Thermal Test Report
Model : YY-3522
Thermal Performance Contest

Date:May.05, 2004

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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-3522
Power Supply	Delta GPS-300CN-100A
Chassis Fan	TOP DF1208BM Speed: 2600RPM(Middle Speed)
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	ASUS P4P800-VM
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

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 5.4℃ 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 2.1℃ up(Tambient vs. Tambient). It shown the CAG rev.1.1 design guide provided thermal advantages.

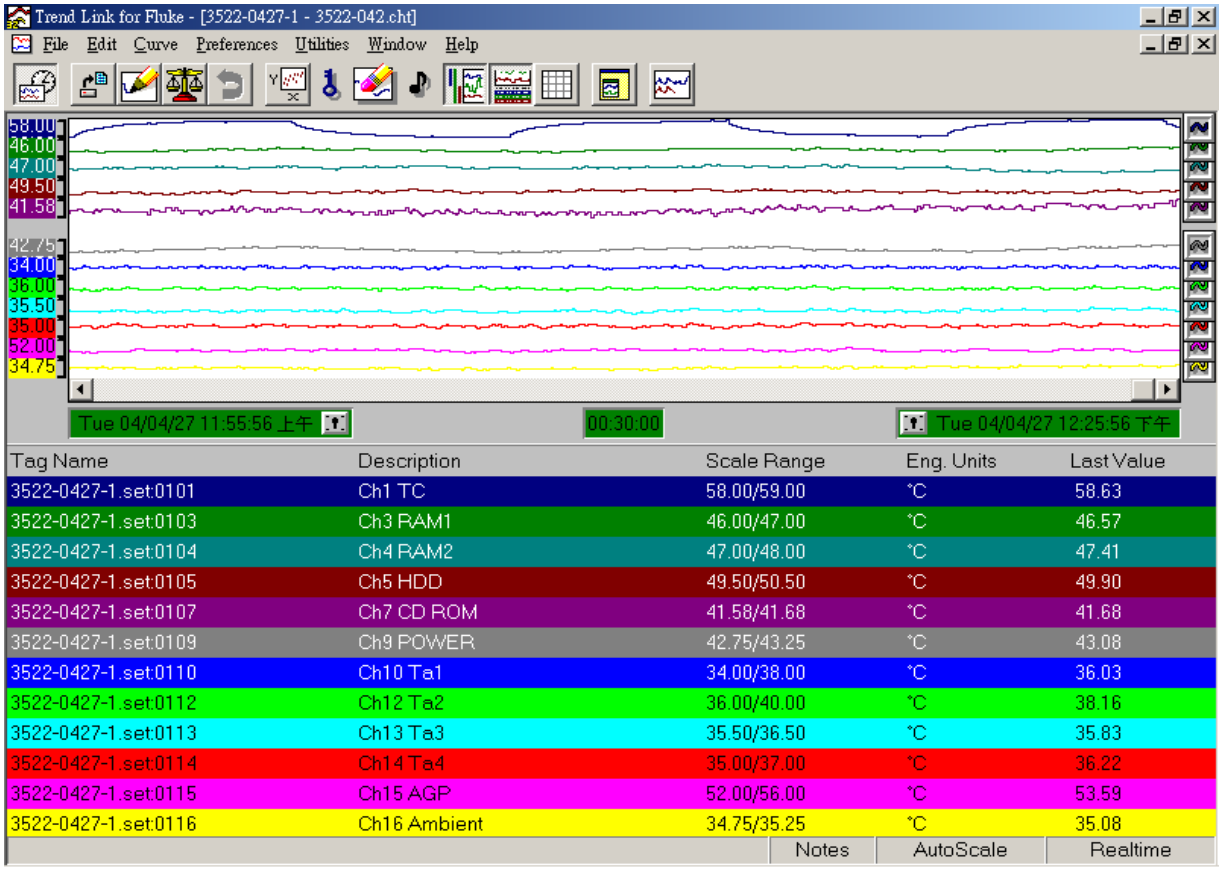
- The tests intends to understand how is the result in the **worse case of normal operation**? we try to test it in ambient **30℃**.
  To compare the test result of mode 4 and mode 8, both results meet Ta38℃. It again shown the CAG rev.1.1 design guide provided thermal advantages.

- The tests intends to understand how is the result if the chassis doesn't adopt the air guide?
  To compare the test result of mode 4 and mode 7, without air guide makes the result fail to meet Ta38℃.

