Thermal Test Report

Model Name: RM11704(REV: B)

Approved by: Jounghwa Lin Issued by: Alcott Huang

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1. Executive Summary of Results

The Chenbro Micom RM11704(REV:B) Rackmount Chassis provides adequate cooling for the INTEL SE7520 AF2 motherboard with Four Seagate 34 GB 15,000 RPM Ultra-320 SCSI Hard Drives and Dual 3.4 GHz INTEL Nocona processors.

Thermal Test	Test Results
Processor 1	PASS
Processor 2	PASS

Table 1 – Summary of Results

2. Introduction

The purpose of this test is to ensure that the design of tested chassis model can pass the thermal goal under specific configuration which is either inquired or the most critical one.

The components examined during this test are processors. The Room Ambient Temperature (T-Room) is specified to 35 degree C.

This report has defined test configuration, test setup, test procedures and all the relevant modifications. The test result would be valid only when the same circumstance has been applied.

The test was done by Chenbro Micom Co., Ltd. which is located at following address:

15Fl., No.150,Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

3. Test Configuration

The tested system configuration is as following.

Component	Manufacturer	Model Number	Q'ty	Specification
Chassis	Chenbro	RM11704(REV:B)	1	Rackmount Server chassis
Main Board	INTEL	SE7520AF2	1	Full function
CPU Type	INTEL	Dual 3.4GHz Nocona	2	Dual Socket 604
Memory	CORSAIR	CM73DD1024R-400/S	8	DDR2-400 1GB With ECC
Chipset	INTEL	E7520	1	Full Function
VGA (on board)	ATI	ATI RAGE XL	1	8M on board
LAN (on board)	INTEL	Intel®82546GB	2	1Gb /sec
Hard Drive	Seagate	ST336753LC 34G Ultra 320	4	15000 RPM 34GB
CD-ROM	TEAC	CD-224E	1	24X speed
Floppy	TEAC	FD05HG	1	1.44MB
PSU	FSP	FSP500-80BU	1	1U 500W
System Fan (middle)	SANYODENKI	9CR0412S501	4	40x40x56/15000 RPM
System Fan(middle)	SANYODENKI	109P0412J3013	1	40x40x28/12500 RPM
SCSI Card	LSI	MEGARAID 320-1	1	SCSI RAID 320 Card
CPU Cooler	Chenbro	NOCONA SAMPLE	2	Passive Heatsink

Table 2 – System Configuration

4. Chassis Description (as Tested)

The RM11704 (REV:B) chassis is a Rackmount Server chassis that may ship with a 500W power supply (optional) and four system fans. It has one exposed slim CD-ROM drive bay and one exposed slim floppy drive bay, Four 3.5" HDD Hot Swap drive bays.

The dimensions of this chassis are 26"D x 16.9"W x 1.7"H

The chassis is manufactured by Chenbro Micom Co., Ltd. which is located at following address:

15Fl., No.150,Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

5. Test Equipment Used

Thermal Chamber

The thermal chamber's picture is as following. This thermal chamber can control the Room Ambient Temperature (T-Room) at 35 degree C.

