

Thermal Test Report

Model Name: **RM11602**

Version : **A**



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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 [RM11602](#) Rackmount Chassis provides adequate cooling for the [Intel Willowbrook](#) motherboard with [two Western Digital 500GB SATA II](#) Hard Drives and [Dual 2.26GHz Intel L5520](#) 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	RM11602	1	Rackmount Server chassis
Main Board	Intel	Willowbrook	1	Full function
CPU Type	Intel	L5520	2	2.26GHz Socket 1366
Memory	NANYA	NT2GC72B8PA0NF-CG	8	2GB.2RX8 1333.ECC
Chipset	Intel	5520	1	Full Function
VGA (on board)	ServerEngins	SE-SM4210-P01	1	On board
Hard Drive	Western Digital	WD50000ABPS-01ZZBO	2	SATAII 500GB
PSU	Seasonic	SS-400H1U	1	400W
System Fan (Middle)	SANYO DENKI	9GV0412K301	4	40x40x28 15000 RPM
CPU Cooler	CoolJag	Engineer Sample	2	Passive Heat Sink

Table 2 – System Configuration

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4. Chassis Description (as Tested)

The RM11602 chassis is a Rackmount Server chassis that may ship with a Seasonic 400W power supply (optional) and four system fans. It has two 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:

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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 (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 2.26GHz Intel L5520](#) 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	72.4	63.2	63.2
2.T-CASE 2	72.4	58.6	58.6
3.TA-1	Reference	39.0	39.0
4.TA-2	Reference	38.0	38.0
5.VRM-1	105	43.9	43.9
6.VRM-2	105	41.7	41.7
7.North-Bridge	99	64.7	64.7
8.South-Bridge	115	69.1	69.1
9.Memory-1	Reference	45.2	45.2
10.Memory-2	Reference	41.6	41.6
11.HDD-1	55	39.1	39.1
12.HDD-2	55	34.0	34.0
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 [RM11602](#) chassis (as tested) does provide adequate cooling for the [Dual 2.26GHz Intel L5520](#) 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