Table 4.1
Date:May.05.2004

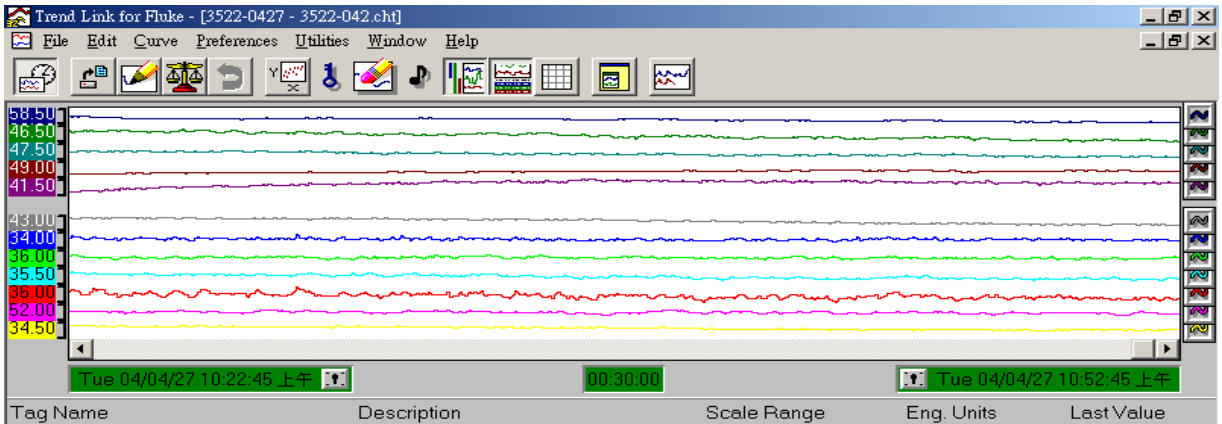
Mode Introductions	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6
Power Model	Delta GPS-300CN-100A (with 8cm Fan for airflow out, vents for air flow out)					
System Fan (Mounted in rear side of chassis)	Yes M Speed	Yes M Speed	Yes M Speed	Yes M Speed	Yes M Speed	Yes M Speed
Panel	22	22	22	22	22	08
Airguide CAG1.1	Yes	Yes	Yes	Yes	CAG1.0	Yes
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%
Test Result (values was according to the screens of Fluke monitor)						
DIMM-1	46.6	46.6	47.2	47.3	50.3	47.3
DIMM-2	47.4	47.7	48.6	48.6	51.4	48.6
HDD	49.9	49.9	49.8	50.2	46.3	49.4
CD ROM	41.7	41.7	41.7	41.9	40.3	42
POWER	43.1	43.2	43.7	43.9	44.3	43.8
AGP	53.6	53.5	58	58.9	73.8	60.5
T-inlet 1	36	36.2	36.9	37.4	41.8	37
T-inlet 2	38.2	38.3	40.3	40.5	37.8	40.5
T-inlet 3	35.8	35.9	36.4	36.5	41.9	36.6
T-inlet 4	36.2	36.3	36.5	36.9	38.2	36.7
T-inlets average Tambient(1~4)	36.6	36.7	37.5	37.8	39.9	37.7
T-case	58.6	58.7	59.9	59.6	60.9	59.8
Ambient(case outside)	35.1	35	35	35.1	35	35.1

Mode Introductions	Mode 7	Mode 8
Power Model	Delta GPS-300CN-100A (with 8cm Fan for airflow out, vents for air flow out)	
System Fan (Mounted in rear side of chassis)	Yes M Speed	Yes M Speed
Panel	22	22
Airguide CAG1.1	Yes-Without Airguide	Yes
PCI Card Install	Yes	Yes
Run the test under the software on 85% or 100% level	100%	100%
Test Result (values was according to the screens of Fluke monitor)		
DIMM-1	50.4	42.3
DIMM-2	47.7	43.6
HDD	49.6	45.3
CD ROM	41.5	36.9
POWER	42.9	39.1
AGP	58.6	54.9
T-inlet 1	44.1	31.9
T-inlet 2	40.2	35.4
T-inlet 3	37.6	31.4
T-inlet 4	42.5	31.5
T-inlets average Tambient(1~4)	41.1	32.6
T-case	61.3	56
Ambient(case outside)	35.1	30.1