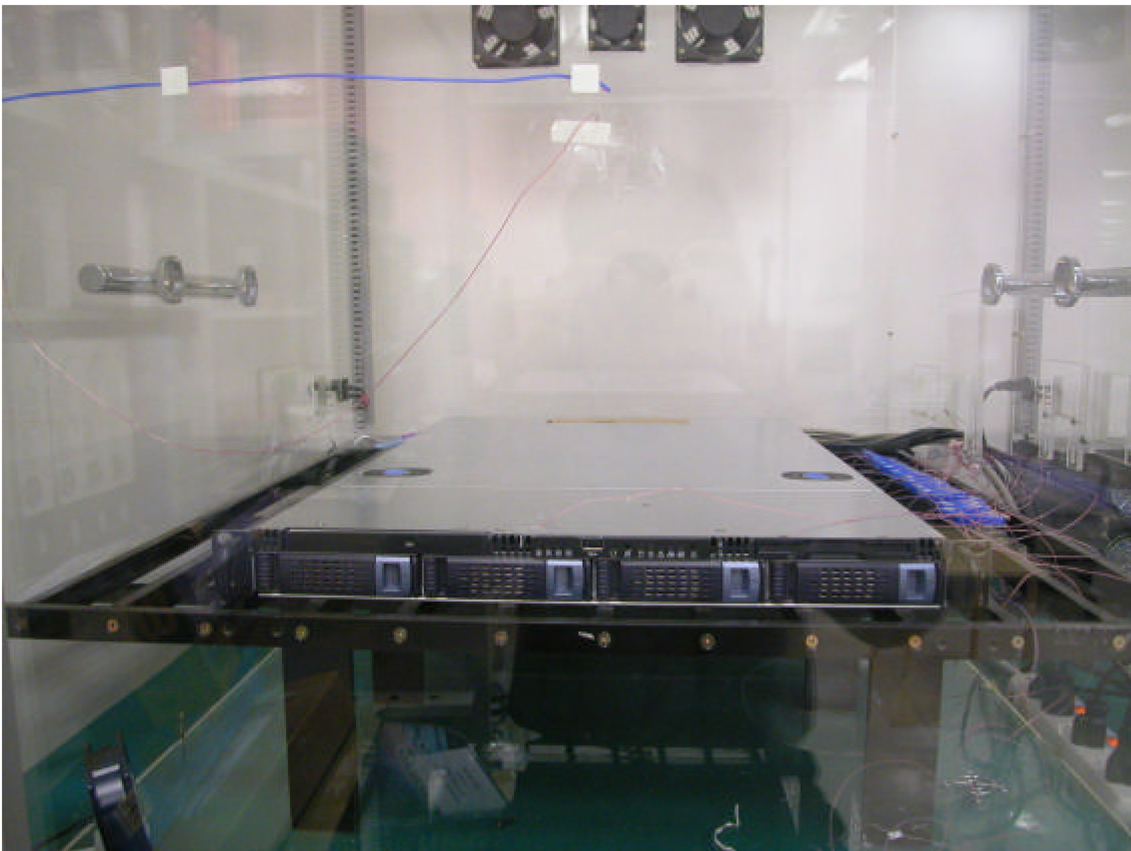

Fig. 1 – Thermal Chamber

Thermocouples

T-type, 36AWG thermocouples are attached to the components.

Data Acquisition System

The picture of Data Acquisition System is as following. The Data Acquisition System includes one Agilent BenchLink Data Logger,48 channel temperature recorder and one PC for logging the measured temperature data. The communication interface between recorder and PC is RS-232C.

Fig. 2 – Data Acquisition System

6. Support Software

The following software was used in this test.

- Maxpower_ NocPsc1.3.2
- I/O Meter. Rev2003.05.10
- Aligent Benchlink Data Logger Rev.1.5.030305
- Windows 2000 Server (English version)

7. Test Setup and Procedure

- Installation of the tested system
- Installation of the operating system with device drivers
- Installation of the stress software utilities
- Installation of the thermocouples
- Place the tested system into thermal chamber
- Power up the tested system
- Run the processor stress utility at 100% loading for both processors
- Run the utilities of the other devices such as HDD for simulating maximum loading
- Run the Data Logging Software to record the measurements
- Power on the process controller on the thermal chamber and control the room ambient at 35 degree C
- After the measured temperatures are settled, record the test duration and analyze the measurements.

8. Test Results

Summary

- With Maxpower_ NocPsc1.3.2 running, the case temperature of processors did not exceed the specification for the 3.4GHz INTEL Nocona processor under specified configuration.