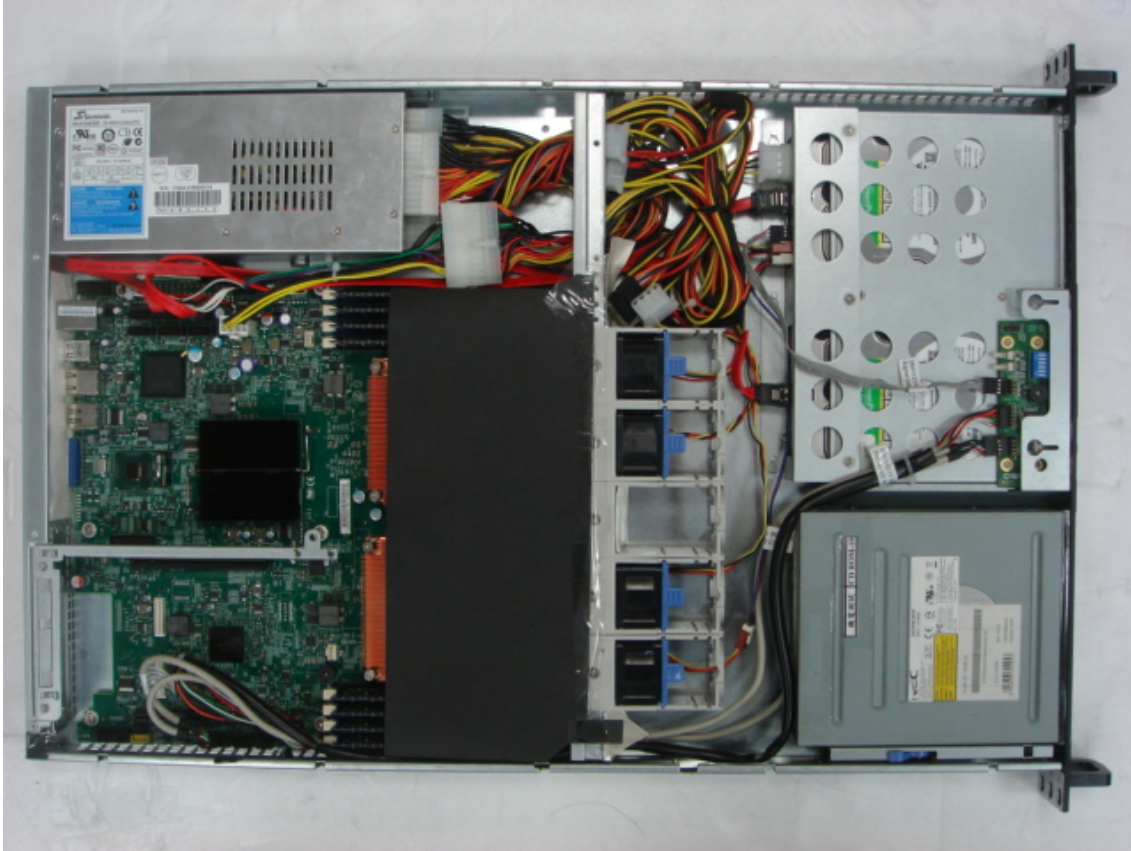


Fig. 3 – System Setup



Fig. 4 – Air Duct

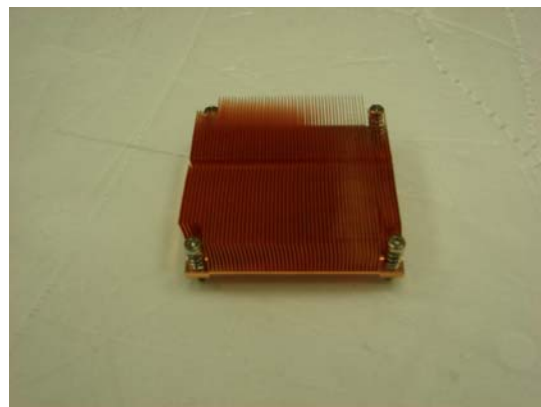


Fig. 5 –Heat Sink

11. Appendix B - Measured Points

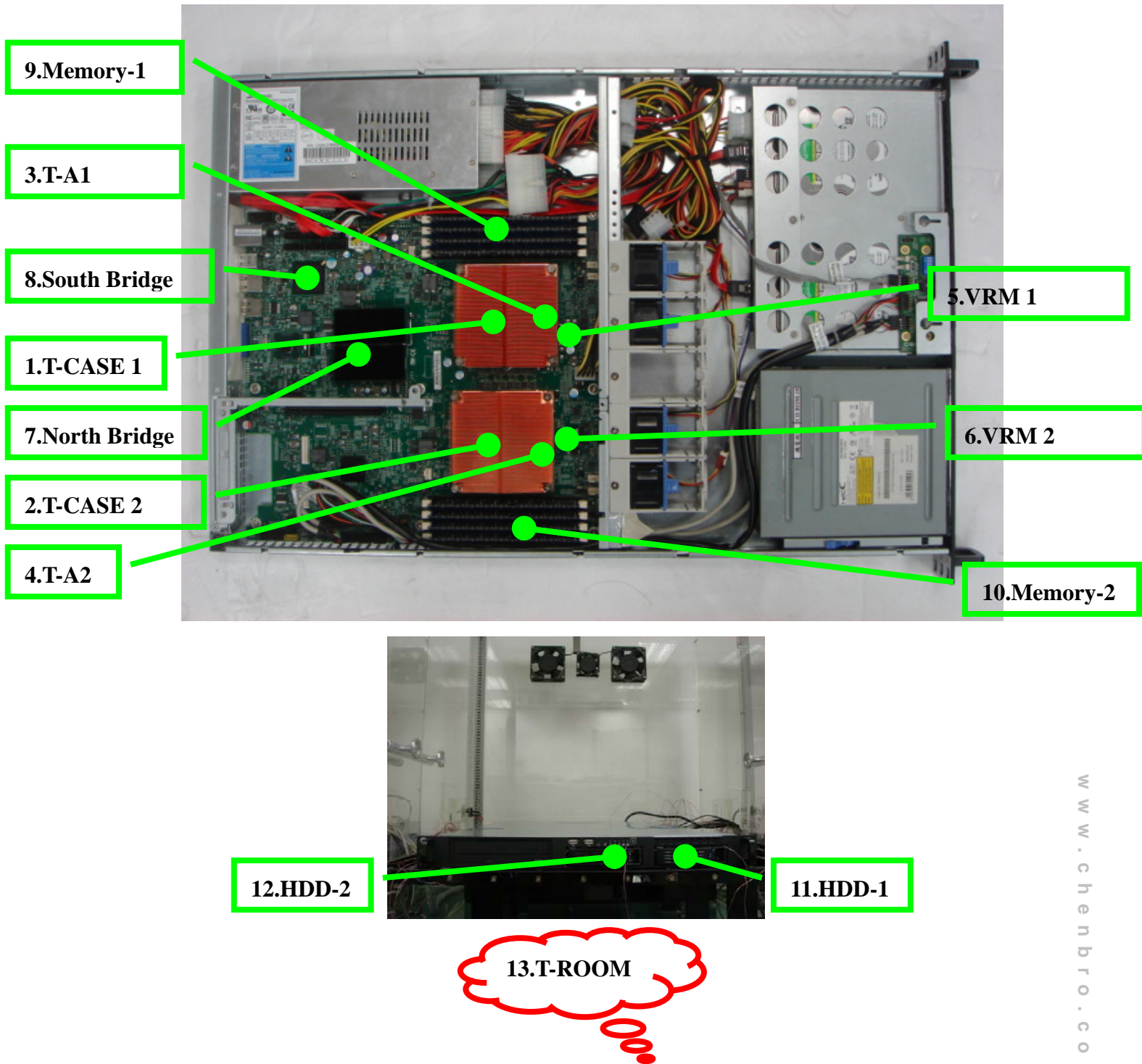


Fig. 6 – Measured Points

