

# Thermal Test Report

Model Name : **RM21600**

Rev : **B**



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Issued by: **Doreen Lee**

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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:

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         | 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          | HOJET           | Engineer Sample       | 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                              | 61.7                     | 61.6                      |
| 2.T-CASE2       | 74.9                              | 69.0                     | 68.9                      |
| 3.T-A1          | Reference                         | 37.7                     | 37.6                      |
| 4.T-A2          | Reference                         | 40.0                     | 39.9                      |
| 5.VRM-1         | 105                               | 55.1                     | 55.0                      |
| 6.VRM-2         | 105                               | 64.4                     | 64.3                      |
| 7.North Bridge  | 99                                | 61.5                     | 61.4                      |
| 8.South Bridge  | 115                               | 67.4                     | 67.3                      |
| 9.Memory-1      | Reference                         | 48.9                     | 48.8                      |
| 10.Memory-2     | Reference                         | 54.6                     | 54.5                      |
| 11.HDD-1        | 55                                | 41.3                     | 41.2                      |
| 12.HDD-2        | 55                                | 40.9                     | 40.8                      |
| 13.HDD-3        | 55                                | 43.2                     | 43.1                      |
| 14.HDD-4        | 55                                | 38.2                     | 38.1                      |
| 15.T-ROOM       | 35                                | 35.1                     | 35.0                      |

Table 3 – Detail of Test Results

\*Compensated Data = Measurement+ (35–T-Room)  
 = Measurement+ (35–35.1)  
 = Measurement – 0.1

