FWS-8500

Environment Test Report

Report No: 15I020012

Summary	☑ **Pass** ☐ **Fail** ☐ **Pass with Deviation** **Comment:**

Test Result Summary				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

Issue date	Approval	Issued by
2015-09-14	**KJ Wang**	**Jerry Chen**

Test item list

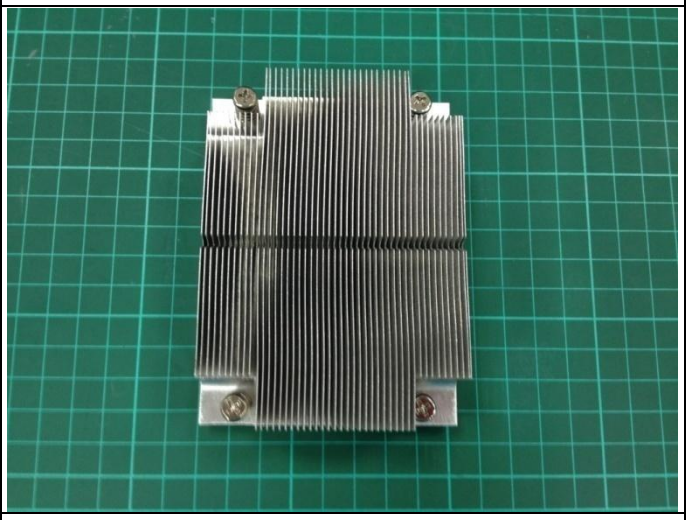
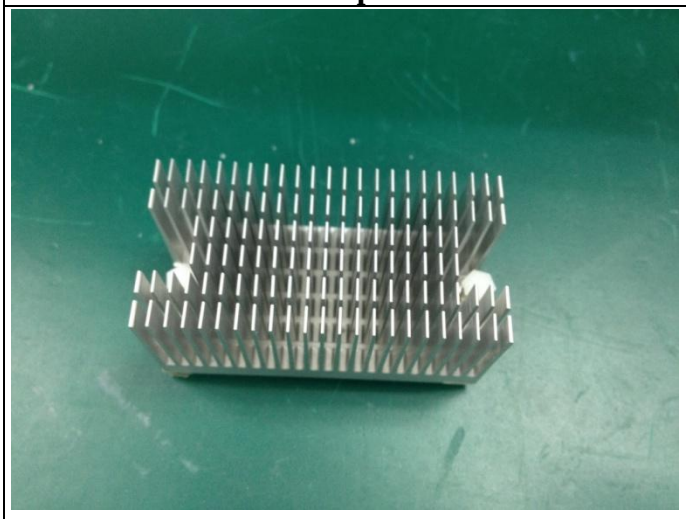
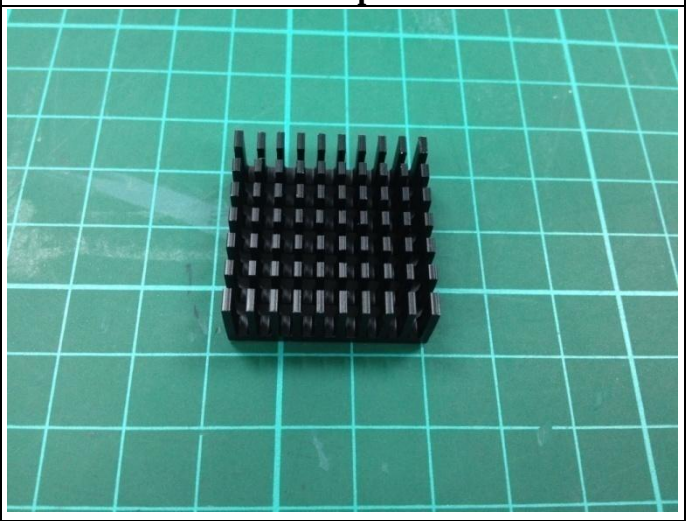
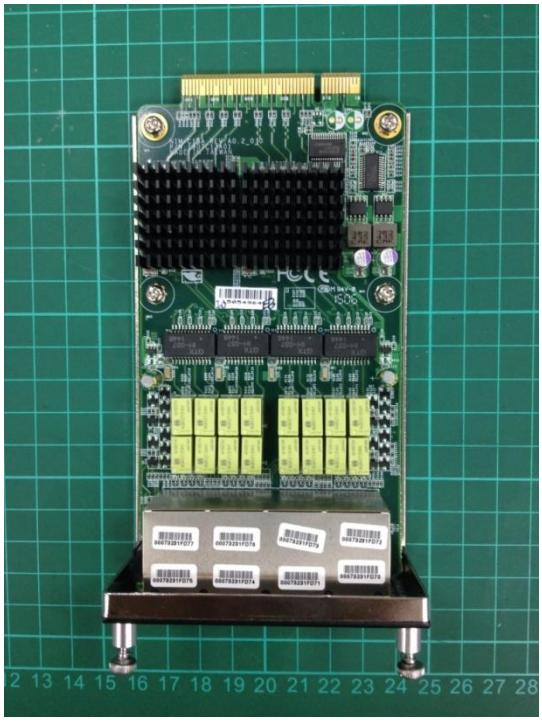
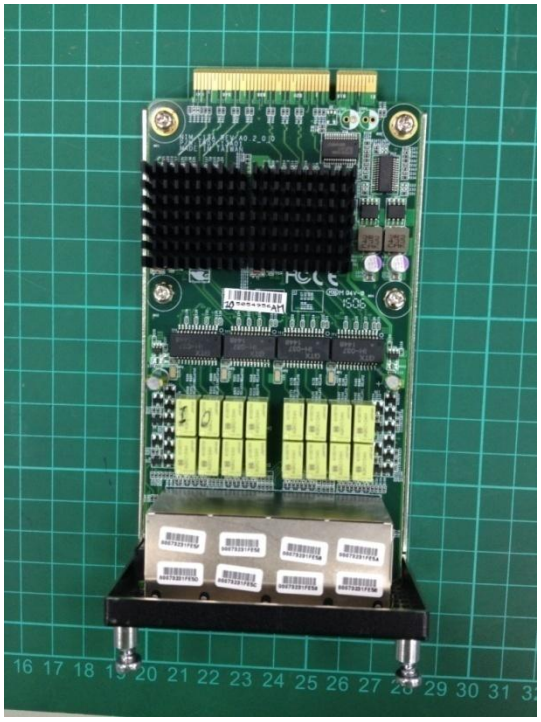
Testing Result

Num	Test item list	Result	Remark
1	High Temperature Operation test	Pass	
2	Temp./humidity power on/off test	Pass	
3	Temperature cycle operation test	Pass	
4	High temperature storage test	Pass	
5	Low temperature storage test	Pass	
6	Humidity test	Pass	
7	Cold start and hot start test	Pass	

Configuration of EUT

Num	Item	Spec
1.	**Test Product: FWS-8500 Ver. A0.3**	
2.	**Client (Main test of system)**	
	1. Model Name	FWS-8500 Ver. A0.3
	2. Main board	FWB-8500 Rev. A0.3
	3. BIOS Ver.	FWS-8500 R1.4 (K850AM14) (07/17/2015)
	4. CPU Type	Intel Xeon® E5-2609 v3 1.90GHz x 2
	5. Chipset	Intel Coleto Creek DH8925 PCH
	6. VGA Module	PER-V09V Rev. A1.0
	7. LAN Module	NIM-C13A Rev. A0.2 x 7 (LAN Chipset - 82580EB)
	8. LAN Module	NIM-C13A Rev. A0.2 x 1 (LAN Chipset - i350)
	9. RISER	PER-R36X Rev. A0.1
	10. Memory	innodisk / DDR4 2133 W/ REG DIMM 8GB x16 (SEC / K4A4G045WD)
	11. 2.5” SATA HDD	Toshiba / MQ01ABF032 320GB
	12. Test Software	ubuntu 12.04 LTS / Run iPerf test
	13. Power supply	Zippy / M1U2-5650V4H / +12V 54A / +5VSB 3A
3.	**Server (Secondary aid test of system)**	
	1. Model Name	FWS-8500 Ver. A0.3
	2. Main board	FWB-8500 Rev. A0.3
	3. BIOS Ver.	FWS-8500 R1.4 (K850AM14) (07/17/2015)
	4. CPU Type	Intel Xeon® E5-2608L v3 2.0GHz x 2
	5. Chipset	Intel Coleto Creek 8925 PCH
	6. VGA Module	PER-V09V Rev. A1.0
	7. LAN Module	NIM-C13A Rev. A0.2 x 1 (LAN Chipset - 82580)
	8. LAN Module	NIM-C13A Rev. A0.2 x 7 (LAN Chipset - i350)
	9. RISER	PER-R36X Rev. A0.1
	10. Memory	ADATA / DDR4 2133 R-DIMM 4GB x2 (SK hynix / H5AN4G8NMFR)
	11. 3.5” SATA HDD	WD / WD5000AAKX 500GB
	12. Test Software	ubuntu 12.04 LTS / Run iPerf test
	13. Power Supply	ETASIS / EFRP-G2657H / +12V 53A / +5VSB 3A

Photos

FWS-8500 - System	FWS-8500 - CPU Heat Sink
	
FWS-8500 - Chipset Heat Sink	**NIM-C13A - Chipset Heat Sink**
	
NIM-C13A - Chipset 82580EB	**NIM-C13A - Chipset i350**
	

High Temperature Operation test

Test Date: 09-08 ~ 09-2015

Test Product: FWS-8500 with NIM-C13A (LAN chipset 82580EB & LAN chipset i350)

Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bd: Dry Heat Test (Operation)

