AEC-6401

(with mSATA)

Environment Test Report

Report NO: 13P020002

Summary	☐ **Pass** ☐ **Fail** Note : There is/are ___ defect(s) not list in the report, please check it in the DTS Website. ☑ **Pass with Deviation** **Comment:** **There are three temperature point marginal passed, the function is normal, hope to get improvement for the next generation.**

Issue date	Approval	Test Engineer
2013-02-08	**Tom Lin**	**Rex Chang**

Test item list

Testing Result

Num	Test item list	Result	Remark
1	Temp./Humidity power on/off test	Pass	
2	Temperature rise 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.	System:	AEC-6401
	1. Main board	PBA-CV02 A0.2
	2. BIOS	AEC-6401 R0.6 (6401AT06) (12/26/2012)
	3. CPU Type	Intel Atom N2600 / 1.6GHz
	4. Wide Temp. Memory	DSLGB * 4 / DDR3-1066 / ELPIDA J2108BCSE-DJ-F
	5. Wide Temp. mSATA	MEMORIGHT 29F64G08AFAAA / 16GB
	6. WiFi Module	VNT9271b6050
	6. Test Software	Windows 7 / Run BurnIn test 7.0 Pro
2.	Adapter	FSP FSP060-DBAB1

Heat Sink

Temp./humidity power on/off test

Test Date: 02-04 ~ 05-2013

Test Product: PBA-CV02 A0.2

Test Site: AAEON QE Dept.

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

Test Equipment:

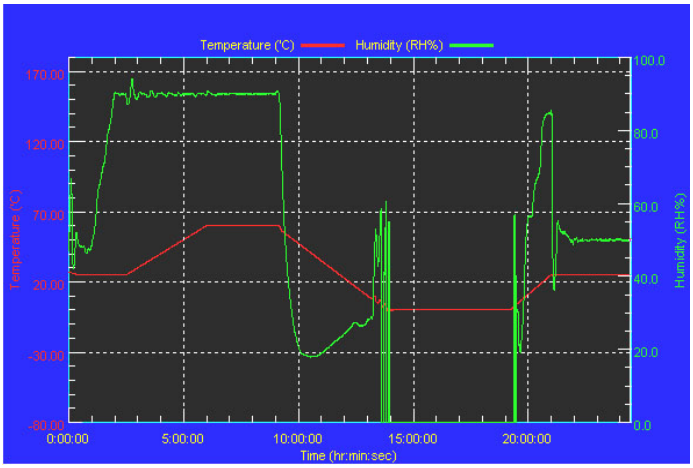
Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/27/12
Serial Number: A0004

Temperature & Humidity Power On/Off Test:

Testing Specification:

Step	Temperature (℃)	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	60	90	03:30
6	60	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	1109/times	1109/times	0 %
Note: Failure rate need to under 0.2%.			