**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

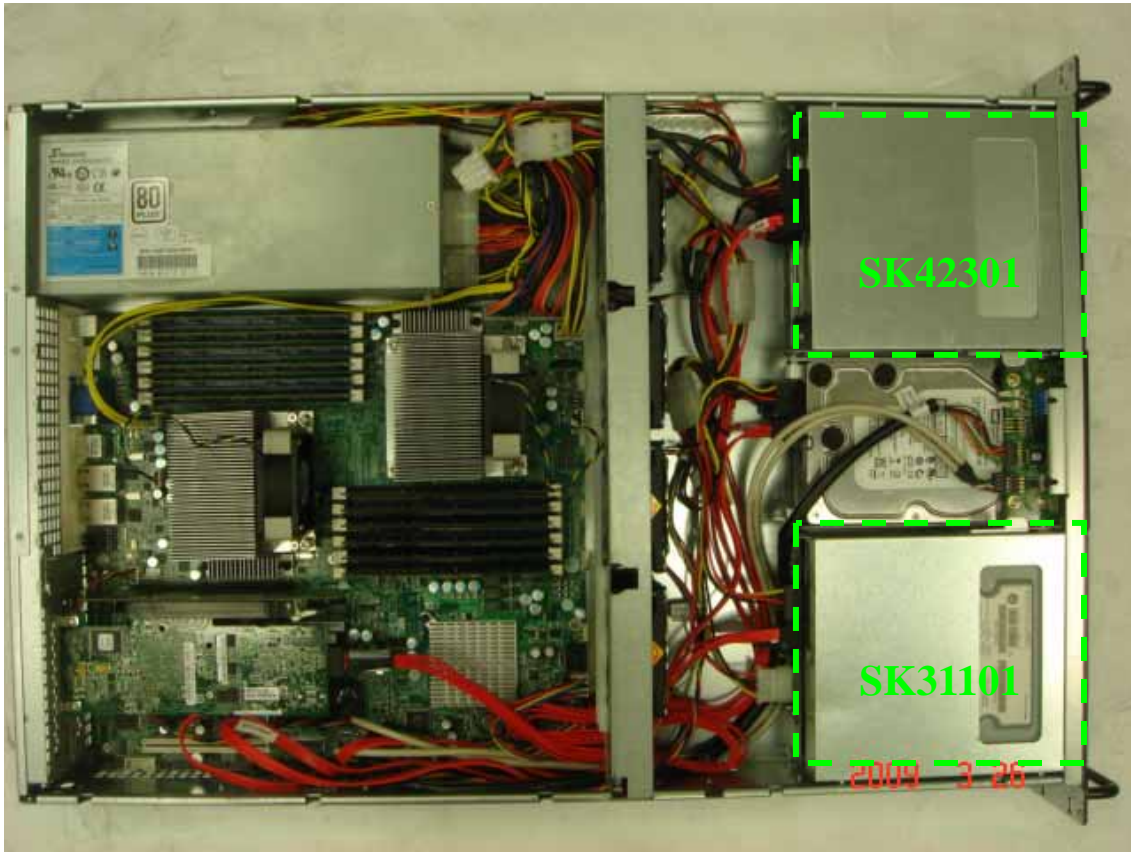


Fig. 3 – System Setup



Fig. 4 – Heat Sink

11. Appendix B - Measured Points

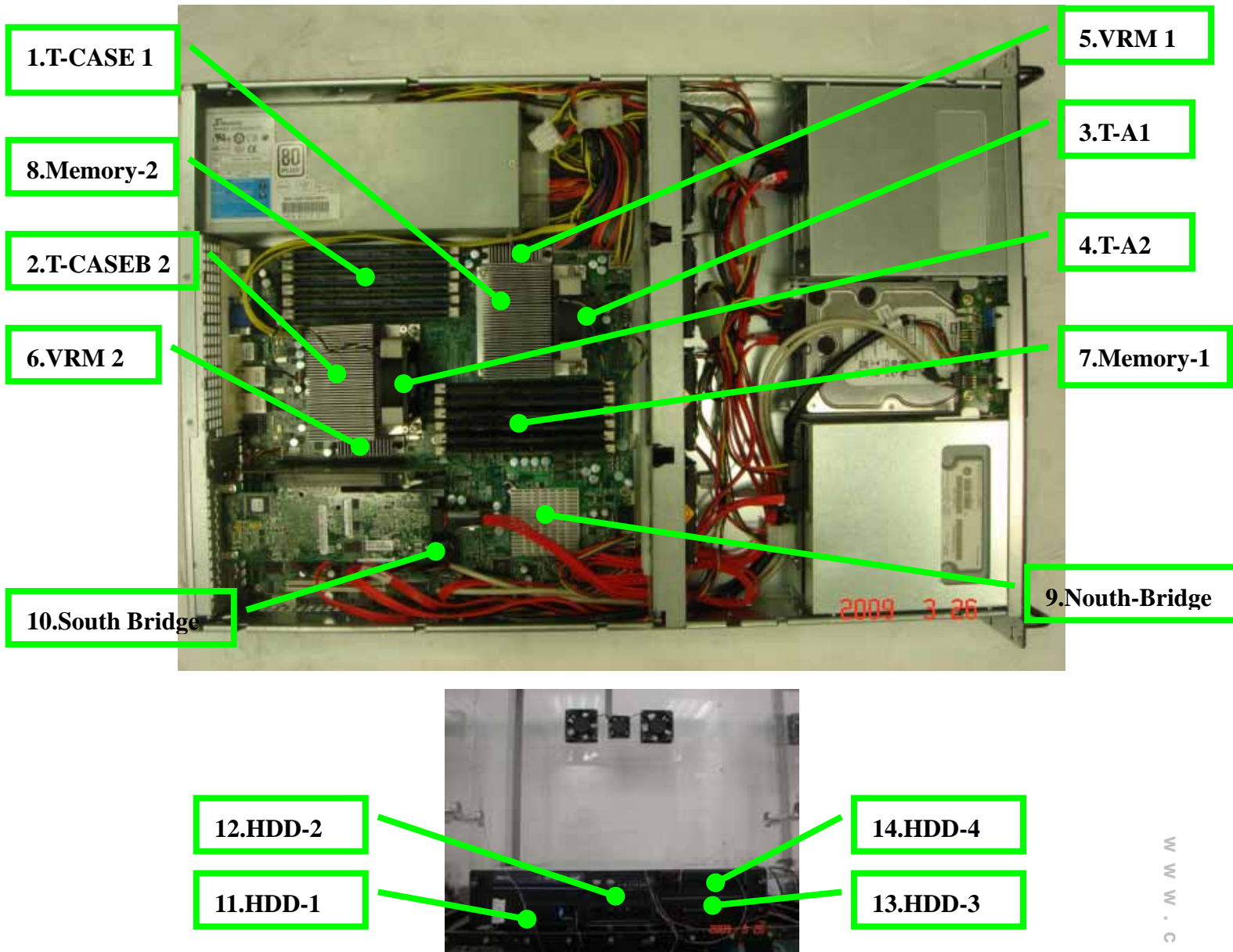


