Thermal Test Report
Model : YY-A202
Thermal Performance Contest

Date:Apr.09, 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-A202
Power Supply	Enhance ENP-2725H
Chassis Fan	TOP DF1206BH, Hi Speed: 4400RPM, Quantity:2 TOP DF1206BM, Middle Speed: 3700RPM, Quantity: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	Model 1~8 :AUSU P4P800-VM Model 9~10 :GIGABYTE 8IPE1000MK
Memory	Kingston DDR400 512MB, Quantity: 2
Hard Drive	SEAGATE 40G, Quantity: 1
CD ROM	Cyber CD526D, Quantity: 1
Floppy Drive	Mitsumi D359M3, Quantity: 1
PCI :AGP Card	Albatron FX5200, Quantity: 1
PCI: Sound Card	ESS SC1938, Quantity: 1
PCI: Lan Card	D-LINK DFE-530TX, 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

- ***Test Result (see table 4.1), & Test mode details (Table 4.2)***

- ***Summary: PASS***

In the conditions of the system must build two pieces of system fans in hi-speed; in the meanwhile to compliant with CAG1.1 design.

- 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?.
  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%.

- The tests intends to understand how thermal solution improved if the chassis have engineering changes to meet CAG design guide rev.1.1?
  To compare the test result of mode 4 and mode 6. We found the chassis meets CAG design guide rev.1.0 may not meet Ta38℃. It shown the CAG rev.1.1 design guide provided thermal advantages.

- The tests intends to understand what different if we installed difference fan speed of system fans? Some customers maybe care the acoustic issues.
  To compare the test result of mode 4 and mode 8. We found the chassis built low speed system fan (mode 8) may not meet Ta38℃.

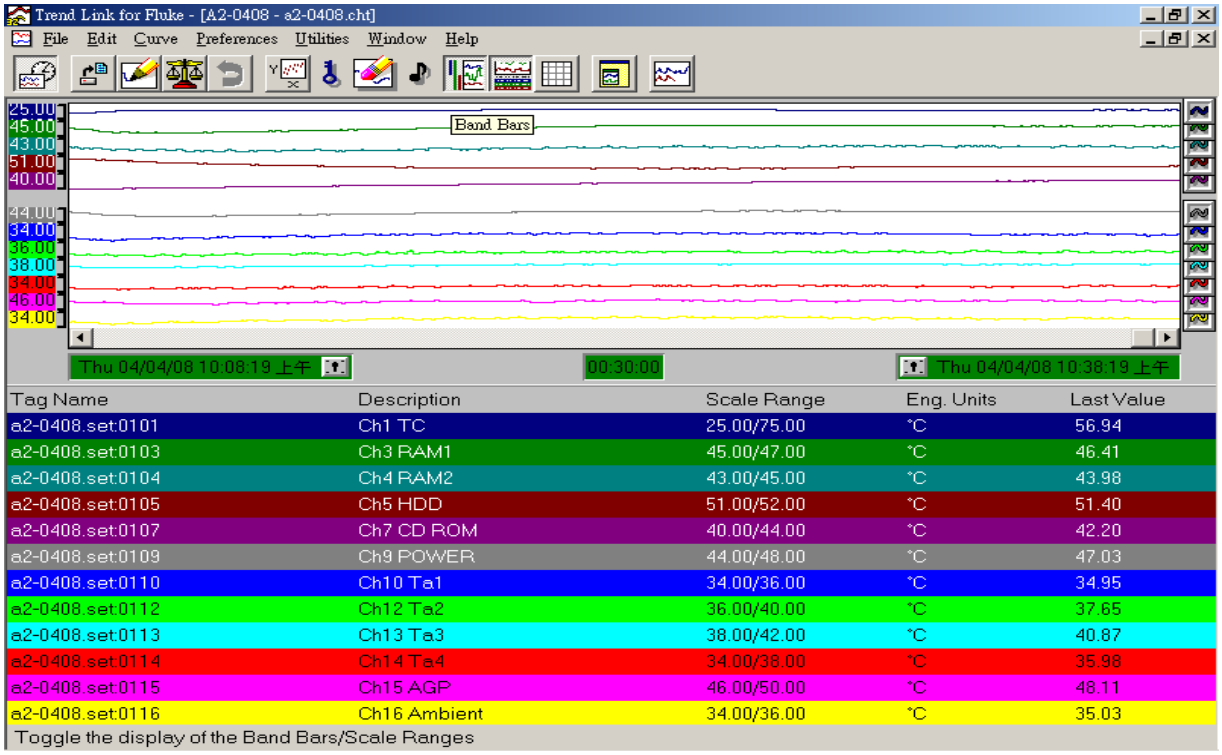
- The test s intends to understand how is the result in the **worse case of normal operation**? we try to test it in ambient **30℃**.
  We may try to compare the test result of mode 4 and mode 5. It certainly meet Ta38℃, so we suggest customer may keep use low-speed fans to have better acoustic result in the friendly operation.

- The test s intends to understand what impact to processor power and thermal result if just change another motherboard?.
  To compare the test result of mode 3,4 and mode 9,10. Both meet Ta38℃, and Tambient, Tcase….all measured values got changed, it shown the different system may deliver different thermal profile.