Temperature rise test

Test Date: 02-07-2013

Test Product: AEC-6401

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

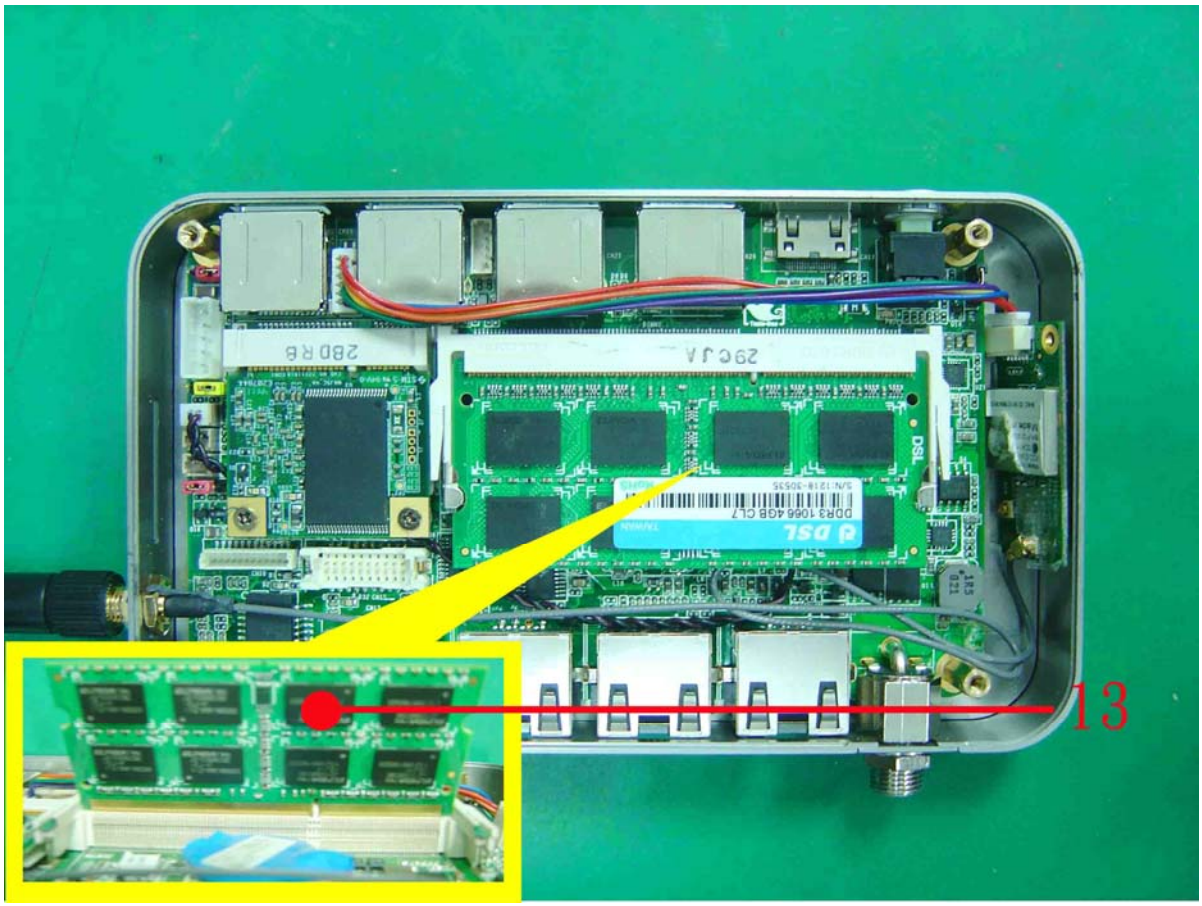
Test Condition:

Ambient temperature: 40℃
Continuous running till thermal stability (within less than 1℃)

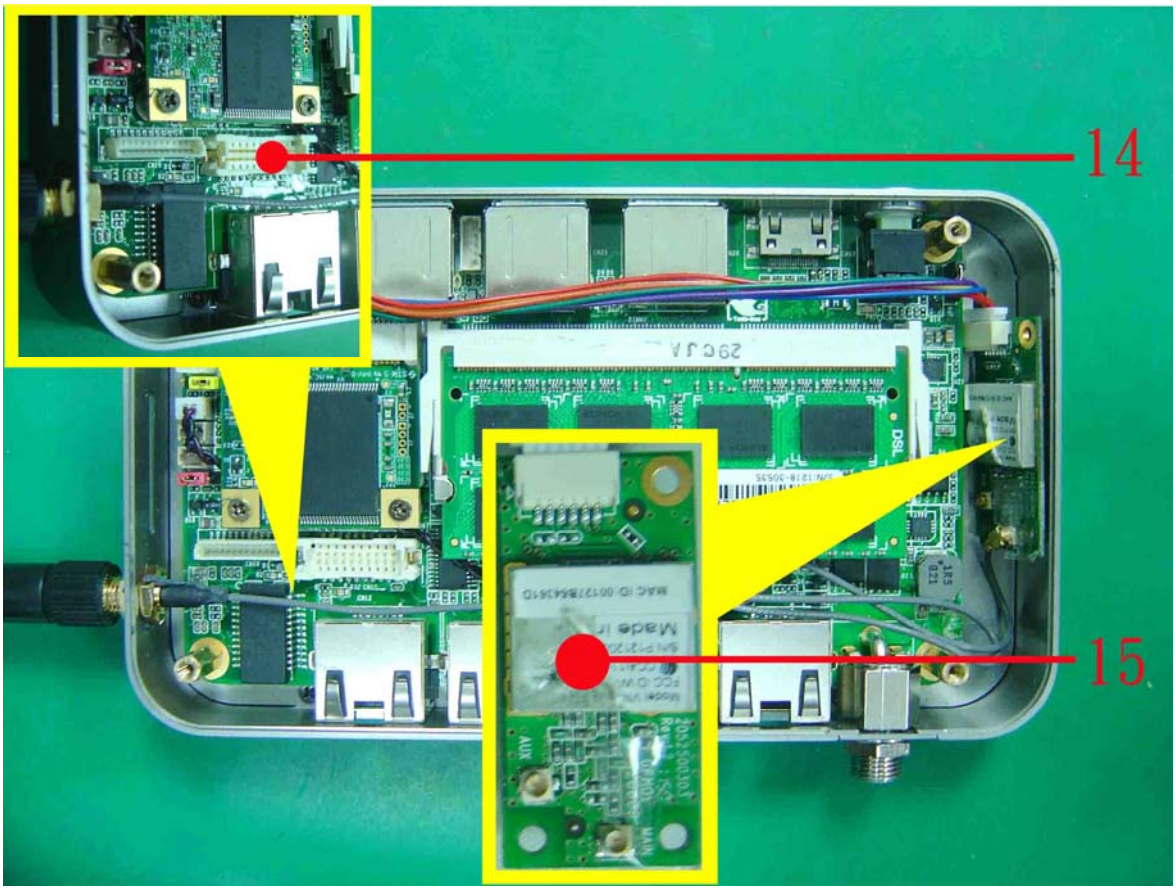
Test Software:

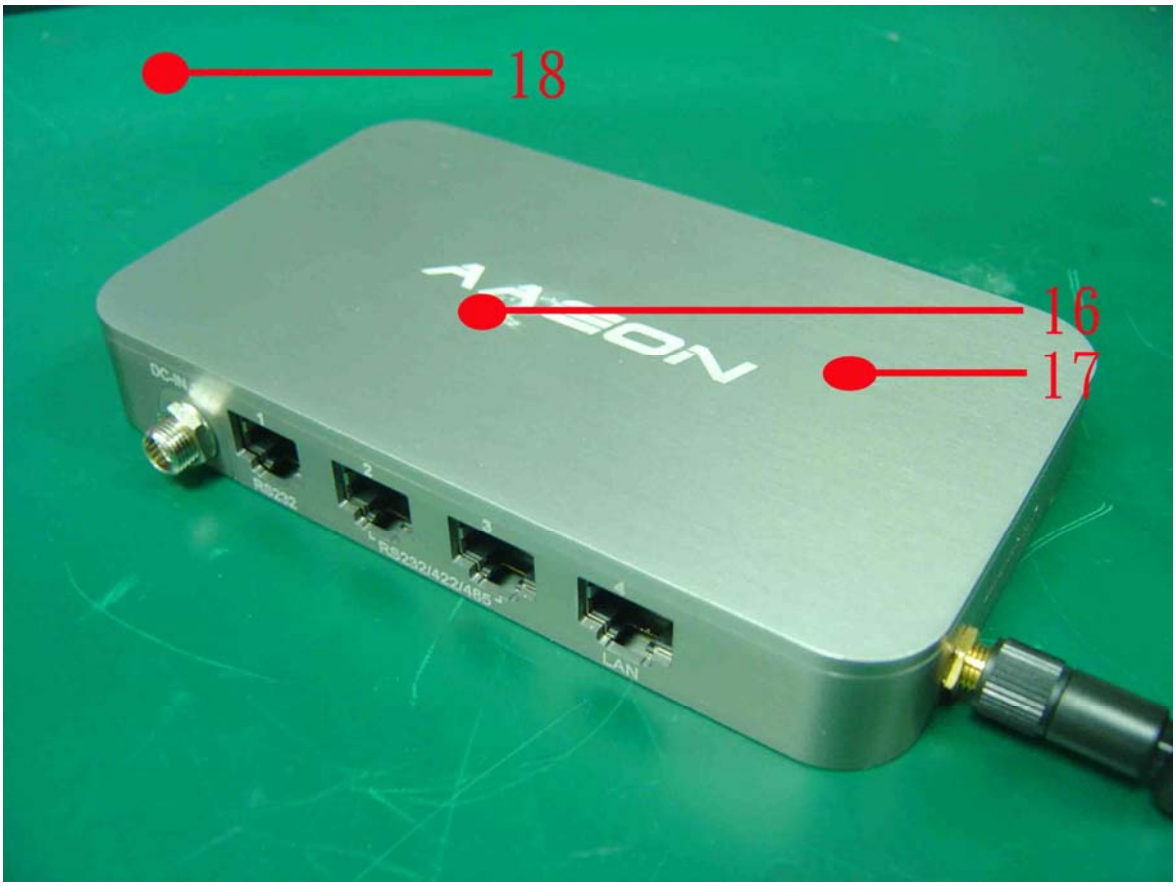
Windows 7 / Run PassMark Burn In Test 7.0 Pro

