Thermal Test Report
Model : YY-A210
Thermal Performance Contest

Date:Dec.17 2004

Table of Contents

1. Introduction

The purpose of this evaluation is to find the best performance thermal solution by system operated as for Intel P4 3.4G processor .

2. References

ATX spec http://formfactors.org

3. Thermal Test

3.1 Test Configuration

Chassis	A210
Power Supply	DELTA DPS-300AB-9A ,300W
Chassis Fan	TOP DF1206BM, **Middle** Speed: 3700RPM, Quantity:1 TOP DF1206BH, **High** Speed: 4400RPM, Quantity:2 *System config. To be tested with various modes, please refer to table 4.1 & 4.2*
Processor	Intel P4 Prescott **3.4**GHz/800MHz 1MB L2-Cache LGA-775, Quantity:1
Processor Thermal solution	Intel Boxed Cooler
Motherboard	ASUS P5GD1-VM(intel 915G)
Memory	Kingston DDR400 512MB, Quantity: 2
Hard Drive	SEAGATE ST380013AS 80G, Quantity: 1
CD ROM	Cyber CD526D, Quantity: 1
Floppy Drive	Mitusumi D359M3, Quantity: 1
AGP Card	GIGABYTE GA-V-NX53128T, Quantity: 1
PCI-Lan Card	D-LINK DFE-530TX, Quantity: 1
PCI-Sound Card	ESS SC1938, Quantity: 1

3.2 Test Equipment Used

FULL SYSTEM OPERATION
Fluke Hydra 2635A
Software: Intel P4 Prescott MAXPOWER Rev:1.4.2

3.3 Test Process

The peripherals listed in section 1 were installed in the chassis and thermocouples were attached at the points designated in section 4. The chassis was tested in a controlled temperature held at a constant 35°C. The thermal readings communicated from the sensors on the test board to the test software. The system was exercised until the initial thermal gradient reached a consistent level with a slope-nearing zero. During testing, the ambient temperature was monitored approximately 2” from the front bezel of the chassis.

3.4 Data Recorded

Temperature readings are measured at the following location(s):

- Ambient -- Hotbox ambient temperature (2” from the front center of the chassis)
- Tinlet1 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the rear port)
- Tinlet2 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the PSU)

- Tinlet3 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the DIMM slot)
- Tinlet4 – Internal ambient temperature of the processor heatsink .5” away from the center of fan hub (near the chipset)
- Tcase -- Processor case temperature

4. Test Result (see table 4.1), & Test mode details (Table 4.2)

5. Summary: PASS
According to the FMB guidance, the CPU is FMB04B, TDP=115W
Psc Tc= Px0.25+44.0 =72.75℃ (Tc spec)

1. Mode1 & Mode2 compare:
在兩者都爲 Airguide 加長的情況下所作的測試,只是兩者的長度不同,由數據看來,適合的長度更有助於 Ta.

2. Mode1 ~ Mode3 compare:
在 Mode1 及 Mode3 都沒有加入系統風扇,兩者在於 Airguide 的長度不同,由測試數據看來,加長的 Airguide 在 Tc 及 Ta 都明顯優於沒有加長的 Airguide,尤其是 Ta 更相差了 4.1℃,因此可明顯知道加長的 Airguide 更符合 Thermal issue.

