

Thermal Test Report

Model Name : **RM21600**

Rev : **B**



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1. Executive Summary of Results

The Chenbro Micom [RM21600](#) Rackmount Chassis provides adequate cooling for the [Tyan S7010](#) motherboard with [six Western Digital 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:

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3. Test Configuration

The tested system configuration is as following.

Component	Manufacturer	Model Number	Q'ty	Specification
Chassis	Chenbro	RM21600	1	Rackmount Server chassis
Main Board	Tyan	S7010	1	Full function
CPU Type	Intel	Intel®Xeon® X5560	2	2.8GHz Socket 1366
Memory	Qimonda	SH1GP03A1F1C-10F P2IM	6	1GB 1Rx8, PC3-8500
Memory	SAMSUNG	M393B2873DZ1-CF8	6	1GB 1Rx8
Chipset	Intel	X58	1	Full Function
VGA (on board)	ASPEED	AST2050	1	On board
Hard Drive	Western Digital	WD5000ABYS-01YNA0	3	SATA II 500GB
Hard Drive	Western Digital	WD5000ABPS-01ZZB0	1	SATA II 500GB
Hard Drive	Western Digital	WD5002ABYS-01B1B0	2	SATA II 500GB
STORAGE KITS	Chenbro	SK31101	1	3.5"SATA2/SAS HDD Tray*1
STORAGE KITS	Chenbro	SK42301	1	Internal 3.5" HDD*3
RAID CARD	Adaptec	ASR-5805	1	SAS/SATA Raid Card
PSU	Sea Sonic	SS-600H2U	1	600W
System Fan (middle)	Y.S.TECH	FD128032HB-P(2W7G)	4	80x80x32/5000 RPM
CPU Cooler	Chenbro	66H083200-002	2	Active Heat sink

Table 2 – System Configuration

4. Chassis Description (as Tested)

The RM21600 chassis is a Rackmount Server chassis that may ship with a Sea Sonic 600W power supply (optional) and four system fans. . It has one exposed Standard CD-ROM drive bay, five 3.5" HDD internal drive bays and one 3.5" Hot-swap HDD drive bay.

The dimensions of this chassis are 26"D x 16.9"W x 3.5"H

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

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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

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	74.9	59.5	59.5
2.T-CASE2	74.9	69.4	69.4
3.T-A1	Reference	37.3	37.3
4.T-A2	Reference	40.6	40.6
5.VRM-1	105	63.7	63.7
6.VRM-2	105	64.9	64.9
7.North Bridge	99	61.4	61.4
8.South Bridge	115	65.8	65.8
9.Memory-1	Reference	50.5	50.5
10.Memory-2	Reference	58.4	58.4
11.HDD-1	55	41.3	41.3
12.HDD-2	55	40.8	40.8
13.HDD-3	55	41.8	41.8
14.HDD-4	55	39.2	39.2
15.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 [RM21600](#) 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.

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10. Appendix A - System Setup

