Thermal Test Report
Model : YY-5601
Thermal Performance Contest

Date:Apr.13, 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 3.2G processor .

2. References

ATX spec http://formfactors.org

3. Thermal Test

3.1 Test Configuration

Chassis	YY-5601
Power Supply	Delta GPS-350BB-100A
Chassis Fan	JAMICON JF1225BILS Speed: 1600RPM(low Speed) JAMICON JF1225BIMS Speed: 2200RPM (Middle Speed) *System config. To be tested with various modes, please refer to table 4.1 & 4.2*
Processor	Intel P4 Prescott FMB1.5 3.2GHz/800MHz, Quantity:1
Processor Thermal solution	GlacialTech Igloo 4360, Cooler Fan(8cm) Speed:2400 RPM,dBA:26
Motherboard	GIGA-BYTE 8S648FX-RZ
Memory	Kingston DDR400 512MB, Quantity: 2
Hard Drive	SEAGATE 40G, Quantity: 1
CD ROM	Cyber CD526D, Quantity: 1
Floppy Drive	Mitsumi D359M3, Quantity: 1
AGP Card	Albatron FX5200, Quantity: 1
PCI-Sound Card	ESS SC1938, Quantity: 1
PCI-Lan Card	D-LINK DFE-530TX, Quantity: 1
PCI-Modem Card	GM56-AMI2019, Quantity: 1

3.2 Test Equipment Used

FULL SYSTEM OPERATION
Fluke Hydra 2635A
Software: Intel P4 Prescott MAXPOWER (85% & 100%)

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

- The tests intends to understand what different from the test results between run trace software 85% level and 100%, and disconnect PCI card and connect 3 x 8w PCI card?.
  We may try to compare the test result of mode 1,2 and 3,4. We found the chassis do provide a good ambient (Tambient) with its thermal performance however on 85% or 100%. And the AGP card's temperature may rise up about 7℃ when the system connected 3 x PCI cards, however both result is PASS to the spec.

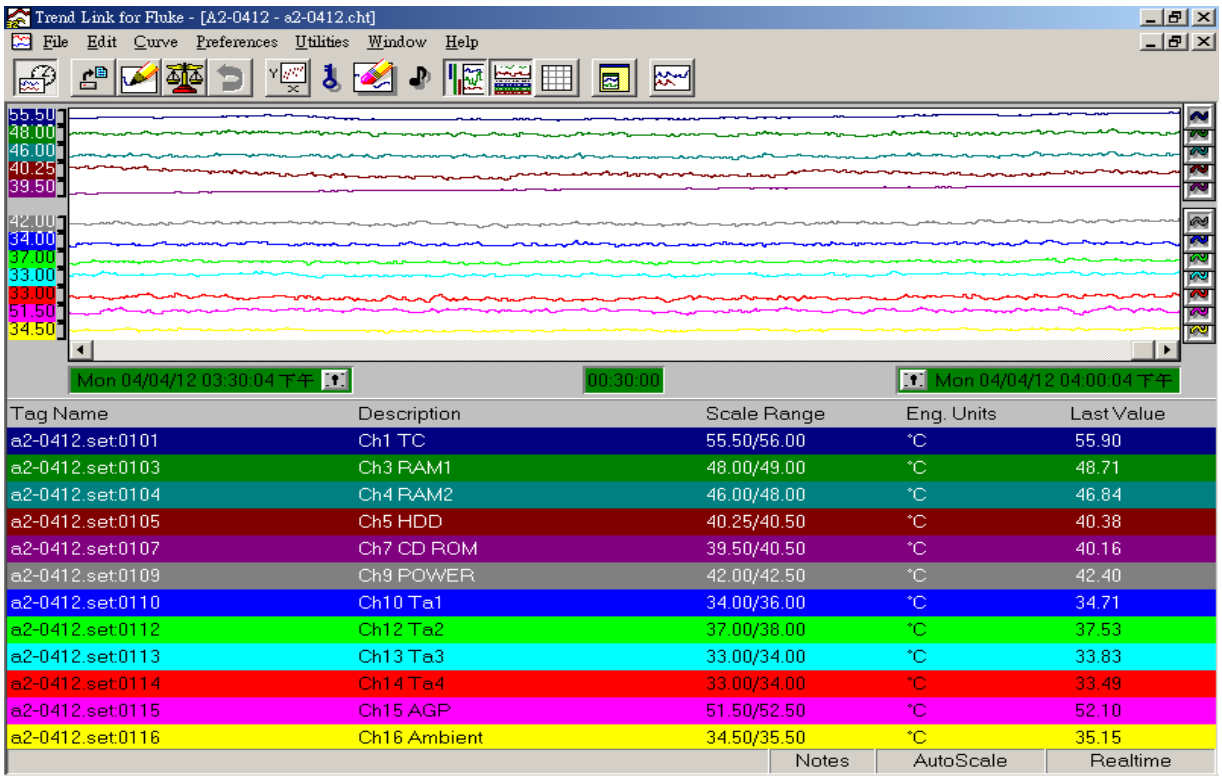
- The tests intends to understand how thermal solution improved if the chassis have engineering changes to meet CAG design guide rev.1.1?
  We may try to compare the test result of mode 4 and mode 5. We found the chassis meets CAG design guide rev.1.0 have 2.4℃ up(Tambient vs. Ambient). And Tambient is keeping the same as Ambient in the chassis meets CAG design guide rev.1.1. It shown the CAG rev.1.1 design guide provided thermal advantages.