Terminal Recorder:



Temperature rise test





Temperature rise test

Thermal profile data:

AEC-6401

Point / Temp. Stage(℃)	Spec	40	25	Note
01. U9 - (TF) INTEL CPU.Cedarview.1.6GHz.N2600	100	77.6	62.6	
02. U3 - (TF) NM10 Express Chipset.INTEL.CG82NM10	115	92.4	77.4	
03. L3 - (TF) COIL.2.2uH.TRIO.EM-22AM01V01	125	87.7	72.7	
04. U8 - (TF) CLOCK GEN. MLF.IDT.9VRS4339BKLFT	115	85.9	70.9	
05. U5 - (TF) Super I/O.Fintek.F81801U-I	127	84.8	69.8	
06. U16 - (TF) Digital Video Level Shifter.for DP to HDMI.PERICOM.PI3VDP411LSZBE	85	84.7	69.7	Note 3
07. L5 - (TF) COIL. 0.56uH. ZenithTek.ZPWM-4020MP-R56	125	90.8	75.8	
08. Q18 - (TF) PWR.Dual N-Channel. MOSFET.SMD.SO-8.IR.IRF8313PbF	150	85.9	70.9	
09. U10 - (TF) Dual Single-Phase PWM.Richtek.RT8167AGQW	100	83.4	68.4	
10. U7 - (TF) Low dropout Linear Regulator.GMT.G9731F11U	100	95.8	80.8	Note 3
11. U35 - (TF) RS-232/RS-485/RS-422 transceiv.Fintek.F81438G	100	86.6	71.6	
12. U2 - (TF) RS232 Driver ESD 15KV.AD.ADM213EARSZ	100	87.7	72.7	
13. Memory	95	85.8	70.8	
14. Control Box Inside Air Temperature (mSATA Ambient)	85	78.2	63.2	
15. Wi-Fi Module – VIA VT9271	80	75.7	60.7	Note 3
16. Chassis Surface Temperature - 1	N/A	72.0	57.0	
17. Chassis Surface Temperature - 2	N/A	72.0	57.0	
18. Chamber Air Temperature	N/A	40.1	25.1	

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 (AEC-6401)

Test Result:

No issues were found during the temperature rise operation test.

Temperature cycle test

Test Date: 02-01 ~ 04-2013

Test Product: AEC-6401

Test Site: AAEON QE Dept.

