Thermal Test Report

Model Name : RM12404

Rev : B

Approved by: Jounghwa Lin Issued by: Max Cheng

Report No.:E65857
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1. Executive Summary of Results

The Chenbro Micom RM12404 Chassis provides adequate cooling for the Asus DSBV-D motherboard with one Western Digital 80GB SATAII Hard Drive and Dual 3.2GHz Intel Dempsey 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 is processor. 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	RM12404	1	Rackmount Server chassis
CPU Type	Intel	3.2GHz Dempsey	2	Socket 771 (108W)
Memory	NANYA	NT1GT72U8PA3BD-4B	6	1GB Fully Buffer Dimm modules
Chipset	Intel	5000P	1	Full Function
Hard Drive	Western Digital	WD800JD-22LSA0	4	SATAII 80GB
HDD Backplane	Chenbro	80-103215-004	1	SATA HDD Backplane
CD-ROM	MITSUMI	SR244W1	1	24X speed
Floppy	TEAC	FD05HC	1	1.44MB
PSU	FSP	FSP500-80BU	1	1U 500W
System Fan (Middle)	Sanyo Denki.	109P0412J3013	1	40x40x28/12500 RPM
System Fan (Middle)	SUNON	PMD1204PQB1-A	4	40x40x48/11000 RPM
System Fan (Rear)	Sanyo Denki.	109P0412J3013	1	40x40x28/12500 RPM
CPU Cooler	CoolJag	Engineer Sample	2	Passive Heat Sink

Table 2 – System Configuration

4. Chassis Description (as Tested)

The RM12404 chassis is a Rackmount Server chassis that may ship with a 500W power supply (optional) and six system fans. It has one exposed slim CD-ROM drive bay, one exposed slim floppy drive bay and four 3.5" HDD Hot Swap drive bays.

The dimensions of this chassis are 22"4D 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.

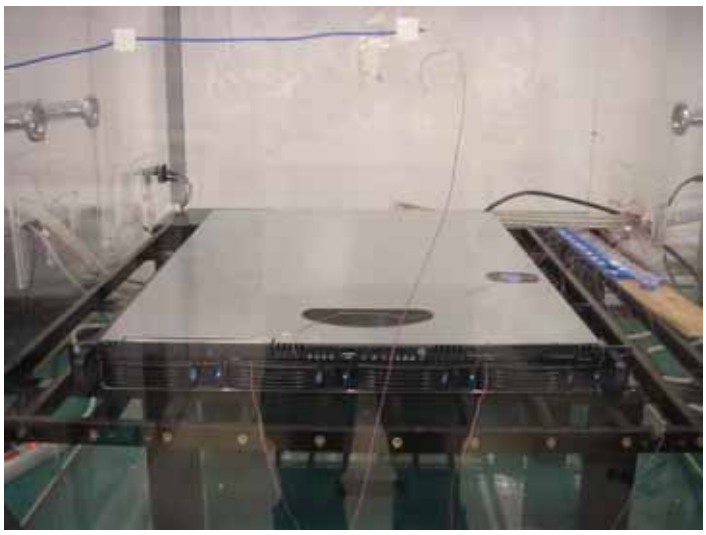

Fig. 1 – Thermal Chamber

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 34970A, 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.

- Maximum Power Program for Dempsey Processor
- I/O Meter. Rev.2003.05.10
- Agilent BenchLink Data Logger Rev.1.5.030305.
- Intel Frequency Display
- Windows XP + SP2 (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 85% loading for the 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 Maximum Power Program for Dempsey Processor running, the case temperature of processors did not exceed the specification for the Dual 3.2GHz Intel Dempsey processors under specified configuration. **Intel Frequency Display window did NOT have the instant warning message** (to present the over-heat status includes message color changed).