Table 4.1
Date:Apr.09.2004

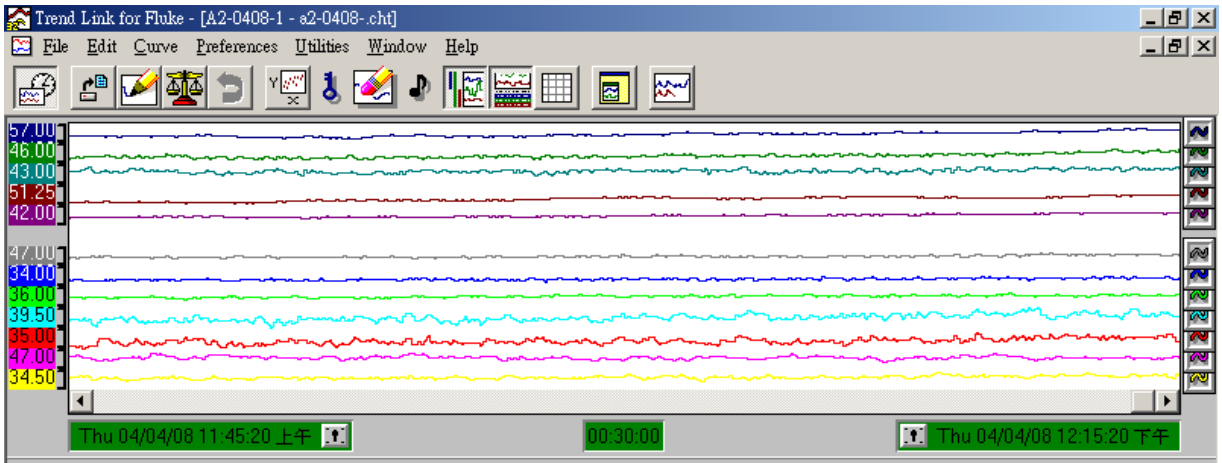
Position	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6
Panel	02	02	02	02	02	02(A2CN)
Power Model	Enhance ENP-2725H (with 8cm Fan for airflow in, vents for air flow out)					
System Fan (Mounted in rear side of chassis)	TOP DF1206BH					
Airguide (CAG1.1)	Yes	Yes	Yes	Yes	Yes	CAG1.0
PCI Card Install	Disconnect	Disconnect	Yes	Yes	Yes	Yes
Run the test under the software on 85% or 100% level	85%	100%	85%	100%	100%	100%
DIMM-1	46.4	46.4	46.4	46.6	41.8	46
DIMM-2	44	43.8	43.6	44.1	39.1	45.2
HDD	51.4	51.5	51.3	51.5	45.9	49.3
CD ROM	42.2	42.3	42.3	42.4	37.3	40.2
POWER	47	47.6	47.1	47.5	42.8	48.6
AGP	48.1	48.2	50.3	51	46.3	45.9
T-inlet 1	35	34.9	34.9	35.1	29.7	38.3
T-inlet 2	37.7	38.6	37.6	40.1	32.8	41.4
T-inlet 3	40.9	39.8	40.1	39.4	34.2	39.4
T-inlet 4	36	35.3	35.6	35.5	30.5	35.5
T-inlets average Tambient(1~4)	37.4	37.2	37.1	37.5	31.8	38.7
T-case	56.9	57.3	56.9	57.4	53.7	59
Ambient(case outside)	35	35.2	35.1	35.1	30.1	35

Position	Mode 7	Mode 8	Mode 9	Mode 10
Panel	06	02	02	02
Power Model	Enhance ENP-2725H (with 8cm Fan for airflow in, vents for air flow out)			
Fan Model	TOP DF1206BH	TOP DF1206BM	TOP DF1206BH	
Airguide (CAG1.1)	Yes	Yes	Yes	Yes
PCI Card Install	Yes	Yes	Yes	Yes
Run the test under the software on 85% or 100% level	100%	100%	85%	100%
DIMM-1	46.9	49.7	49.2	49.1
DIMM-2	44.2	46.2	44.9	44.7
HDD	52.1	53.8	50.8	51.4
CD ROM	42.5	45.1	41.1	41.1
POWER	47.8	49	46.1	46.6
AGP	50.7	63.2	50.9	50.9
T-inlet 1	35.3	37.7	34.7	34.4
T-inlet 2	38.2	41.6	37.6	37.3
T-inlet 3	41.2	41.9	40.4	40.3
T-inlet 4	36.4	37.5	35.3	34.6
T-inlets average Tambient(1~4)	37.8	39.7	37	36.7
T-case	57.9	59.6	55.6	56.3
Ambient(case outside)	35.1	35.1	35.1	35



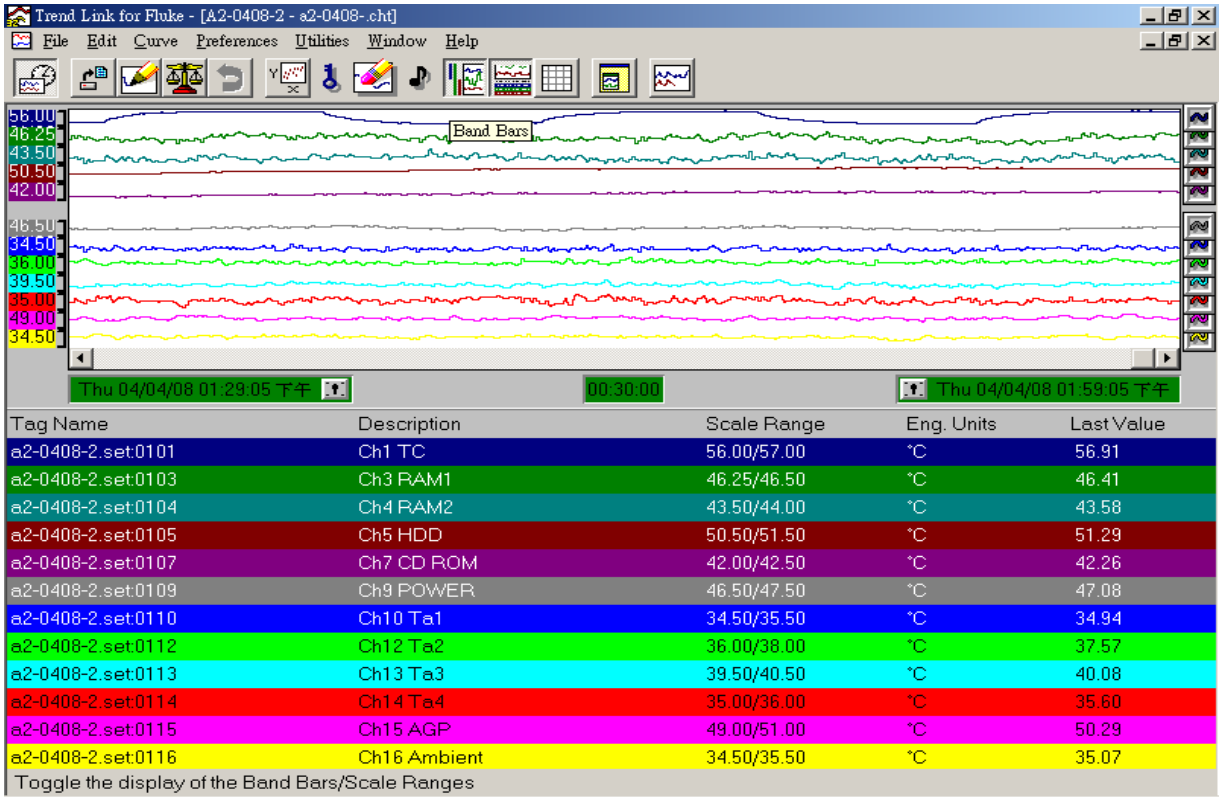
Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0408.set:0101	Ch1 TC	25.00/75.00	°C	56.94
a2-0408.set:0103	Ch3 RAM1	45.00/47.00	°C	46.41
a2-0408.set:0104	Ch4 RAM2	43.00/45.00	°C	43.98
a2-0408.set:0105	Ch5 HDD	51.00/52.00	°C	51.40
a2-0408.set:0107	Ch7 CD ROM	40.00/44.00	°C	42.20
a2-0408.set:0109	Ch9 POWER	44.00/48.00	°C	47.03
a2-0408.set:0110	Ch10 Ta1	34.00/36.00	°C	34.95
a2-0408.set:0112	Ch12 Ta2	36.00/40.00	°C	37.65
a2-0408.set:0113	Ch13 Ta3	38.00/42.00	°C	40.87
a2-0408.set:0114	Ch14 Ta4	34.00/38.00	°C	35.98
a2-0408.set:0115	Ch15 AGP	46.00/50.00	°C	48.11
a2-0408.set:0116	Ch16 Ambient	34.00/36.00	°C	35.03

