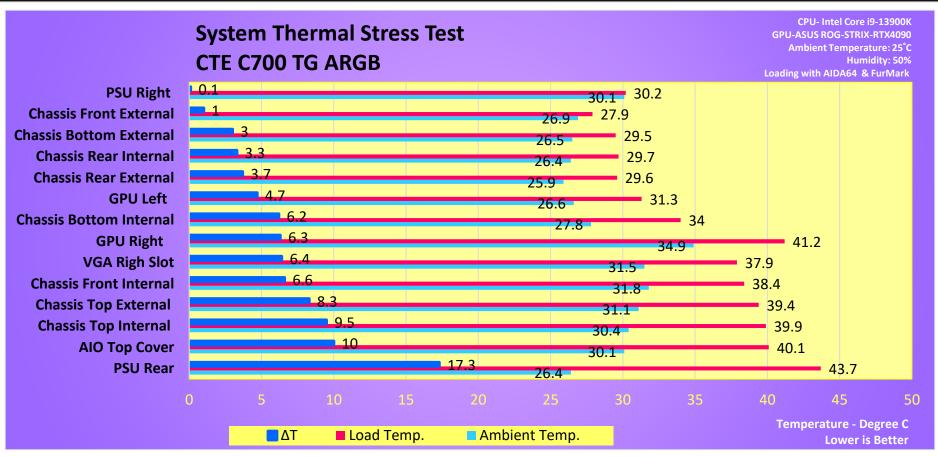
- Setting up the chamber temperature and humidity
- Temperature: 25°C
- Humidity: 50%
- Recording Data

## 6. Thermal Stress Test

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#### Temperature Data Recoding

## 6. Thermal Stress Test



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 42°C since they were drawing air from environment. Two critical positions we were looking at are NO. 115 GPU Right and NO. 116 AIO Top 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.

n Stability Test - AIDA64	-				
itress CPU Date & Time Status itress FPU 6/20/2023 10:32:15 AM Stebility Ti	urt Started	🗳 Date	6/20/2023	Date Date	6/20/2023
itress cache itress system memory itress local disks	Ser Alerice	C Time (HH:MM)	10:30 AM	Time (HH:MM)	) 11:03 AM
itress GPU(s) entrunes Cooling Fans Voltages Currents Powers Clocks	United Operation	CPU Clock	5500 MHz	CPU Clock	5200 MHz
Motherboard 🖉 CPU 💆 CPU Core #1 📝	CPU Core #2 CPU Core #3 CPU Core #4	🛄 Motherboard Asus R	OG Maximus Z790 Apex		Asus ROG Maximus Z790 Ape
		# BIOS Version		BIOS Version	0904
o°c		Free Memory	25858 MB	= Free Memory	25270 MI
CPU Usage   CPU Throttling (mi	n (91) - Overheating Delected	GPU Clock		GPU Clock	2745 MH
				. Motherboard	
		E CPU		CPU	35°0 87°0
Battery: No ballery Test Started: 6/20/2023 10:	N215.AM Elapsed Time: 00.31:24	CPU Package		CPU Package	
Step Clear Save	CPUID Preferences		100000	GPU Diode	82°0
AIDA64 E	xtreme				
FurMark RDG Edition	828	CPU Hotspot		GPU Hotspot	91°
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direm	up fie	SPU TDP%		GPU TDP%	989
Ovtere		2 GPO TEP 70	470	Gro IDF/0	967