Detail

Measured Points	Max. Specified Temp Limit (deg C)	Measurements @35 deg C	Compensated Data* (deg C)
1.T-CASE 1	Reference	62.5	62.6
2.T-CASE 2	Reference	67.9	68.0
3.T-A1	Reference	48.8	48.9
4.T-A2	Reference	54.2	54.3
5.VRM	Reference	61.7	61.8
6.Memory-1	Reference	71.7	71.8
7.Memory-2	Reference	76.2	76.3
8.Memory-3	Reference	69.9	70.0
9.Memory-4	Reference	61.7	61.8
10.Memory-5	Reference	68.7	68.8
11.Memory-6	Reference	74.0	74.1
12.North-Bridge	99	70.6	70.7
13.South-Bridge	115	71.4	71.5
14.HDD	55	37.1	37.2
15.T-ROOM	35	34.9	35.0

Table 3 – Detail of Test Results

*Compensated Data = Measurement+(35–T-Room)
= Measurement+(35–34.9)
= Measurement+0.1

Test Duration: 24 hours.

9. Conclusion

The RM12404 chassis (as tested) does provide adequate cooling for the Dual 3.2GHz Intel Dempsey processors.

The maximum temperatures of processor, which were at 85% loading of processors stress utility under 35 degree C room ambient. The most important part of the test result was that Intel Frequency Display window did NOT present the warning message.

