

Thermal Test Report

Model Name: **RM12404**

Rev : **B**



Approved by: **Jounghwa Lin**

Issued by: **Doreen Lee**

Report No.: **E2009021122**
Revision 1.2
Date: **2008/02/18**

CHENBRO MICOM CO., LTD.

15Fl., No.150, Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan R.O.C.,
Tel: +886 2 82265500 Fax: +886 2 82265392 Email: info@chenbro.com.tw

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY OF RESULTS	3
2. INTRODUCTION	3
3. TEST CONFIGURATION	3
4. CHASSIS DESCRIPTION (AS TESTED).....	4
5. TEST EQUIPMENT USED	4
6. SUPPORT SOFTWARE	5
7. TEST SETUP AND PROCEDURE.....	5
8. TEST RESULTS	6
9. CONCLUSION	6
10. APPENDIX A - SYSTEM SETUP	7
11. APPENDIX B - MEASURED POINTS	8
12. APPENDIX C - REALTIME TREND	9
13. APPENDIX D - INTEL FREQUENCY DISPLAY	10

1. Executive Summary of Results

The Chenbro Micom [RM12404](#) Chassis provides adequate cooling for the [Tyan S7005](#) motherboard with [four Western Digital 500GB SATAII](#) Hard Drives and [Dual 2.8GHz Intel Xeon X5560](#) 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	RM12404	1	Rackmount Server chassis
Main Board	Tyan	S7005	1	Full Function
CPU Type	Intel	Intel®Xeon® X5560	2	2.8GHz Socket 1366
Memory	NANYA	NT2GC72B8PA0NF-CG	8	2GB.2RX8 1333.ECC
Chipset	Intel	ID3403	1	Full Function
VGA (on board)	ASPEED	AST2050	1	On board
Hard Drive	Western Digital	WD5002ABYS-01B1B0	4	SATAII 500GB
PSU	Seasonic	SS-400H1U	1	1U 400W
System Fan (Middle)	Sanyo Denki	109P0412J3013	3	40x40x28/12500 RPM
System Fan (Middle)	SUNON	PMD1204PJB1-A	2	40x40x48 In:15000/Out:14000RPM
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 400W power supply (optional) and six system fans. It has 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.

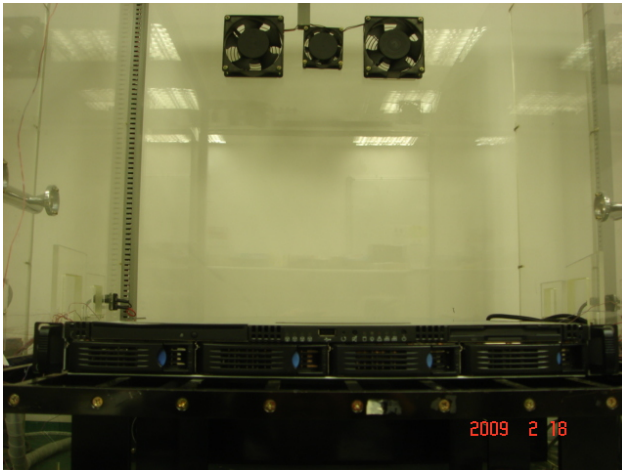


Fig. 1 – Thermal Chamber

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.

- ♦ Power Thermal Utility for the Nehalem-EP Processor Rev1.0
- ♦ I/O Meter. Rev.2003.05.10
- ♦ Core Temp0.99.3
- ♦ 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 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 [Power Thermal Utility for the Nehalem-EP Processor Rev1.0](#) running, the case temperature of processors did not exceed the specification for the [Dual 2.8GHz Intel Xeon X5560](#) 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	75	56.2	56.2
2.T-CASE 2	75	71.9	71.9
3.TA-1	Reference	43.9	43.9
4.TA-2	Reference	53.7	53.7
5.VRM-1	105	48.3	48.3
6.VRM-2	105	60.9	60.9
7.North-Bridge	99	73.6	73.6
8.South-Bridge	115	75.1	75.1
9.Memory-1	Reference	51.4	51.4
10.Memory-2	Reference	49.7	49.7
11.HDD-1	55	42.3	42.3
12.HDD-2	55	40.6	40.6
13.T-ROOM	35	35.0	35.0

Table 3 – Detail of Test Results

*Compensated Data = Measurement+(35–T-Room)
 = Measurement+(35–35.0)
 = Measurement

Test Duration: 24 hours.