Toggle the display of the Band Bars/Scale Ranges



Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0408-1.set:0101	Ch1 TC	57.00/57.50	°C	57.32
a2-0408-1.set:0103	Ch3 RAM1	46.00/46.50	°C	46.36
a2-0408-1.set:0104	Ch4 RAM2	43.00/44.00	°C	43.81
a2-0408-1.set:0105	Ch5 HDD	51.25/51.75	°C	51.49
a2-0408-1.set:0107	Ch7 CD ROM	42.00/42.50	°C	42.30
a2-0408-1.set:0109	Ch9 POWER	47.00/48.00	°C	47.56
a2-0408-1.set:0110	Ch10 Ta1	34.00/36.00	°C	34.87
a2-0408-1.set:0112	Ch12 Ta2	36.00/40.00	°C	38.57
a2-0408-1.set:0113	Ch13 Ta3	39.50/40.00	°C	39.80
a2-0408-1.set:0114	Ch14 Ta4	35.00/36.00	°C	35.34
a2-0408-1.set:0115	Ch15 AGP	47.00/49.00	°C	48.15
a2-0408-1.set:0116	Ch16 Ambient	34.50/35.50	°C	35.19

Notes | AutoScale | Realtime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Band Bars
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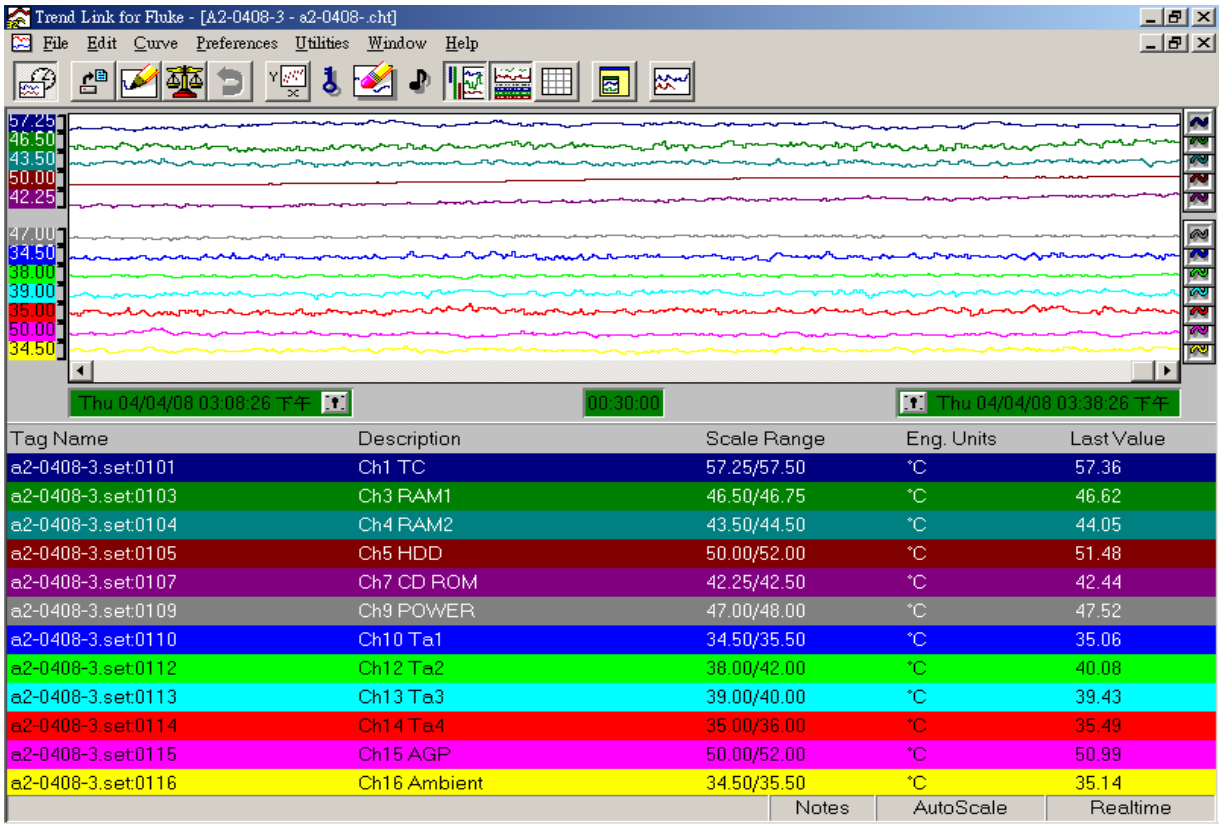
00:30:00
Thu 04/04/08 01:59:05 下午
Tag Name | Description | Scale Range | Eng. Units | Last Value
a2-0408-2.set:0101 | Ch1 TC | 56.00/57.00 | °C | 56.91
a2-0408-2.set:0103 | Ch3 RAM1 | 46.25/46.50 | °C | 46.41
a2-0408-2.set:0104 | Ch4 RAM2 | 43.50/44.00 | °C | 43.58
a2-0408-2.set:0105 | Ch5 HDD | 50.50/51.50 | °C | 51.29
a2-0408-2.set:0107 | Ch7 CD ROM | 42.00/42.50 | °C | 42.26
a2-0408-2.set:0109 | Ch9 POWER | 46.50/47.50 | °C | 47.08
