PC-AM9000
Environment Test Report

Report NO: 13I020025

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

Issue date	Approval	Test Engineer
2013-08-30	**Tom Lin**	**Willy Shih**

Test item list

Testing Result

Num	Test item list	Result	Remark
1	Temperature rise test	Pass	
2	Temperature cycle operation test	Pass	
3	High temperature storage test	Pass	
4	Low temperature storage test	Pass	
5	Humidity test	Pass	
6	Cold start and hot start test	Pass	

Configuration of EUT

Num	Item	Spec
1	CPU	Intel Pentium Processor G850(3M Cache, 2.90 GHz)
2	CPU Board	EMB-B75A
3	BIOS	R1.1(EM75AM11)(08/31/2012)
4	Chipset	Intel B75
5	Memory(wide temp.)	Transcend 4GB 2R*8 DDR3 1333 U SEC 231 HCKO K4B2G0846D *2
6	HDD	TOSHIBA 2.5” 320GB(MK3276GSX)
7	Test Software	Windows 7 / Run PassMark Burn In Test 7.0 Pro

Temperature rise test

Test Date: 08-30-2013

Test Product: PC-AM9000

Test Site: AAEON QE Dept.

Test Standard: Refer to EN 61131-2(94), UL508 (94)

Temperature Measurement:

40 Channel Thermal Recorder: (YOKOGAWA Inc,)
Model: DA100-13-1D
Date of Calibration: 10/08/12
Serial Number: 12A323190

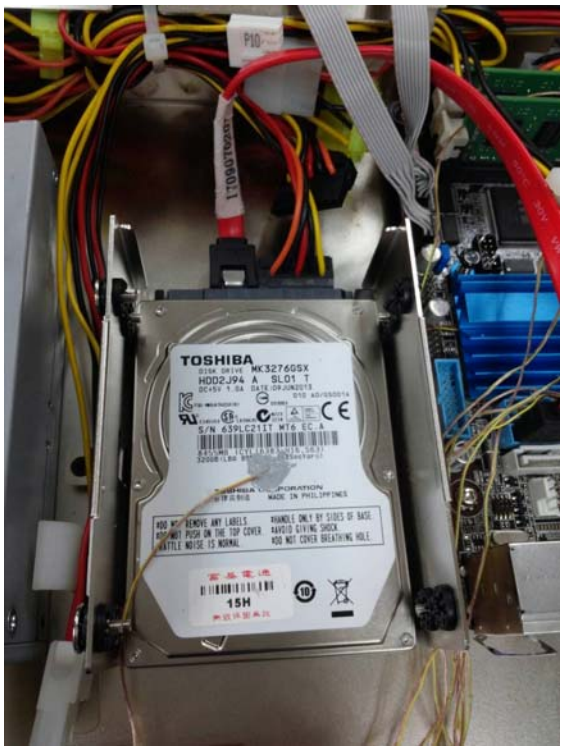
Test Condition:

Ambient temperature: 45℃
Continuous running till thermal stability (within less than 1℃)

Test Software:

Windows 7 / Run PassMark Burn In Test 7.0 Pro

Terminal Recorder:



Temperature rise test

Thermal profile data:

Point	Position	Describe	Tc (*1) (℃)	Tm (*2) Measured Under		Note
				25℃	45℃	
1	CPU	Intel core i7-2600 / 3.40GHz	72.6	39	59.0	
2	B75	Intel C.S BD82B75 FCBGA942	100	59.5	79.5	
3	PQ7	PH7030AL	150	48.8	68.8	
4	PL6	INDUCTOR 0.68UH/35A 1.5φ DI	125	45.7	65.7	
5	PQ26	PH2525L	150	47.1	67.1	
6	U62	APE8955MP	85	50.9	70.9	
7	PQ17	PH2525L	150	51.2	71.2	
8	Memory	Transcend 4GB 2R*8 DDR3 1333 U SEC 231 HCKO K4B2G0846D	85	36.3	56.3	
9	Memory	Transcend 4GB 2R*8 DDR3 1333 U SEC 231 HCKO K4B2G0846D	60	36.1	56.1	
10	HDD	TOSHIBA 2.5” 320GB(MK3276GSX)	85	34.3	54.3	

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.
- **Margin Pass** : Tc > Tm > Tc-5℃; The measured value is within specification with margin.
  It is strongly recommended to add thermal dissipation design for better reliability.
- **Pass** : Tm < Tc-5℃; The measured value is with safety margin.

Sample Configuration & Quantity Under Test:

Quantity: 1 (PC-AM9000)

Test Result:

No issues were found during the temperature rise operation test.

Temperature cycle test

Test Date: 08-28 ~ 30-2013

Test Product: PC-AM9000

Test Site: AAEON QE Dept.