9. Conclusion

The [RM12404](#) chassis (as tested) does provide adequate cooling for the [Dual 2.8GHz Intel Xeon X5560](#) processors.

The maximum temperatures of processors, which were at 100% loading of processor 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.

CHENBRO MICOM CO., LTD.

10. Appendix A - System Setup

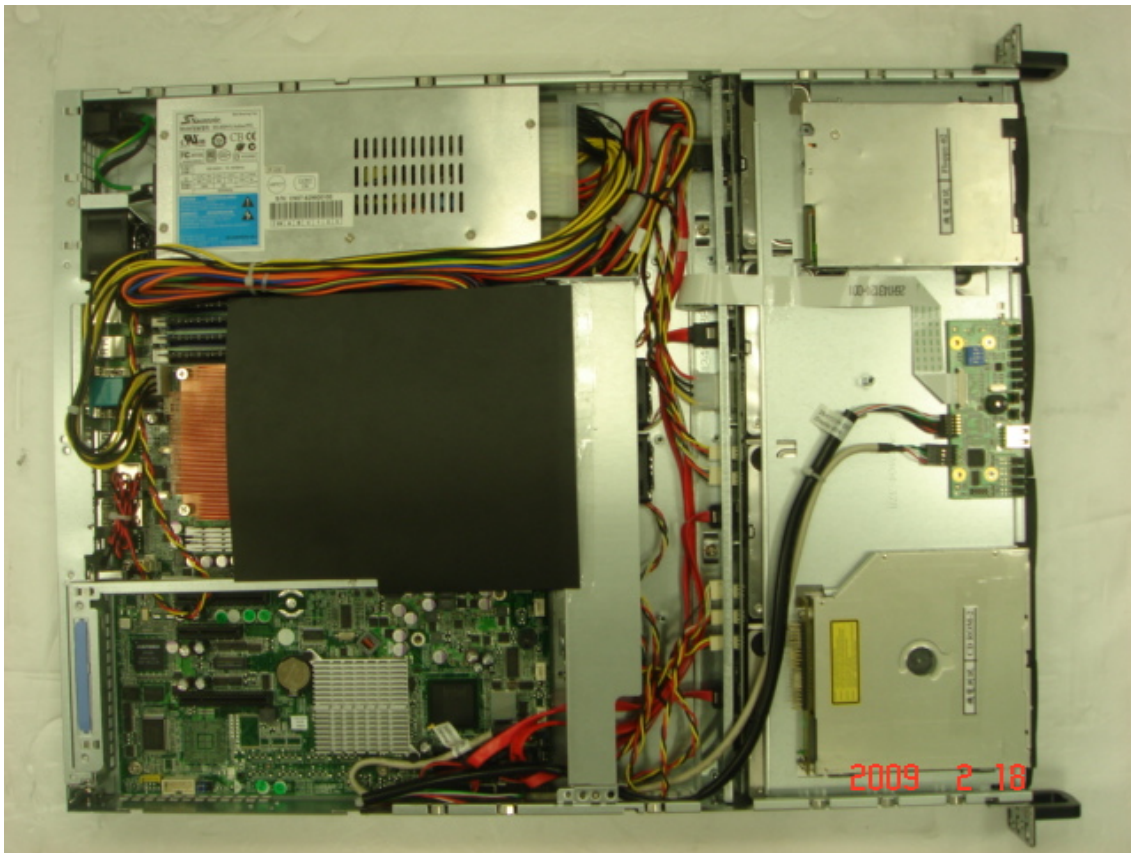


Fig. 3 – System Setup

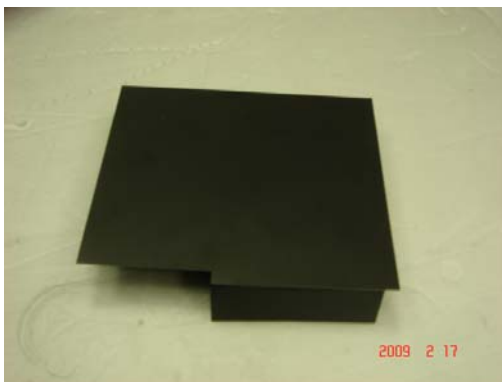


Fig. 4 – Air Duct