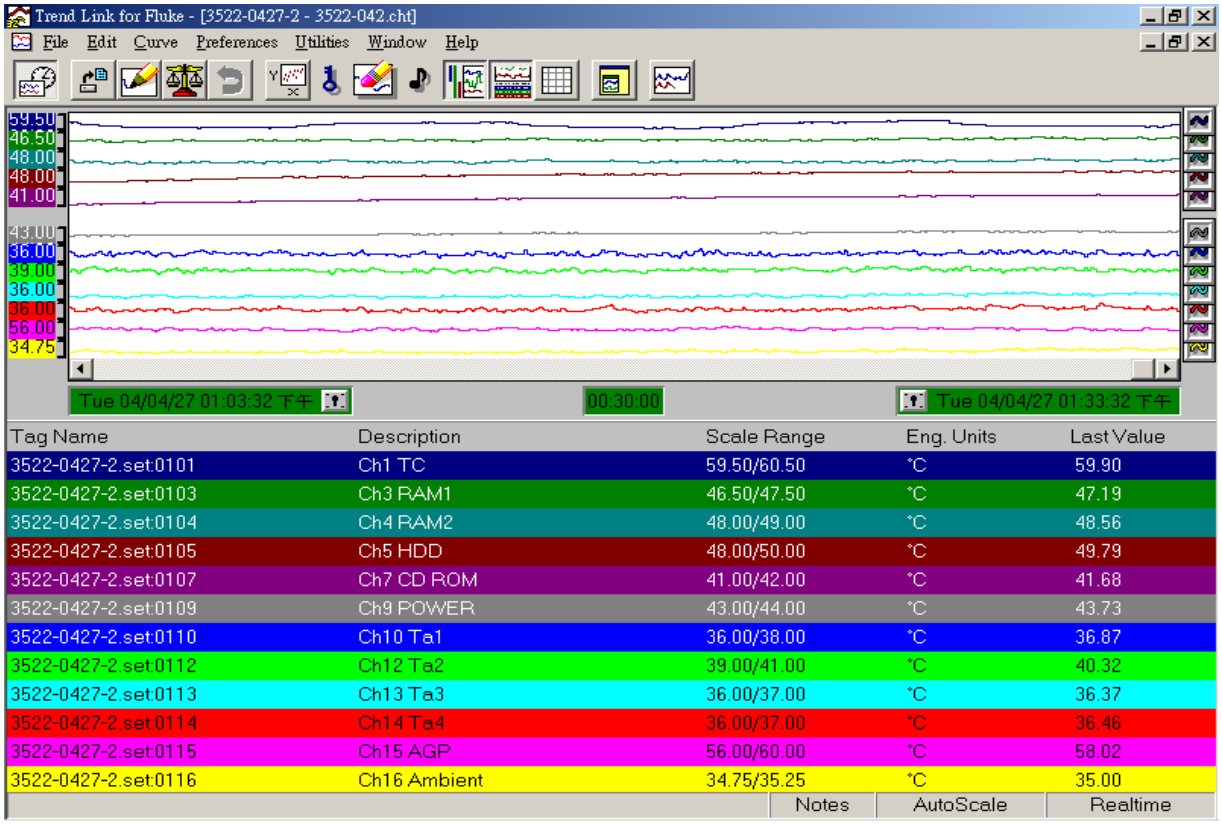
Tag Name	Description	Scale Range	Eng. Units	Last Value
3522-0427-1.set:0101	Ch1 TC	58.00/59.00	°C	58.63
3522-0427-1.set:0103	Ch3 RAM1	46.00/47.00	°C	46.57
3522-0427-1.set:0104	Ch4 RAM2	47.00/48.00	°C	47.41
3522-0427-1.set:0105	Ch5 HDD	49.50/50.50	°C	49.90
3522-0427-1.set:0107	Ch7 CD ROM	41.58/41.68	°C	41.68
3522-0427-1.set:0109	Ch9 POWER	42.75/43.25	°C	43.08
3522-0427-1.set:0110	Ch10 Ta1	34.00/38.00	°C	36.03
3522-0427-1.set:0112	Ch12 Ta2	36.00/40.00	°C	38.16
3522-0427-1.set:0113	Ch13 Ta3	35.50/36.50	°C	35.83
3522-0427-1.set:0114	Ch14 Ta4	35.00/37.00	°C	36.22
3522-0427-1.set:0115	Ch15 AGP	52.00/56.00	°C	53.59
3522-0427-1.set:0116	Ch16 Ambient	34.75/35.25	°C	35.08