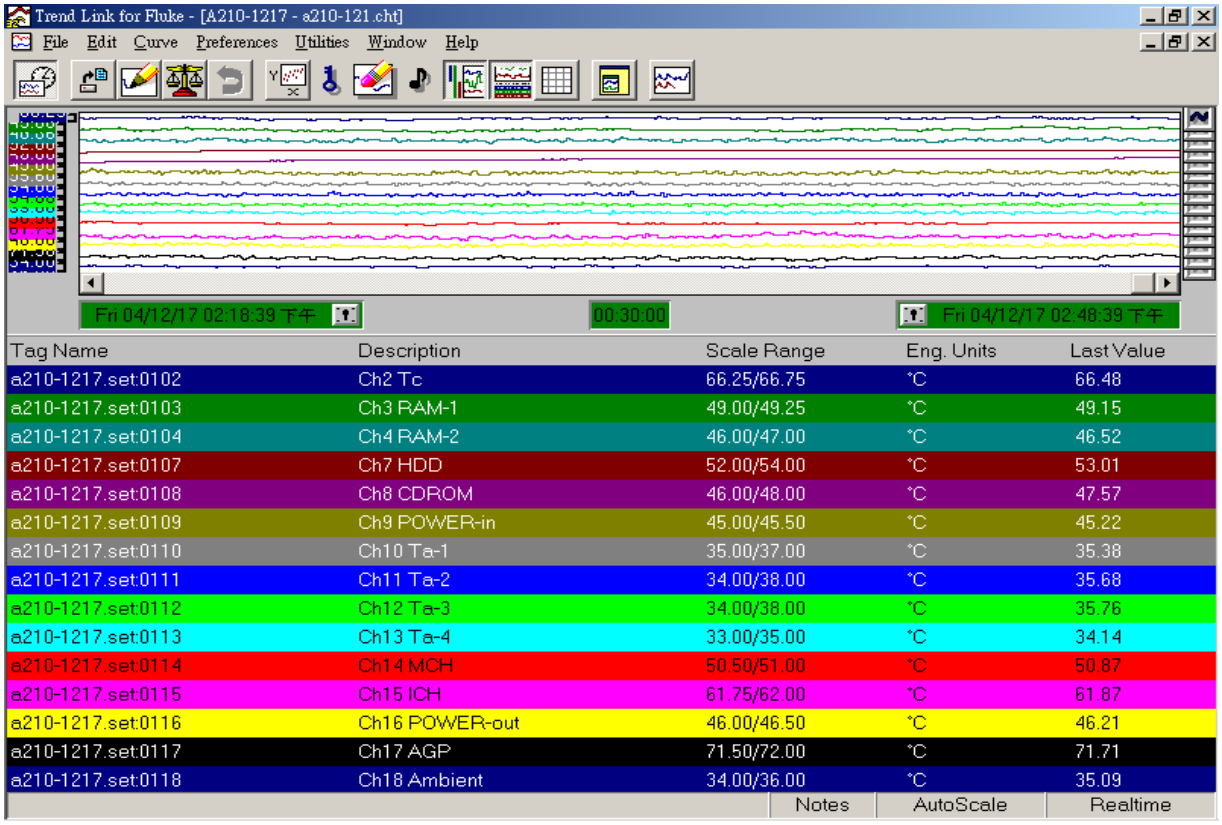
3. Mode1 & Mode4 compare:
此兩個模式爲 Airguide 加長及目前系統最好的模式所做的測試比較,由測試數據看來,Tc 爲目前加了風扇的較好,約低了 0.6℃但 Ta 則是加長的 Airguide 數據較優,低了 2.3℃;在各週邊來說,由於有兩顆高轉速風扇,所以數據都比不加風扇的模式要好,約有 1~3℃之多的溫差,AGP card 則有 17.7℃的溫差,但此溫差仍都符合各週邊的 SPEC.

由此次的測試驗證,我們可以發現,Airguide 的長度的確對我們 care 的 Ta 及 Tc 有著明顯的差異存在,在我們取得 Airguide 的長度只要罩住 cooler fan 約 2mm 的情況下,不需加入系統風扇(又可降低噪音問題也可減少成本),我們就能有不錯的散熱解決對策.