Test Equipment:

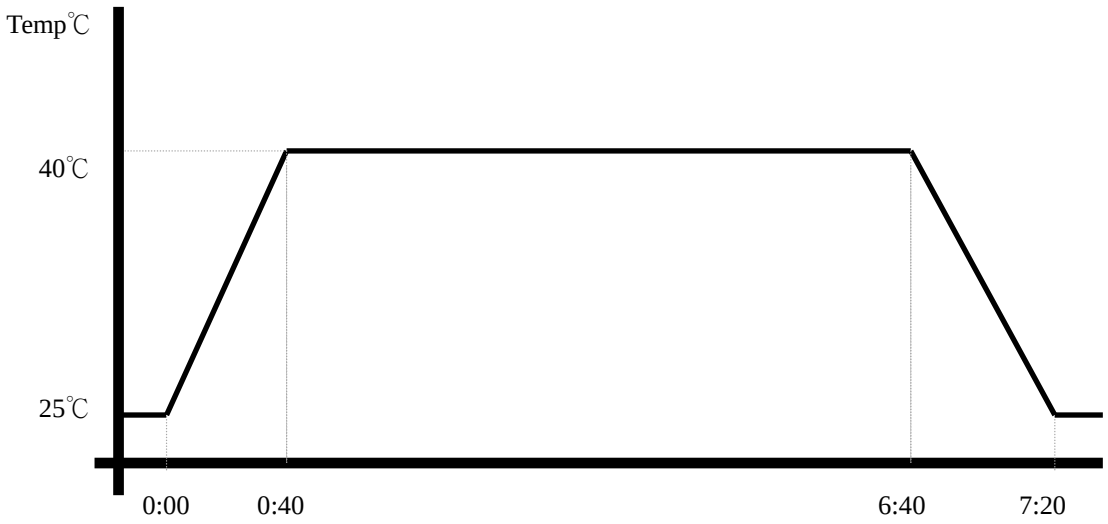
Natural Convection Oven Chamber: (K.SON. INS. TECH. CORP.)
Model: NCO-BT-80
Date of Calibration: 03/19/2015
Serial Number: A0446

Temperature Measurement:

40 Channel Thermal Recorder: (YOKOGAWA Inc,)
Model: DA100-13-1D
Date of Calibration: 10/01/2014
Serial Number: 12A323190

Testing Item:

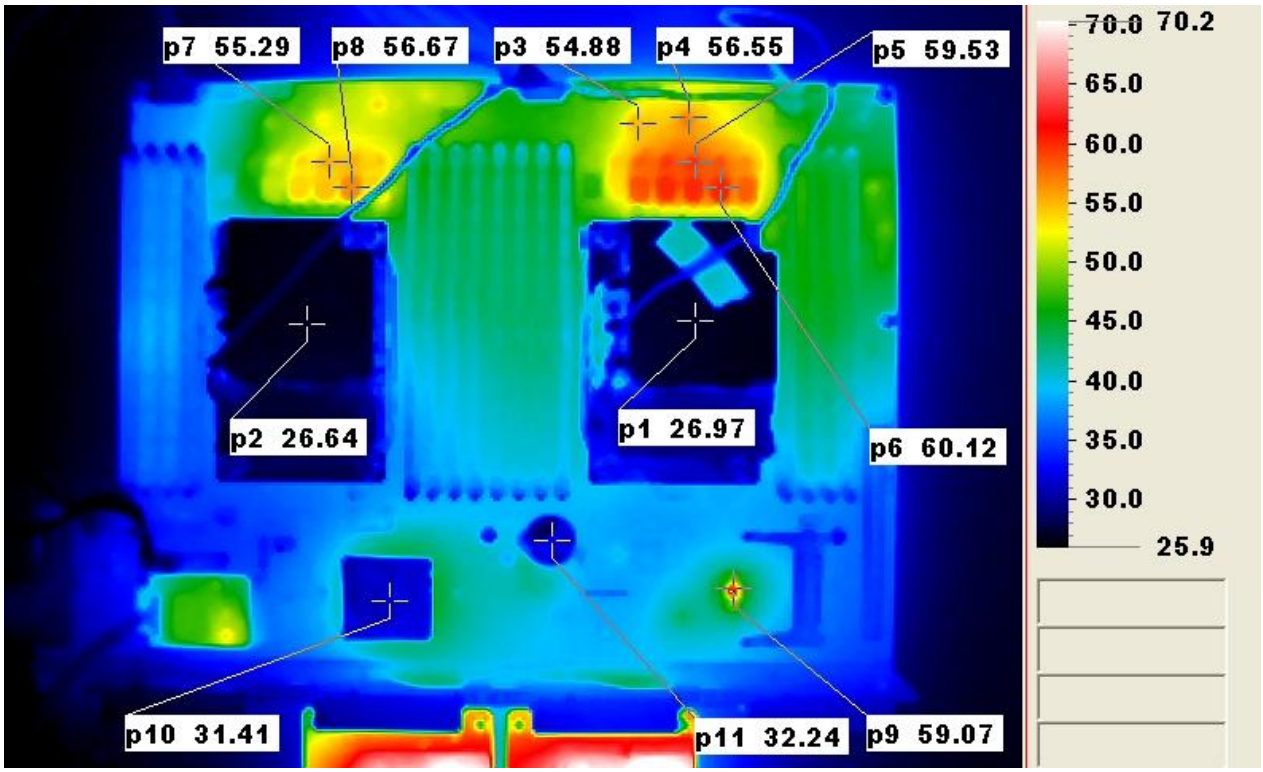
1. Test Temperature: 40℃
2. Test Times: 6Hrs
3. Test Software: ubuntu 12.04 LTS / Run iPerf test
4. Test Environment Curve:



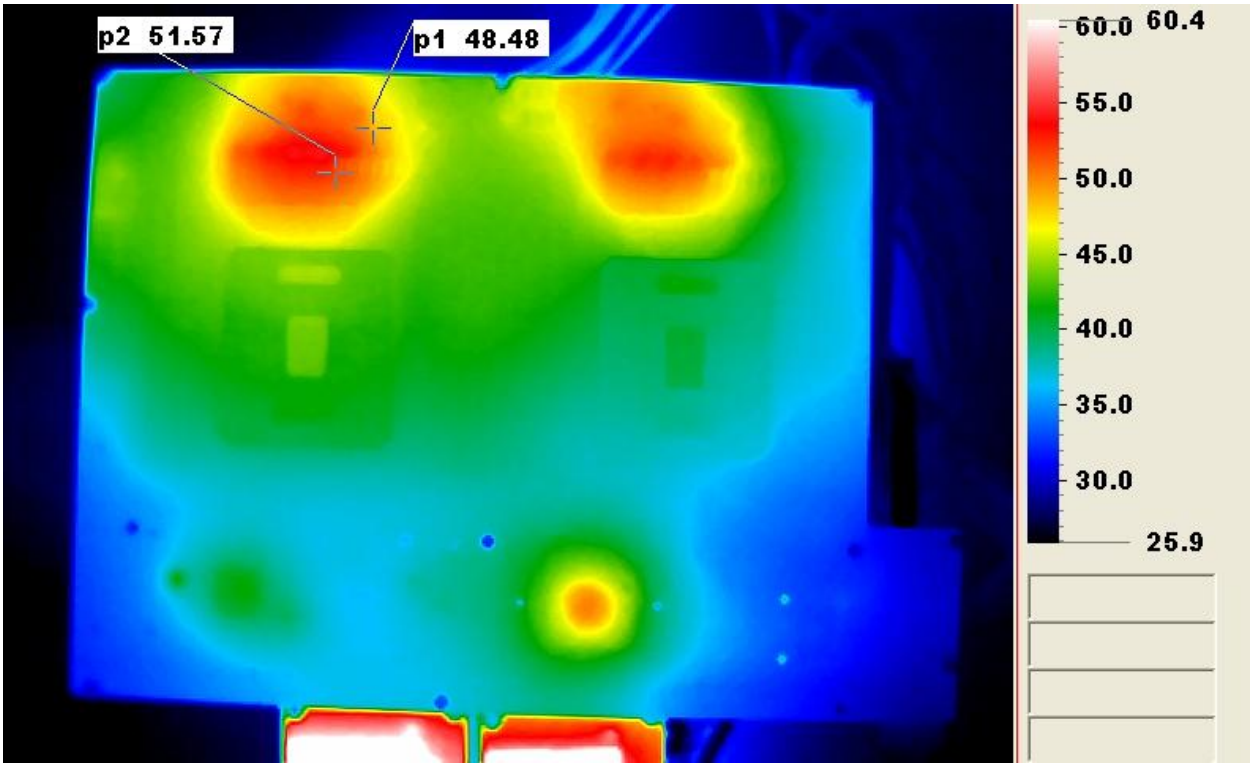
High Temperature Operation test

IR Thermal Photos

Main Board Front Side

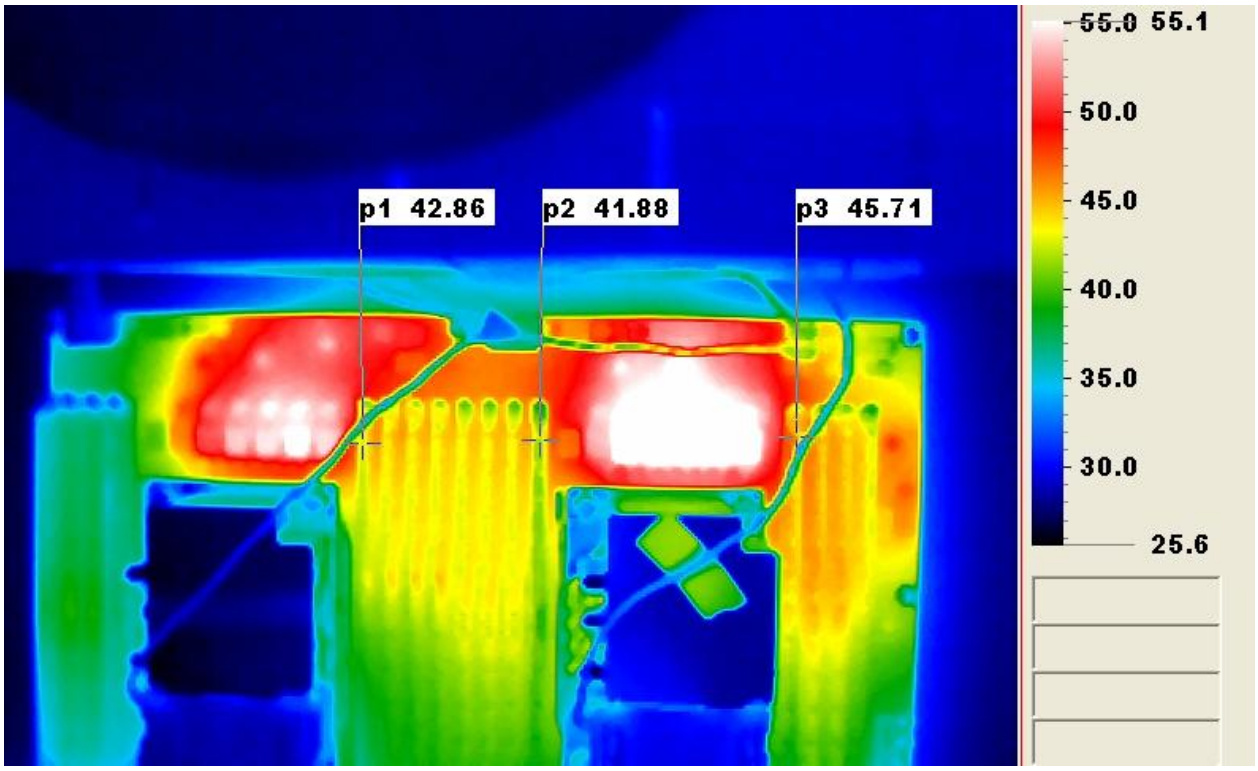


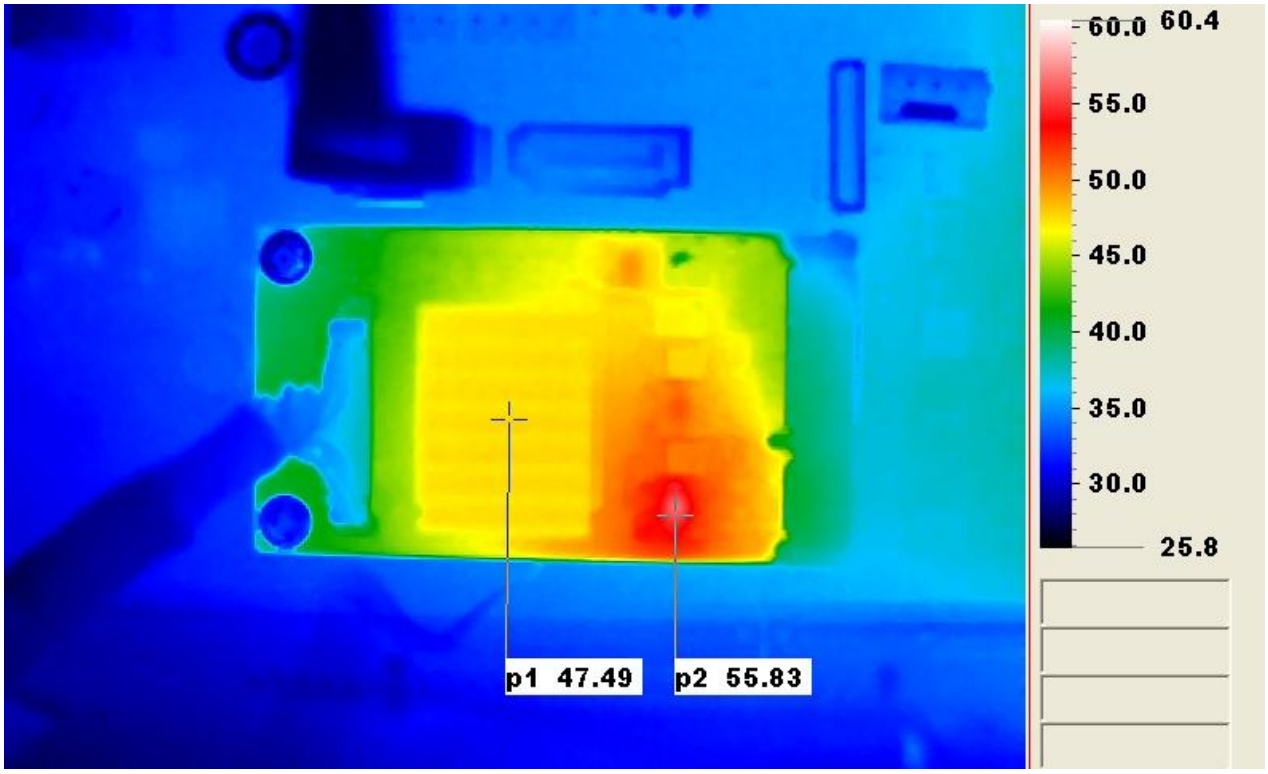
Main Board Rear Side



High Temperature Operation test

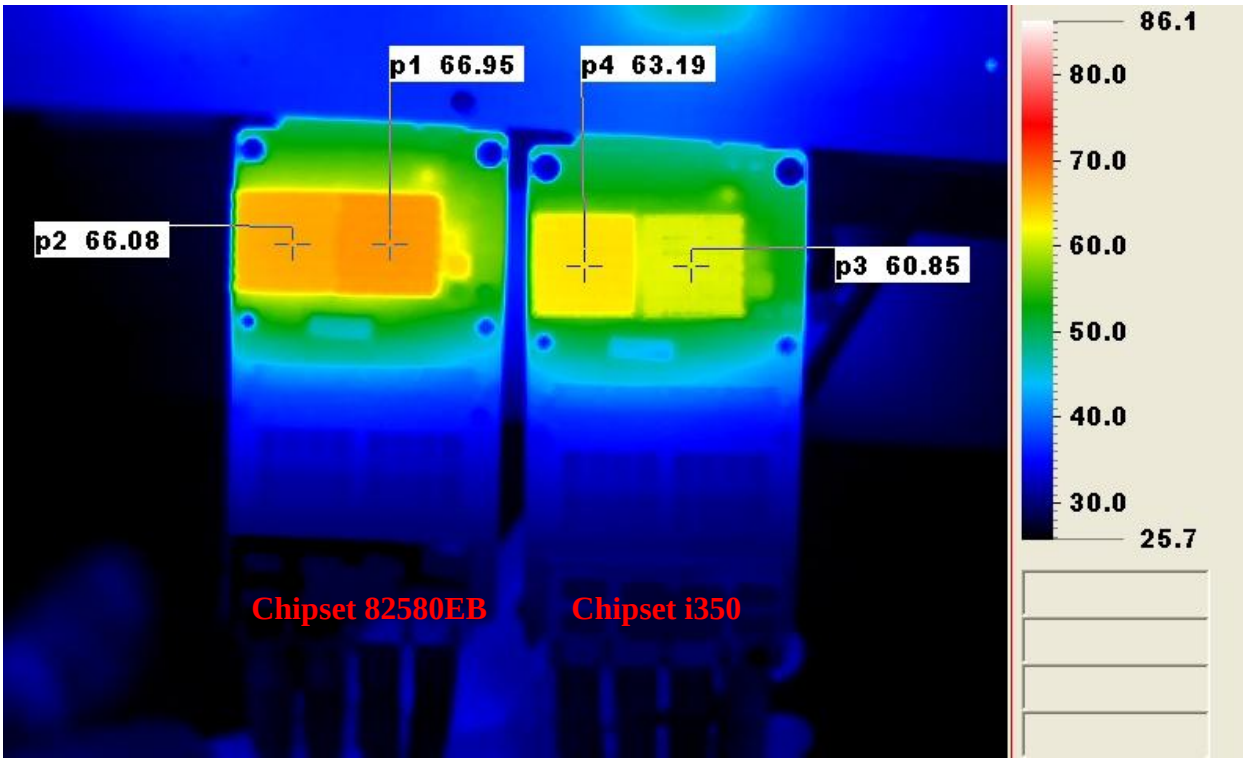
Main Board Front Side



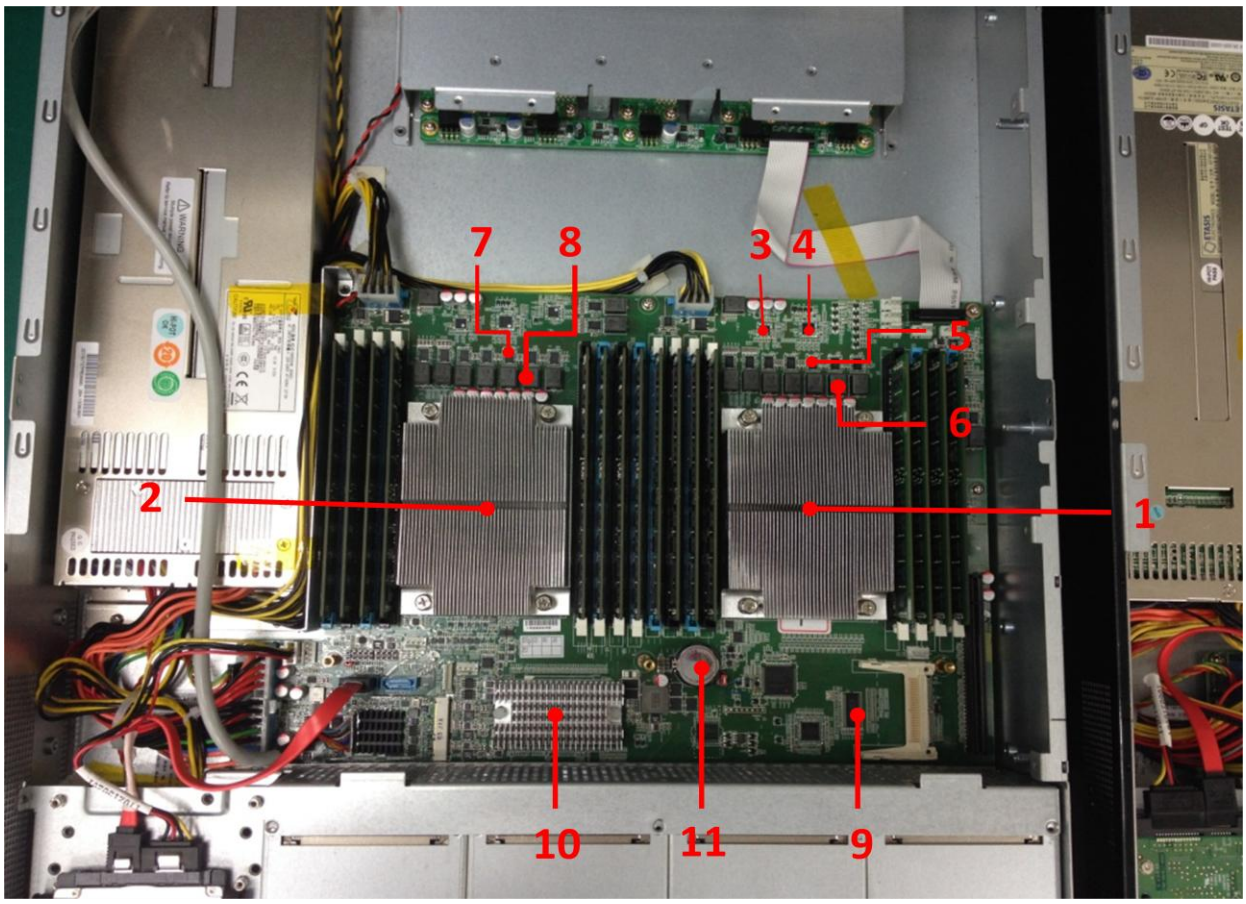


High Temperature Operation test

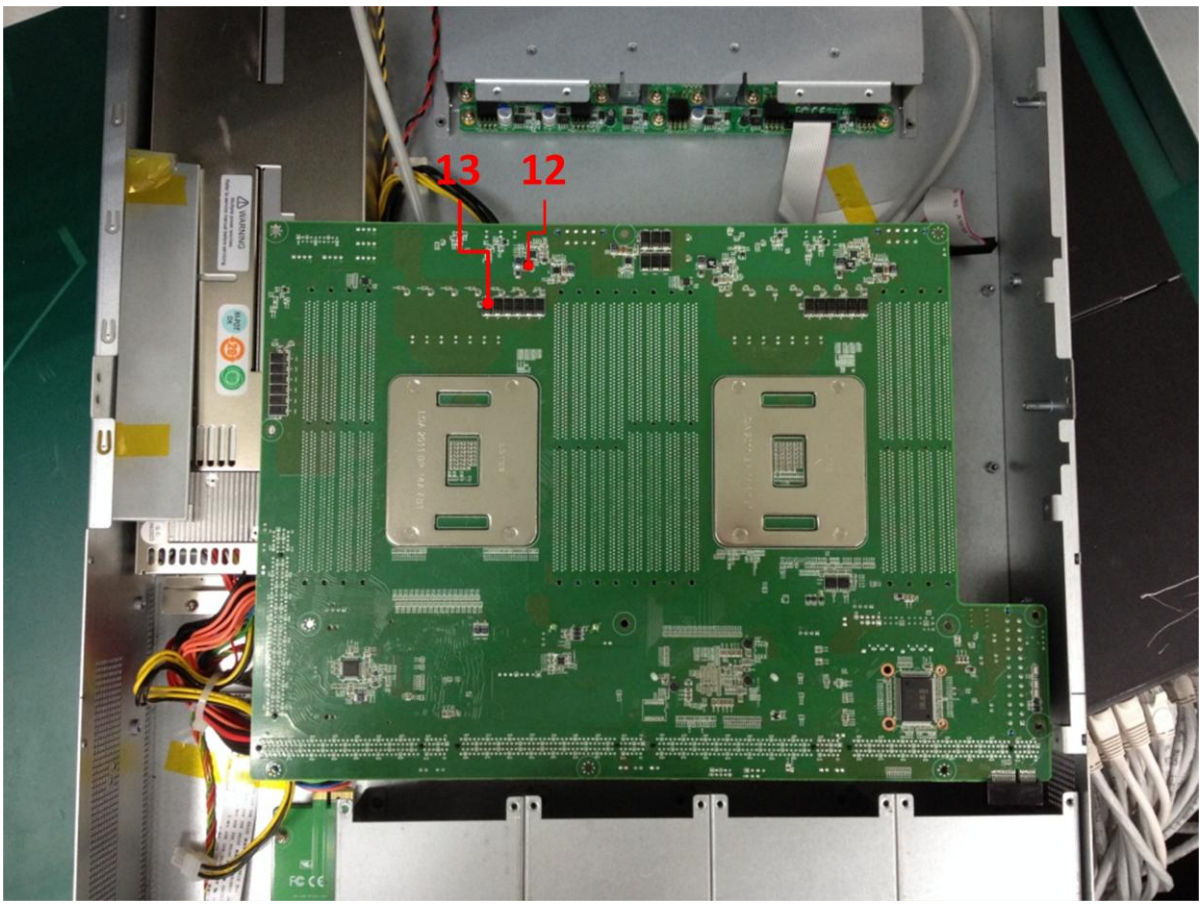
LAN Module Front Side

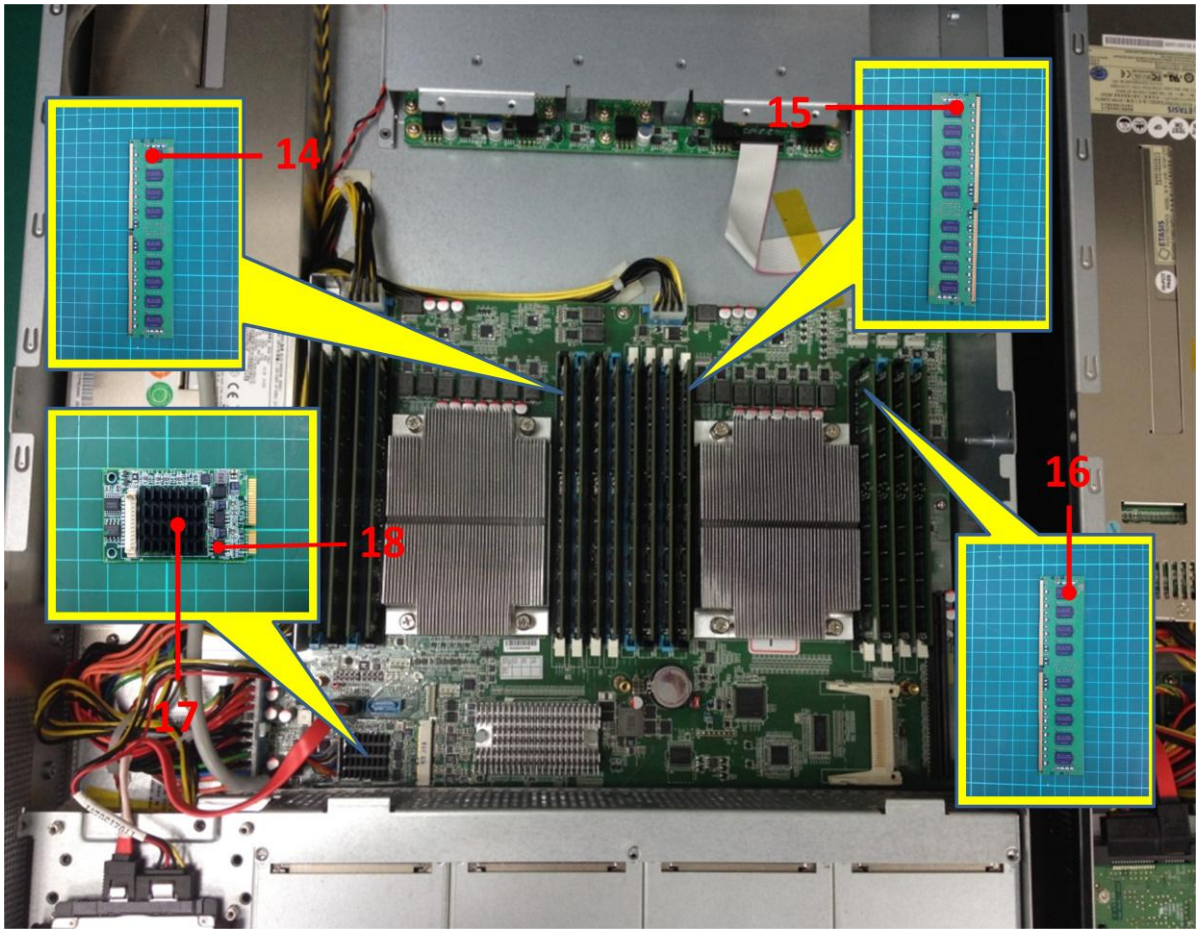


Measuring Thermal Couple Position：

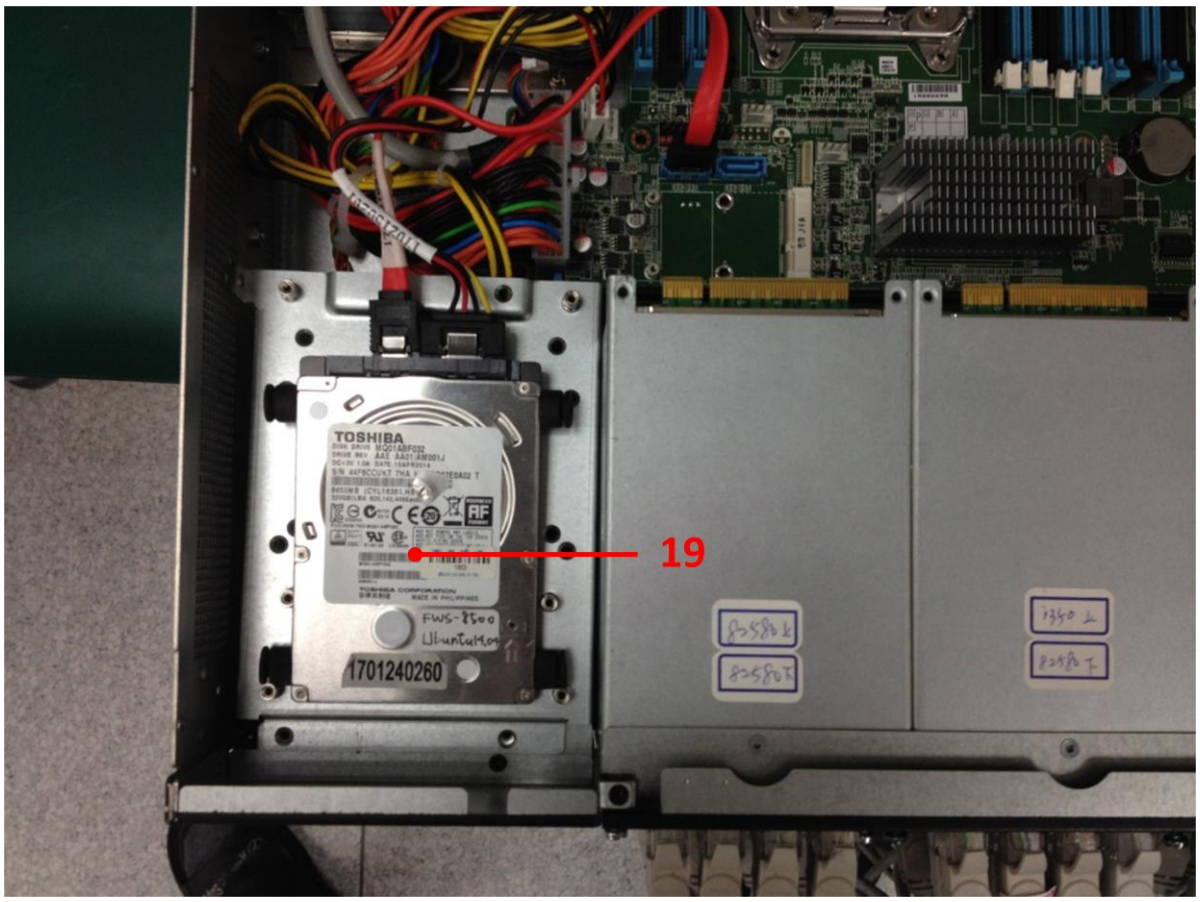


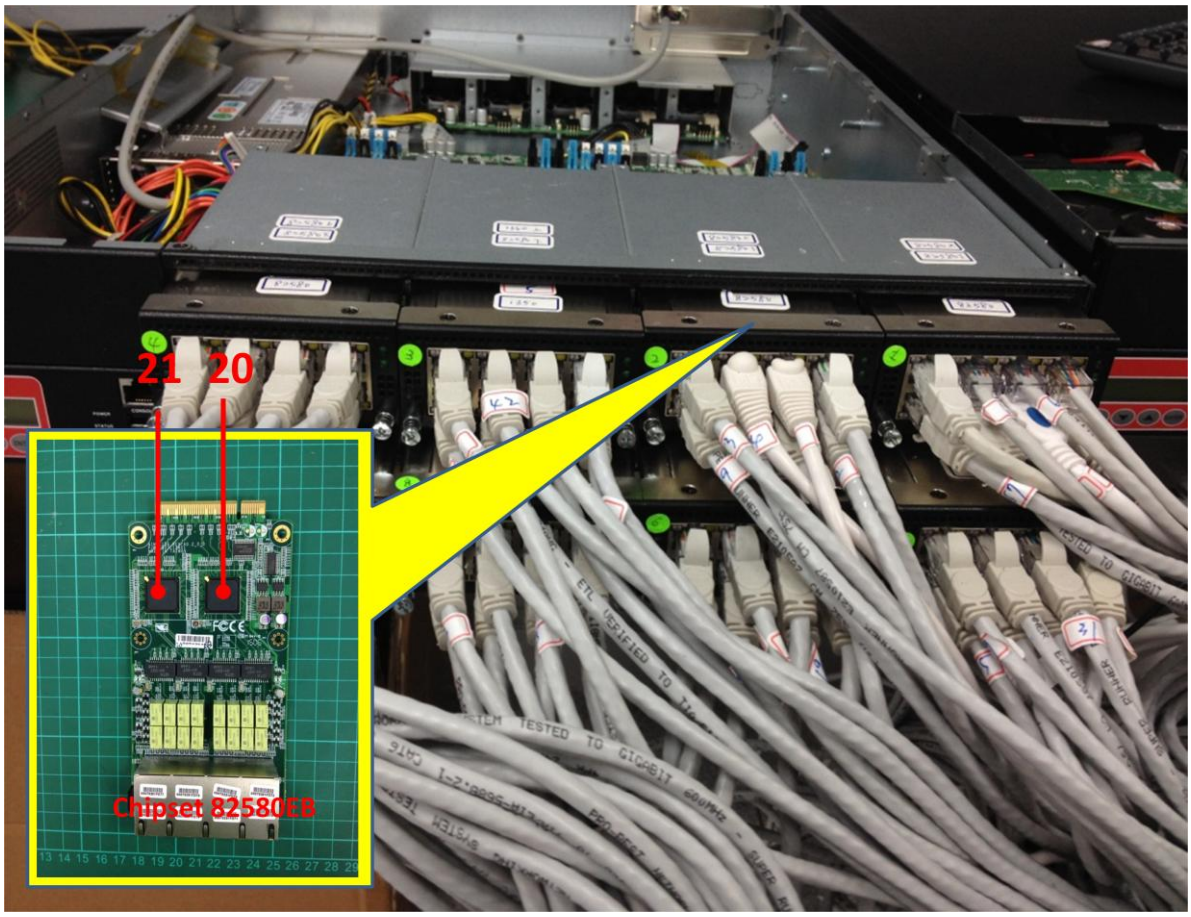
High Temperature Operation test



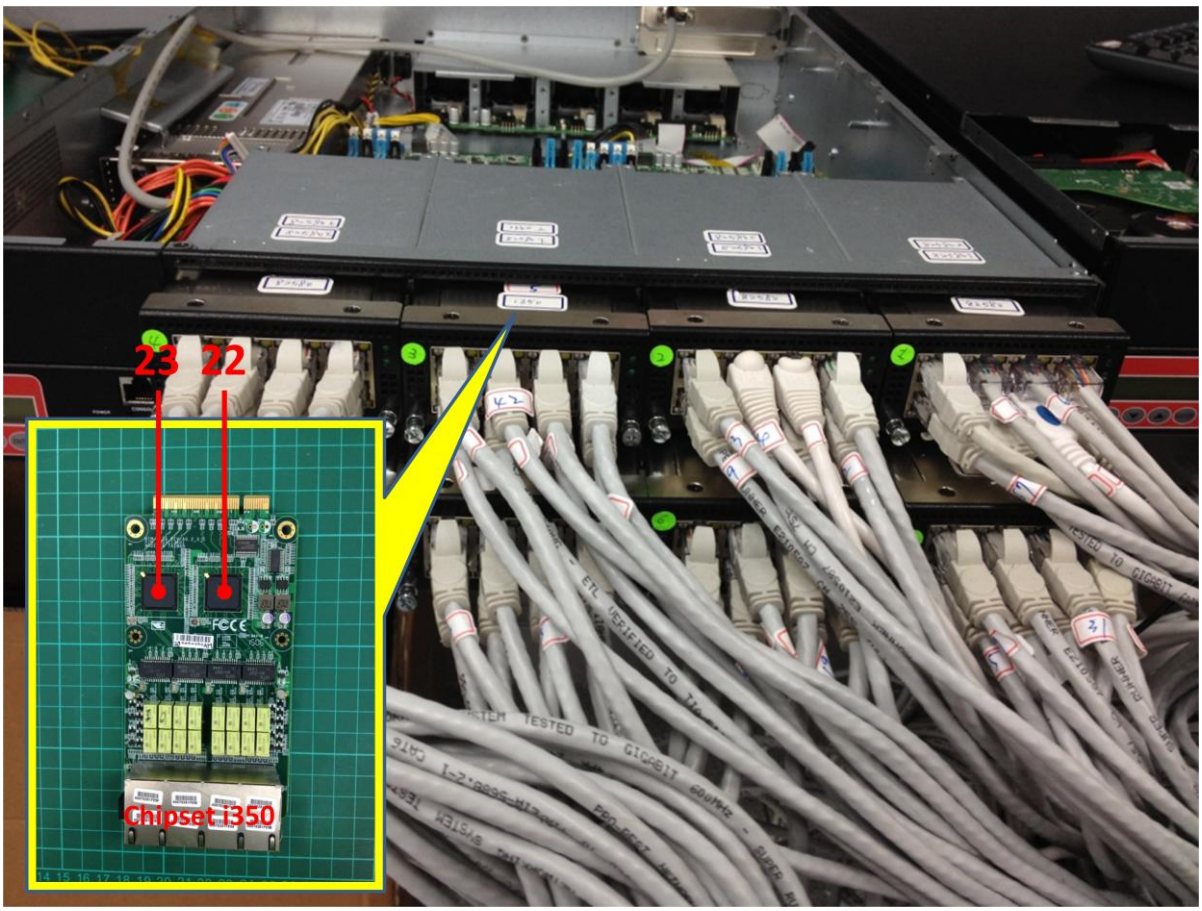


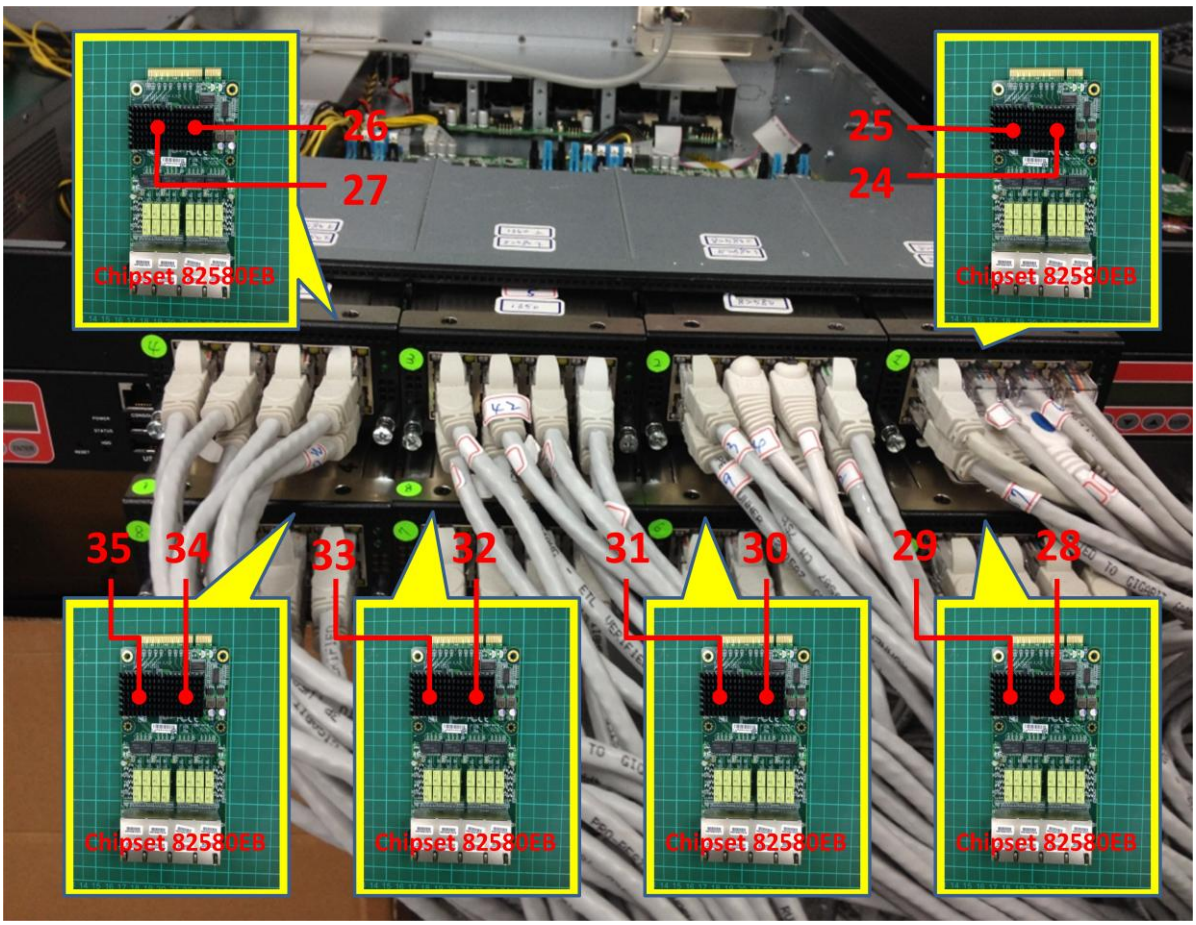
High Temperature Operation test



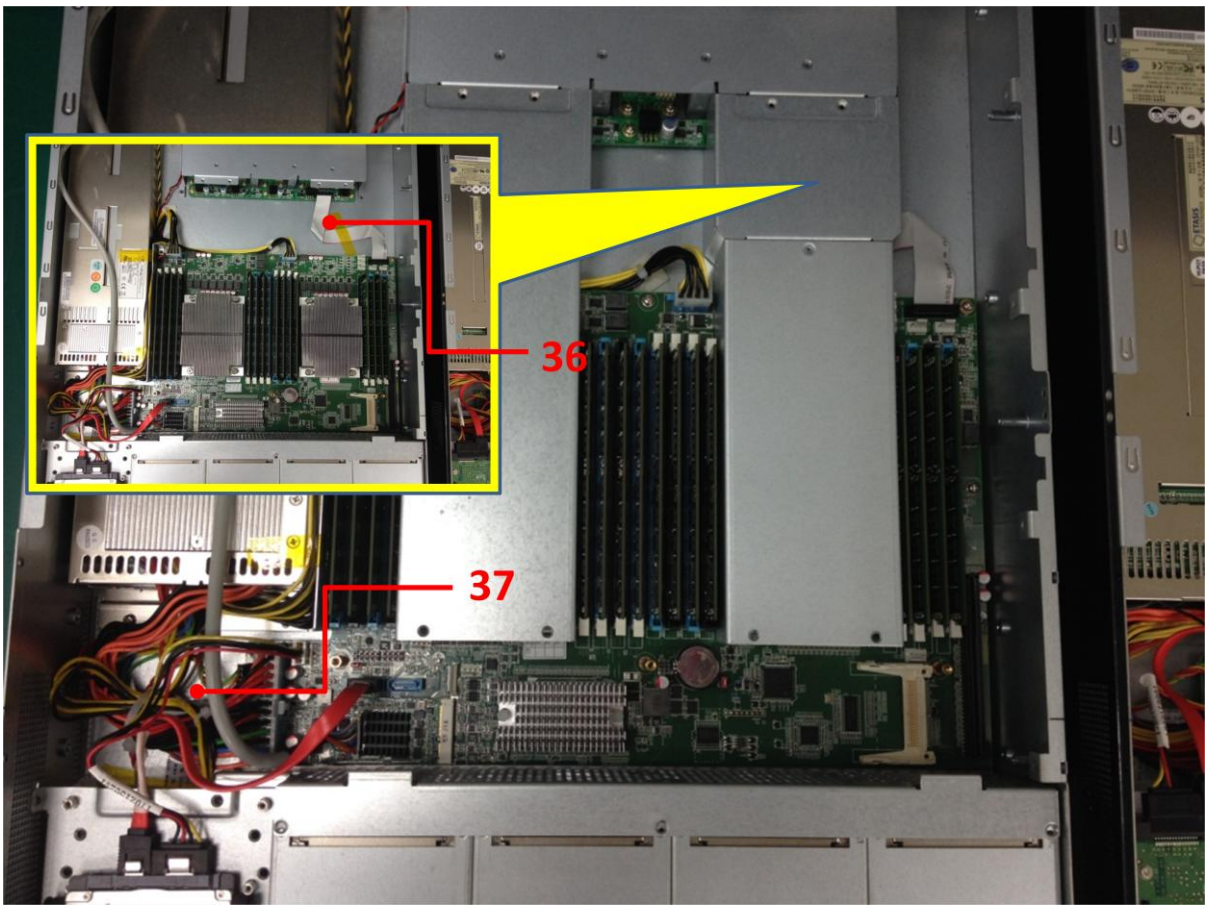


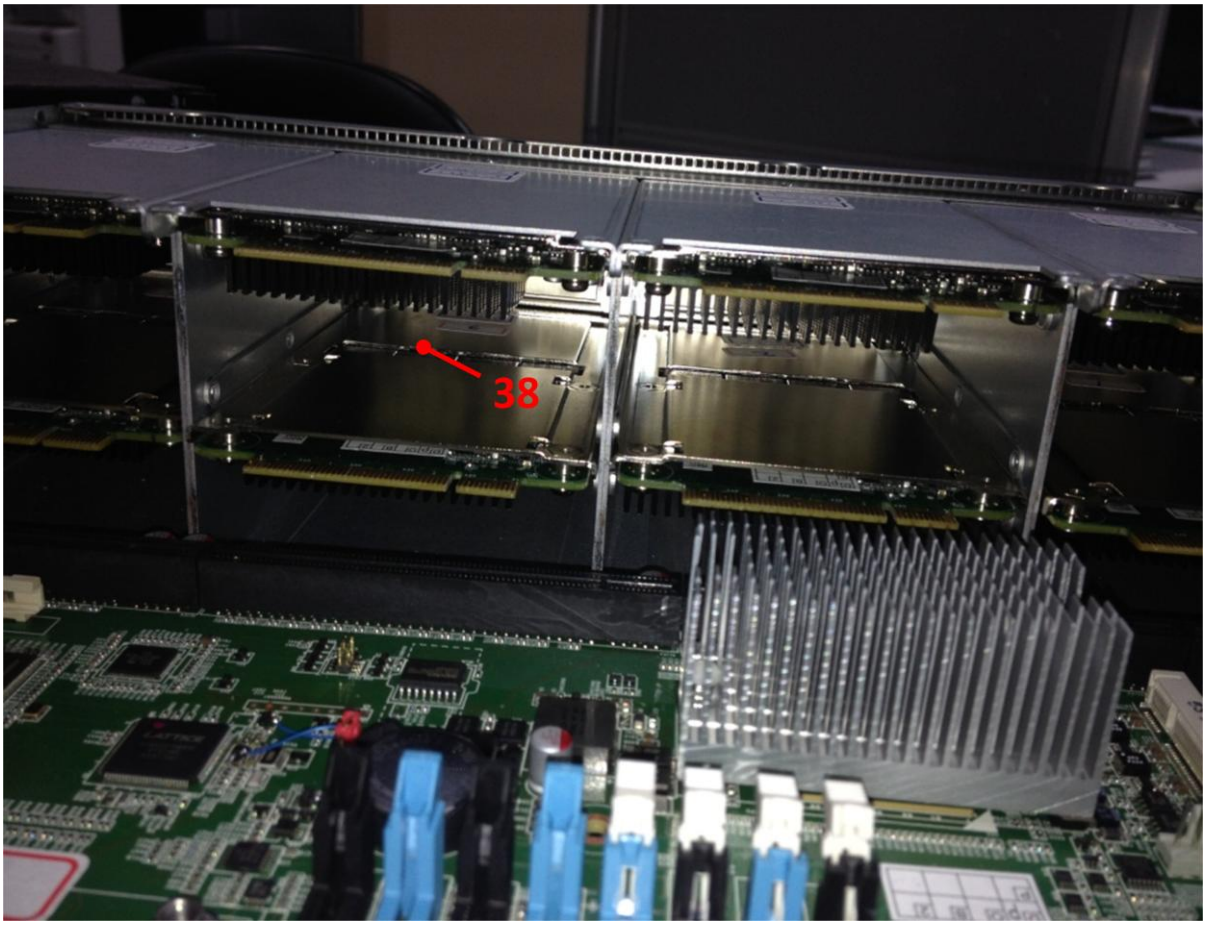
High Temperature Operation test





High Temperature Operation test





High Temperature Operation test

High Temperature Operation test

Thermal profile data:

FWS-8500 (With 0.2m/sec airflow)

Point \ Temp. Stage(℃)	Spec	25	40	Note
FWB-8500 Rev. A0.3				
01. CPU-1 - Intel Xeon® E5-2609 v3 1.90GHz	70.9	40.2	55.2	