Notes | AutoScale | Realtime



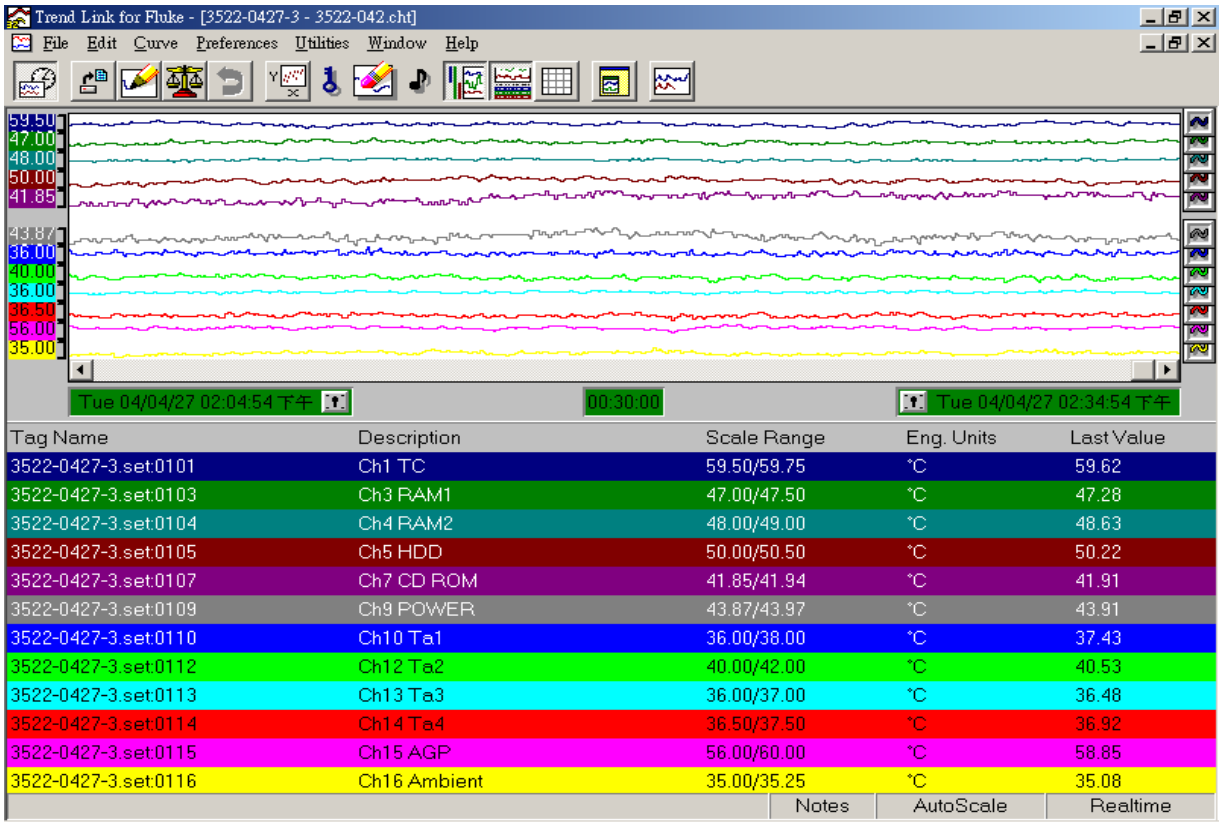
Tag Name	Description	Scale Range	Eng. Units	Last Value
3522-0427.set:0101	Ch1 TC	58.50/59.50	°C	58.70
3522-0427.set:0103	Ch3 RAM1	46.50/47.00	°C	46.55
3522-0427.set:0104	Ch4 RAM2	47.50/48.50	°C	47.72
3522-0427.set:0105	Ch5 HDD	49.00/51.00	°C	49.92
3522-0427.set:0107	Ch7 CD ROM	41.50/41.75	°C	41.69
3522-0427.set:0109	Ch9 POWER	43.00/43.50	°C	43.20
3522-0427.set:0110	Ch10 Ta1	34.00/38.00	°C	36.17
3522-0427.set:0112	Ch12 Ta2	36.00/40.00	°C	38.28
3522-0427.set:0113	Ch13 Ta3	35.50/36.50	°C	35.87
3522-0427.set:0114	Ch14 Ta4	36.00/37.00	°C	36.28
3522-0427.set:0115	Ch15 AGP	52.00/56.00	°C	53.53
3522-0427.set:0116	Ch16 Ambient	34.50/35.50	°C	35.01