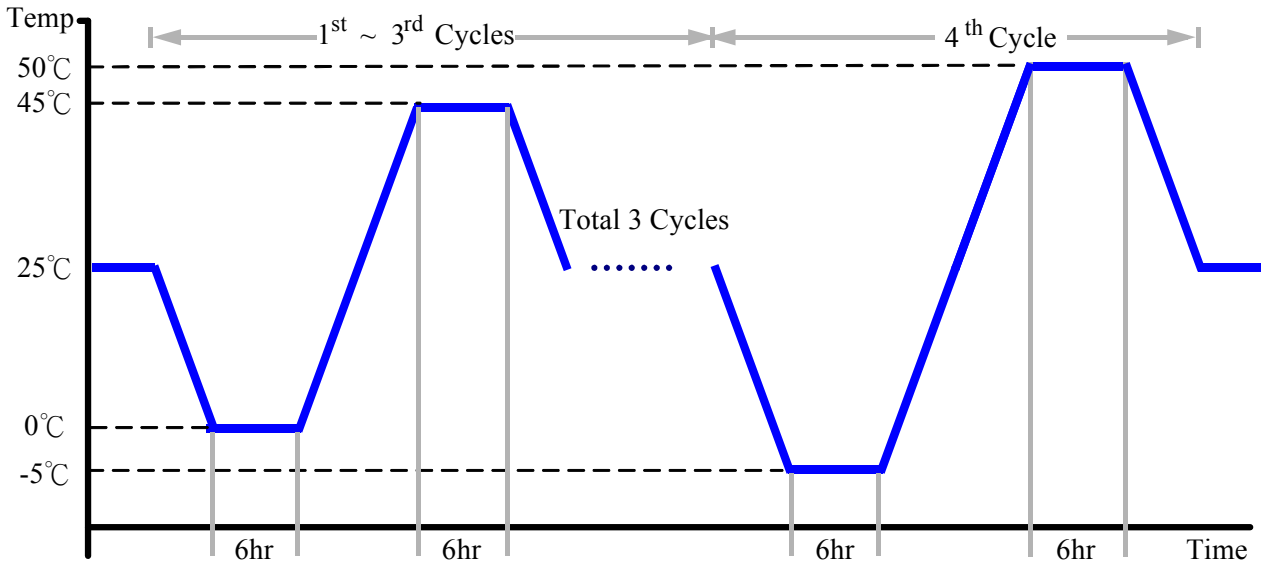
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H+-100
Date of Calibration: 10/10/12
Serial Number: 2582

Test Condition:

1. Test Low Temperature: 0℃ (1~3 cycles)
   -5℃ (4th cycle)
2. Test High Temperature: 45℃ (1~3 cycles)
   50℃ (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 (PC-AM9000)

Test Result:

No issues were found during the temperature operation cycle test.

High temperature storage test

Test Date: 08-26 ~ 28-2013

Test Product: PC-AM9000

Test Site: AAEON QE Dept.

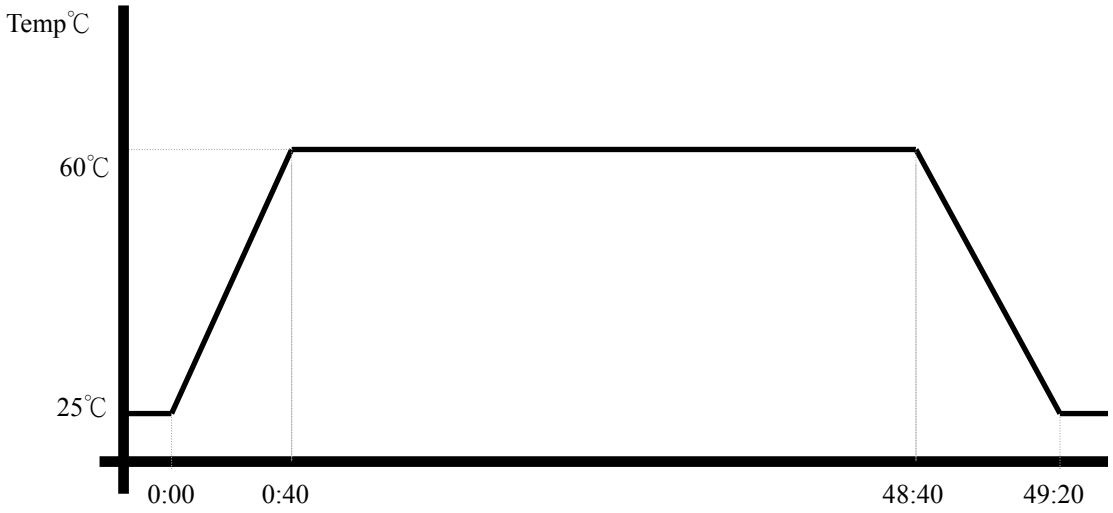
Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bb: Dry Heat Test (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H+-100
Date of Calibration: 10/10/12
Serial Number: 2582

Testing Item:

1. Test Temperature: 60℃
2. Test Times: 48Hrs
3. Test Software: Windows 7 / Run PassMark Burn In Test 7.0 Pro
4. Test Environment Curve:



Sample Configuration & Quantity Under Test:

Quantity: 1 (PC-AM9000)

Test Result:

No issues were found after the high temperature storage test.