Detail

Measured Points	Max. Specified Temp Limit (deg C)	Measurements @35 (deg C)	Compensated Data* (deg C)
1.T-CASE 1	70	68.6	66.0
2.T-CASE 2	70	66.0	63.4
3.T1 (T-Ambient)	42	47.6	45.0
4.T2 (T-Ambient)	42	42.5	39.9
5.VRM	90	47.1	44.5
6.Memory 1	70	57.5	54.9
7.Memory 2	70	62.5	59.9
8.North-Bridge	99	62.5	59.9
9.South-Bridge	115	56.5	53.9
10.SCSI HDD-1	55	41.2	38.6
11.SCSI HDD-2	55	43.3	40.7
12.ADD-ON CARD	70	72.0	69.4
13.T-ROOM	35	37.6	35.0

Table 3 – Detail of Test Results

*Compensated Data = Measurement+(35–T-Room)
= Measurement+(35–37.6)
= Measurement – 2.6

Test Duration: 24 hours.

9. Conclusion

The RM11704 (REV:B) chassis (as tested) does provide adequate cooling for the Dual 3.4GHz INTEL NOCONA processors.

The maximum temperatures of processors, which were at 100% loading of processor stress utility under 35 degree C room ambient, were below the maximum limit of temperature which is defined by the manufacturers. The margins in this report reflect a combination of worst cases.

The tested system does not necessarily represent the absolute worst-case that the system is subject to.

The system is not maximally loaded with add-in cards and their associated cables that could cause the internal temperatures to increase and reroute airflow.

10. Appendix A - System Setup

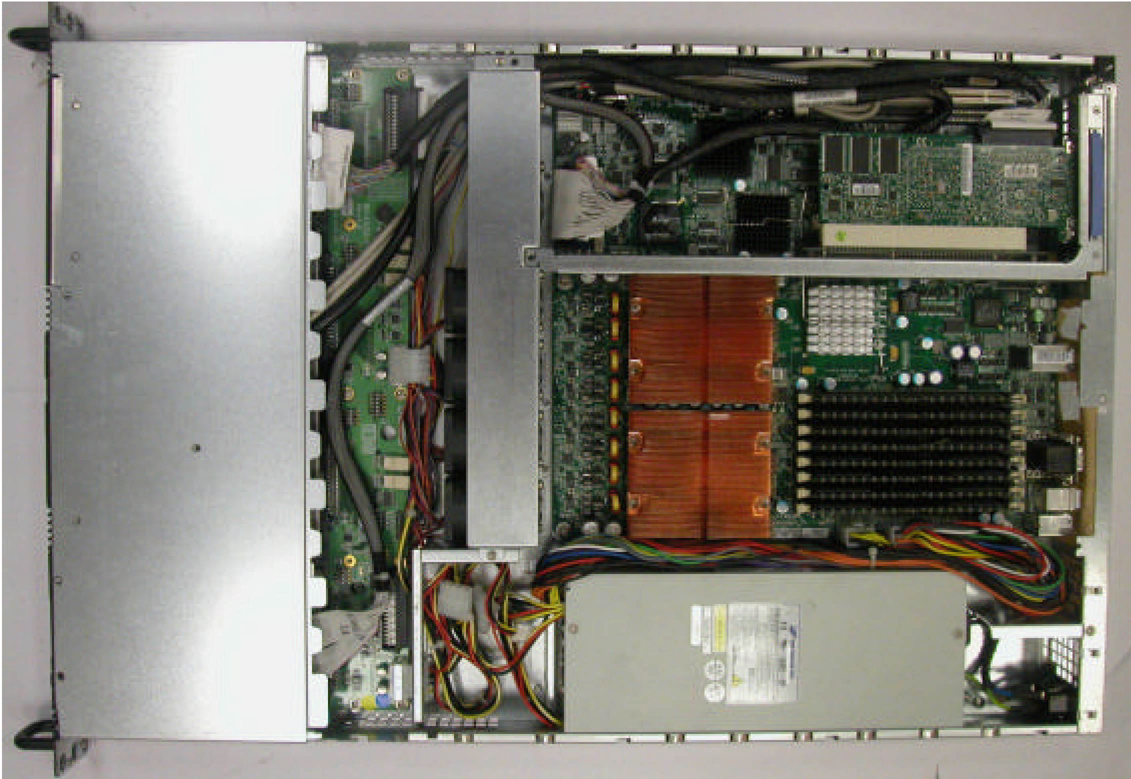

Fig. 3 – System Setup

Fig. 4 –Air Duct

Fig.5 – TOP COVER

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11. Appendix B - Measured Points