02. CPU-2 - Intel Xeon® E5-2609 v3 1.90GHz	70.9	39.8	54.8	
03. U9 - IC Dual Output.Digital Multi-Phase QFN40.Checksum:CA.IR3564BMTRPBF	100	39.6	54.6	
04. U6 - IC.Dual Output.Digital Multi-Phase QFN48.Checksum:33.IR3566BMTRPBF	100	40.4	55.4	
05. U24 - IC.4x6mm.40A Integrated PowIRstage.PQFN25.IR.IR3553MTRPBF	100	42.2	57.2	
06. L18 - INDUCTOR.0.15uH.DCR=0.29mohm.GOTREND.GTV1007PR1-R15K	140	39	54	
07. U16 - IC.4x6mm.40A Integrated PowIRstage.PQFN25.IR.IR3553MTRPBF	100	42.6	57.6	
08. L13 - INDUCTOR.0.15uH.DCR=0.29mohm.GOTREND.GTV1007PR1-R15K	140	38.8	53.8	
09. U74 - IC.CLOCK GENERATOR.TSSOP 64P.IDT.932SQ420DGLFT	110	60.5	75.5	
10. U22 - IC.Server Coleto Creek PCH.INTEL.DH8925CL SLK96	78	41.7	56.7	
11. BAT1 - Lithium Battery.3V.225mAH.PANASONIC.CR2032	60	32	47	
12. L36 - Phase out,COIL.3.3uH.DCR=49mohm.Sumida.0420CDMCBDS-3R3MC	120	35	50	
13. C985 - SP CAP.470uF.2V.+-20%.D.6mOhm.Panasonic.EEFSX0D471XE	120	39.2	54.2	
14. Memory-1 - innodisk / 8GB DDR4 2133 W/ REG DIMM (SEC / K4A4G045WD)	85	30.4	45.4	
15. Memory-2 - innodisk / 8GB DDR4 2133 W/ REG DIMM (SEC / K4A4G045WD)	85	31	46	
16. Memory-3 - innodisk / 8GB DDR4 2133 W/ REG DIMM (SEC / K4A4G045WD)	85	31	46	