- The test s intends to understand what different if we installed difference fan speed of system fans? Some customers maybe care the acoustic issues.
  We may try to compare the test result of mode 4 and mode 6. We found the chassis built low speed system fan (mode 6) may rise Tambient up about 1.7℃ compare to the system built in middle-speed system fan. However both result is PASS to the spec. We suggest customer may decide to select low speed or middle speed depends on the system configuration and acoustic requirement.

- The test s intends to understand how is the result in the **worse case of normal operation**? we try to test it in ambient **30℃**.
  We may try to compare the test result of mode 4 and mode 7. We found the Tambient is keeping the same as Ambient in the chassis meets CAG design guide rev.1.1. It again shown the CAG rev.1.1 design guide provided thermal advantages.

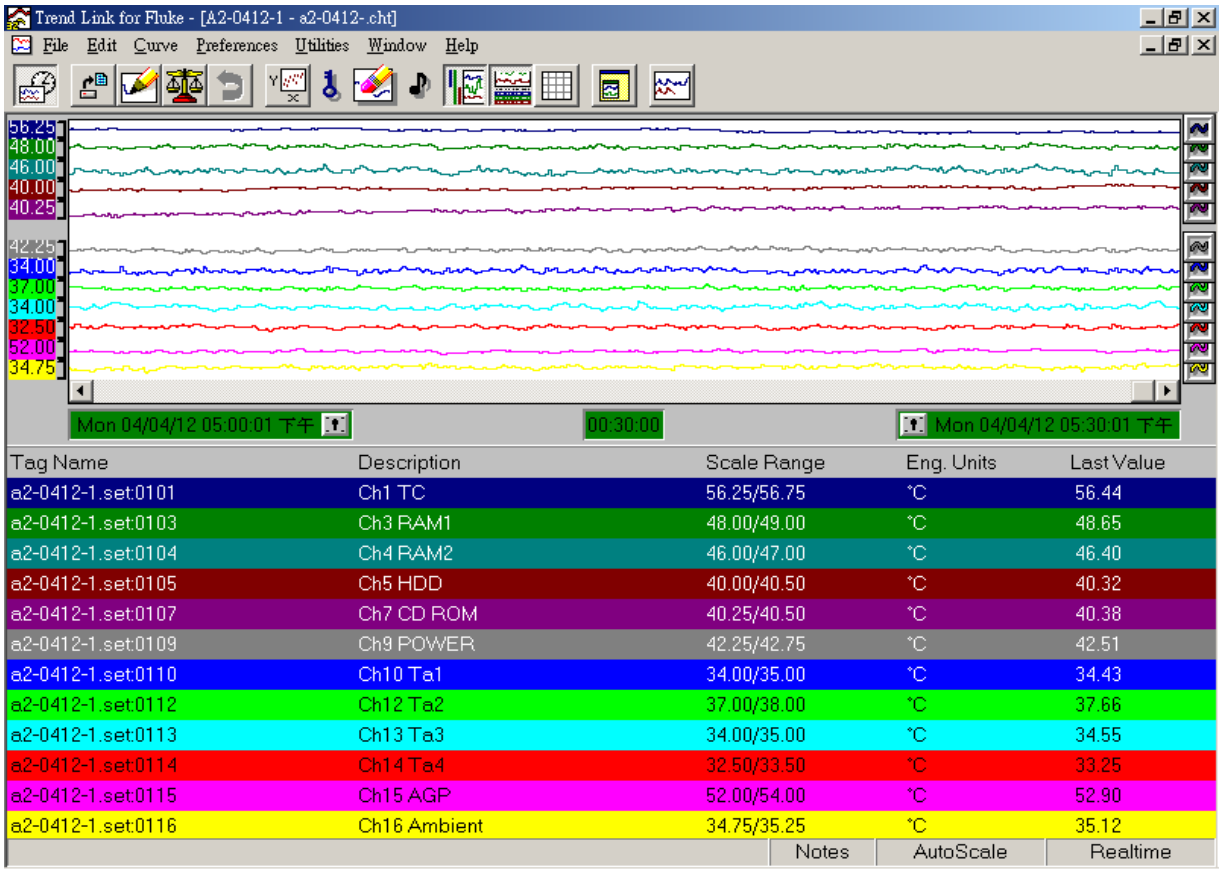
Table 4.1
Date:Apr.13.2004

Mode Introductions	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7
Power Model	Delta GPS-350BB-100A (with 12cm Fan for airflow in, vents for air flow out)						
System Fan (Mounted in rear side of chassis)	Yes- M Speed	Yes- M Speed	Yes- M Speed	Yes- M Speed	Yes- M Speed	Yes- L Speed	Yes- M Speed
System Fan - low speed (Mounted in front side of chassis)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Airguide CAG1.1	Yes	Yes	Yes	Yes	CAG1.0	Yes	Yes