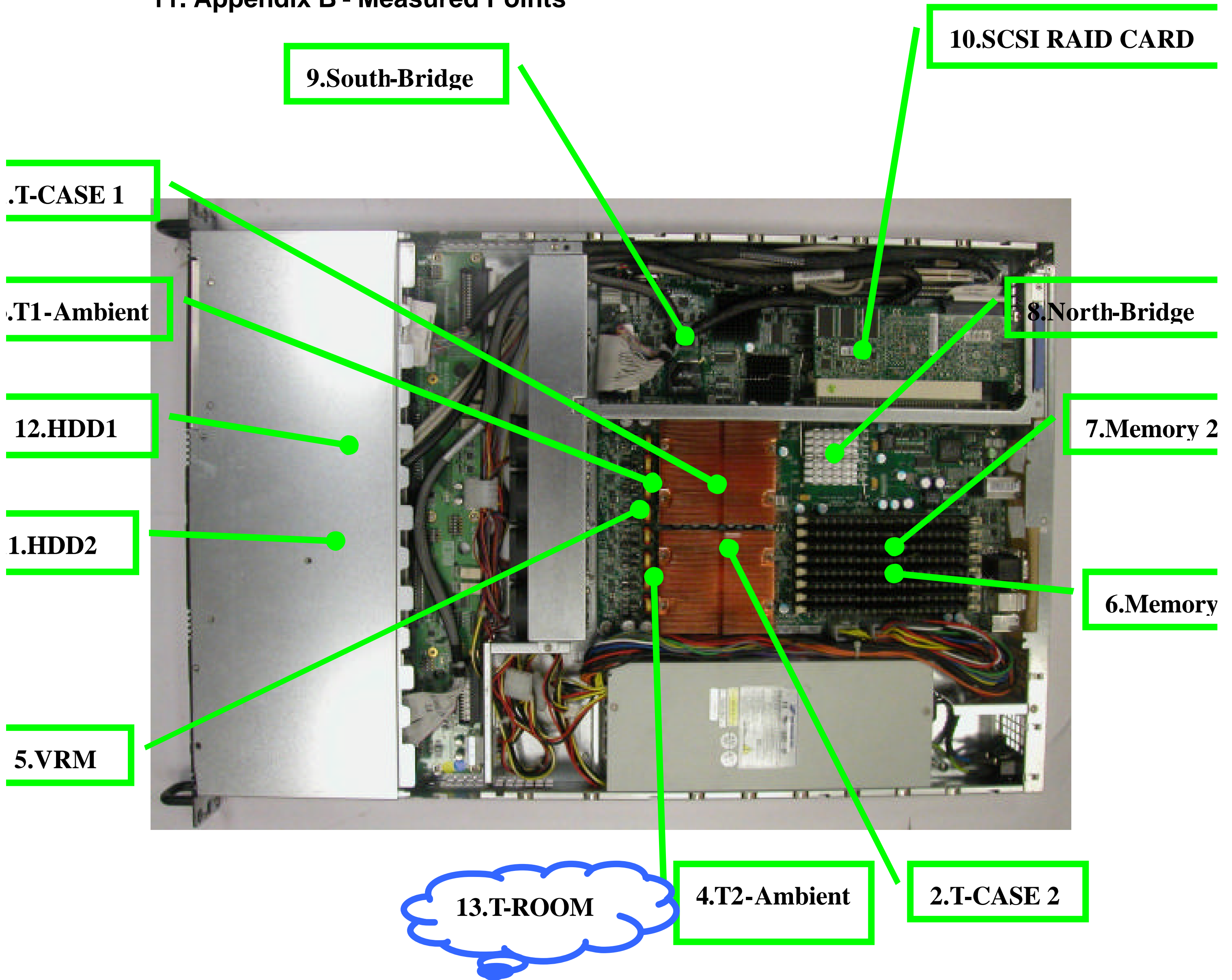

Fig. 6– Measured Points

12. Appendix C - Real-Time Trend

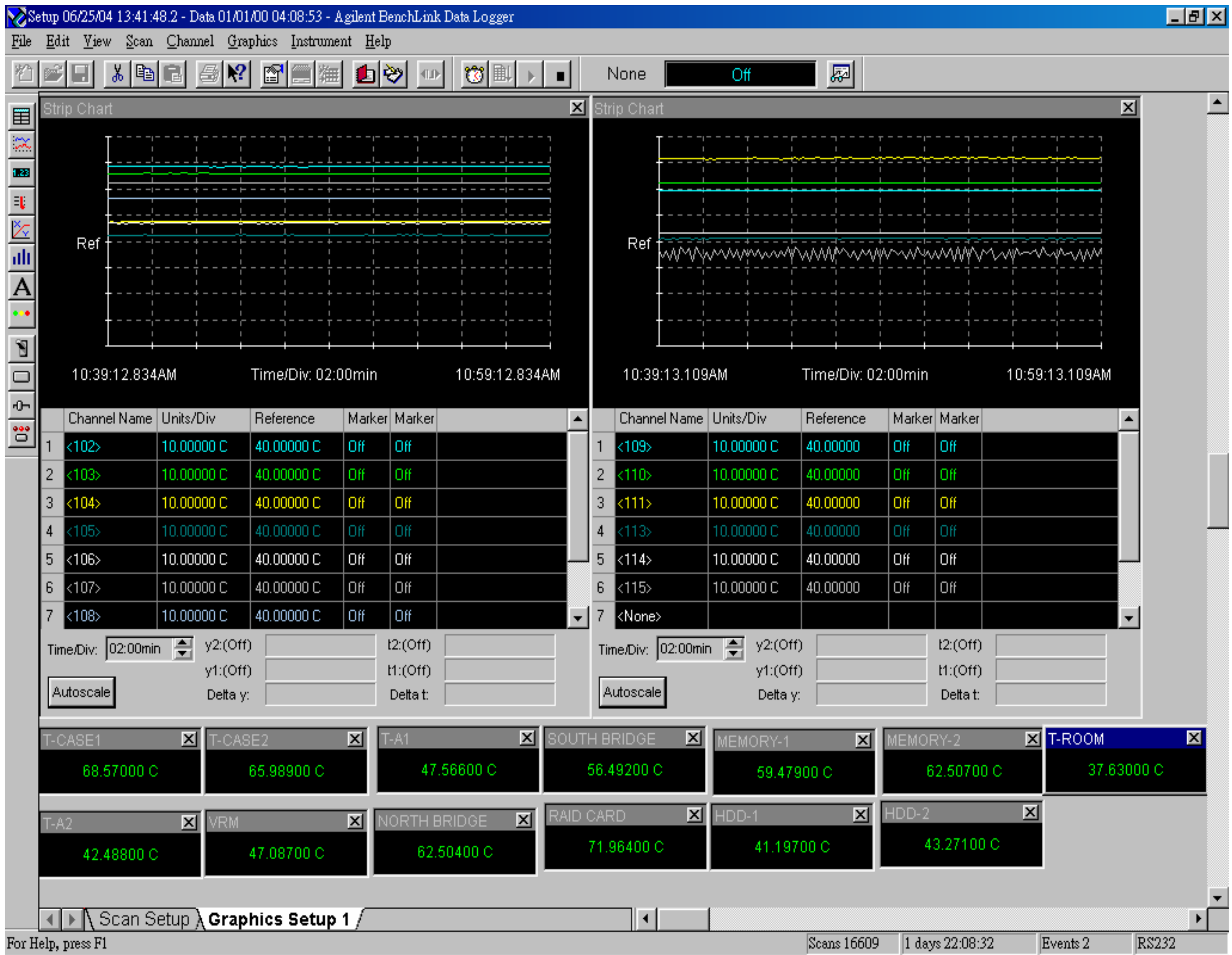

Fig.7 – Real-Time Trend