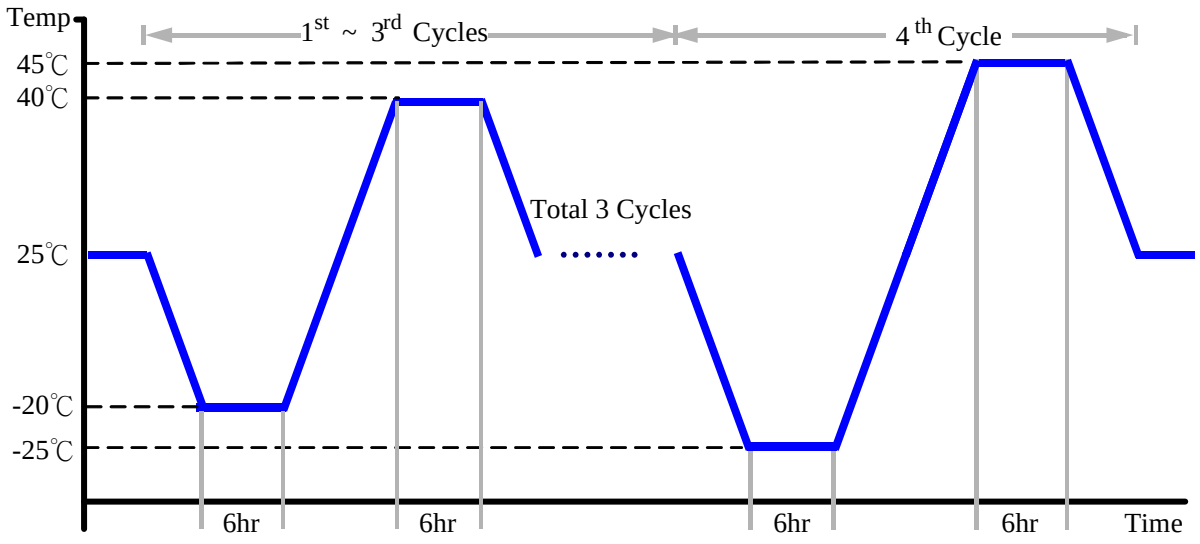
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/27/12
Serial Number: A0004

Test Condition:

1. Test Low Temperature: -20℃ (1~3 cycles)
   -25℃ (4^{th} cycle)
2. Test High Temperature: 40℃ (1~3 cycles)
   45℃ (4^{th} 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 (AEC-6401)

Test Result:

No issues were found during the temperature operation cycle test.

High temperature storage test

Test Date: 01-29 ~ 31-2013

Test Product: AEC-6401

Test Site: AAEON QE Dept.

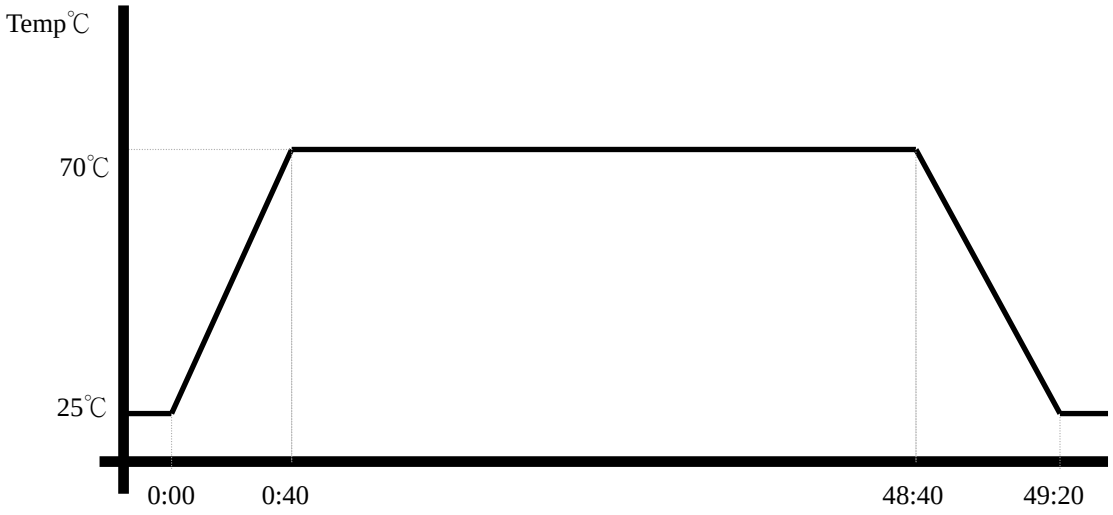
Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bb: Dry Heat Test (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/27/12
Serial Number: A0004

Testing Item:

1. Test Temperature: 70℃
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 (AEC-6401)

Test Result:

No issues were found after the high temperature storage test.

Low temperature storage test

Test Date: 01-27 ~ 29-2013

Test Product: AEC-6401

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-D7TS-100+LN2
Date of Calibration: 09/27/12
Serial Number: A0004

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 (AEC-6401)

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

Humidity test

Test Date: 01-24 ~ 26-2013

Test Product: AEC-6401

Test Site: AAEON QE Dept.