VGA Module - PER-V09V Rev. A1.0				
17. U3 - IC.PCI-Express to GPU Bridge.BGA 265P.SiliconMotion.SM750GX160000-AC	90	36.8	51.8	
18. U5 - IC.3A.Ultra Low Dropout LDO.SOP-8.YOBON.YB1283PSP8	100	47.4	62.4	
2.5" SATA HDD				
19. HDD - Toshiba / MQ01ABF032 320GB	55	25.5	40.5	
LAN Module - NIM-C13A Rev. A0.2 (LAN Chipset – 82580EB)				
20. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	67.3	82.3	
21. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	60.7	75.7	
LAN Module - NIM-C13A Rev. A0.2 (LAN Chipset - i350)				
22. LAN Chipset-1 - IC.PCI-E.GbE Controller.Qual Port.PBGA 256P.Intel.I350-AM4	100	58	73	
23. LAN Chipset-2 - IC.PCI-E.GbE Controller.Qual Port.PBGA 256P.Intel.I350-AM4	100	62.8	77.8	
LAN Module - NIM-C13A Rev. A0.2 (LAN Chipset – 82580EB)				
24. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	55.4	70.4	
25. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	63.5	78.5	
26. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	58.4	73.4	
27. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	58.4	73.4	
28. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	72.4	87.4	
29. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	70.9	85.9	