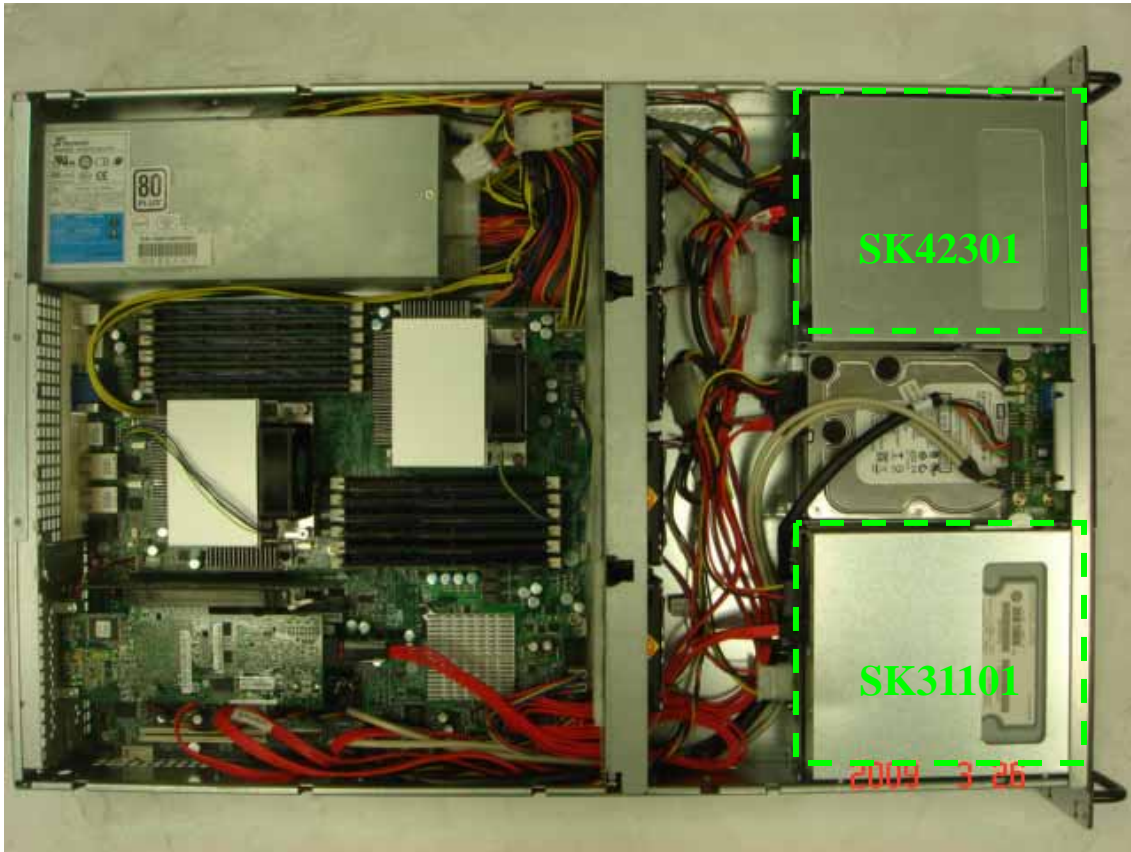


Fig. 3 – System Setup



Fig. 4 – Heat Sink

11. Appendix B - Measured Points

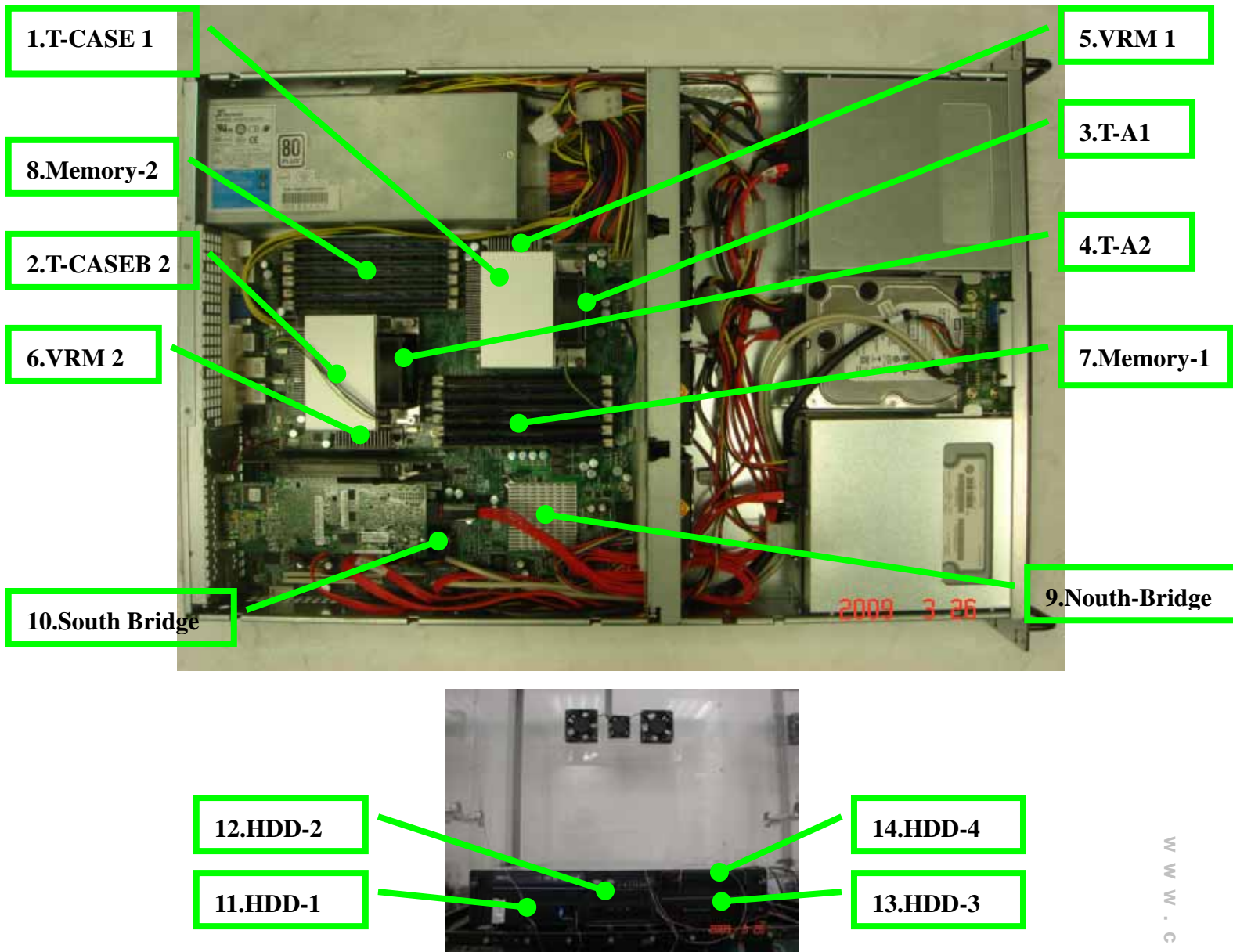


Fig. 5 – Measured Points