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

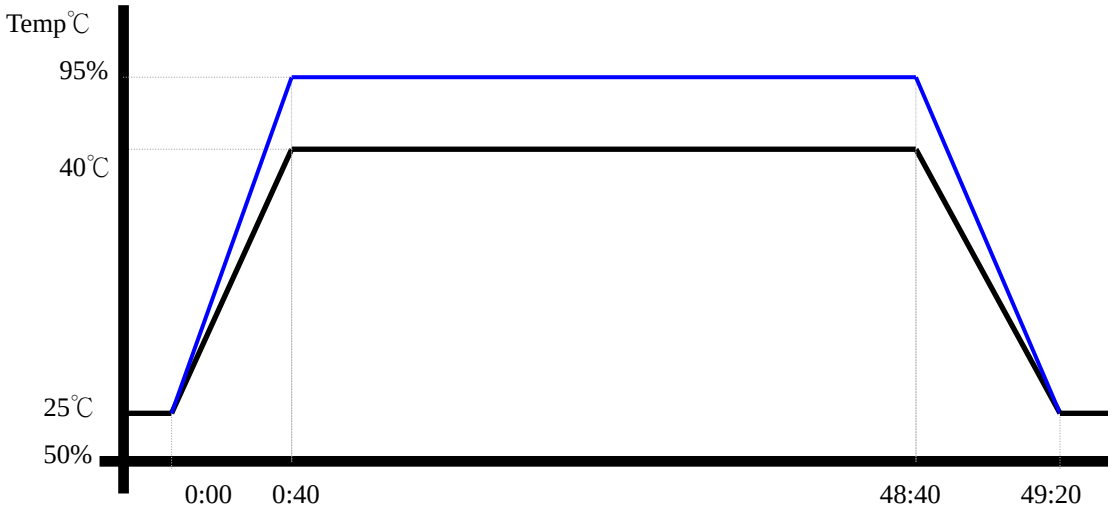
Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/27/12
Serial Number: A0004

Testing Item:

1. Test Temperature: 40℃
2. Test Humidity: 95%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 (AEC-6401)

Test Result:

No issues were found after the humidity storage test.

Cold start and hot start test

Test Date: 02-05~ 06-2013

Test Product: AEC-6401

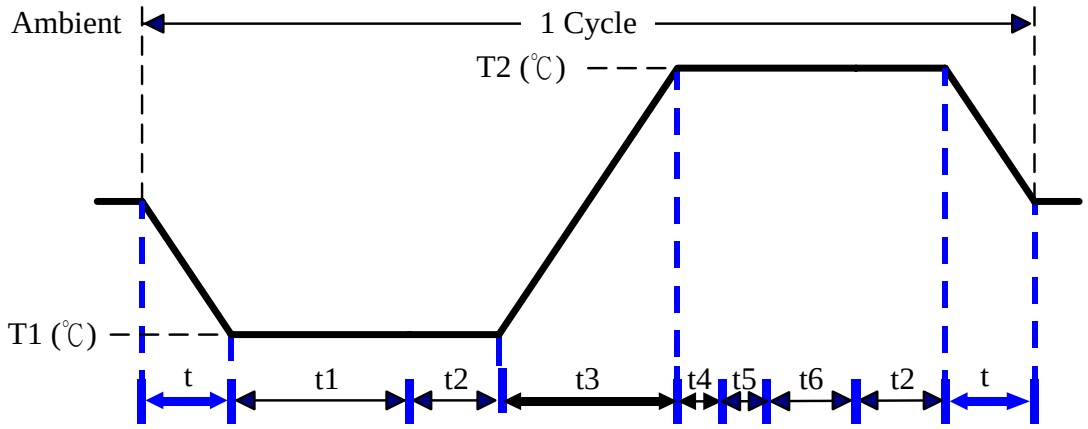
Test Site: AAEON QE Dept.

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-D7TS-100+LN2
Date of Calibration: 09/27/12
Serial Number: A0004

Test Condition:



Parameters	Description
T1	-25℃
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 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.