Fig. 5 – Measured Points





### 12. Appendix C - Real-Time Trend

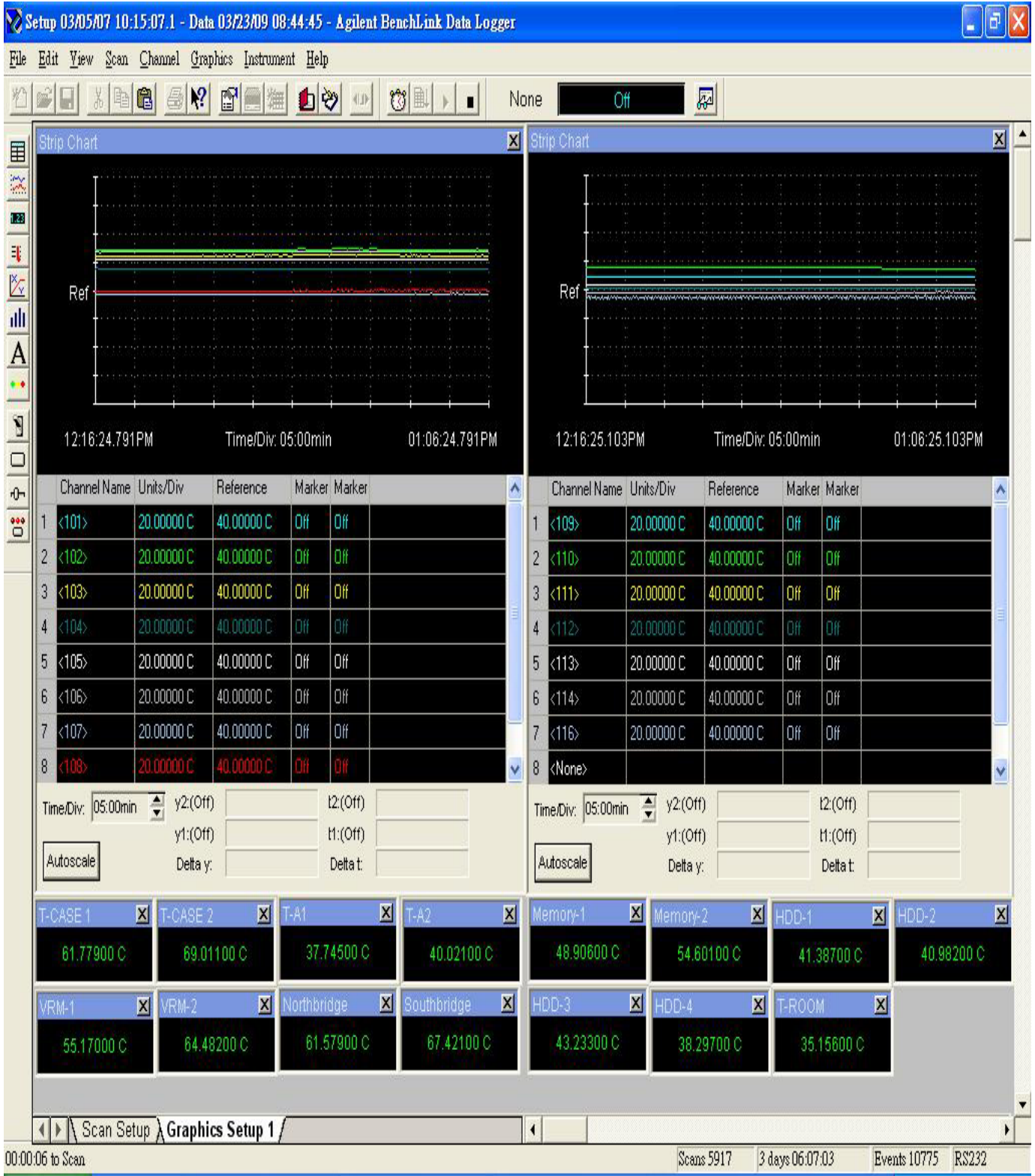


Fig.6 – Real-Time Trend

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### 13. Appendix D - Intel Frequency Display