FurMark

Idle

Full load

## 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.





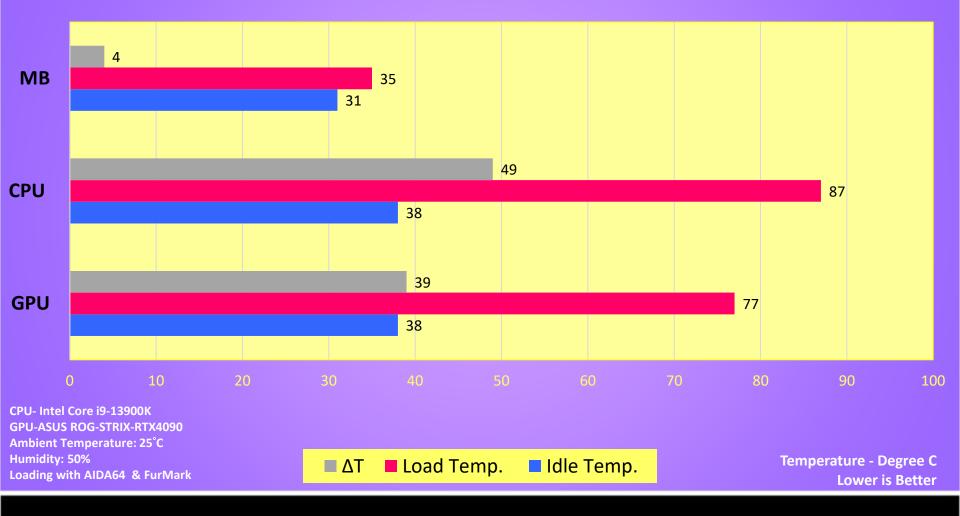
Full load

Idle

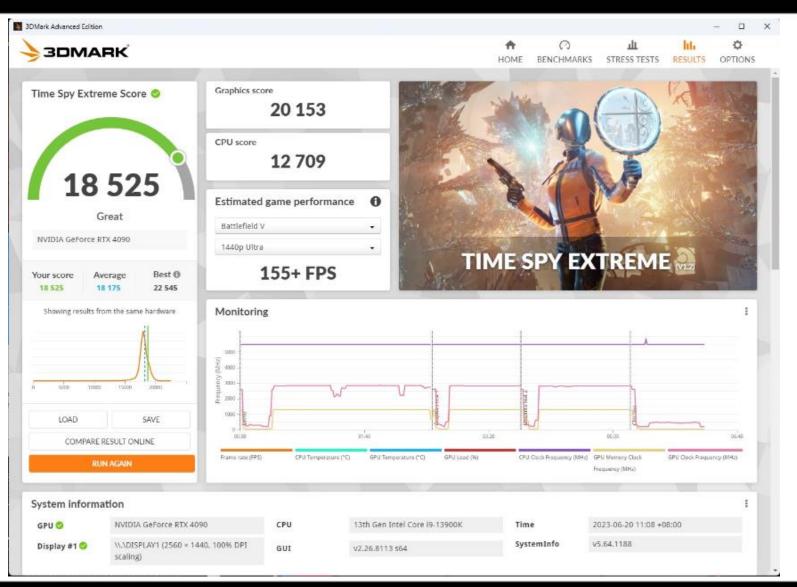


#### 7. AIDA64 & FurMark Test

#### CPU & GPU Thermal Stress Test CTE C700 TG ARGB



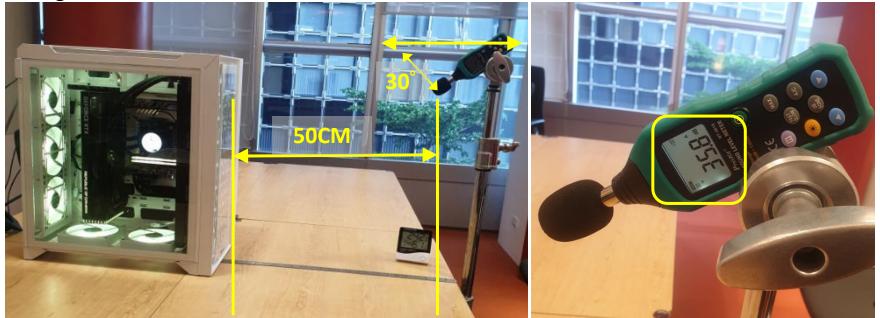
## 8. Graphics Performance Testing





# **9.** Acoustic Sound Pressure Level Test

Test Environment : Thermaltake Taipei Office Test Model: CTE C700 TG ARGB Test Ambience: 24.2 °C(Temperature) / 61% R.H.(Relative Humidity) Microphone position: 50 cm / in front of PC system Background Noise : 35.8 dBA.



Microphone position

**Test Ambience** 

## 9. Acoustic Sound Pressure Level Test

#### Fan Speed 500rpm – 36.3dBA



📱 Date	6/20/2023
Time (HH:MM)	5:48 PM
E CPU Clock	5500 MHz
Motherboard Asus ROG	Maximus Z790 Apex
BIOS Version	0904
= Free Memory	24957 MB
GPU Clock	255 MHz
	33°C
CPU	42°C
CPU Package	49°C
GPU Diode	43°C
S GPU Hotspot	51°C
S AlO Pump	2356 RPM
🛎 CPU	465 RPM
🛎 СРИ ОРТ	
🖷 GPU	0 RPM
R GPU	0%
CPU Core	1.332 V
GPU Core	0.875 V
👅 CPU Package	46.28 W
s GPU	17.95 W
🤜 GPU TDP%	4%

#### Fan Speed 650rpm – 37.2dBA

III Motherboard Asus ROG Maximus Z790 Apex

6/21/2023

8:32 AM

0904

27°C

33°C

42°C

34°C

42°C

2556 RPM

549 RPM 675 RPM

0 RPM

1.323 V

0.880 V

40.05 W

22.49 W

4%

0%

5500 MHz

24631 MB

225 MHz

Date

Time (HH:MM)