a2-0408-2.set:0110 | Ch10 Ta1 | 34.50/35.50 | °C | 34.94
a2-0408-2.set:0112 | Ch12 Ta2 | 36.00/38.00 | °C | 37.57
a2-0408-2.set:0113 | Ch13 Ta3 | 39.50/40.50 | °C | 40.08
a2-0408-2.set:0114 | Ch14 Ta4 | 35.00/36.00 | °C | 35.60
a2-0408-2.set:0115 | Ch15 AGP | 49.00/51.00 | °C | 50.29
a2-0408-2.set:0116 | Ch16 Ambient | 34.50/35.50 | °C | 35.07
Toggle the display of the Band Bars/Scale Ranges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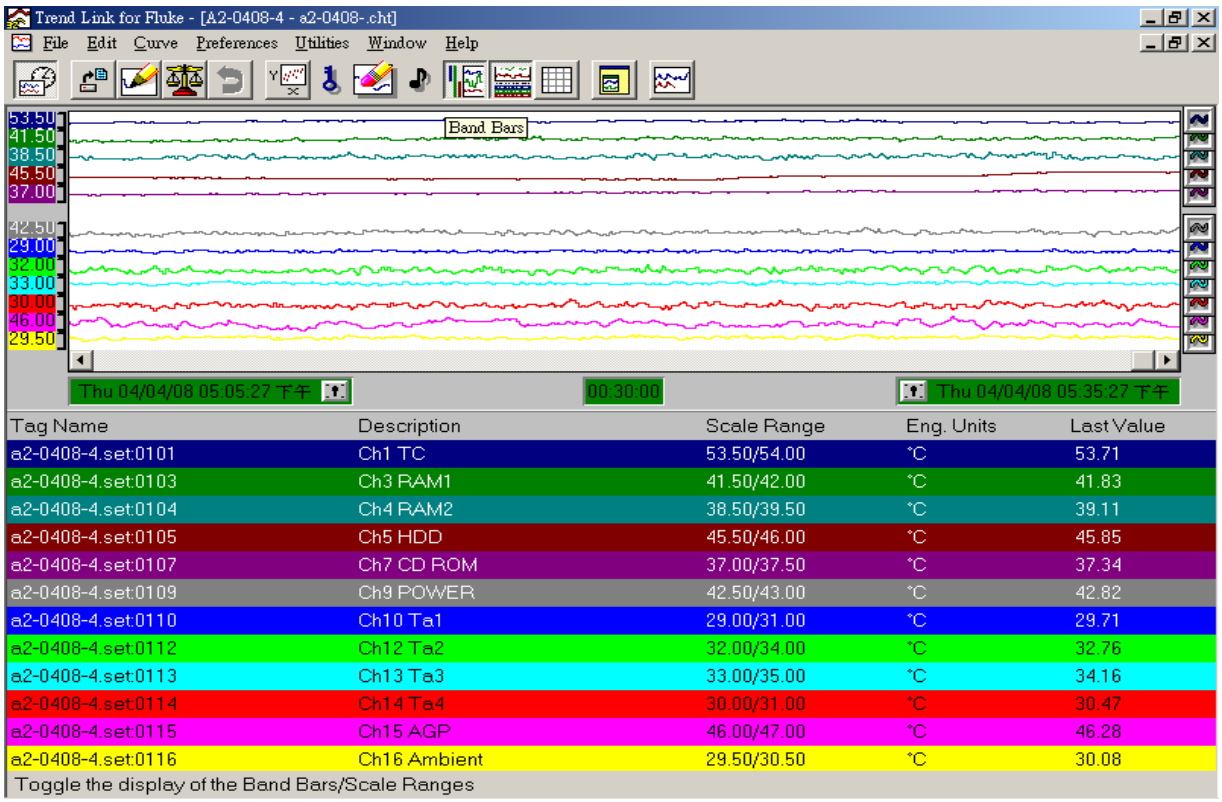
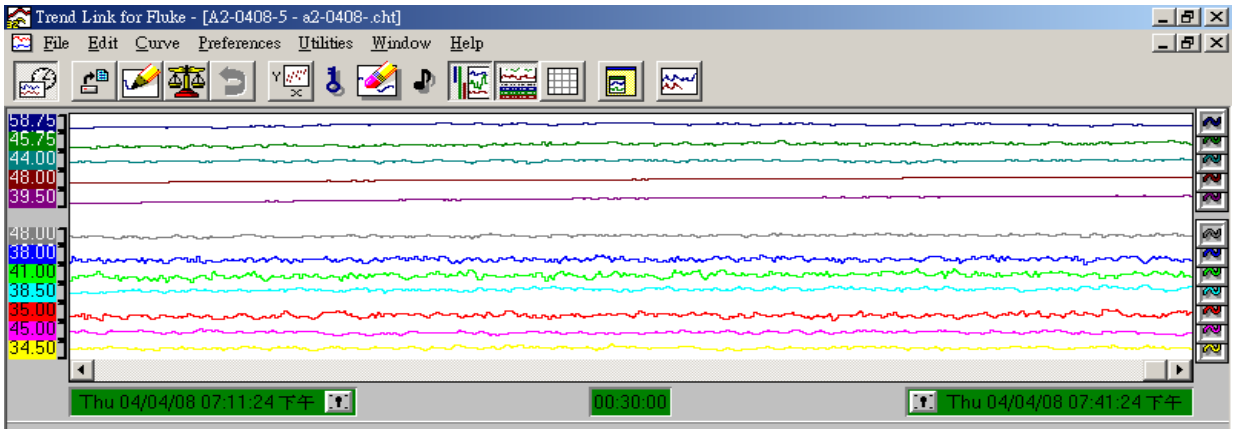
00:30:00
Thu 04/04/08 03:38:26 下午
Tag Name | Description | Scale Range | Eng. Units | Last Value
a2-0408-3.set:0101 | Ch1 TC | 57.25/57.50 | °C | 57.36
a2-0408-3.set:0103 | Ch3 RAM1 | 46.50/46.75 | °C | 46.62
a2-0408-3.set:0104 | Ch4 RAM2 | 43.50/44.50 | °C | 44.05
a2-0408-3.set:0105 | Ch5 HDD | 50.00/52.00 | °C | 51.48
a2-0408-3.set:0107 | Ch7 CD ROM | 42.25/42.50 | °C | 42.44
a2-0408-3.set:0109 | Ch9 POWER | 47.00/48.00 | °C | 47.52
a2-0408-3.set:0110 | Ch10 Ta1 | 34.50/35.50 | °C | 35.06
a2-0408-3.set:0112 | Ch12 Ta2 | 38.00/42.00 | °C | 40.08
a2-0408-3.set:0113 | Ch13 Ta3 | 39.00/40.00 | °C | 39.43
a2-0408-3.set:0114 | Ch14 Ta4 | 35.00/36.00 | °C | 35.49
a2-0408-3.set:0115 | Ch15 AGP | 50.00/52.00 | °C | 50.99
a2-0408-3.set:0116 | Ch16 Ambient | 34.50/35.50 | °C | 35.14
Notes AutoScale Realtime