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12. Appendix C - Real-Time Trend

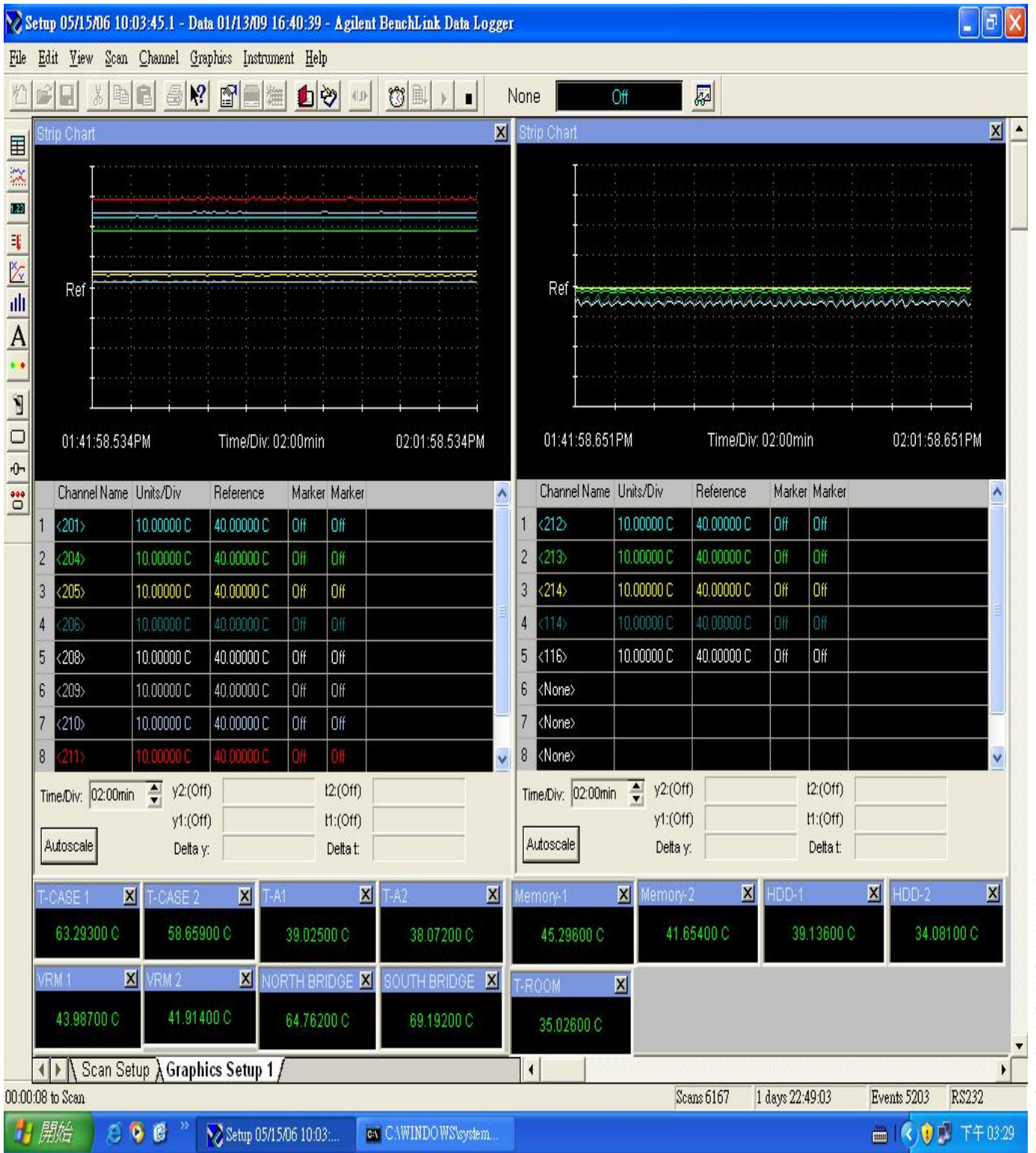


Fig. 7 – Real-time Trend

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13. Appendix D - Intel Frequency Display