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

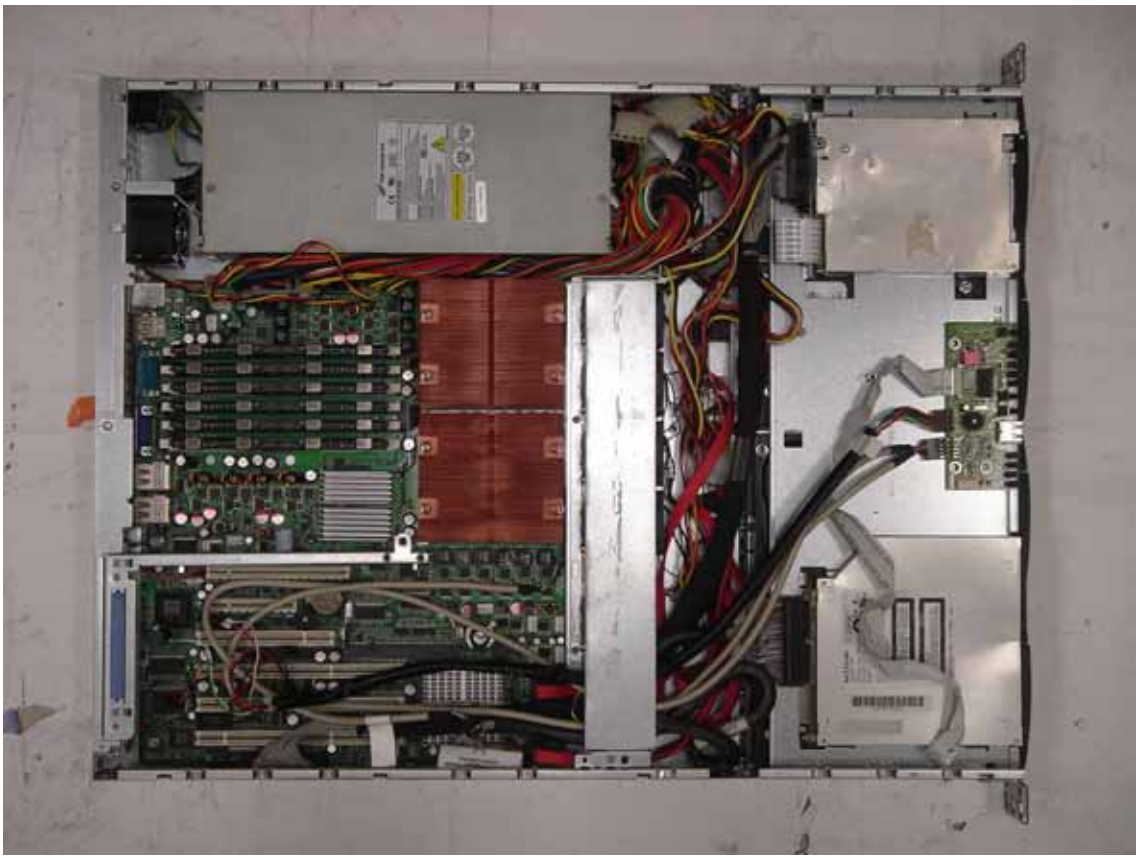

Fig. 3 – System Setup

Fig. 5 – Fuselage lid venting

Fig. 4 – Air Duct

11. Appendix B - Measured Points