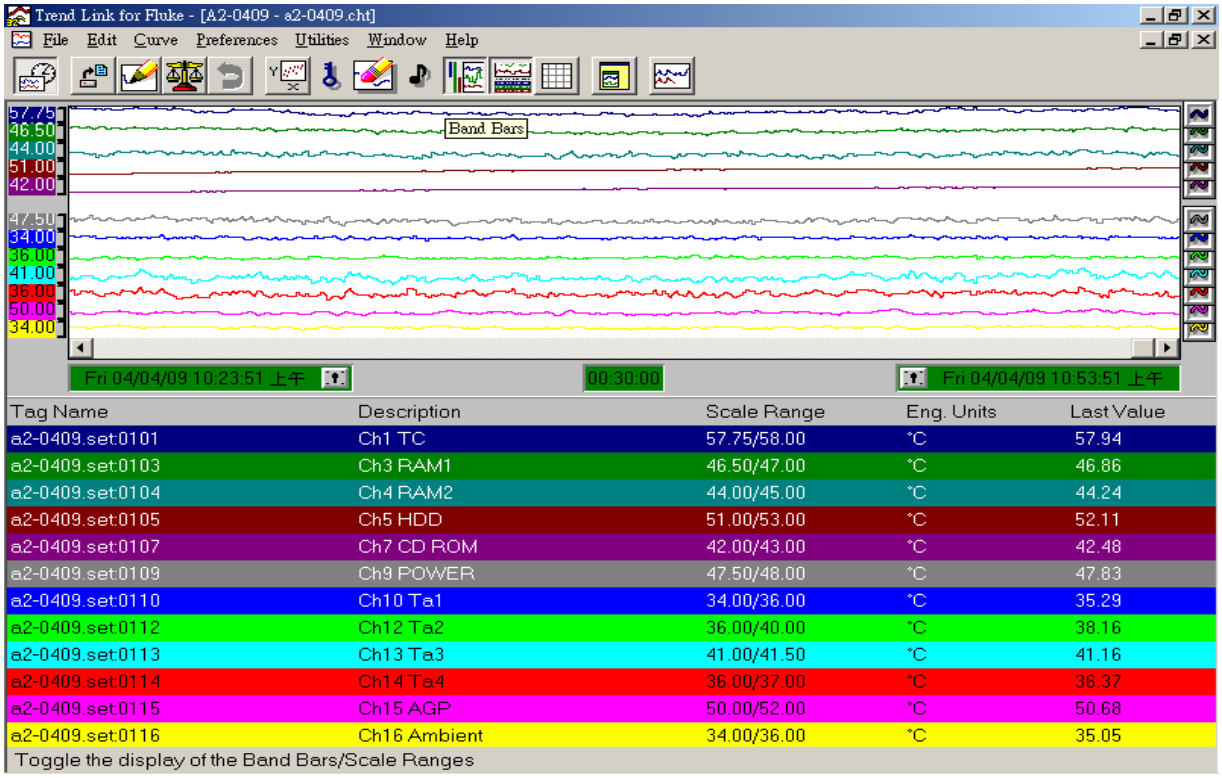
Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0408-4.set:0101	Ch1 TC	53.50/54.00	°C	53.71
a2-0408-4.set:0103	Ch3 RAM1	41.50/42.00	°C	41.83
a2-0408-4.set:0104	Ch4 RAM2	38.50/39.50	°C	39.11
a2-0408-4.set:0105	Ch5 HDD	45.50/46.00	°C	45.85
a2-0408-4.set:0107	Ch7 CD ROM	37.00/37.50	°C	37.34
a2-0408-4.set:0109	Ch9 POWER	42.50/43.00	°C	42.82
a2-0408-4.set:0110	Ch10 Ta1	29.00/31.00	°C	29.71
a2-0408-4.set:0112	Ch12 Ta2	32.00/34.00	°C	32.76
a2-0408-4.set:0113	Ch13 Ta3	33.00/35.00	°C	34.16
a2-0408-4.set:0114	Ch14 Ta4	30.00/31.00	°C	30.47
a2-0408-4.set:0115	Ch15 AGP	46.00/47.00	°C	46.28
a2-0408-4.set:0116	Ch16 Ambient	29.50/30.50	°C	30.08