11. Appendix B - Measured Points

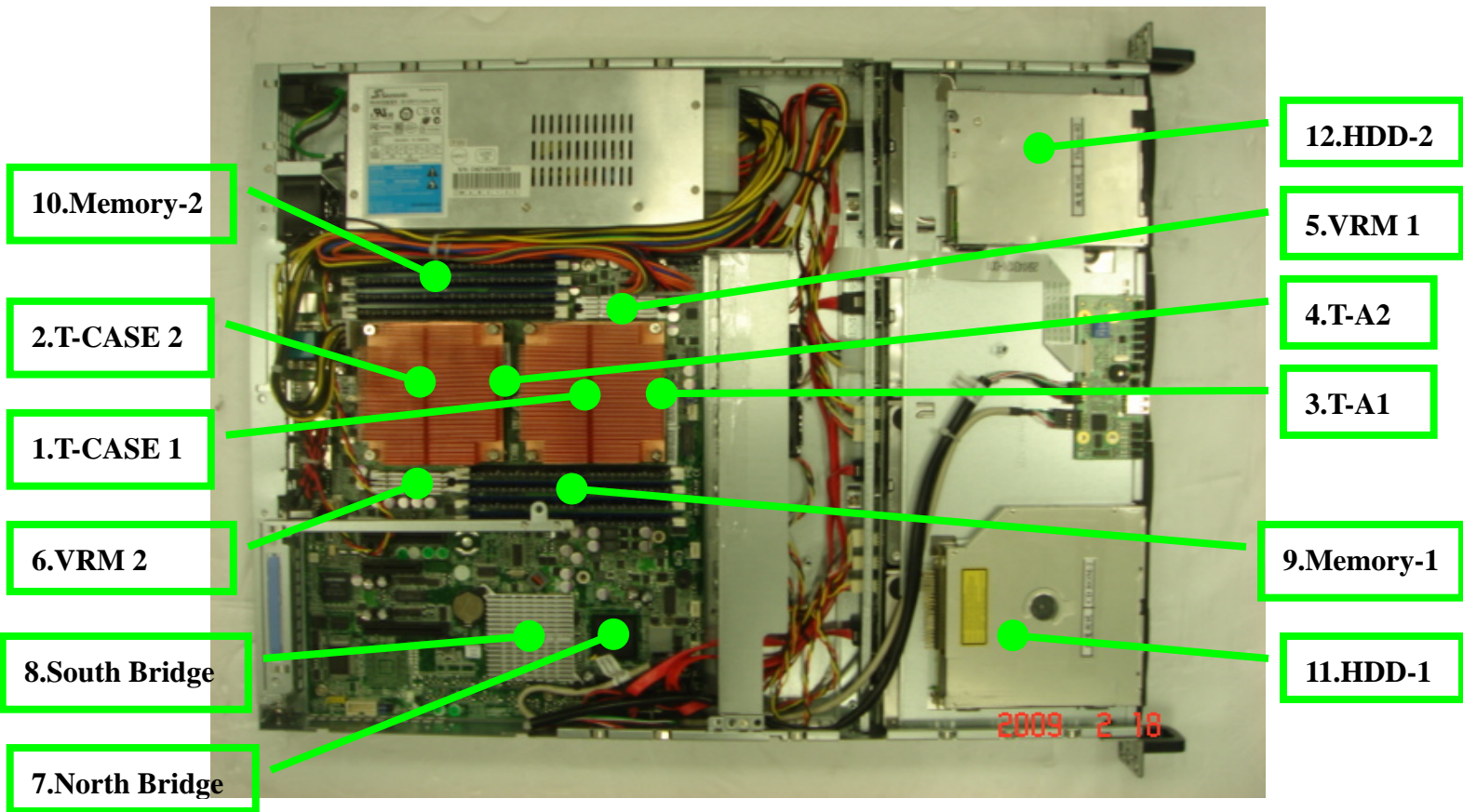


Fig. 5 – Measured Points



12. Appendix C - Real-Time Trend

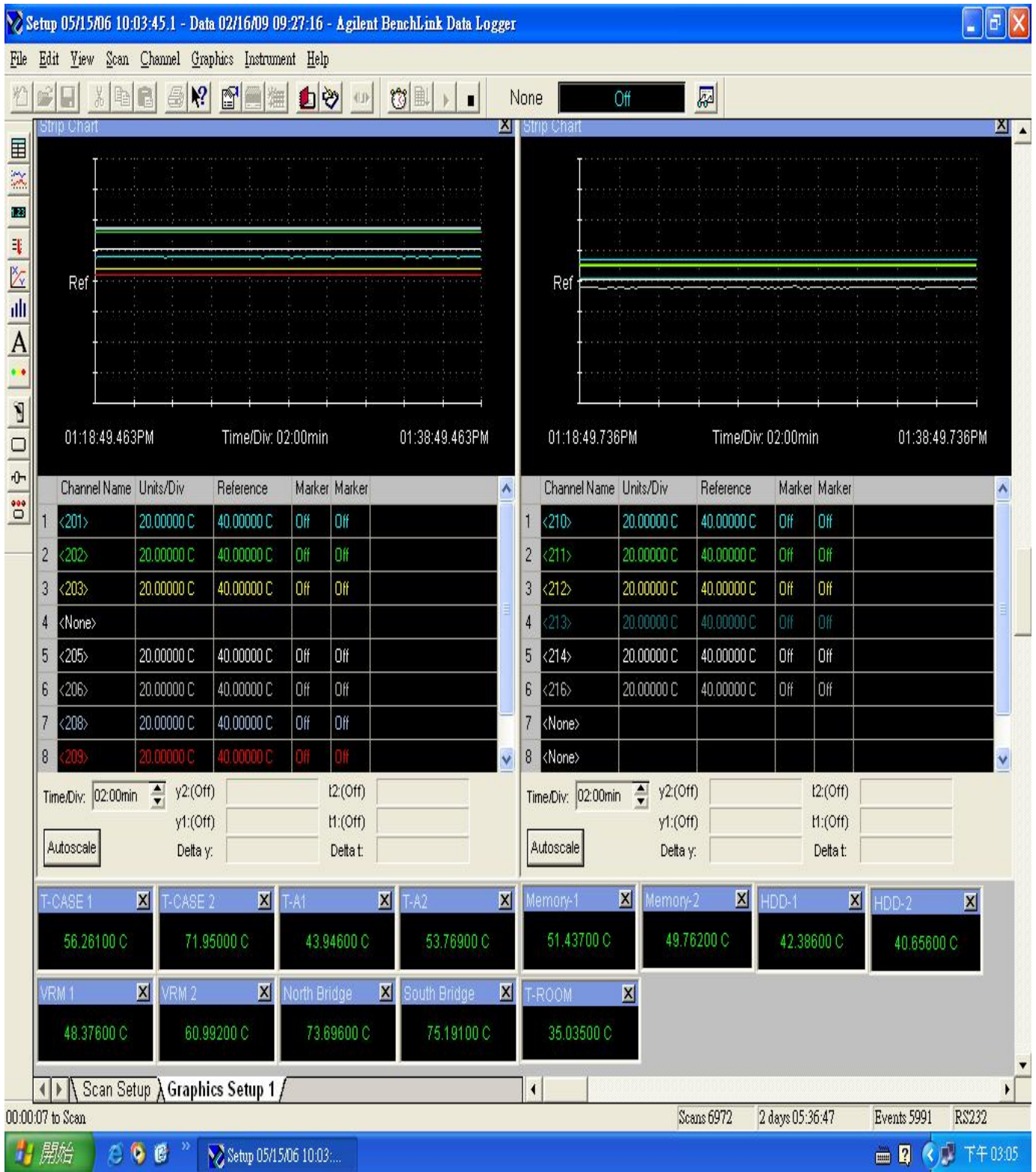


Fig. 6 – Real-time Trend

CHENBRO MICOM CO., LTD.