Notes | AutoScale | Realtime



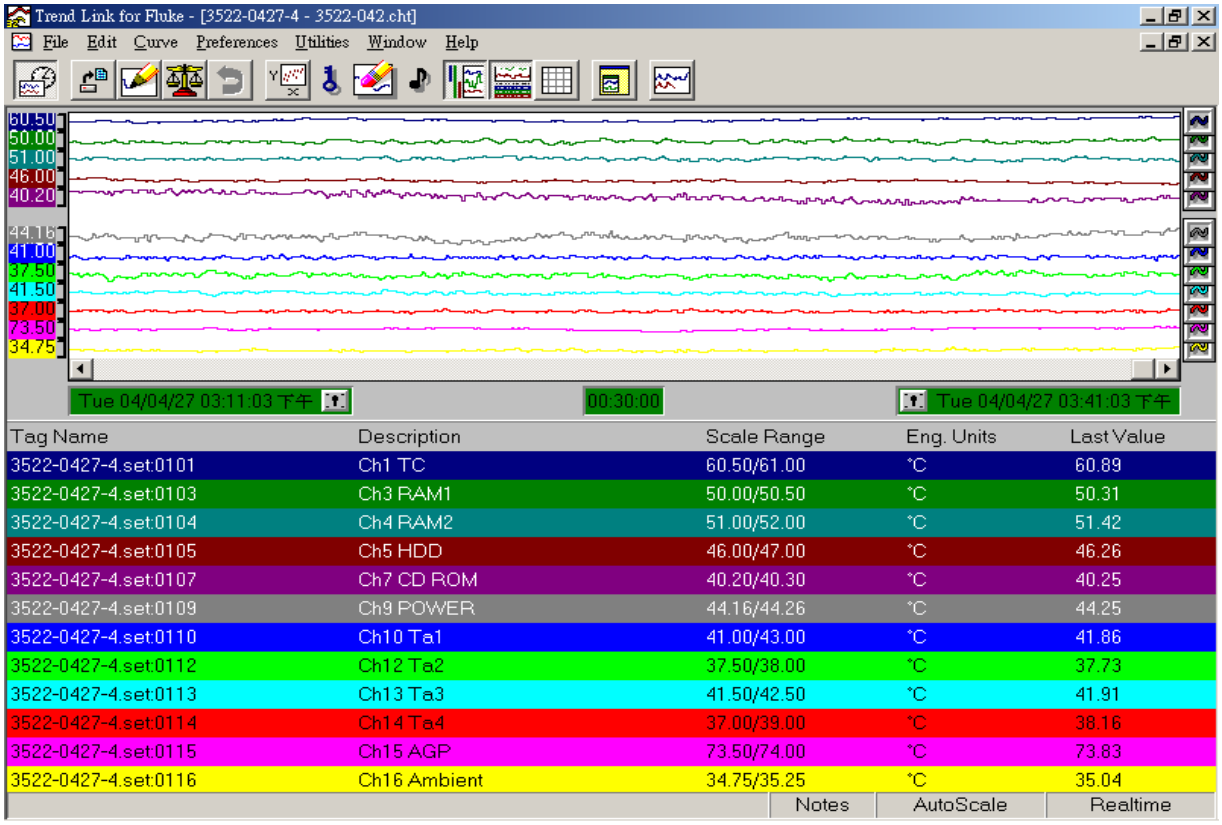
Tag Name	Description	Scale Range	Eng. Units	Last Value
3522-0427-2.set:0101	Ch1 TC	59.50/60.50	°C	59.90
3522-0427-2.set:0103	Ch3 RAM1	46.50/47.50	°C	47.19
3522-0427-2.set:0104	Ch4 RAM2	48.00/49.00	°C	48.56
3522-0427-2.set:0105	Ch5 HDD	48.00/50.00	°C	49.79
3522-0427-2.set:0107	Ch7 CD ROM	41.00/42.00	°C	41.68
3522-0427-2.set:0109	Ch9 POWER	43.00/44.00	°C	43.73
3522-0427-2.set:0110	Ch10 Ta1	36.00/38.00	°C	36.87
3522-0427-2.set:0112	Ch12 Ta2	39.00/41.00	°C	40.32
3522-0427-2.set:0113	Ch13 Ta3	36.00/37.00	°C	36.37
3522-0427-2.set:0114	Ch14 Ta4	36.00/37.00	°C	36.46
3522-0427-2.set:0115	Ch15 AGP	56.00/60.00	°C	58.02
3522-0427-2.set:0116	Ch16 Ambient	34.75/35.25	°C	35.00

Notes AutoScale Realtime



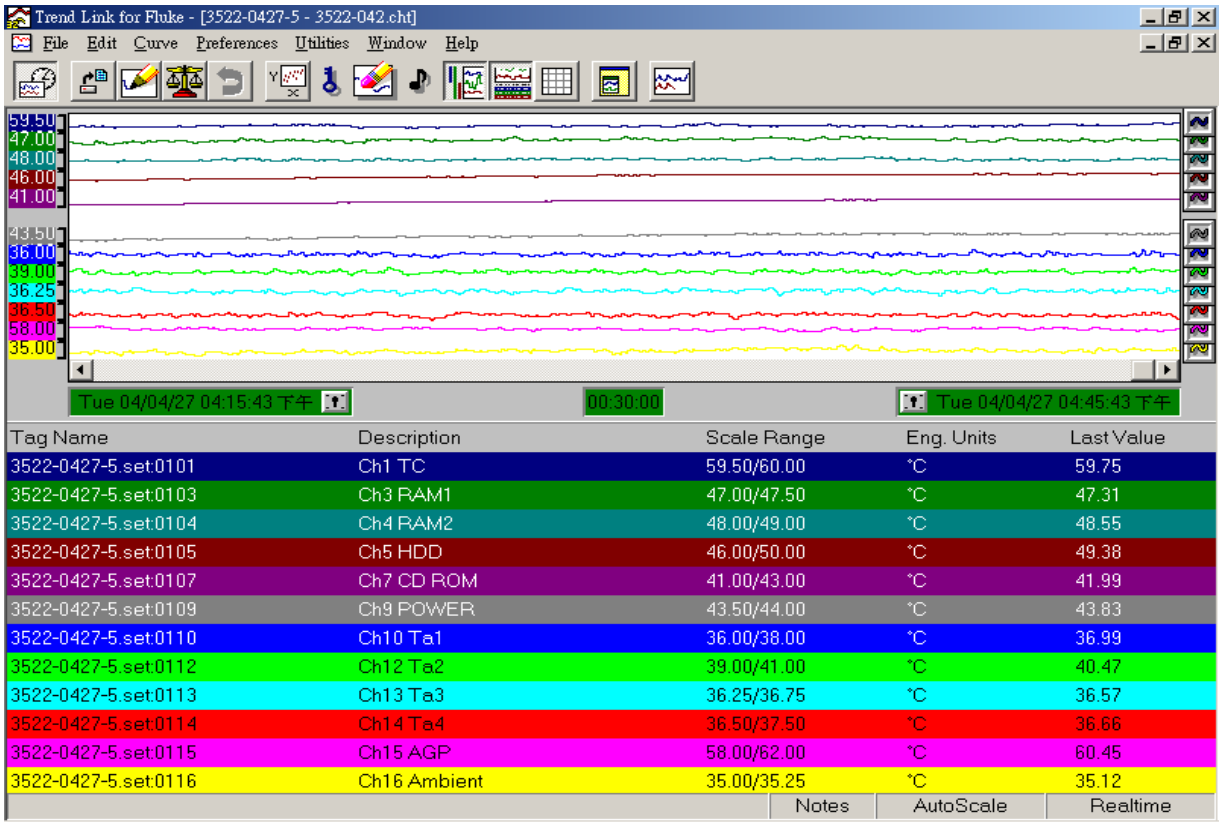
Tag Name	Description	Scale Range	Eng. Units	Last Value
3522-0427-3.set:0101	Ch1 TC	59.50/59.75	°C	59.62
3522-0427-3.set:0103	Ch3 RAM1	47.00/47.50	°C	47.28
3522-0427-3.set:0104	Ch4 RAM2	48.00/49.00	°C	48.63
3522-0427-3.set:0105	Ch5 HDD	50.00/50.50	°C	50.22
3522-0427-3.set:0107	Ch7 CD ROM	41.85/41.94	°C	41.91
3522-0427-3.set:0109	Ch9 POWER	43.87/43.97	°C	43.91
3522-0427-3.set:0110	Ch10 Ta1	36.00/38.00	°C	37.43
3522-0427-3.set:0112	Ch12 Ta2	40.00/42.00	°C	40.53
3522-0427-3.set:0113	Ch13 Ta3	36.00/37.00	°C	36.48
3522-0427-3.set:0114	Ch14 Ta4	36.50/37.50	°C	36.92
3522-0427-3.set:0115	Ch15 AGP	56.00/60.00	°C	58.85
3522-0427-3.set:0116	Ch16 Ambient	35.00/35.25	°C	35.08