12. Appendix C - Real-Time Trend

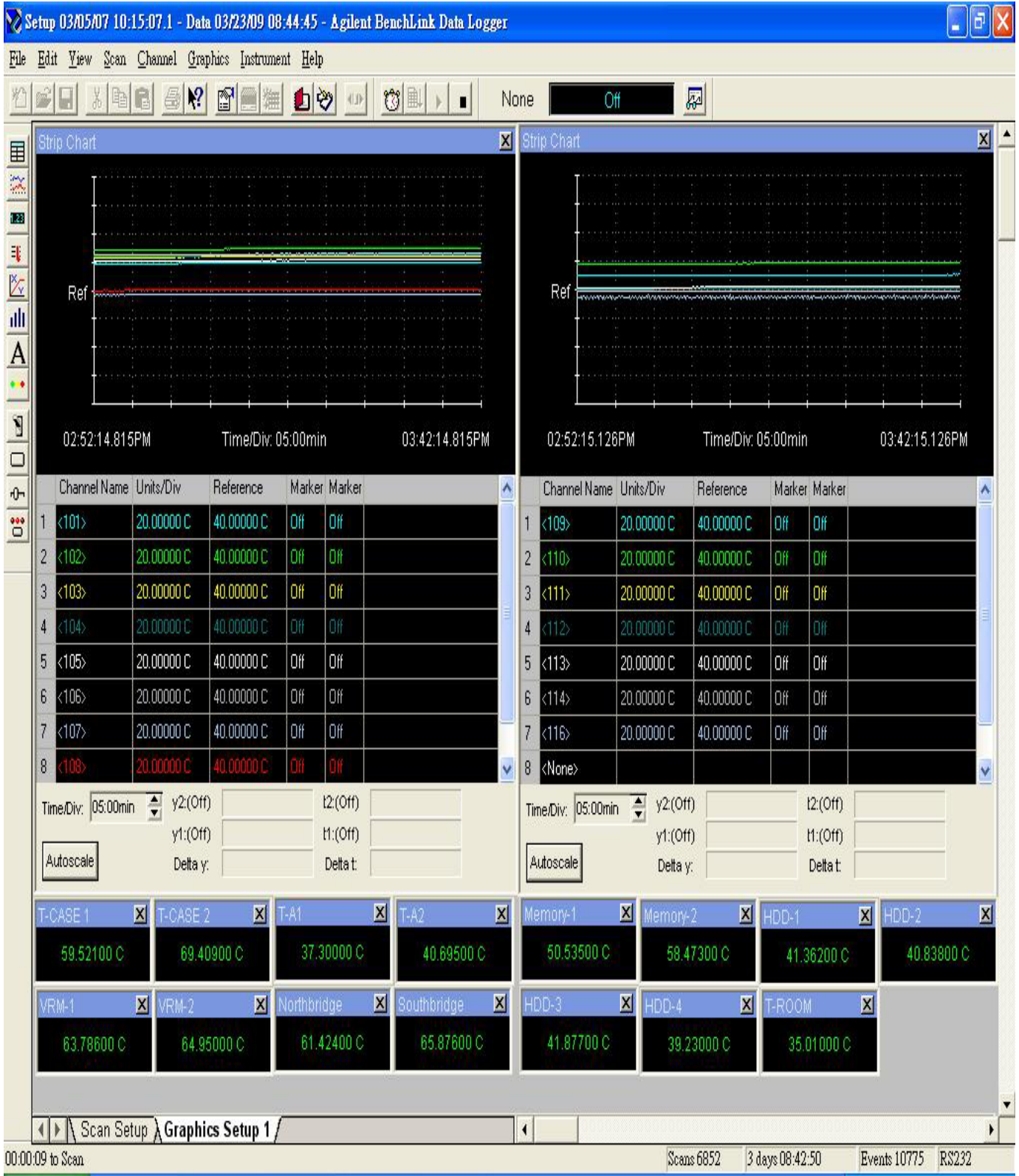


Fig.6 – Real-Time Trend

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13. Appendix D - Intel Frequency Display

