AEC-6402

(with mSATA)

Environment Test Report

Report NO: 14P020003

Summary	☐ **Pass** ☐ **Fail** ☑ **Pass with Deviation** Comment: There are 1 temperature point marginal passed, the function is normal, hope to get improvement for the next generation.

Issue date	Approval	Test Engineer
2014-01-14	**Tom Lin**	**Ben Sun**

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.	System:	AEC-6402
	1. Main board	AEC-6402
	2. BIOS	AEC-6402 R0.2 (A402AM02)
	3. CPU Type	Intel Atom N2600 / 1.6GHz
	4. Wide Temp. Memory	Transcend DDR3-1333 4GB (TS512MSK64V3N-I)
	5. Wide Temp. mSATA	INNODISK nSATA 3ME 64GB
	6. Test Software	Windows 7 / Run BurnIn test 7.1 Pro
2.	Adapter	FSP FSP084-DMAA1

Heat Sink

Temperature rise test

Test Date: 12-24~25-2013

Test Product: AEC-6402

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: 10/01/13
Serial Number: 12A323190

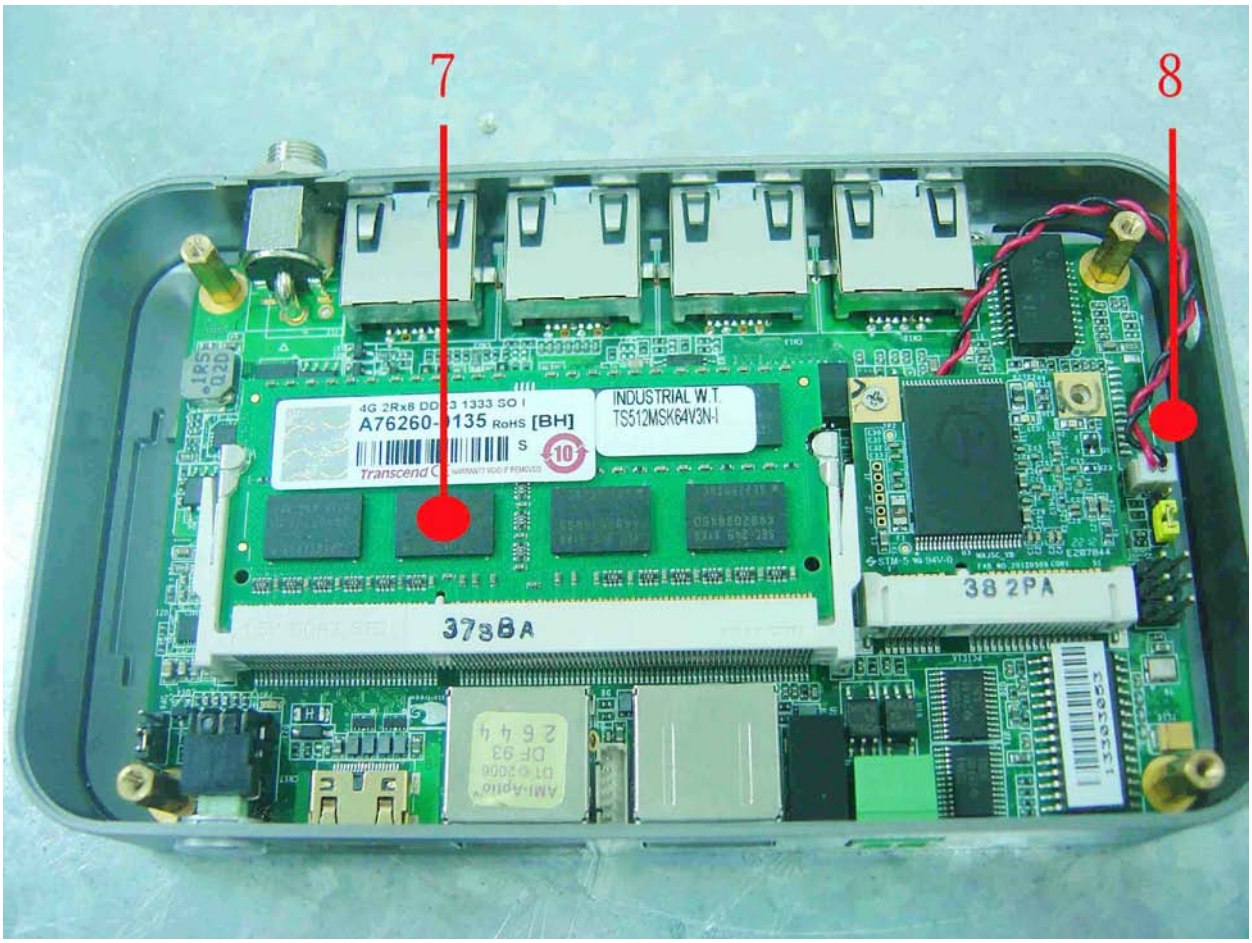
Test Condition:

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

Test Software:

Windows 7 / Run PassMark Burn In Test 7.1 Pro

Terminal Recorder:



Temperature rise test

Thermal profile data:

Point	Describe	Tc (*1) (℃)	Tm (*2) Measured Under 40℃	Note
1	U9 - (TF) INTEL CPU.Cedarview.1.6GHz.N2600	100	75.2	
2	U3 - (TF) NM10 Express Chipset.INTEL.CG82NM10	115	91.2	
3	U16 - (TF) Digital Video Level Shifter.for DP to HDMI.PERICOM.PI3VDP411LSZBE	85	80.8	*Note 3
4	U10 - (TF) Dual Single-Phase PWM.Richtek.RT8167AGQW	100	80.5	
5	U7 - (TF) Low dropout Linear Regulator.GMT.G9731F11U	150	99.1	
6	U35 - (TF) RS-232/RS-485/RS-422 transceiv.Fintek.F81438G	100	82.8	
7	Memory	95	80.2	
8	Control Box Inside Air Temperature (mSATA Ambient)	85	75.9	
9	Chassis Surface Temperature	N/A	71.6	
10	Chamber Air Temperature	N/A	40.2	

Temperature rise test

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-6402)

Test Result:

No issues were found during the temperature rise operation test.

Temperature cycle test

Test Date: 12-26 ~ 27-2013

Test Product: AEC-6402

Test Site: AAEON QE Dept.

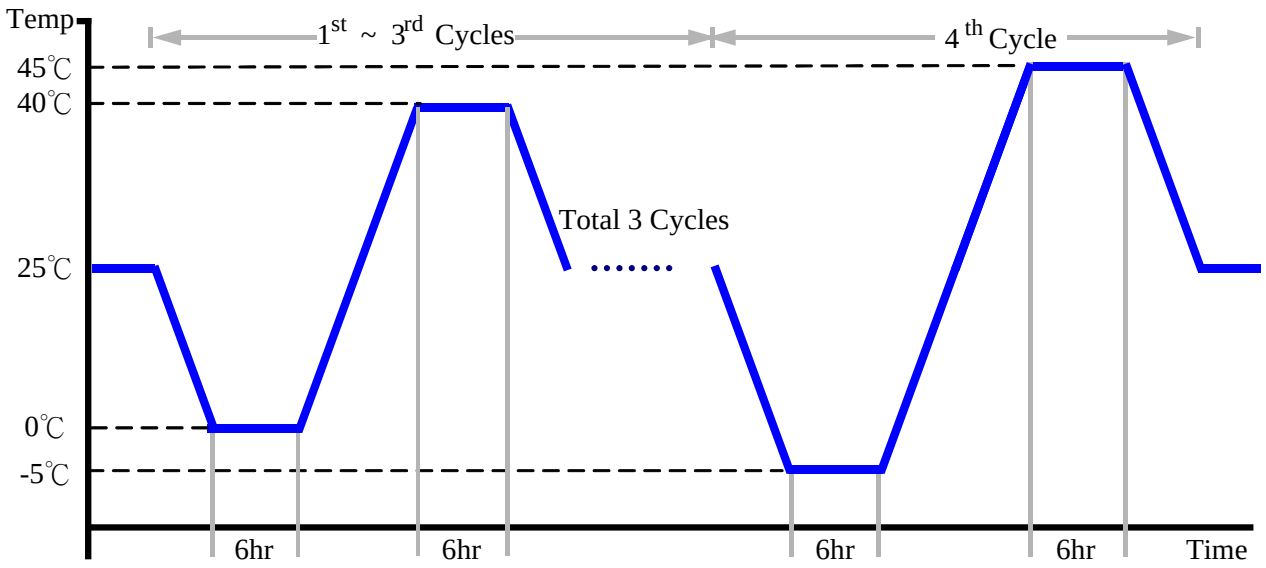
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H+-100
Date of Calibration: 10/09/13
Serial Number: 2582