Notes AutoScale Realtime



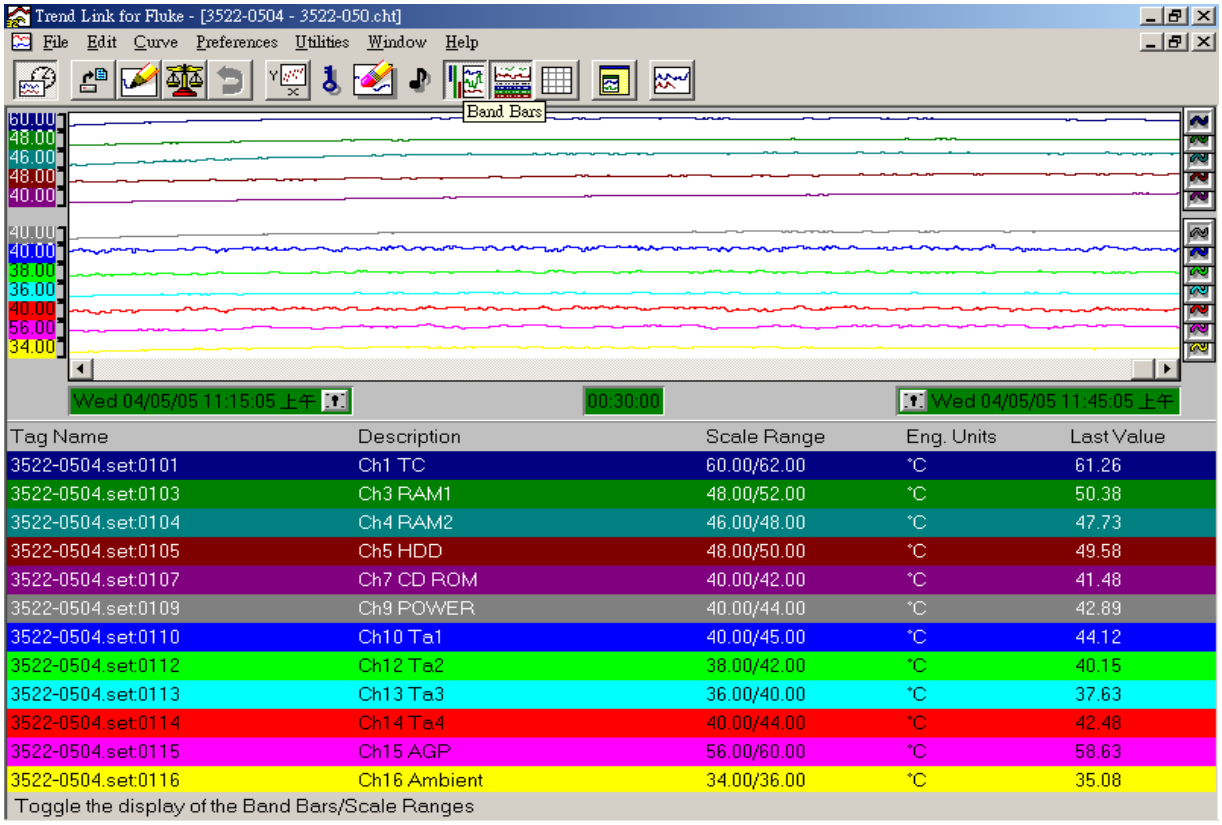
Tag Name	Description	Scale Range	Eng. Units	Last Value
3522-0427-4.set:0101	Ch1 TC	60.50/61.00	°C	60.89
3522-0427-4.set:0103	Ch3 RAM1	50.00/50.50	°C	50.31
3522-0427-4.set:0104	Ch4 RAM2	51.00/52.00	°C	51.42
3522-0427-4.set:0105	Ch5 HDD	46.00/47.00	°C	46.26
3522-0427-4.set:0107	Ch7 CD ROM	40.20/40.30	°C	40.25
3522-0427-4.set:0109	Ch9 POWER	44.16/44.26	°C	44.25
3522-0427-4.set:0110	Ch10 Ta1	41.00/43.00	°C	41.86
3522-0427-4.set:0112	Ch12 Ta2	37.50/38.00	°C	37.73
3522-0427-4.set:0113	Ch13 Ta3	41.50/42.50	°C	41.91
3522-0427-4.set:0114	Ch14 Ta4	37.00/39.00	°C	38.16
3522-0427-4.set:0115	Ch15 AGP	73.50/74.00	°C	73.83
3522-0427-4.set:0116	Ch16 Ambient	34.75/35.25	°C	35.04