PCI Card Install	Disconnect	Disconnect	Yes	Yes	Yes	Yes	Yes
Run the test under the software on 85% or 100% level	85%	100%	85%	100%	100%	100%	100%
Test Result (values was according to the screens of Fluke monitor)							
DIMM-1	48.7	48.7	50.1	50.4	51.9	52	45.7
DIMM-2	46.8	46.4	48.5	48.4	49.7	50.1	44.4
HDD	40.4	40.3	41	40.8	40.2	41.6	36.7
CD ROM	40.2	40.4	41.1	41.1	39.7	43	36.2
POWER	42.4	42.5	43.2	43.2	45.7	44.6	38.4
AGP	52.1	52.9	60.3	60.2	69.4	65.3	54.5
T-inlet 1	34.7	34.4	34.9	34.6	38.5	36.9	29.5
T-inlet 2	37.5	37.7	37.8	37.7	40.2	39.1	32.6
T-inlet 3	33.8	34.6	34.5	34.3	36.3	36.5	29.1
T-inlet 4	33.5	33.3	34	33.6	35.1	34.7	29.1
T-inlets average Tambient(1~4)	34.9	35	35.3	35.1	37.5	36.8	30.1
T-case	55.9	56.4	56.4	56.9	58.2	58.1	52.5
Ambient(case outside)	35.2	35.1	35.1	35.1	35.1	35.1	30.1



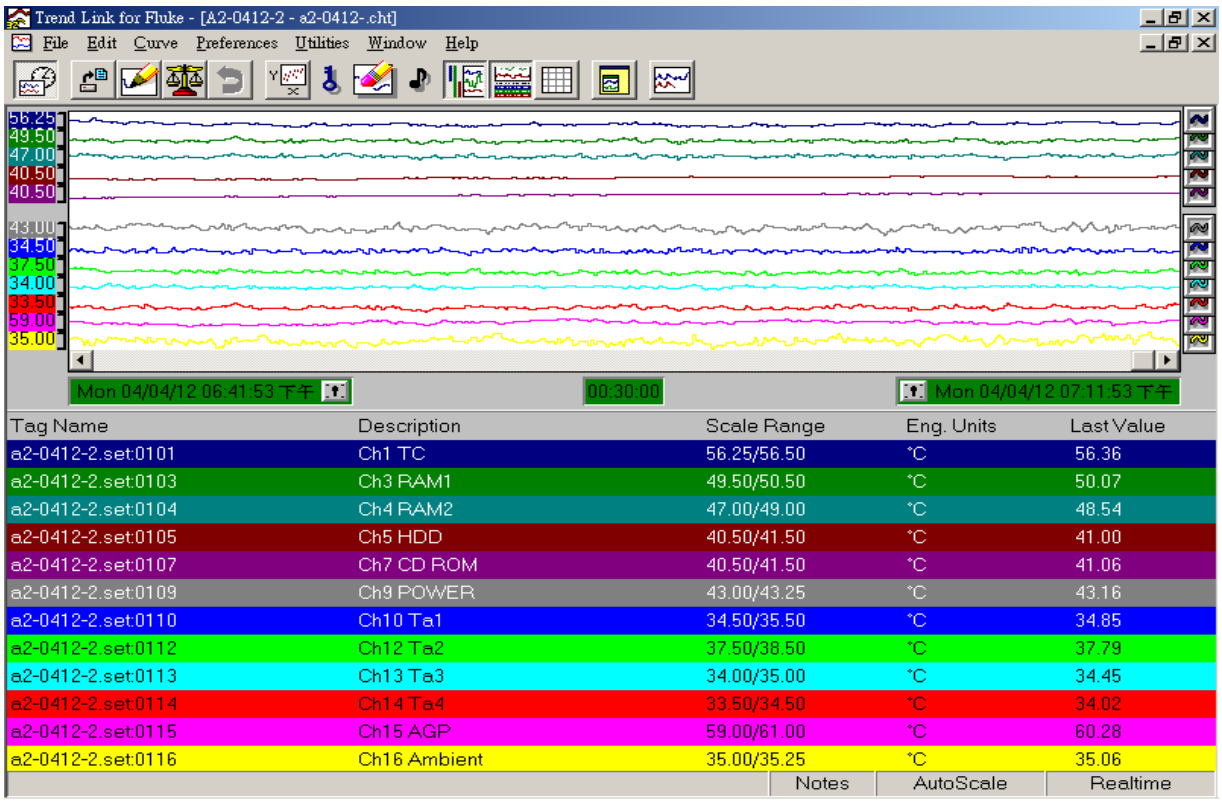
Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0412.set:0101	Ch1 TC	55.50/56.00	°C	55.90
a2-0412.set:0103	Ch3 RAM1	48.00/49.00	°C	48.71
a2-0412.set:0104	Ch4 RAM2	46.00/48.00	°C	46.84
a2-0412.set:0105	Ch5 HDD	40.25/40.50	°C	40.38
a2-0412.set:0107	Ch7 CD ROM	39.50/40.50	°C	40.16
a2-0412.set:0109	Ch9 POWER	42.00/42.50	°C	42.40
a2-0412.set:0110	Ch10 Ta1	34.00/36.00	°C	34.71
a2-0412.set:0112	Ch12 Ta2	37.00/38.00	°C	37.53
a2-0412.set:0113	Ch13 Ta3	33.00/34.00	°C	33.83
a2-0412.set:0114	Ch14 Ta4	33.00/34.00	°C	33.49
a2-0412.set:0115	Ch15 AGP	51.50/52.50	°C	52.10
a2-0412.set:0116	Ch16 Ambient	34.50/35.50	°C	35.15