Table 4.1
Date:Dec.17.2004

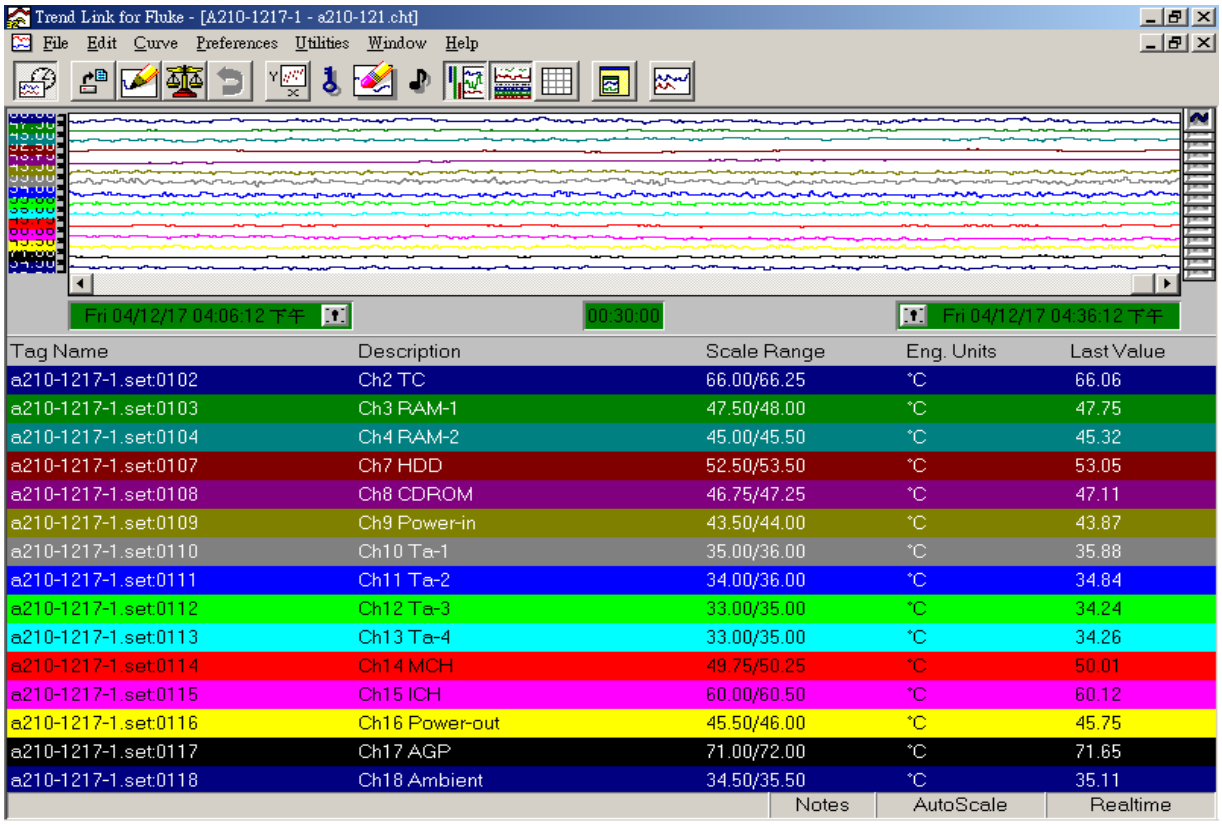
position	Mode 1	Mode 2	Mode 3	Mode 4
Power model	Delta 3DPS-300AB-9A (with 8cm Fan for airflow out, vents for air flow out)			
Processor thermal solution	Intel Boxed cooler	Intel Boxed cooler	Intel Boxed cooler	Intel Boxed cooler
System Fan (Mounted in rear side of chassis)	Vents only No fan	TOP DF1206BM*1	Vents only No fan	TOP DF1206BH*2
Airguide (CAG1.1)	Yes-CAG1.1* Extend	Yes-CAG1.1* Extend	Yes	Yes
AGP & PCI Card	Yes	Yes	Yes	Yes
Run the test under the software on 100 % Level	100 %	100 %	100 %	100 %
Test Result (values was according to the screens of Fluke monitor)				
DIMM-1	49.2	47.8	49.3	46.6
DIMM-2	46.5	45.3	42.2	49.4
HDD	53	53.1	54.2	51.9
CD ROM	47.6	47.1	47.9	45.1
MCH	50.9	50	53.1	49.7
ICH	61.9	60.1	60.2	58.3
AGP	71.7	71.7	72.1	54
POWER-in	45.2	43.9	47.4	42.6
POWER-out	46.2	45.8	49.6	45.9
T-inlet 1	35.4	35.9	44.4	40.7
T-inlet 2	35.7	34.8	37.8	35.5
T-inlet 3	35.7	34.2	34.8	37.2
T-inlet 4	34.1	34.3	40.1	36.4
T-inlets average Tambient(1~4)	35.2	34.8	39.3	37.5
T-case	66.5	66.1	67.9	65.9
Ambient(case outside)	35.1	35.1	35.2	35.1