Test Condition:

1. Test Low Temperature: 0℃ (1~3 cycles)
   -5℃ (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-6402)

Test Result:

No issues were found during the temperature operation cycle test.

High temperature storage test

Test Date: 12-30 ~ 31-2013

Test Product: AEC-6402

Test Site: AAEON QE Dept.

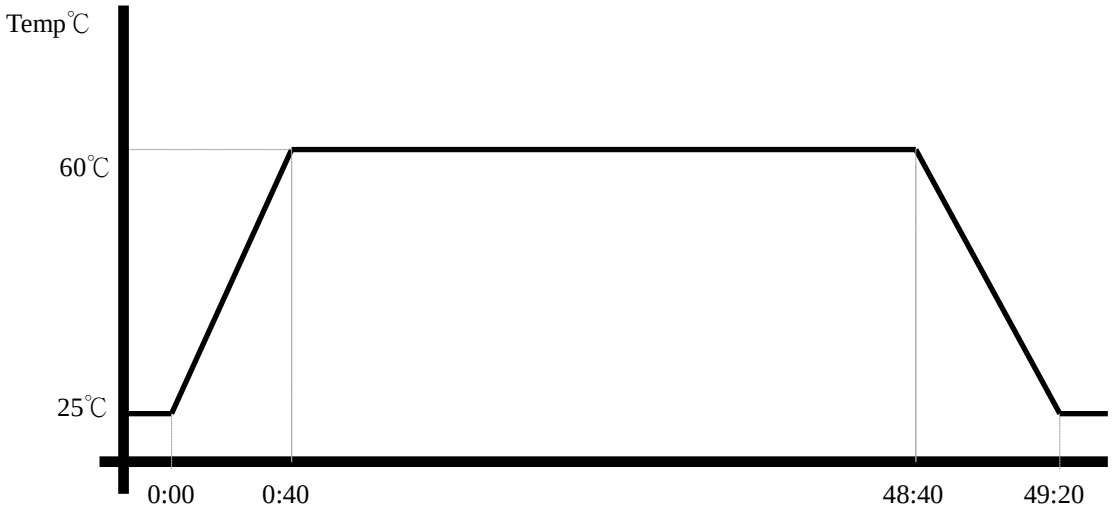
Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bb: Dry Heat Test (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H+-100
Date of Calibration: 10/09/13
Serial Number: 2582

Testing Item:

1. Test Temperature: 60℃
2. Test Times: 48Hrs
3. Test Software: Windows 7 / Run PassMark Burn In Test 7.1 Pro
4. Test Environment Curve:



Sample Configuration & Quantity Under Test:

Quantity: 1 (AEC-6402)

Test Result:

No issues were found after the high temperature storage test.

Low temperature storage test

Test Date: 01-02 ~ 03-2014

Test Product: AEC-6402

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: 10/09/13
Serial Number: 2582

Testing Item:

1. Test Temperature: -20℃
2. Test Times: 48Hrs
3. Test Software: Windows 7 / Run PassMark Burn In Test 7.1 Pro
4. Test Environment Curve:

Sample Configuration & Quantity Under Test:
Quantity: 1 (AEC-6402)

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

Humidity test

Test Date: 01-06~07-2014

Test Product: AEC-6402

Test Site: AAEON QE Dept.