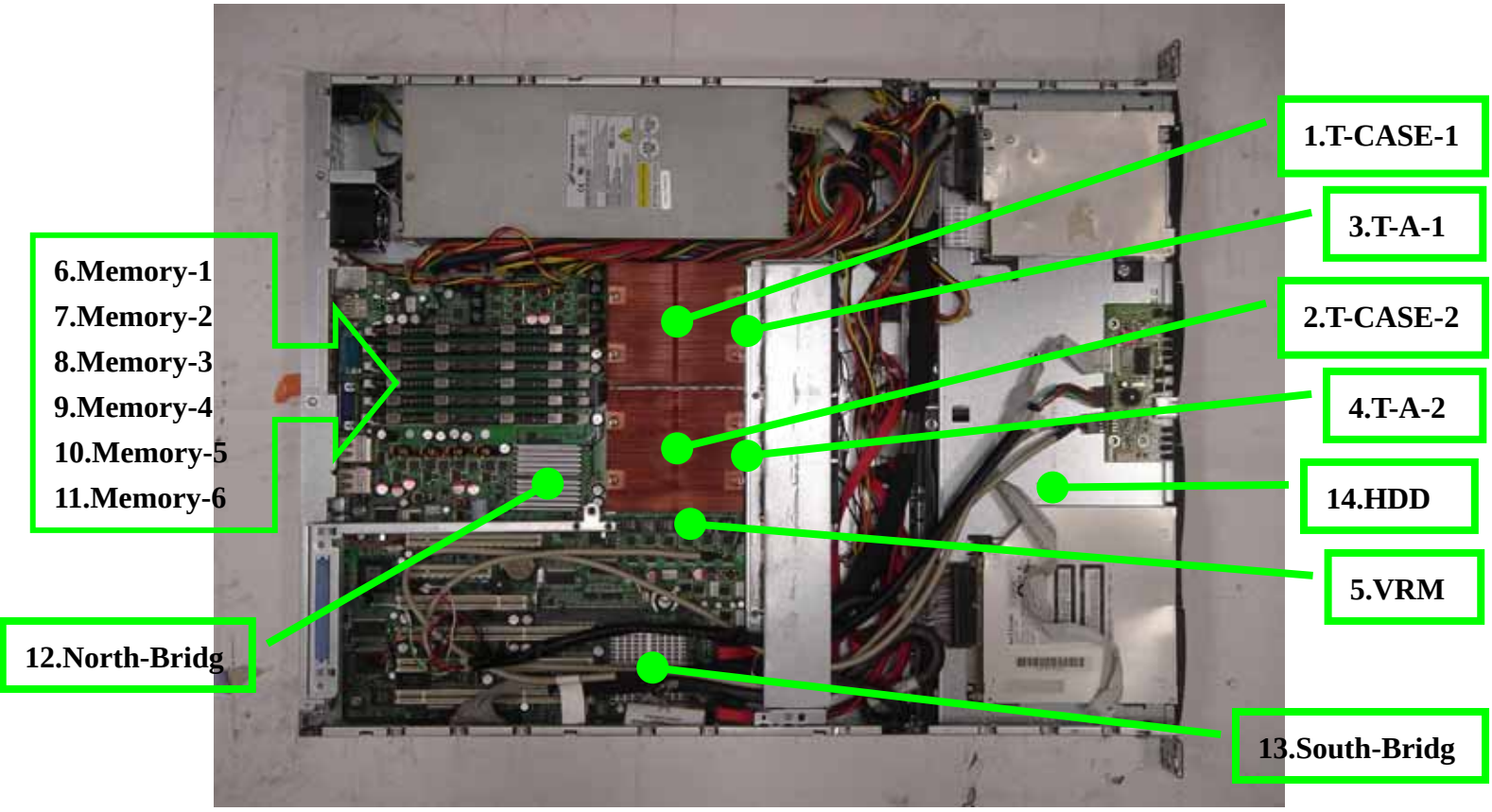

Fig. 5 – Measured Points

12. Appendix C - Real-Time Trend

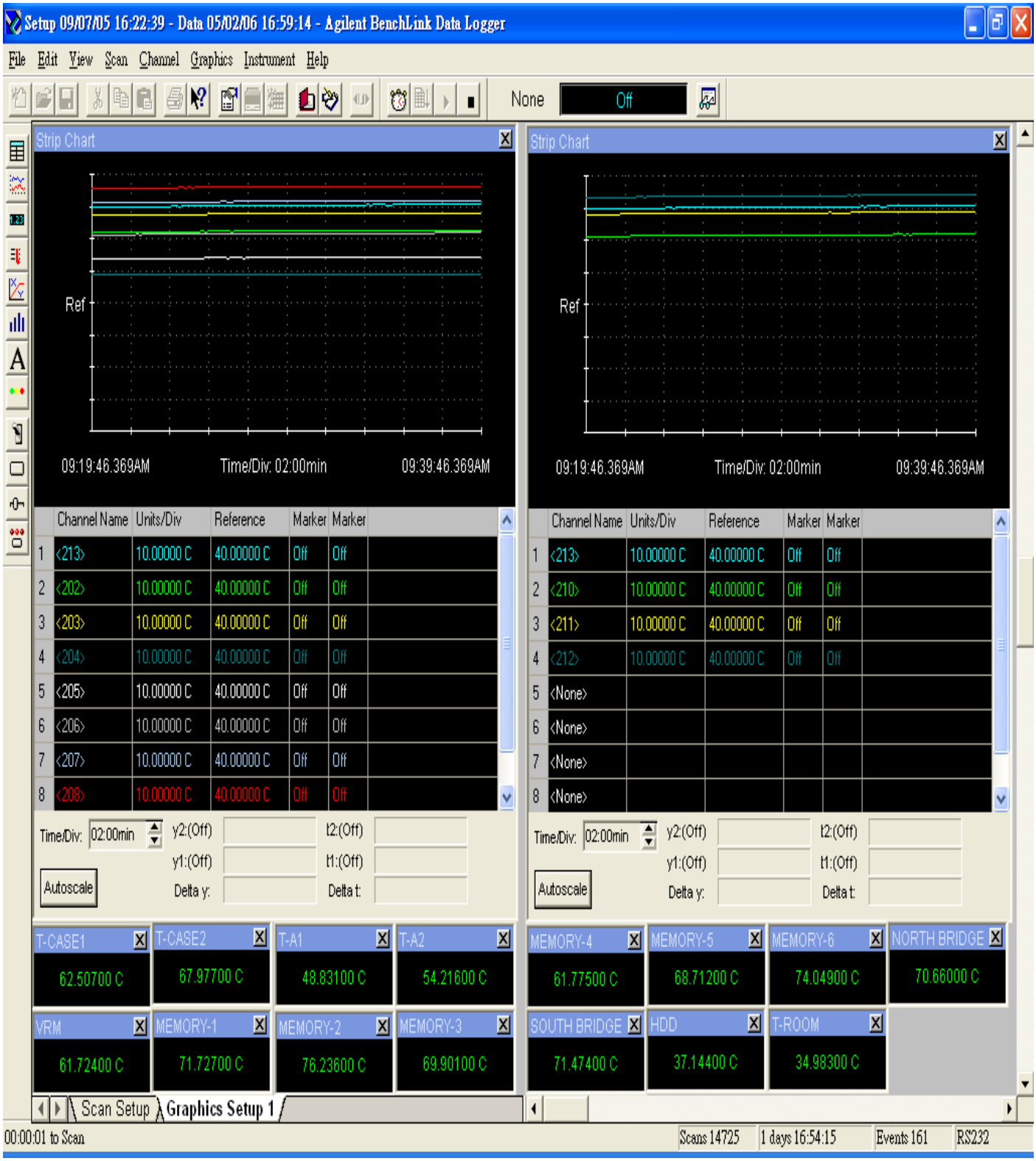

Fig. 6 – Real-time Trend

13. Appendix D - Intel Frequency Display

Fig. 7 – Intel Frequency Display