CPU Clock

**BIOS Version** 

= Free Memory

III Motherboard

CPU Package

S GPU Hotspot

GPU Diode

S AIO Pump

CPU\_

CPU Core

GPU Core

CPU Package

GPU TDP%

CPU OPT

GPU Clock

CPU

GPU

🖷 GPU

#### Fan Speed 950rpm – 38.2dBA



Late	6/20/2023
Time (HH:MM)	5:50 PM
CPU Clock	5500 MHz
Motherboard Asus ROG	Maximus Z790 Apex
BIOS Version	0904
= Free Memory	24485 MB
GPU Clock	255 MHz
🎟 Motherboard	31°C
CPU	43°C
CPU Package	48°C
GPU Diode	43°C
GPU Hotspot	51°C
S AIO Pump	2755 RPM
E CPU	1110 RPM
🗵 СРU ОРТ	
🗟 GPU	0 RPM
S GPU	0%
CPU Core	1.332 V
GPU Core	0.875 V
ECPU Package	45.11 W
I GPU	15.46 W
🤜 GPU TDP%	3%

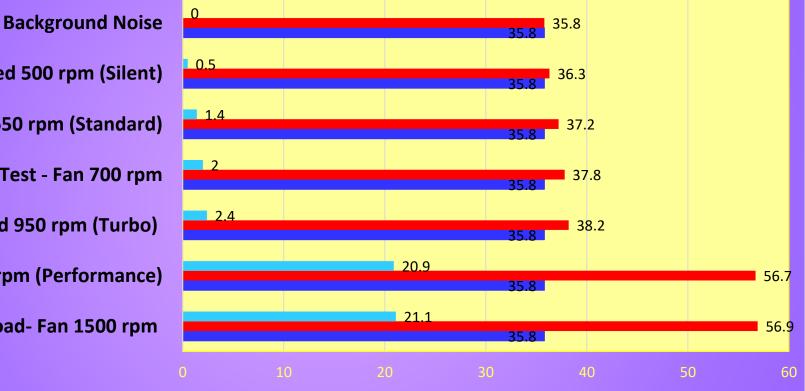
#### Fan Speed 1500rpm – 56.7dBA



🗳 Date	6/20/2023
© Time (HH:MM)	5:52 PM
CPU Clock	5500 MHz
😬 Motherboard Asus ROG Maximi	us Z790 Apex
18 BIOS Version	0904
= Free Memory	24574 MB
GPU Clock	240 MHz
🕮 Motherboard	30°C
CPU	39°C
CPU Package	44°C
SPU Diode	42°C
SPU Hotspot	50°C
😂 AIO Pump	3245 RPM
С СРШ	2109 RPM
CPU OPT	1472 RPM
🗟 GPU	0 RPM
S GPU	0%
CPU Core	1.332 V
GPU Core	0.875 V
🖲 CPU Package	41.44 W
S GPU	17.19 W
🤜 GPU TDP%	3%

## 9. Acoustic Sound Pressure Level Test

#### **Acoustic Sound Pressure Level Test - CTE C700 TG ARGB**



🗖 Load dBA 🛛 🗖 Idle dBA

Fan Speed 500 rpm (Silent) Fan Speed 650 rpm (Standard) **3DMARK Test - Fan 700 rpm** Fan Speed 950 rpm (Turbo) Fan Speed 1500 rpm (Performance) Stress Test Full Load- Fan 1500 rpm

**Diff** 

thermaltake

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

NO: RS202306260001

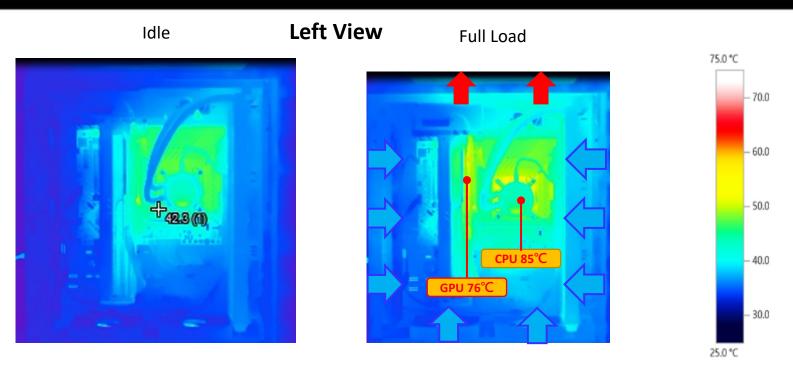
**Temperature - Degree C** 

**Lower is Better** 



## C. Conclusion

## Conclusion



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) : 87°C (TDP 253W)
- -ASUS ROG Strix GeForce RTX<sup>®</sup> 4090 OC / GPU Temp. (Max) : 77°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 The CTE C700 TG ARGB is regarding cooling performance.

# 



## thermaltake

# Thank you!