Notes | AutoScale | Realtime



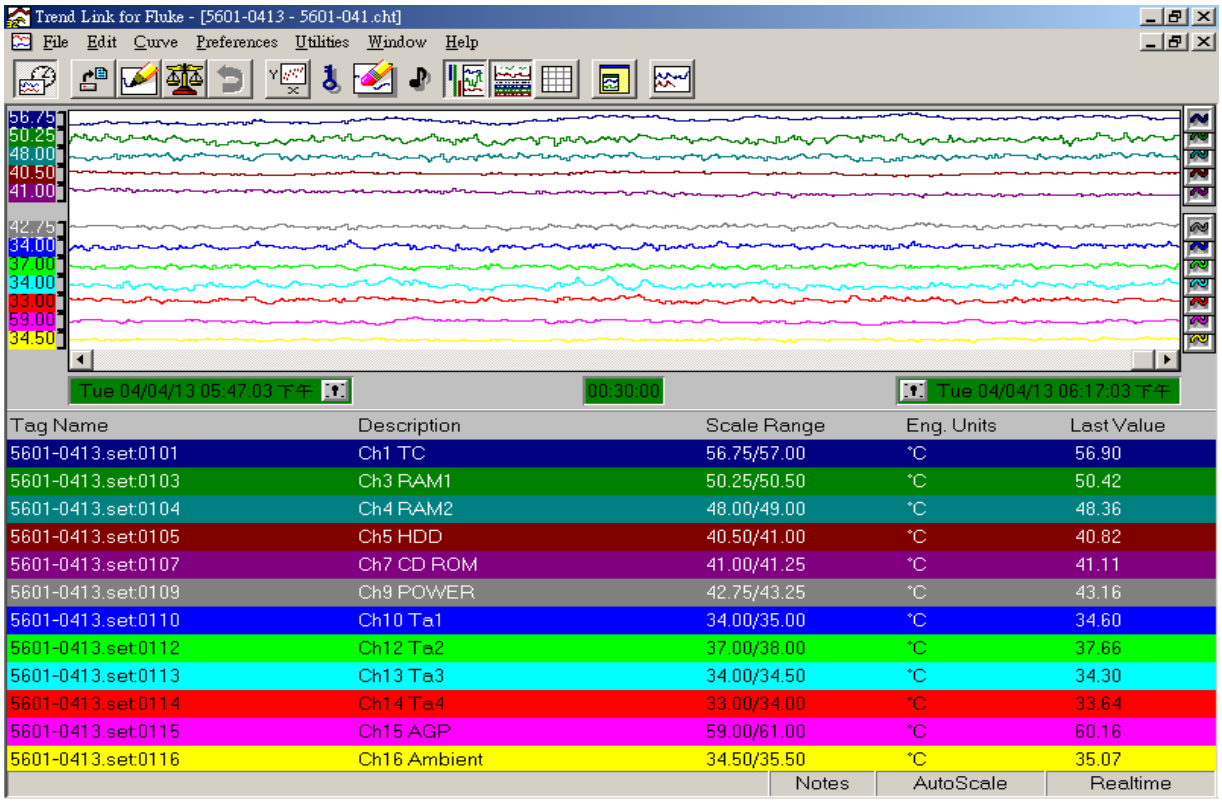
Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0412-1.set:0101	Ch1 TC	56.25/56.75	°C	56.44
a2-0412-1.set:0103	Ch3 RAM1	48.00/49.00	°C	48.65
a2-0412-1.set:0104	Ch4 RAM2	46.00/47.00	°C	46.40
a2-0412-1.set:0105	Ch5 HDD	40.00/40.50	°C	40.32
a2-0412-1.set:0107	Ch7 CD ROM	40.25/40.50	°C	40.38
a2-0412-1.set:0109	Ch9 POWER	42.25/42.75	°C	42.51
a2-0412-1.set:0110	Ch10 Ta1	34.00/35.00	°C	34.43
a2-0412-1.set:0112	Ch12 Ta2	37.00/38.00	°C	37.66
a2-0412-1.set:0113	Ch13 Ta3	34.00/35.00	°C	34.55
a2-0412-1.set:0114	Ch14 Ta4	32.50/33.50	°C	33.25
a2-0412-1.set:0115	Ch15 AGP	52.00/54.00	°C	52.90
a2-0412-1.set:0116	Ch16 Ambient	34.75/35.25	°C	35.12