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

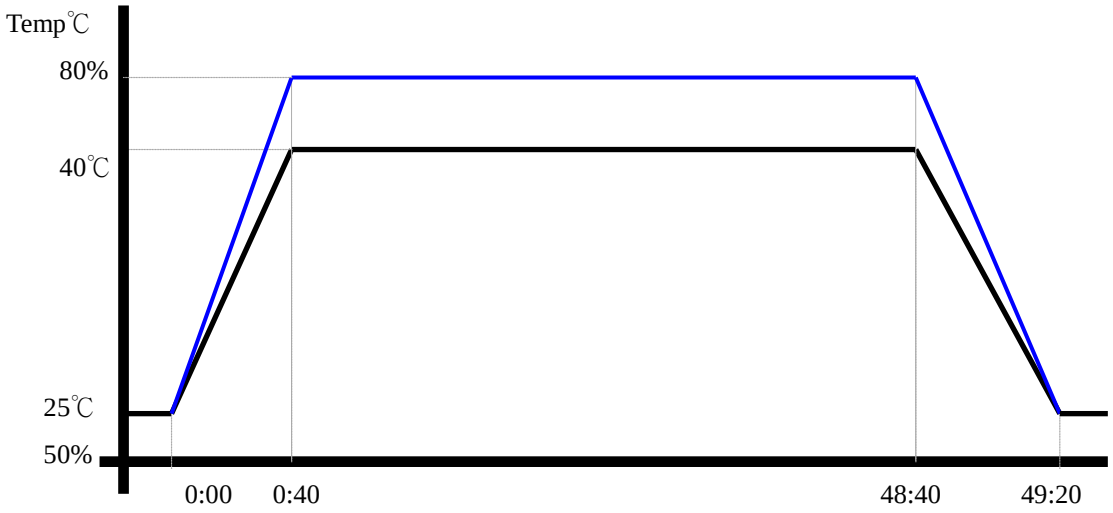
Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D4H+-100
Date of Calibration: 10/09/13
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 7.1 Pro
5. Test Environment Curve:

Humidity %



Sample Configuration & Quantity Under Test:

Quantity: 1 (AEC-6402)

Test Result:

No issues were found after the humidity storage test.

Cold start and hot start test

Test Date: 12-19~ 20-2013

Test Product: AEC-6402

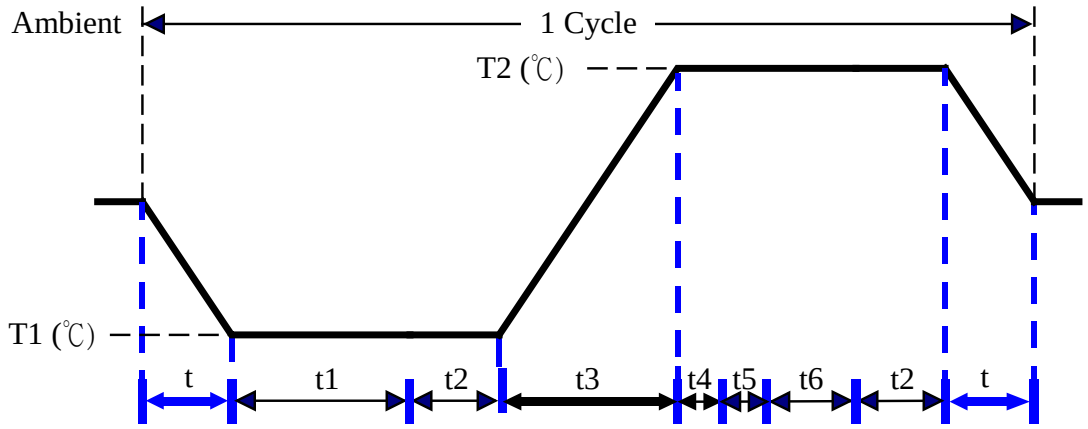
Test Site: AAEON QE Dept.

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: 10/09/13
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 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.