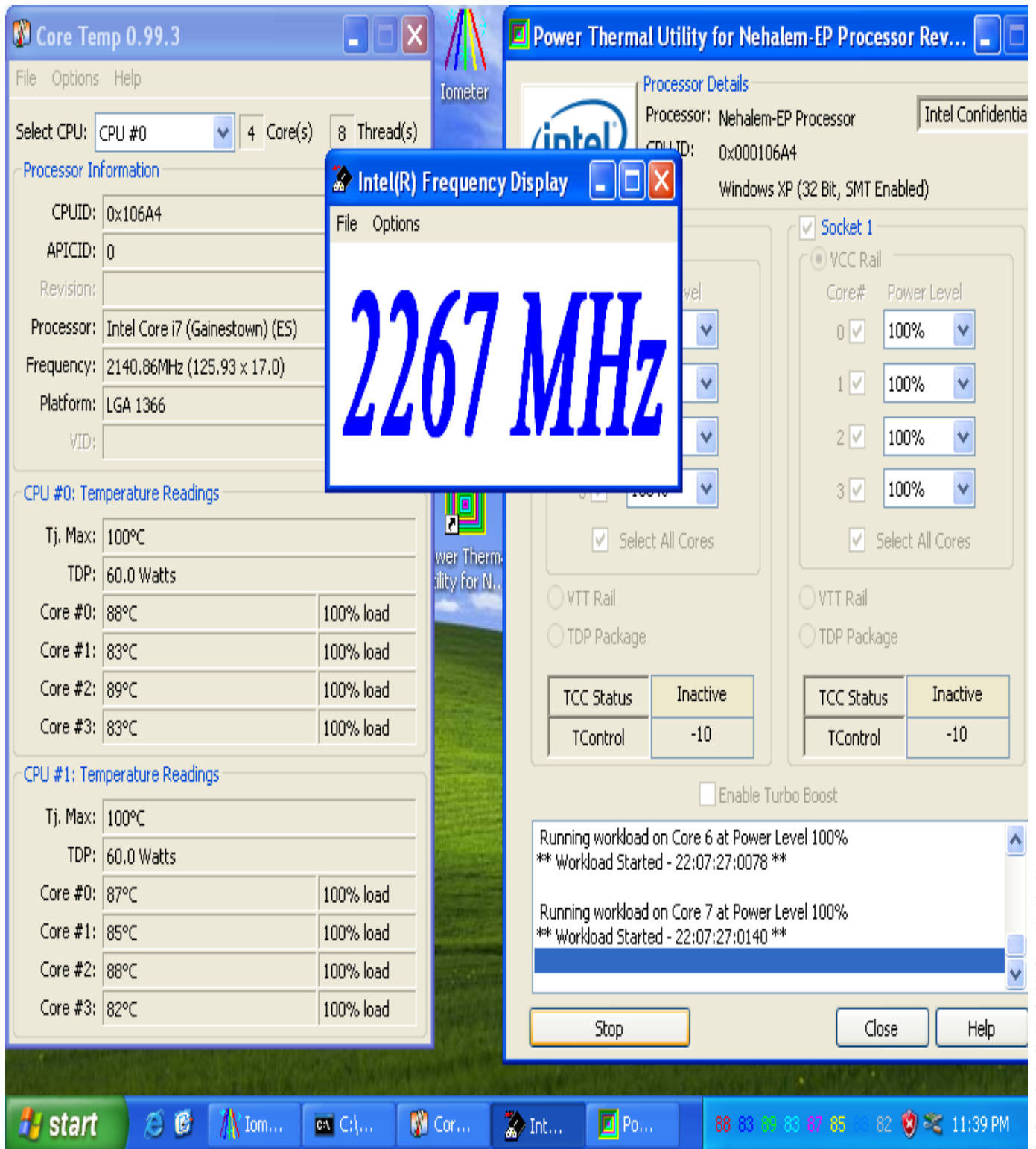


Fig. 8 – Intel Frequency Display

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