High Temperature Operation test

30. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	73.3	88.3	
31. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	68.1	83.1	
32. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	68.3	83.3	
33. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	70.9	85.9	
34. LAN Chipset-1 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	71.6	86.6	
35. LAN Chipset-2 - IC.PCI-E.GbE Controller Quad Port.PBGA 256P.Intel.82580EB	100	64.8	79.8	
Control Box Inside Air Temperature				
36. Control Box Inside Air Temperature-1	N/A	33.1	48.1	
37. Control Box Inside Air Temperature-2	N/A	23.8	38.8	
38. Control Box Inside Air Temperature-3	N/A	31	46	
Control Box External Surface Temperature				
39. Control Box External Surface Temperature	N/A	25.7	40.7	
Chamber Air Temperature				
40. Chamber Air Temperature	N/A	25	40	

Note(*):
1. "Tc" indicates the component's case maximum temperature value specified in its datasheet.
2. "Tm" indicates the measured Tc value under working environmental temperature within product specification.
3. Judgment Criteria:
- **Fail** : Tm > Tc; The measured value is over specification plus margin.
- **Margin** : Tc > Tm > Tc-5℃; The measured value is within specification with margin.
  For FANLESS system application, it is strongly recommended to add thermal dissipation design for better reliability.
- **Pass** : Tm < Tc-5℃; The measured value is with safety margin.

4. Defect NO.

Sample Configuration & Quantity Under Test:

Quantity: 1 (FWS-8500)

Test Result:

No issues were found during the temperature rise operation test.

Temp./humidity power on/off test

Test Date: 08-27 ~ 28-2015

Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-30 Testing procedures
Test Db: Damp Heat Test

Test Equipment:

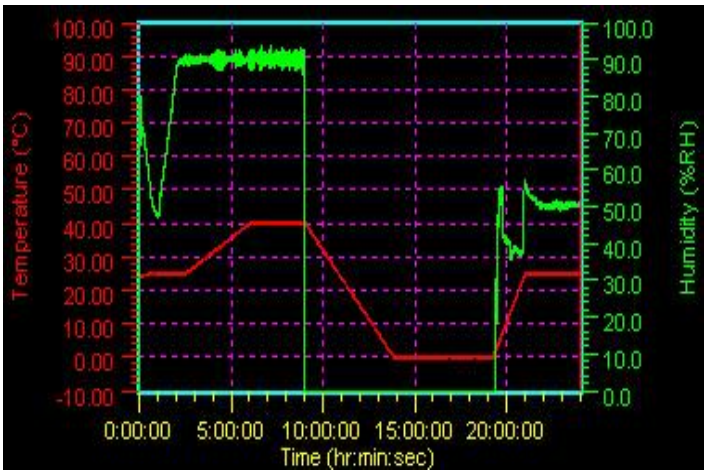
Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H + - 100
Date of Calibration: 10/09/2014
Serial Number: 2582

Temperature & Humidity Power On/Off Test:

Testing Specification:

Step	Temperature (¢J)	Humidity (%RH)	Duration (HH:MM)
1	25	50	00:30
2	25	50	00:30
3	25	90	01:00
4	25	90	00:30
5	40	90	03:30
6	40	90	03:00
7	0	0	04:50
8	0	0	05:23
9	25	50	01:47
10	25	50	03:00

Test Curve:



Test Result:

Test Method	Actual	Successful	Failure rate
Power On/Off	725/times	725/times	0 %
Note: Failure rate need to under 0%.			