*-The seperation distance between airguide and active fan is removed,the airguide extend to cover the active fan of 2 mm.



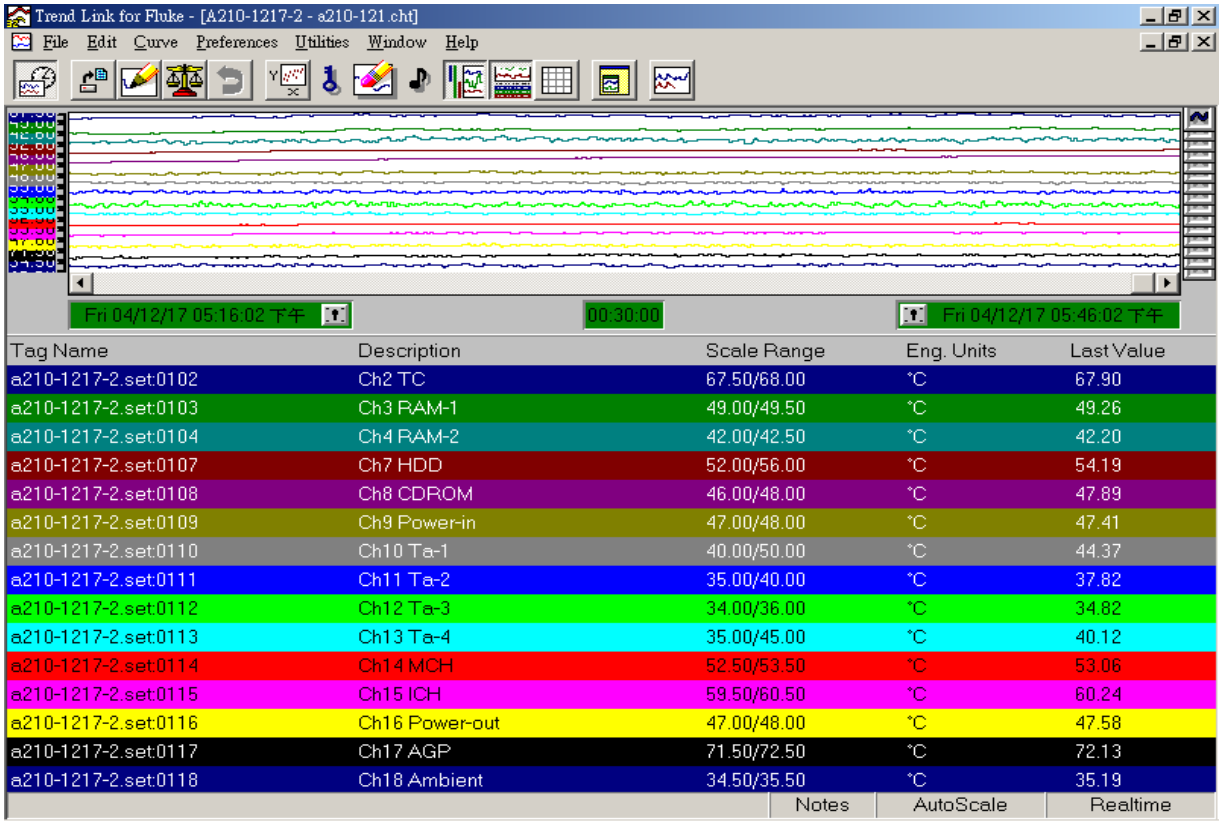
Tag Name	Description	Scale Range	Eng. Units	Last Value
a210-1217.set:0102	Ch2 Tc	66.25/66.75	°C	66.48
a210-1217.set:0103	Ch3 RAM-1	49.00/49.25	°C	49.15
a210-1217.set:0104	Ch4 RAM-2	46.00/47.00	°C	46.52
a210-1217.set:0107	Ch7 HDD	52.00/54.00	°C	53.01
a210-1217.set:0108	Ch8 CDROM	46.00/48.00	°C	47.57
a210-1217.set:0109	Ch9 POWER-in	45.00/45.50	°C	45.22
a210-1217.set:0110	Ch10 Ta-1	35.00/37.00	°C	35.38
a210-1217.set:0111	Ch11 Ta-2	34.00/38.00	°C	35.68
a210-1217.set:0112	Ch12 Ta-3	34.00/38.00	°C	35.76
a210-1217.set:0113	Ch13 Ta-4	33.00/35.00	°C	34.14
a210-1217.set:0114	Ch14 MCH	50.50/51.00	°C	50.87
a210-1217.set:0115	Ch15 ICH	61.75/62.00	°C	61.87
a210-1217.set:0116	Ch16 POWER-out	46.00/46.50	°C	46.21
a210-1217.set:0117	Ch17 AGP	71.50/72.00	°C	71.71
a210-1217.set:0118	Ch18 Ambient	34.00/36.00	°C	35.09