Notes | AutoScale | Realtime



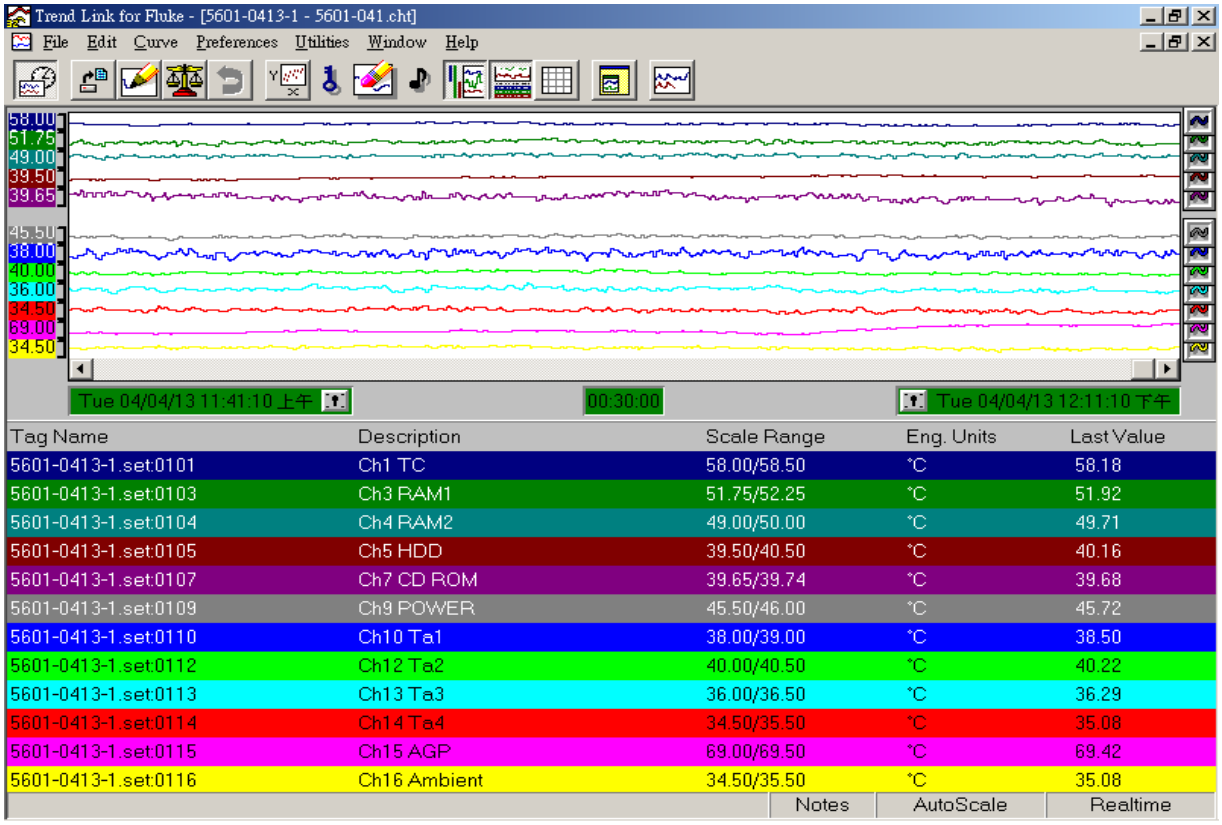
Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0412-2.set:0101	Ch1 TC	56.25/56.50	°C	56.36
a2-0412-2.set:0103	Ch3 RAM1	49.50/50.50	°C	50.07
a2-0412-2.set:0104	Ch4 RAM2	47.00/49.00	°C	48.54
a2-0412-2.set:0105	Ch5 HDD	40.50/41.50	°C	41.00
a2-0412-2.set:0107	Ch7 CD ROM	40.50/41.50	°C	41.06
a2-0412-2.set:0109	Ch9 POWER	43.00/43.25	°C	43.16
a2-0412-2.set:0110	Ch10 Ta1	34.50/35.50	°C	34.85
a2-0412-2.set:0112	Ch12 Ta2	37.50/38.50	°C	37.79
a2-0412-2.set:0113	Ch13 Ta3	34.00/35.00	°C	34.45
a2-0412-2.set:0114	Ch14 Ta4	33.50/34.50	°C	34.02
a2-0412-2.set:0115	Ch15 AGP	59.00/61.00	°C	60.28
a2-0412-2.set:0116	Ch16 Ambient	35.00/35.25	°C	35.06