Temperature cycle test

Test Date: 09-04 ~ 07-2015

Test Product: FWS-8500 with NIM-C13A (LAN chipset 82580EB & LAN chipset i350)

Test Site: AAEON QE Dept.

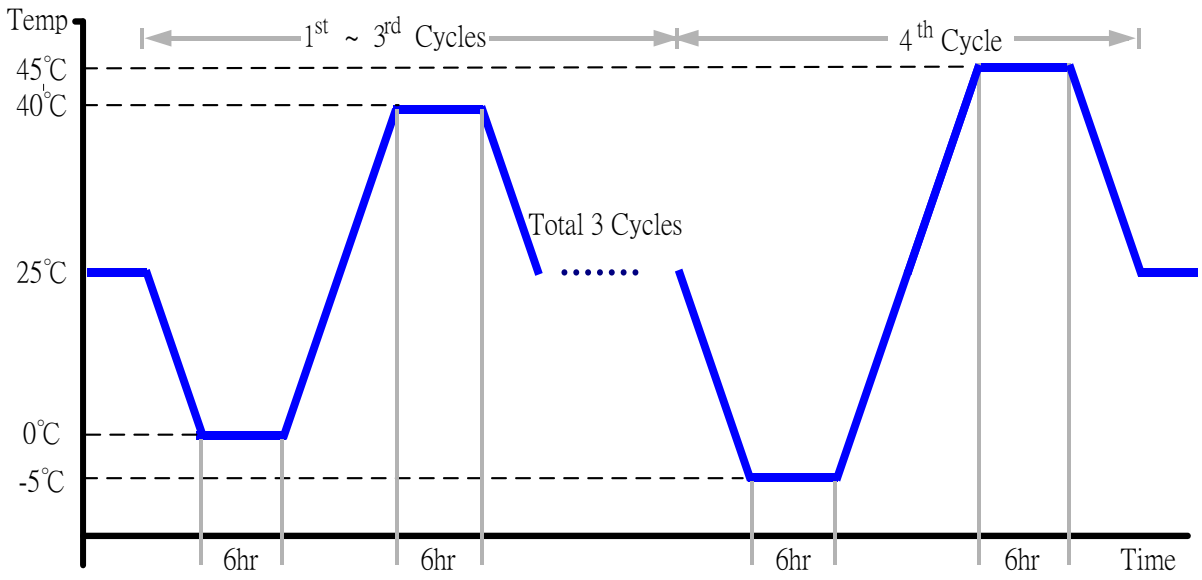
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H + - 100
Date of Calibration: 10/09/2014
Serial Number: 2582

Test Condition:

1. Test Low Temperature: 0℃ (1~3 cycles)
   -5℃ (4th cycle)
2. Test High Temperature: 40℃ (1~3 cycles)
   45℃ (4th cycle)
3. Test dwell time: 6Hrs
4. Temperature slope: 2℃/min
5. Test cycle: 4 cycles
6. Test Environment Curve:



Sample Configuration & Quantity Under Test:

Quantity: 1 (FWS-8500)

Test Result:

No issues were found during the temperature operation cycle test.

High temperature storage test

Test Date: 09-02 ~ 04-2015

Test Product: FWS-8500 with NIM-C13A (LAN chipset 82580EB & LAN chipset i350)

Test Site: AAEON QE Dept.

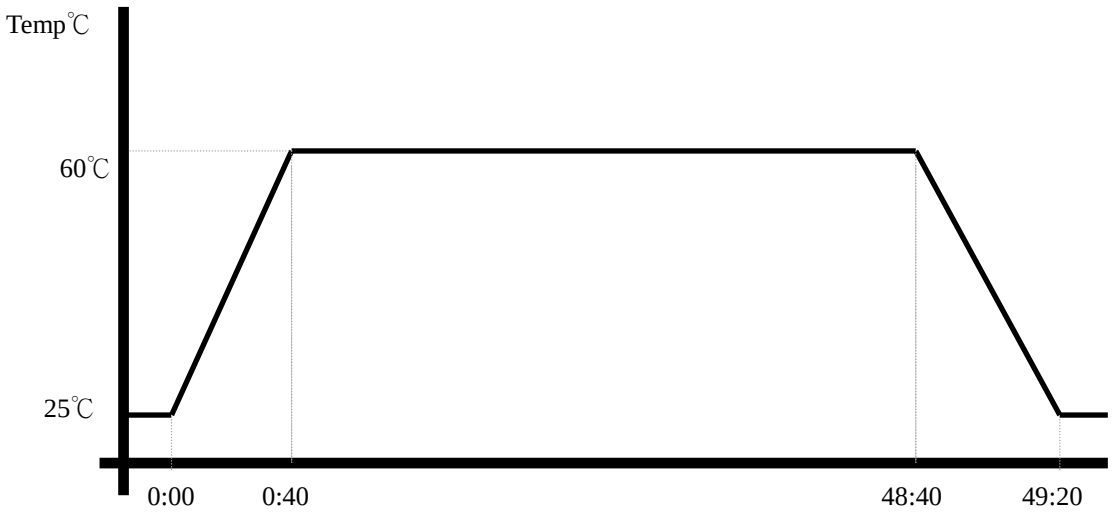
Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bb: Dry Heat Test (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H + - 100
Date of Calibration: 10/09/2014
Serial Number: 2582

Testing Item:

5. Test Temperature: 60℃
6. Test Times: 48Hrs
7. Test Software: ubuntu 12.04 LTS / Run iPerf test
8. Test Environment Curve:



Sample Configuration & Quantity Under Test:
Quantity: 1 (FWS-8500)

Test Result:

No issues were found after the high temperature storage test.

Low temperature storage test

Test Date: 08-31 ~ 09-02-2015

Test Product: FWS-8500 with NIM-C13A (LAN chipset 82580EB & LAN chipset i350)

Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-1 Testing procedures
Test Ab: Cold Test (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H + - 100
Date of Calibration: 10/09/2014
Serial Number: 2582

Testing Item:

1. Test Temperature: -20℃
2. Test Times: 48Hrs
3. Test Software: ubuntu 12.04 LTS / Run iPerf test
4. Test Environment Curve:

Sample Configuration & Quantity Under Test:
Quantity: 1 (FWS-8500)

Test Result:
No issues were found after the low temperature storage test.

Humidity test

Test Date: 08-28 ~ 31-2014

Test Product: FWS-8500 with NIM-C13A (LAN chipset 82580EB & LAN chipset i350)

Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-3 Testing procedures
Test Ca: Damp heat, steady state (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H + - 100
Date of Calibration: 10/09/2014
Serial Number: 2582

Testing Item:

1. Test Temperature: 40℃
2. Test Humidity: 80%RH
3. Test Times: 48Hrs
5. Test Software: ubuntu 12.04 LTS / Run iPerf test
4. Test Environment Curve:

Humidity %

Sample Configuration & Quantity Under Test:
Quantity: 1 (FWS-8500)

Test Result:

No issues were found after the humidity storage test.

Cold start and hot start test

Test Date: 09-07 ~ 08-2015

Test Product: FWS-8500 with NIM-C13A (LAN chipset 82580EB & LAN chipset i350)

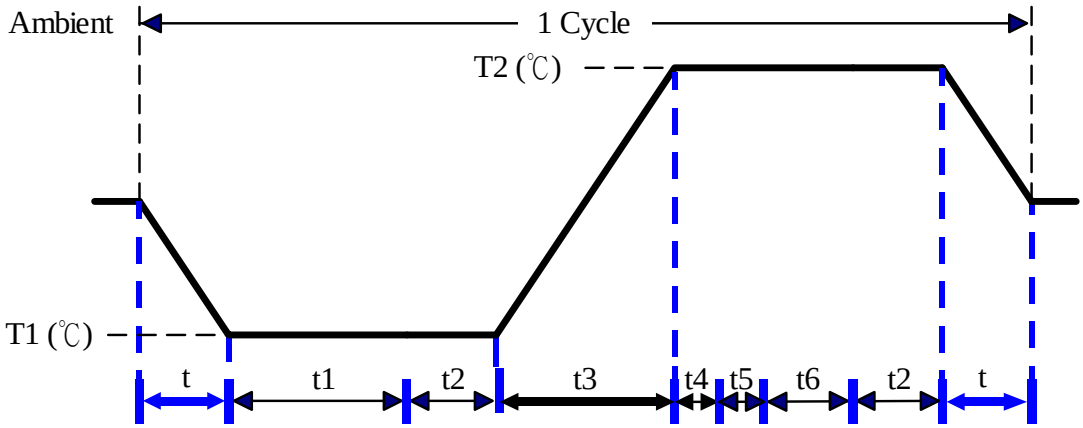
Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H + - 100
Date of Calibration: 10/09/2014
Serial Number: 2582

Test Condition:



Parameters	Description
T1	-5℃
T2	45℃
t1	4 hrs
t2, t6	2 hrs
t4, t5	1hrs
t, t3	2℃/min
n (Cycle)	1

t = temprature slope
t , t1, t6: Power Off
t2: Power on/off test 10 times (on 2 min / off 5min)
t3, t4: Run iPerf test
t5: ubuntu 12.04 LTS Software restart test 3 times
Test Software: ubuntu 12.04 LTS

Test Result:

a. No issues were found during the cold start test.

b. No issues were found during the hot start test.