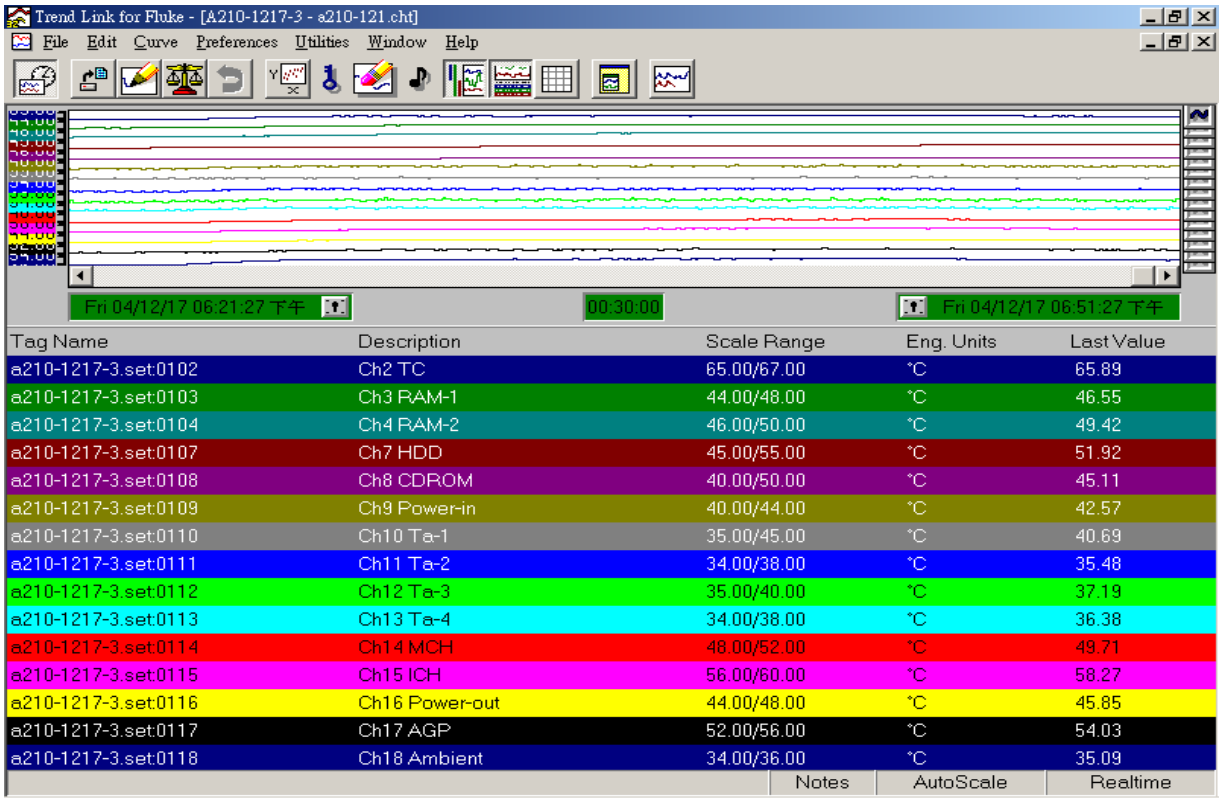
Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
a210-1217-1.set:0102	Ch2 TC	66.00/66.25	°C	66.06
a210-1217-1.set:0103	Ch3 RAM-1	47.50/48.00	°C	47.75
a210-1217-1.set:0104	Ch4 RAM-2	45.00/45.50	°C	45.32
a210-1217-1.set:0107	Ch7 HDD	52.50/53.50	°C	53.05
a210-1217-1.set:0108	Ch8 CDROM	46.75/47.25	°C	47.11
a210-1217-1.set:0109	Ch9 Power-in	43.50/44.00	°C	43.87
a210-1217-1.set:0110	Ch10 Ta-1	35.00/36.00	°C	35.88
a210-1217-1.set:0111	Ch11 Ta-2	34.00/36.00	°C	34.84
a210-1217-1.set:0112	Ch12 Ta-3	33.00/35.00	°C	34.24
a210-1217-1.set:0113	Ch13 Ta-4	33.00/35.00	°C	34.26
a210-1217-1.set:0114	Ch14 MCH	49.75/50.25	°C	50.01
a210-1217-1.set:0115	Ch15 ICH	60.00/60.50	°C	60.12
a210-1217-1.set:0116	Ch16 Power-out	45.50/46.00	°C	45.75
a210-1217-1.set:0117	Ch17 AGP	71.00/72.00	°C	71.65
a210-1217-1.set:0118	Ch18 Ambient	34.50/35.50	°C	35.11