Toggle the display of the Band Bars/Scale Ranges



Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0408-5.set:0101	Ch1 TC	58.75/59.25	°C	58.96
a2-0408-5.set:0103	Ch3 RAM1	45.75/46.25	°C	45.95
a2-0408-5.set:0104	Ch4 RAM2	44.00/46.00	°C	45.16
a2-0408-5.set:0105	Ch5 HDD	48.00/50.00	°C	49.29
a2-0408-5.set:0107	Ch7 CD ROM	39.50/40.50	°C	40.15
a2-0408-5.set:0109	Ch9 POWER	48.00/49.00	°C	48.57
a2-0408-5.set:0110	Ch10 Ta1	38.00/39.00	°C	38.27
a2-0408-5.set:0112	Ch12 Ta2	41.00/42.00	°C	41.36
a2-0408-5.set:0113	Ch13 Ta3	38.50/39.50	°C	39.39
a2-0408-5.set:0114	Ch14 Ta4	35.00/36.00	°C	35.52
a2-0408-5.set:0115	Ch15 AGP	45.00/47.00	°C	45.86
a2-0408-5.set:0116	Ch16 Ambient	34.50/35.50	°C	35.02

Notes AutoScale Realtime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Band Bars
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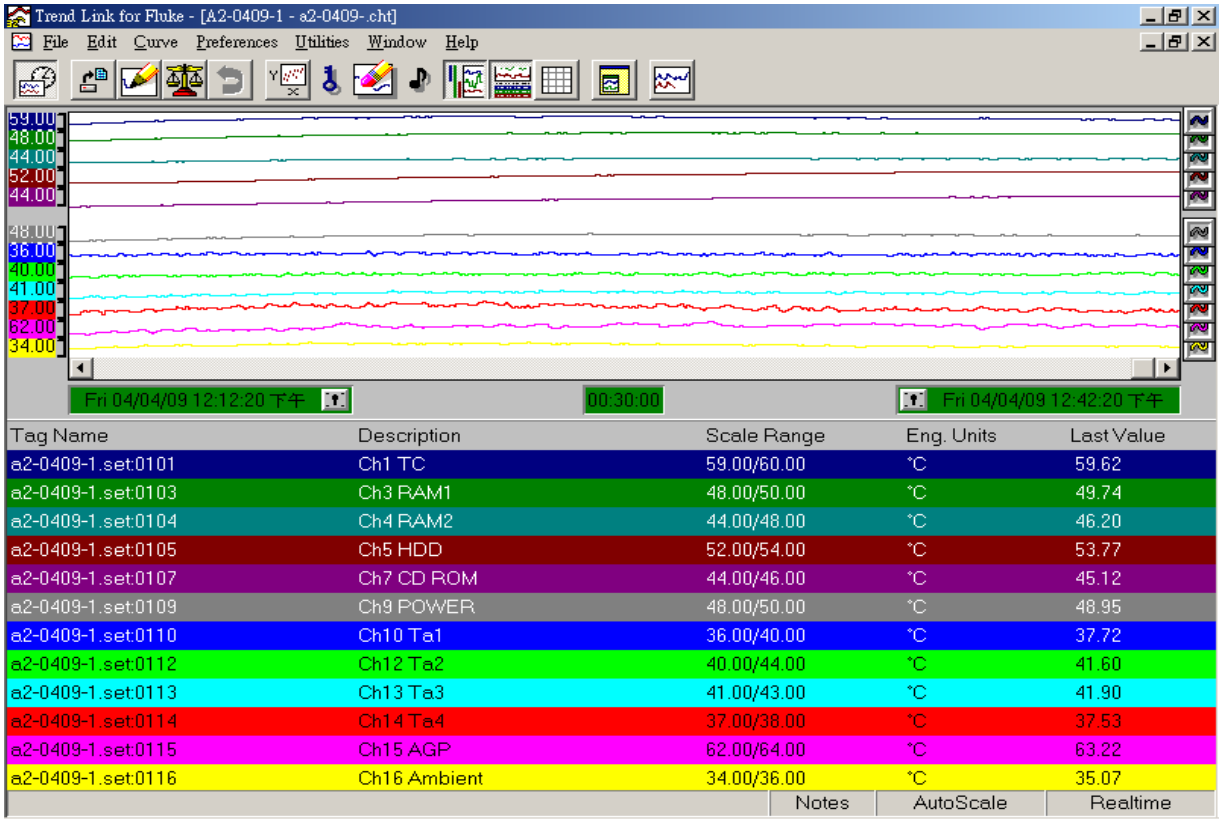
00:30:00
Fri 04/04/09 10:53:51 上午
Tag Name | Description | Scale Range | Eng. Units | Last Value
a2-0409.set:0101 | Ch1 TC | 57.75/58.00 | °C | 57.94
a2-0409.set:0103 | Ch3 RAM1 | 46.50/47.00 | °C | 46.86
a2-0409.set:0104 | Ch4 RAM2 | 44.00/45.00 | °C | 44.24
a2-0409.set:0105 | Ch5 HDD | 51.00/53.00 | °C | 52.11
a2-0409.set:0107 | Ch7 CD ROM | 42.00/43.00 | °C | 42.48
a2-0409.set:0109 | Ch9 POWER | 47.50/48.00 | °C | 47.83
a2-0409.set:0110 | Ch10 Ta1 | 34.00/36.00 | °C | 35.29
a2-0409.set:0112 | Ch12 Ta2 | 36.00/40.00 | °C | 38.16
a2-0409.set:0113 | Ch13 Ta3 | 41.00/41.50 | °C | 41.16
a2-0409.set:0114 | Ch14 Ta4 | 36.00/37.00 | °C | 36.37
a2-0409.set:0115 | Ch15 AGP | 50.00/52.00 | °C | 50.68
a2-0409.set:0116 | Ch16 Ambient | 34.00/36.00 | °C | 35.05