Notes AutoScale Realtime



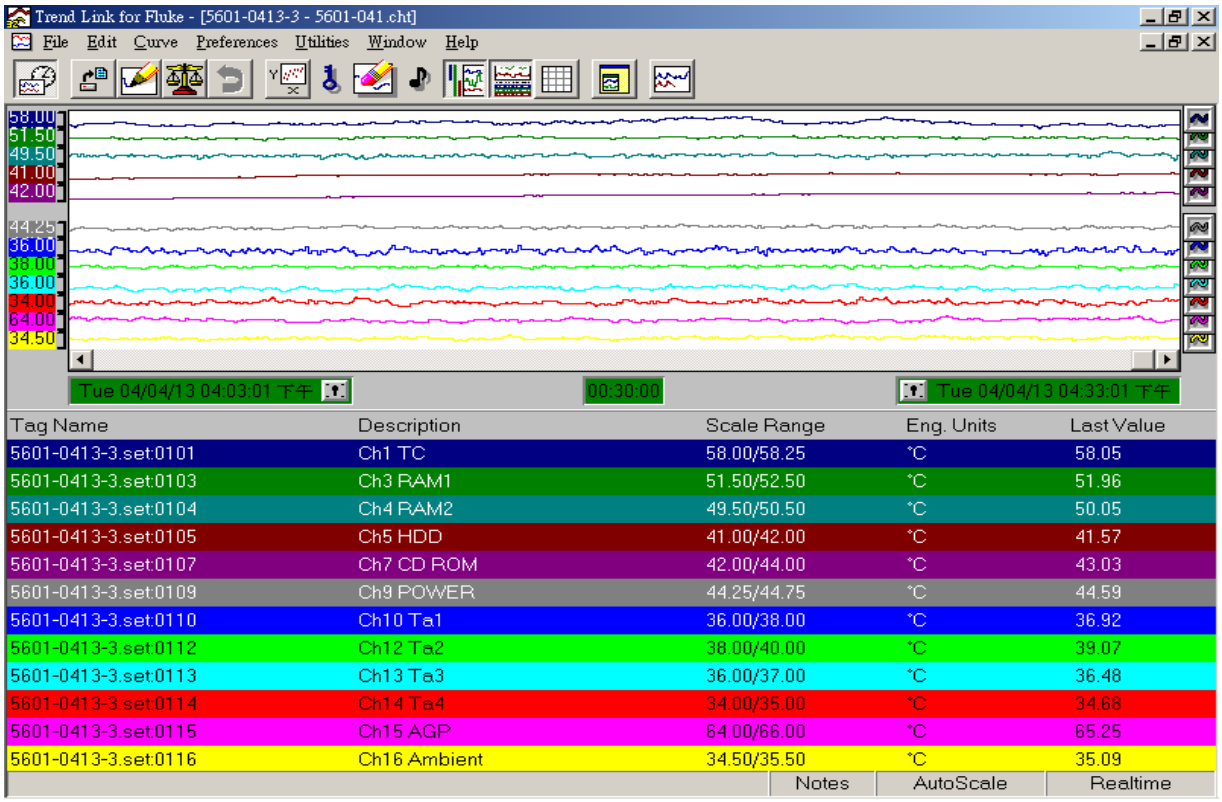
Tag Name	Description	Scale Range	Eng. Units	Last Value
5601-0413.set:0101	Ch1 TC	56.75/57.00	°C	56.90
5601-0413.set:0103	Ch3 RAM1	50.25/50.50	°C	50.42
5601-0413.set:0104	Ch4 RAM2	48.00/49.00	°C	48.36
5601-0413.set:0105	Ch5 HDD	40.50/41.00	°C	40.82
5601-0413.set:0107	Ch7 CD ROM	41.00/41.25	°C	41.11
5601-0413.set:0109	Ch9 POWER	42.75/43.25	°C	43.16
5601-0413.set:0110	Ch10 Ta1	34.00/35.00	°C	34.60
5601-0413.set:0112	Ch12 Ta2	37.00/38.00	°C	37.66
5601-0413.set:0113	Ch13 Ta3	34.00/34.50	°C	34.30
5601-0413.set:0114	Ch14 Ta4	33.00/34.00	°C	33.64
5601-0413.set:0115	Ch15 AGP	59.00/61.00	°C	60.16
5601-0413.set:0116	Ch16 Ambient	34.50/35.50	°C	35.07