Notes AutoScale Realtime


Trend Link for Fluke - [A210-1217-2 - a210-121.cht]
File Edit Curve Preferences Utilities Window Help
Fri 04/12/17 05:16:02 下午
00:30:00
Fri 04/12/17 05:46:02 下午
Tag Name Description Scale Range Eng. Units Last Value
a210-1217-2.set:0102 Ch2 TC 67.50/68.00 °C 67.90
a210-1217-2.set:0103 Ch3 RAM-1 49.00/49.50 °C 49.26
a210-1217-2.set:0104 Ch4 RAM-2 42.00/42.50 °C 42.20
a210-1217-2.set:0107 Ch7 HDD 52.00/56.00 °C 54.19
a210-1217-2.set:0108 Ch8 CDROM 46.00/48.00 °C 47.89
a210-1217-2.set:0109 Ch9 Power-in 47.00/48.00 °C 47.41
a210-1217-2.set:0110 Ch10 Ta-1 40.00/50.00 °C 44.37
a210-1217-2.set:0111 Ch11 Ta-2 35.00/40.00 °C 37.82
a210-1217-2.set:0112 Ch12 Ta-3 34.00/36.00 °C 34.82
a210-1217-2.set:0113 Ch13 Ta-4 35.00/45.00 °C 40.12
a210-1217-2.set:0114 Ch14 MCH 52.50/53.50 °C 53.06
a210-1217-2.set:0115 Ch15 ICH 59.50/60.50 °C 60.24
a210-1217-2.set:0116 Ch16 Power-out 47.00/48.00 °C 47.58
a210-1217-2.set:0117 Ch17 AGP 71.50/72.50 °C 72.13
a210-1217-2.set:0118 Ch18 Ambient 34.50/35.50 °C 35.19
Notes AutoScale Realtime