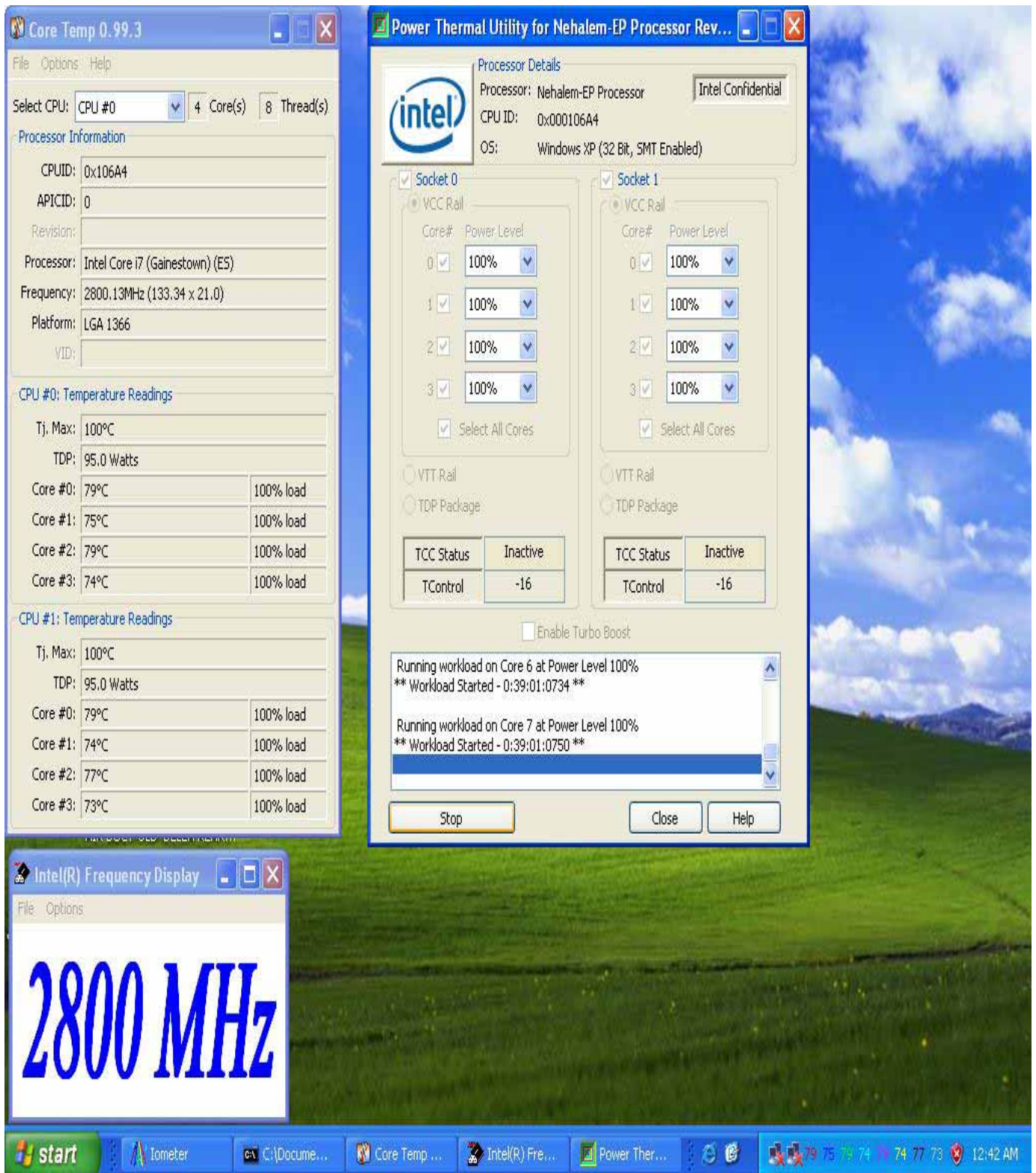


Fig. 7- Intel Frequency Display

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