15Fl., No.150, Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan R.O.C.,
 Tel: +886 2 82265500 Fax: +886 2 82265392 Email: info@chenbro.com.tw

13. Appendix D - Intel Frequency Display

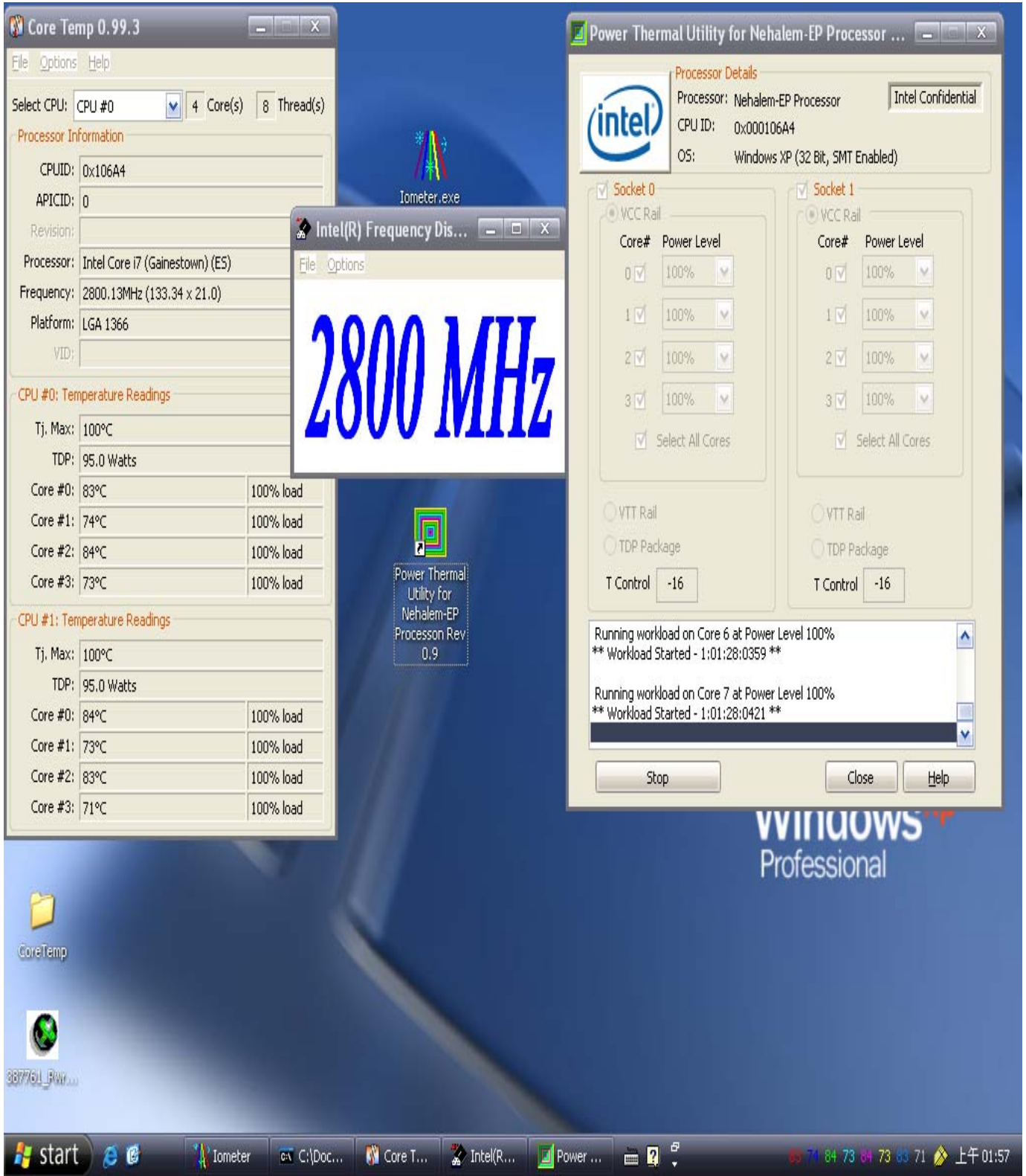


Fig. 7 – Intel Frequency Display

CHENBRO MICOM CO., LTD.

15Fl., No.150, Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan R.O.C.,
 Tel: +886 2 82265500 Fax: +886 2 82265392 Email: info@chenbro.com.tw