Notes AutoScale Realtime



Tag Name	Description	Scale Range	Eng. Units	Last Value
3522-0427-5.set:0101	Ch1 TC	59.50/60.00	°C	59.75
3522-0427-5.set:0103	Ch3 RAM1	47.00/47.50	°C	47.31
3522-0427-5.set:0104	Ch4 RAM2	48.00/49.00	°C	48.55
3522-0427-5.set:0105	Ch5 HDD	46.00/50.00	°C	49.38
3522-0427-5.set:0107	Ch7 CD ROM	41.00/43.00	°C	41.99
3522-0427-5.set:0109	Ch9 POWER	43.50/44.00	°C	43.83
3522-0427-5.set:0110	Ch10 Ta1	36.00/38.00	°C	36.99
3522-0427-5.set:0112	Ch12 Ta2	39.00/41.00	°C	40.47
3522-0427-5.set:0113	Ch13 Ta3	36.25/36.75	°C	36.57
3522-0427-5.set:0114	Ch14 Ta4	36.50/37.50	°C	36.66
3522-0427-5.set:0115	Ch15 AGP	58.00/62.00	°C	60.45
3522-0427-5.set:0116	Ch16 Ambient	35.00/35.25	°C	35.12

Notes AutoScale Realtime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Band Bars
Wed 04/05/05 11:15:05 上午
00:30:00
Wed 04/05/05 11:45:05 上午
Tag Name Description Scale Range Eng. Units Last Value
3522-0504.set:0101 Ch1 TC 60.00/62.00 °C 61.26
3522-0504.set:0103 Ch3 RAM1 48.00/52.00 °C 50.38
3522-0504.set:0104 Ch4 RAM2 46.00/48.00 °C 47.73
3522-0504.set:0105 Ch5 HDD 48.00/50.00 °C 49.58
3522-0504.set:0107 Ch7 CD ROM 40.00/42.00 °C 41.48
3522-0504.set:0109 Ch9 POWER 40.00/44.00 °C 42.89
3522-0504.set:0110 Ch10 Ta1 40.00/45.00 °C 44.12
3522-0504.set:0112 Ch12 Ta2 38.00/42.00 °C 40.15
3522-0504.set:0113 Ch13 Ta3 36.00/40.00 °C 37.63
3522-0504.set:0114 Ch14 Ta4 40.00/44.00 °C 42.48
3522-0504.set:0115 Ch15 AGP 56.00/60.00 °C 58.63
3522-0504.set:0116 Ch16 Ambient 34.00/36.00 °C 35.08
Toggle the display of the Band Bars/Scale Ranges