Notes AutoScale Realtime



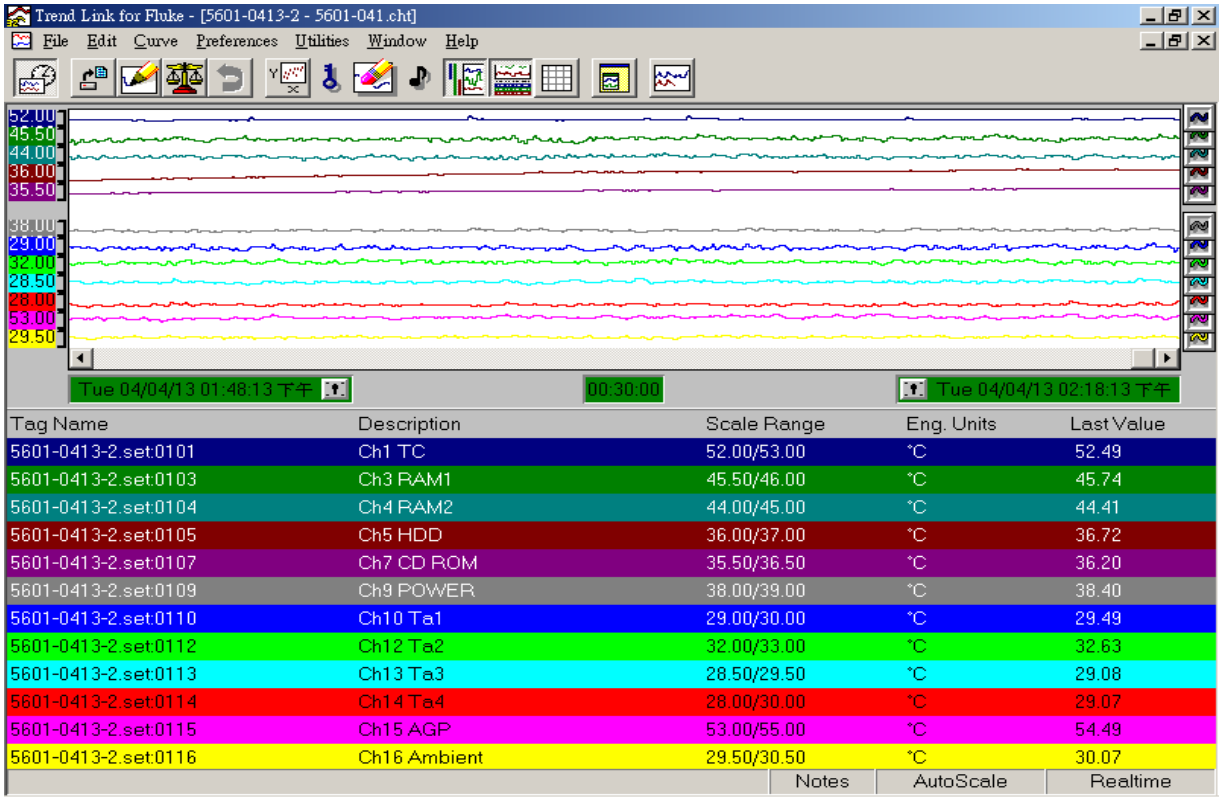
Tag Name	Description	Scale Range	Eng. Units	Last Value
5601-0413-1.set:0101	Ch1 TC	58.00/58.50	°C	58.18
5601-0413-1.set:0103	Ch3 RAM1	51.75/52.25	°C	51.92
5601-0413-1.set:0104	Ch4 RAM2	49.00/50.00	°C	49.71
5601-0413-1.set:0105	Ch5 HDD	39.50/40.50	°C	40.16
5601-0413-1.set:0107	Ch7 CD ROM	39.65/39.74	°C	39.68
5601-0413-1.set:0109	Ch9 POWER	45.50/46.00	°C	45.72
5601-0413-1.set:0110	Ch10 Ta1	38.00/39.00	°C	38.50
5601-0413-1.set:0112	Ch12 Ta2	40.00/40.50	°C	40.22
5601-0413-1.set:0113	Ch13 Ta3	36.00/36.50	°C	36.29
5601-0413-1.set:0114	Ch14 Ta4	34.50/35.50	°C	35.08
5601-0413-1.set:0115	Ch15 AGP	69.00/69.50	°C	69.42
5601-0413-1.set:0116	Ch16 Ambient	34.50/35.50	°C	35.08

Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
5601-0413-3.set:0101	Ch1 TC	58.00/58.25	°C	58.05
5601-0413-3.set:0103	Ch3 RAM1	51.50/52.50	°C	51.96
5601-0413-3.set:0104	Ch4 RAM2	49.50/50.50	°C	50.05
5601-0413-3.set:0105	Ch5 HDD	41.00/42.00	°C	41.57
5601-0413-3.set:0107	Ch7 CD ROM	42.00/44.00	°C	43.03
5601-0413-3.set:0109	Ch9 POWER	44.25/44.75	°C	44.59
5601-0413-3.set:0110	Ch10 Ta1	36.00/38.00	°C	36.92
5601-0413-3.set:0112	Ch12 Ta2	38.00/40.00	°C	39.07
5601-0413-3.set:0113	Ch13 Ta3	36.00/37.00	°C	36.48
5601-0413-3.set:0114	Ch14 Ta4	34.00/35.00	°C	34.68
5601-0413-3.set:0115	Ch15 AGP	64.00/66.00	°C	65.25
5601-0413-3.set:0116	Ch16 Ambient	34.50/35.50	°C	35.09

Notes AutoScale Realtime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File Edit Curve Preferences Utilities Window Help
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45.50
44.00
36.00
35.50
38.00
29.00
32.00
28.50
28.00
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29.50
Tue 04/04/13 01:48:13 下午
00:30:00
Tue 04/04/13 02:18:13 下午
Tag Name | Description | Scale Range | Eng. Units | Last Value
5601-0413-2.set:0101 | Ch1 TC | 52.00/53.00 | °C | 52.49
5601-0413-2.set:0103 | Ch3 RAM1 | 45.50/46.00 | °C | 45.74
5601-0413-2.set:0104 | Ch4 RAM2 | 44.00/45.00 | °C | 44.41
5601-0413-2.set:0105 | Ch5 HDD | 36.00/37.00 | °C | 36.72
5601-0413-2.set:0107 | Ch7 CD ROM | 35.50/36.50 | °C | 36.20
5601-0413-2.set:0109 | Ch9 POWER | 38.00/39.00 | °C | 38.40
5601-0413-2.set:0110 | Ch10 Ta1 | 29.00/30.00 | °C | 29.49
5601-0413-2.set:0112 | Ch12 Ta2 | 32.00/33.00 | °C | 32.63
5601-0413-2.set:0113 | Ch13 Ta3 | 28.50/29.50 | °C | 29.08
5601-0413-2.set:0114 | Ch14 Ta4 | 28.00/30.00 | °C | 29.07
5601-0413-2.set:0115 | Ch15 AGP | 53.00/55.00 | °C | 54.49
5601-0413-2.set:0116 | Ch16 Ambient | 29.50/30.50 | °C | 30.07
Notes
AutoScale
Realtime

Table 4.2

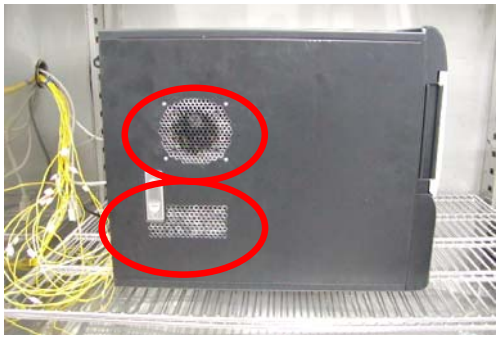
	The view of the chassis front side.
	The view of chassis right side.
	The view of the chassis left side.
	The view of the chassis back side.

The view of the thermocouples connections.

The view of Air Guide, meets CAG 1.1 (the diameter of guide is enlarged)
The tested unit is a Prototype

The view of CPU Vents - before Engineering Change for CAG1.1

Called CAG1.0, i.e. the design meets CAG design guide rev.1.0



The view of CPU Vents & PCI Vents, meet CAG 1.1 (bigger Air Guide venting area and add vents for AGP, PCI area)