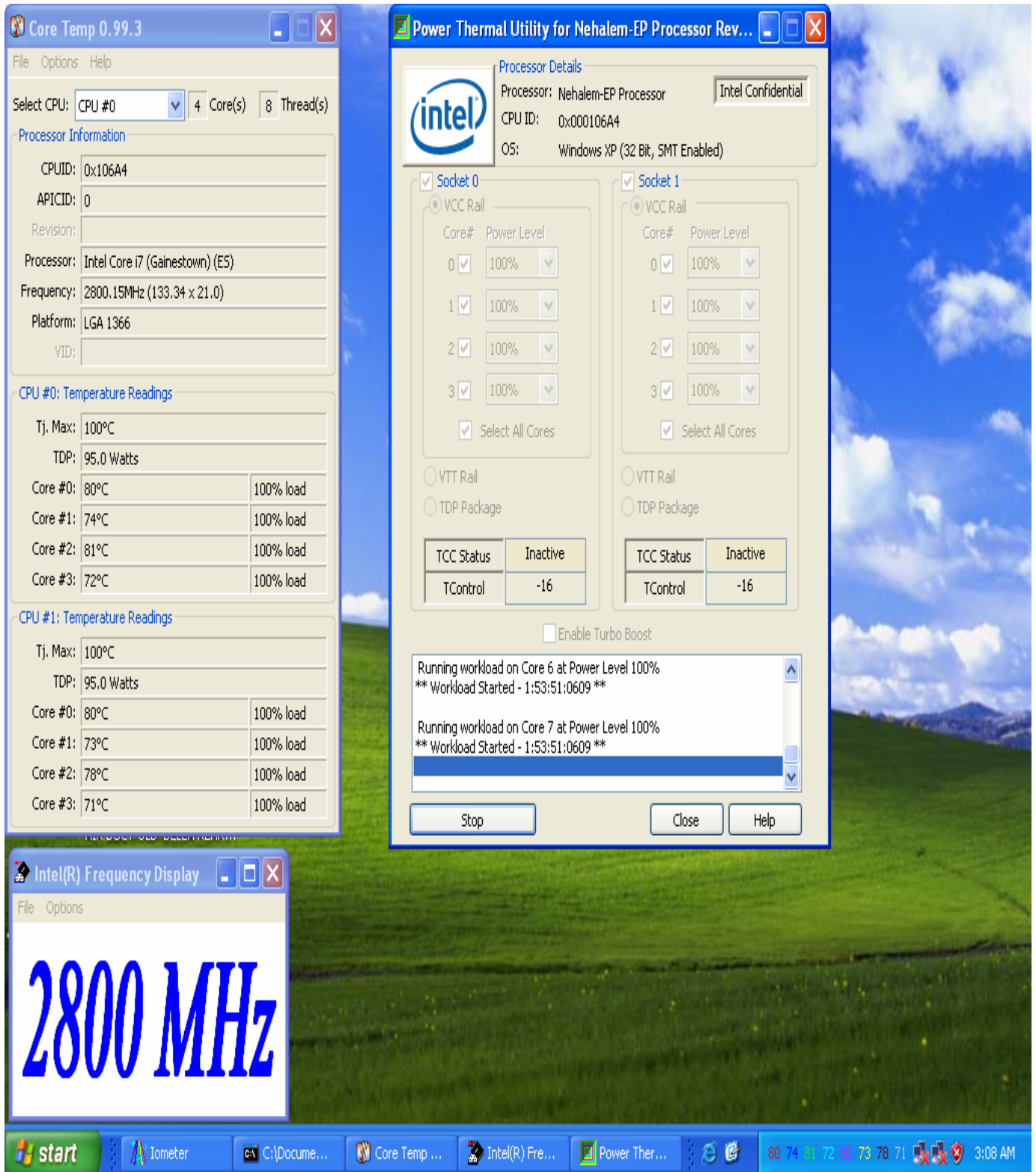


Fig. 7- Intel Frequency Display

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