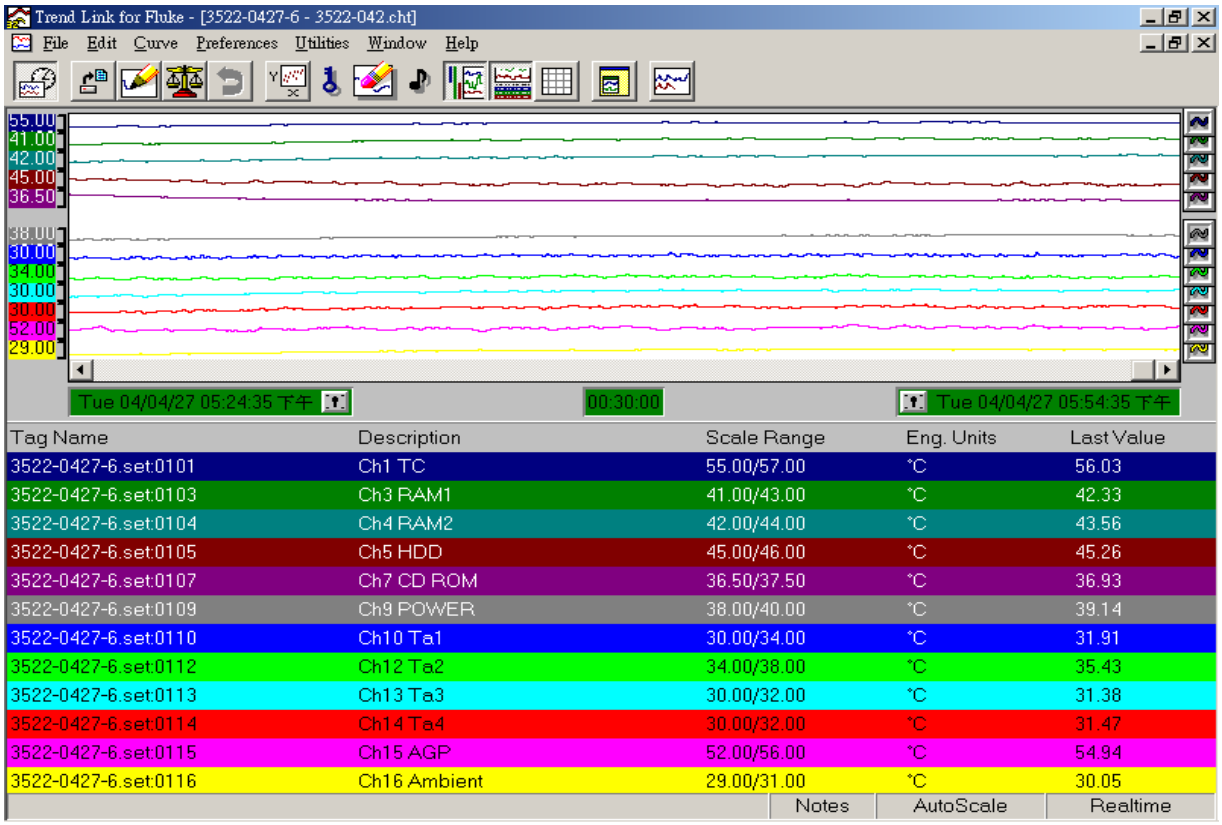

Trend Link for Fluke - [3522-0427-6 - 3522-042.cht]
File Edit Curve Preferences Utilities Window Help
Tue 04/04/27 05:24:35 下午
00:30:00
Tue 04/04/27 05:54:35 下午
Tag Name Description Scale Range Eng. Units Last Value
3522-0427-6.set:0101 Ch1 TC 55.00/57.00 °C 56.03
3522-0427-6.set:0103 Ch3 RAM1 41.00/43.00 °C 42.33
3522-0427-6.set:0104 Ch4 RAM2 42.00/44.00 °C 43.56
3522-0427-6.set:0105 Ch5 HDD 45.00/46.00 °C 45.26
3522-0427-6.set:0107 Ch7 CD ROM 36.50/37.50 °C 36.93
3522-0427-6.set:0109 Ch9 POWER 38.00/40.00 °C 39.14
3522-0427-6.set:0110 Ch10 Ta1 30.00/34.00 °C 31.91
3522-0427-6.set:0112 Ch12 Ta2 34.00/38.00 °C 35.43
3522-0427-6.set:0113 Ch13 Ta3 30.00/32.00 °C 31.38
3522-0427-6.set:0114 Ch14 Ta4 30.00/32.00 °C 31.47
3522-0427-6.set:0115 Ch15 AGP 52.00/56.00 °C 54.94
3522-0427-6.set:0116 Ch16 Ambient 29.00/31.00 °C 30.05
Notes AutoScale Realtime

Table 4.2

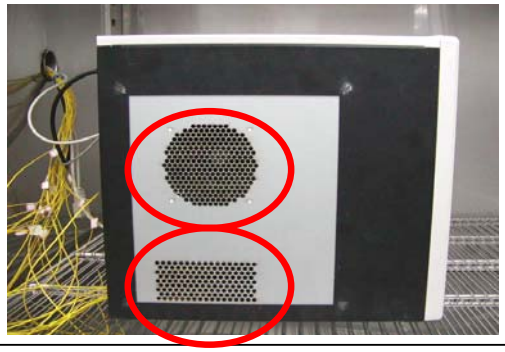
	The view of the chassis front side.
	The view of chassis right side.
	The view of the chassis left side.
	The view of the chassis back side.

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)