Low temperature storage test

Test Date: 08-24 ~ 08-26-2013

Test Product: PC-AM9000

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: 10/10/12
Serial Number: 2582

Testing Item:

1. Test Temperature: -20℃
2. Test Times: 48Hrs
3. Test Software: Windows 7 / Run PassMark Burn In Test 7.0 Pro
4. Test Environment Curve:

Sample Configuration & Quantity Under Test:
Quantity: 1 (PC-AM9000)

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

Humidity test

Test Date: 08-22~24-2013

Test Product: PC-AM9000

Test Site: AAEON QE Dept.

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

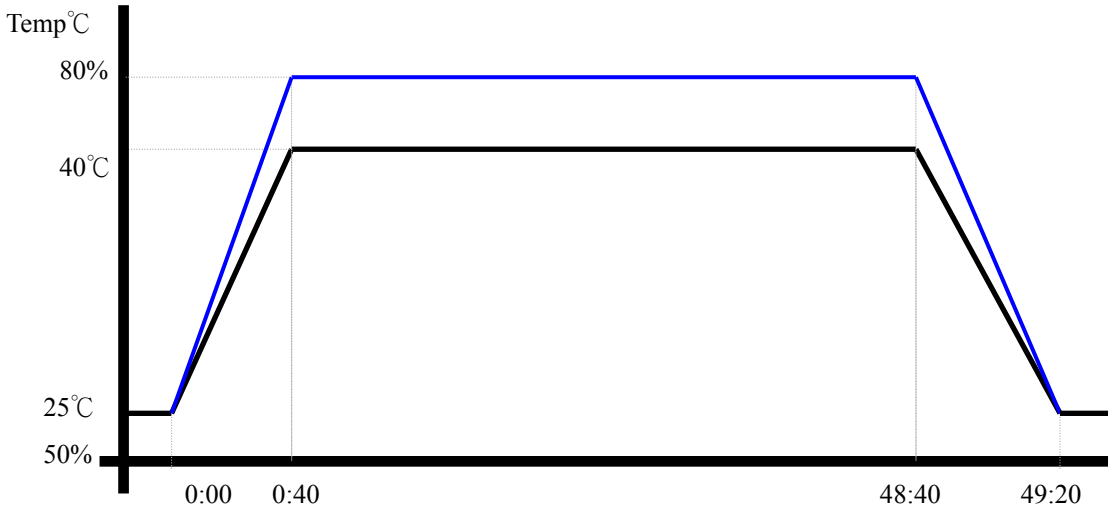
Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H+-100
Date of Calibration: 10/10/12
Serial Number: 2582

Testing Item:

1. Test Temperature: 40℃
2. Test Humidity: 80%RH
3. Test Times: 48Hrs
4. Test Software: Windows 7 / Run PassMark Burn In Test 7.0 Pro
5. Test Environment Curve:

Humidity %



Sample Configuration & Quantity Under Test:

Quantity: 1 (PC-AM9000)

Test Result:

No issues were found after the humidity storage test.

Cold start and hot start test

Test Date: 08-20~ 22-2013

Test Product: PC-AM9000

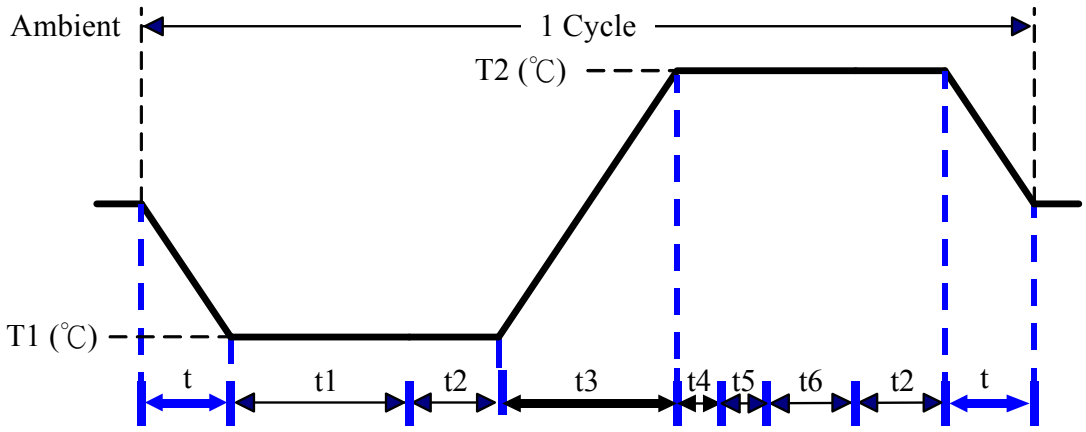
Test Site: AAEON QE Dept.

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: 10/10/12
Serial Number: 2582

Test Condition:



Parameters	Description
T1	-5℃
T2	50℃
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 burn in test 7.0
t5: Win 7 Software restart test 3 times
Test Software: Windows 7

Test Result:

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

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