Toggle the display of the Band Bars/Scale Ranges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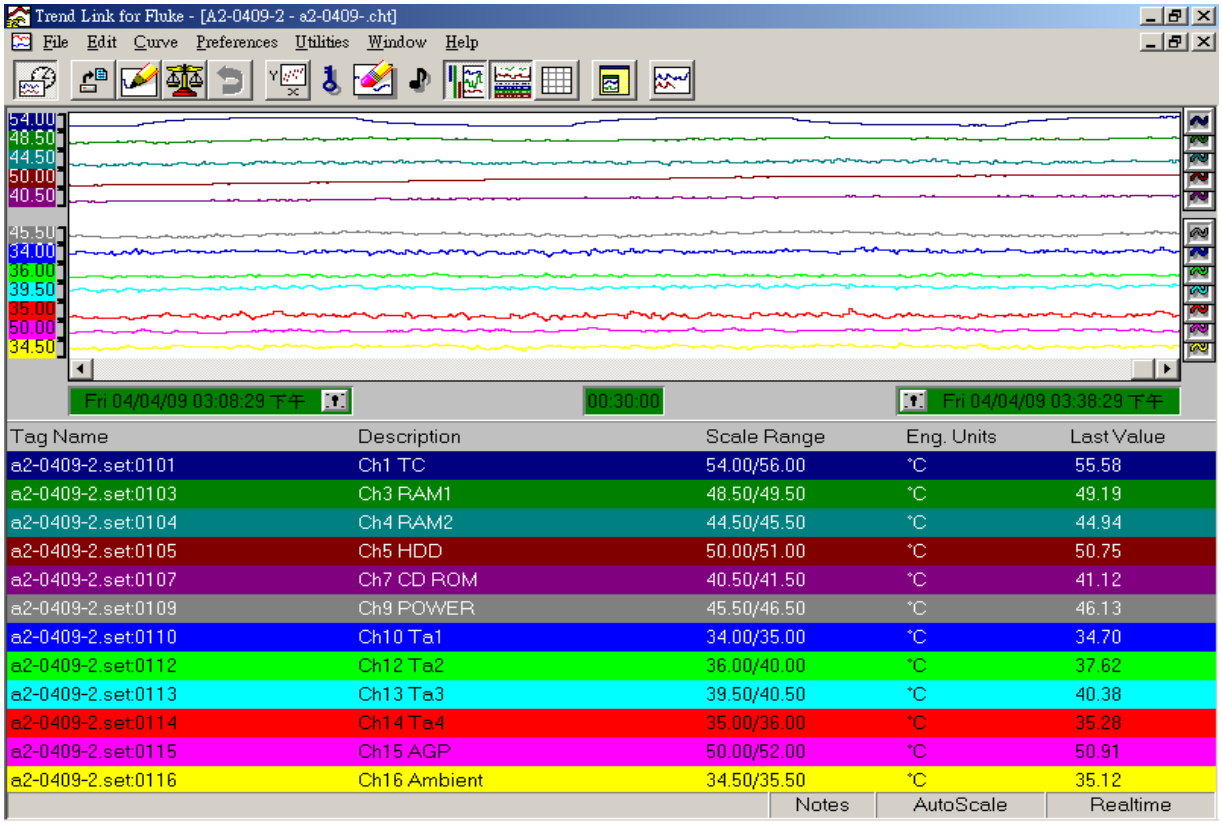
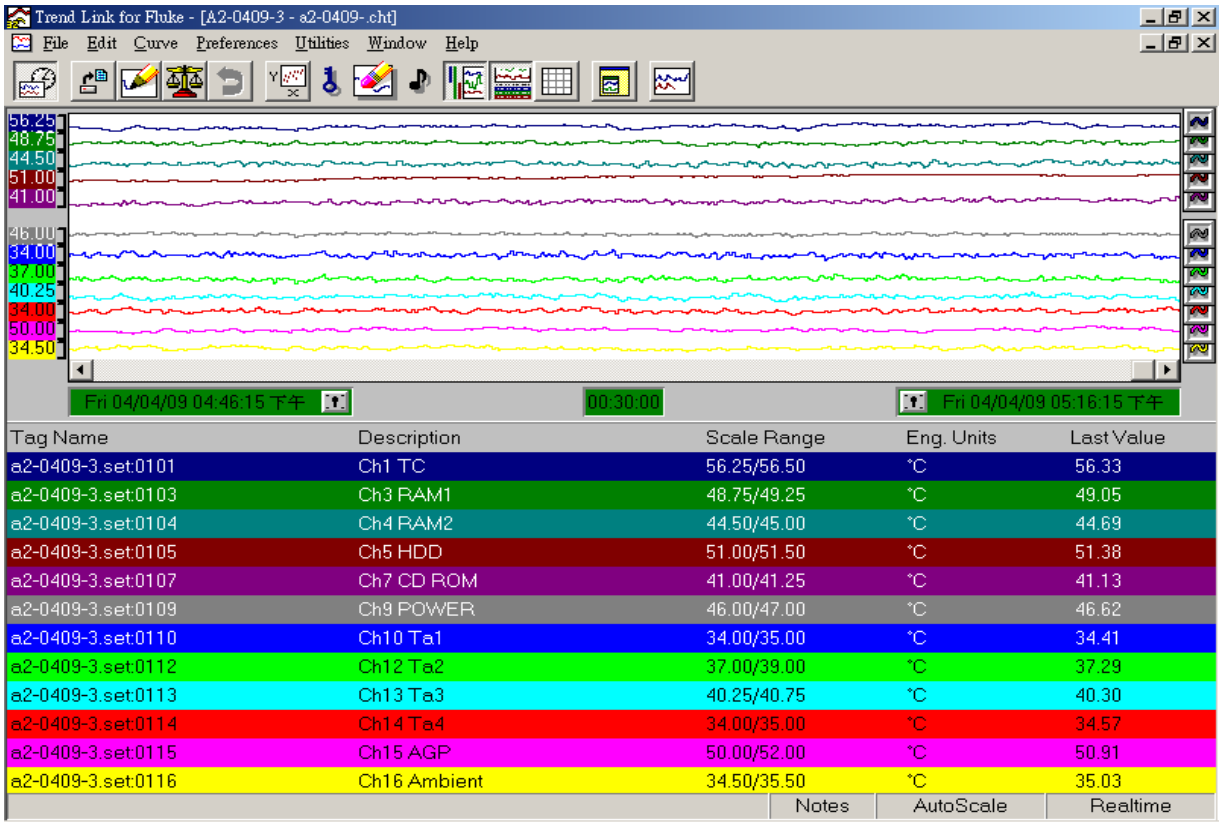
File Edit Curve Preferences Utilities Window Help
Fri 04/04/09 12:12:20 下午
00:30:00
Fri 04/04/09 12:42:20 下午
Tag Name | Description | Scale Range | Eng. Units | Last Value
a2-0409-1.set:0101 | Ch1 TC | 59.00/60.00 | °C | 59.62
a2-0409-1.set:0103 | Ch3 RAM1 | 48.00/50.00 | °C | 49.74
a2-0409-1.set:0104 | Ch4 RAM2 | 44.00/48.00 | °C | 46.20
a2-0409-1.set:0105 | Ch5 HDD | 52.00/54.00 | °C | 53.77
a2-0409-1.set:0107 | Ch7 CD ROM | 44.00/46.00 | °C | 45.12
a2-0409-1.set:0109 | Ch9 POWER | 48.00/50.00 | °C | 48.95
a2-0409-1.set:0110 | Ch10 Ta1 | 36.00/40.00 | °C | 37.72
a2-0409-1.set:0112 | Ch12 Ta2 | 40.00/44.00 | °C | 41.60
a2-0409-1.set:0113 | Ch13 Ta3 | 41.00/43.00 | °C | 41.90
a2-0409-1.set:0114 | Ch14 Ta4 | 37.00/38.00 | °C | 37.53
a2-0409-1.set:0115 | Ch15 AGP | 62.00/64.00 | °C | 63.22
a2-0409-1.set:0116 | Ch16 Ambient | 34.00/36.00 | °C | 35.07
Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0409-2.set:0101	Ch1 TC	54.00/56.00	°C	55.58
a2-0409-2.set:0103	Ch3 RAM1	48.50/49.50	°C	49.19
a2-0409-2.set:0104	Ch4 RAM2	44.50/45.50	°C	44.94
a2-0409-2.set:0105	Ch5 HDD	50.00/51.00	°C	50.75
a2-0409-2.set:0107	Ch7 CD ROM	40.50/41.50	°C	41.12
a2-0409-2.set:0109	Ch9 POWER	45.50/46.50	°C	46.13
a2-0409-2.set:0110	Ch10 Ta1	34.00/35.00	°C	34.70
a2-0409-2.set:0112	Ch12 Ta2	36.00/40.00	°C	37.62
a2-0409-2.set:0113	Ch13 Ta3	39.50/40.50	°C	40.38
a2-0409-2.set:0114	Ch14 Ta4	35.00/36.00	°C	35.28
a2-0409-2.set:0115	Ch15 AGP	50.00/52.00	°C	50.91
a2-0409-2.set:0116	Ch16 Ambient	34.50/35.50	°C	35.12

Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
a2-0409-3.set:0101	Ch1 TC	56.25/56.50	°C	56.33
a2-0409-3.set:0103	Ch3 RAM1	48.75/49.25	°C	49.05
a2-0409-3.set:0104	Ch4 RAM2	44.50/45.00	°C	44.69
a2-0409-3.set:0105	Ch5 HDD	51.00/51.50	°C	51.38
a2-0409-3.set:0107	Ch7 CD ROM	41.00/41.25	°C	41.13
a2-0409-3.set:0109	Ch9 POWER	46.00/47.00	°C	46.62
a2-0409-3.set:0110	Ch10 Ta1	34.00/35.00	°C	34.41
a2-0409-3.set:0112	Ch12 Ta2	37.00/39.00	°C	37.29
a2-0409-3.set:0113	Ch13 Ta3	40.25/40.75	°C	40.30
a2-0409-3.set:0114	Ch14 Ta4	34.00/35.00	°C	34.57
a2-0409-3.set:0115	Ch15 AGP	50.00/52.00	°C	50.91
a2-0409-3.set:0116	Ch16 Ambient	34.50/35.50	°C	35.03

Notes AutoScale Realtime

Table 4.2

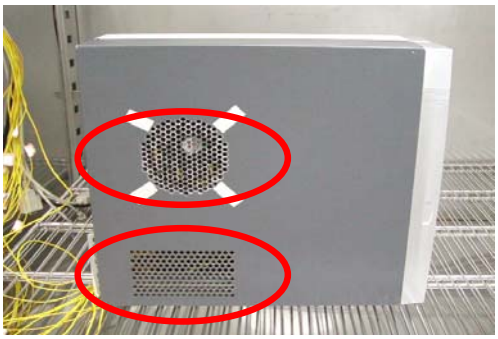
	The view of the chassis front side.
	The view of the chassis left side.
	The view of the chassis right side.
	The view of the chassis back side.

The view of thermocouples connections.

The view of 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

In this test, we used a modified side cover which some with some vents on PCI area that got the same concept as CAG1.1.



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