Trend Link for Fluke - [A210-1217-3 - a210-121.cht]
File Edit Curve Preferences Utilities Window Help
Fri 04/12/17 06:21:27 下午
00:30:00
Fri 04/12/17 06:51:27 下午
Tag Name Description Scale Range Eng. Units Last Value
a210-1217-3.set:0102 Ch2 TC 65.00/67.00 °C 65.89
a210-1217-3.set:0103 Ch3 RAM-1 44.00/48.00 °C 46.55
a210-1217-3.set:0104 Ch4 RAM-2 46.00/50.00 °C 49.42
a210-1217-3.set:0107 Ch7 HDD 45.00/55.00 °C 51.92
a210-1217-3.set:0108 Ch8 CDROM 40.00/50.00 °C 45.11
a210-1217-3.set:0109 Ch9 Power-in 40.00/44.00 °C 42.57
a210-1217-3.set:0110 Ch10 Ta-1 35.00/45.00 °C 40.69
a210-1217-3.set:0111 Ch11 Ta-2 34.00/38.00 °C 35.48
a210-1217-3.set:0112 Ch12 Ta-3 35.00/40.00 °C 37.19
a210-1217-3.set:0113 Ch13 Ta-4 34.00/38.00 °C 36.38
a210-1217-3.set:0114 Ch14 MCH 48.00/52.00 °C 49.71
a210-1217-3.set:0115 Ch15 ICH 56.00/60.00 °C 58.27
a210-1217-3.set:0116 Ch16 Power-out 44.00/48.00 °C 45.85
a210-1217-3.set:0117 Ch17 AGP 52.00/56.00 °C 54.03
a210-1217-3.set:0118 Ch18 Ambient 34.00/36.00 °C 35.09
Notes AutoScale Realtime

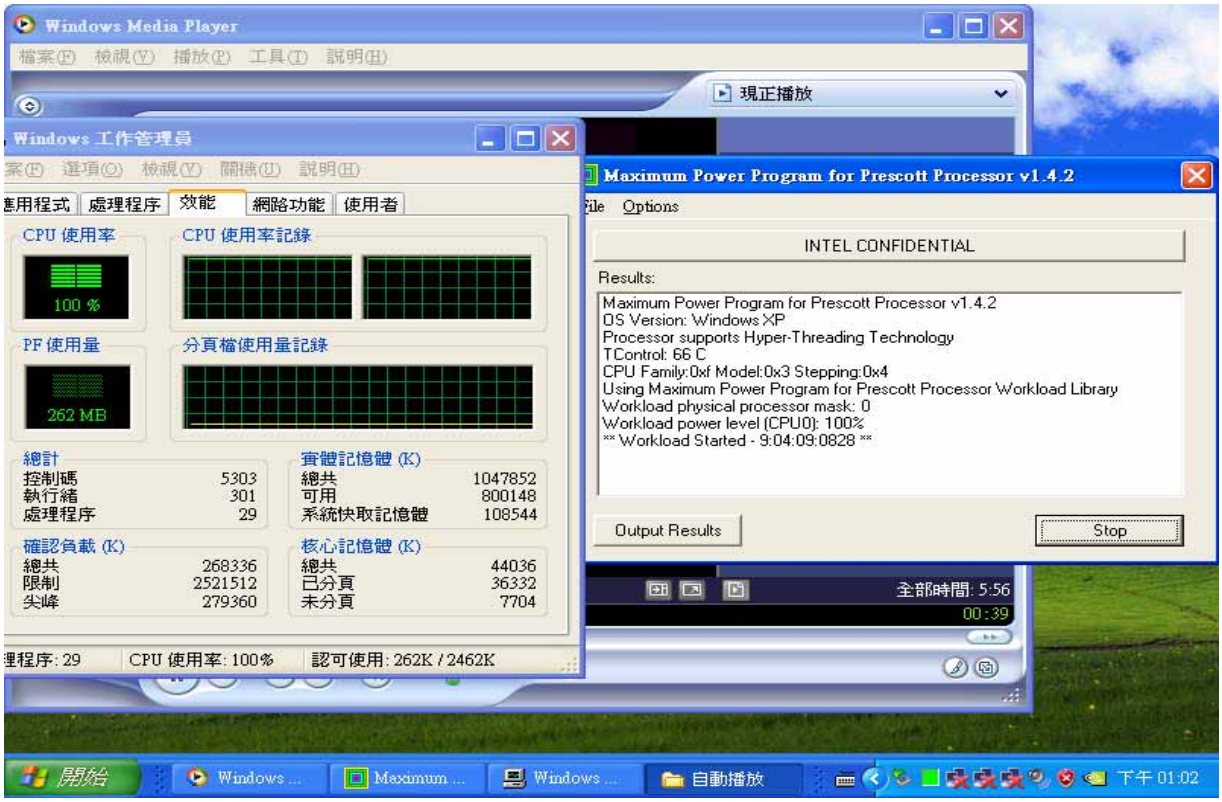
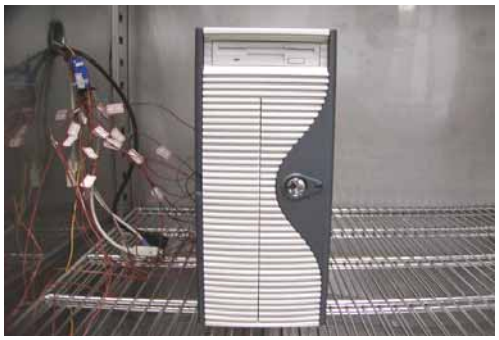

Windows Media Player
檔案(F) 檢視(V) 播放(P) 工具(T) 說明(H)
現正播放
Windows 工作管理員
案(F) 選項(O) 檢視(V) 關機(U) 說明(H)
應用程式 處理程序 效能 網路功能 使用者
CPU 使用率
100 %
CPU 使用率記錄
PF 使用量
262 MB
分頁檔使用量記錄
總計
控制碼 5303
執行緒 301
處理程序 29
實體記憶體 (K)
總共 1047852
可用 800148
系統快取記憶體 108544
確認負載 (K)
總共 268336
限制 2521512
尖峰 279360
核心記憶體 (K)
總共 44036
已分頁 36332
未分頁 7704
理程序: 29
CPU 使用率: 100%
認可使用: 262K / 2462K
Maximum Power Program for Prescott Processor v1.4.2
ile Options
INTEL CONFIDENTIAL
Results:
Maximum Power Program for Prescott Processor v1.4.2
OS Version: Windows XP
Processor supports Hyper-Threading Technology
TControl: 66 C
CPU Family:0xf Model:0x3 Stepping:0x4
Using Maximum Power Program for Prescott Processor Workload Library
Workload physical processor mask: 0
Workload power level (CPU0): 100%
** Workload Started - 9:04:09:0828 **
Output Results
Stop
全部時間: 5:56
00:39
開始
Windows ...
Maximum ...
Windows ...
自動播放
下午 01:02

Table 4.2

	The view of the chassis front side.
	The view of the chassis right side.
	The view of the chassis left side.
	The view of the chassis back side.

The view of the thermocouples connections.

The view of the airguide to extend.