NANO-001N

Fanless

Environment Test Report

Report NO: 15IP020021

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

Test Result Summary				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	1
Defect Unsolved	0	0	0	1

Issue date	QE Manager	Test Engineer
2015-12-24	**KJ Wang**	**Rex Chang**

Test item list

Testing Result

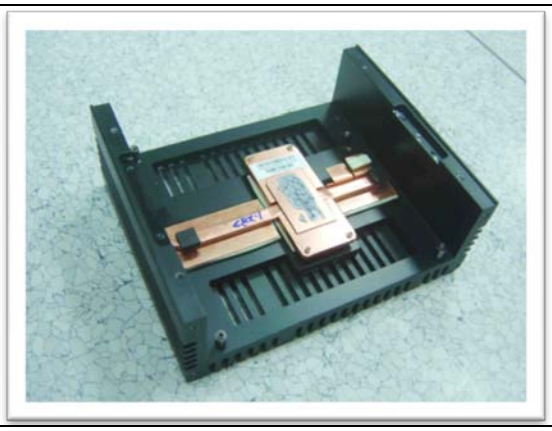
Num	Test item list	Result	Remark
1	Temp./humidity power on/off test	Pass	
2	High temperature operation test	Pass	
3	Temperature cycle operation test	Pass	
4	Cold start and hot start test	Pass	

Configuration of EUT

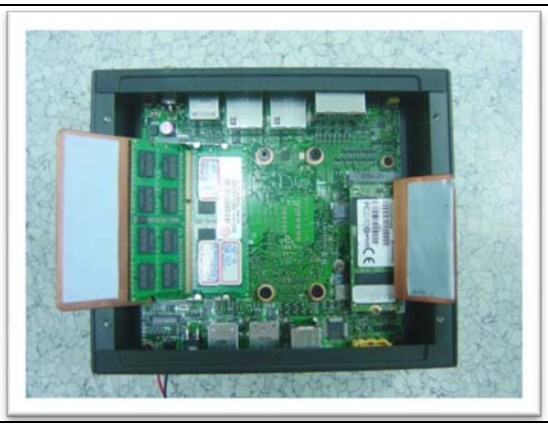
Num	Item	Spec
1.	**Fanless System**	NANO-001N Ver. A1.02
	1. Main Board	NITX-BD1 Ver. A1.02
	2. BIOS Ver.	R1.1 (TBD1AM11) (10/16/2015) For Debug
	3. CPU Type	Intel Core i7-5650U 2.20GHz
	4. Chipset	Intel Bay Trail-D
	5. Memory	Kingston 8GB * 2 / DDR3L 1600 / D5128ED1FPGGBU
	6. M.2	Transcend 32G / TS32GMTS600
	7. USB Flash	Apacer 4GB (For DOS Mode Power On/Off Test)
	8. Test Software	Windows 8 / Run PassMark BurnIn test 8.0 Pro
2.	**Adapter:**	EDACPOWER / EA1050A-120 / 12V 5A

Photos

CPU Heat Sink



Memory and M.2 Heat Sink



Temp./humidity power on/off test

Test Date: 12-16 ~ 17-2015

Test Product: NITX-BD1 A1.02

Test Site: AAEON QE Dept.

Test Standard: Refer to IEC 68-2-30 Testing procedures
Test Db: Damp Heat Test
Refer to IEC 68-2-1 Testing procedures
Test Ad: Cold Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7S-100+L N2
Date of Calibration: 10/08/15
Serial Number: 3898

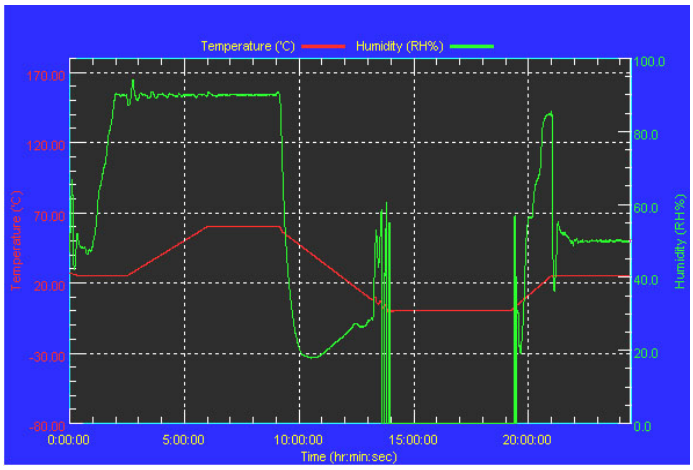
Temperature & Humidity Power On/Off Test:

1. Test High Temp./Humidity: 60℃@90%RH
2. Test Low Temperature: 0℃
3. Test Time: 24Hours / Cycle
4. Test Cycle: 1 Cycles
5. Test Software: DOS Mode / Run Boot Up Record Program ver 1.41

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	Result
Power On/Off	1006/times	1006/times	0 %	Pass
Note: Failure rate need to under 0%.				

High Temperature Operation test

Test Date: 12-23-2015

Test Product: NANO-001N

Test Site: AAEON QE Dept.

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

Test Equipment:

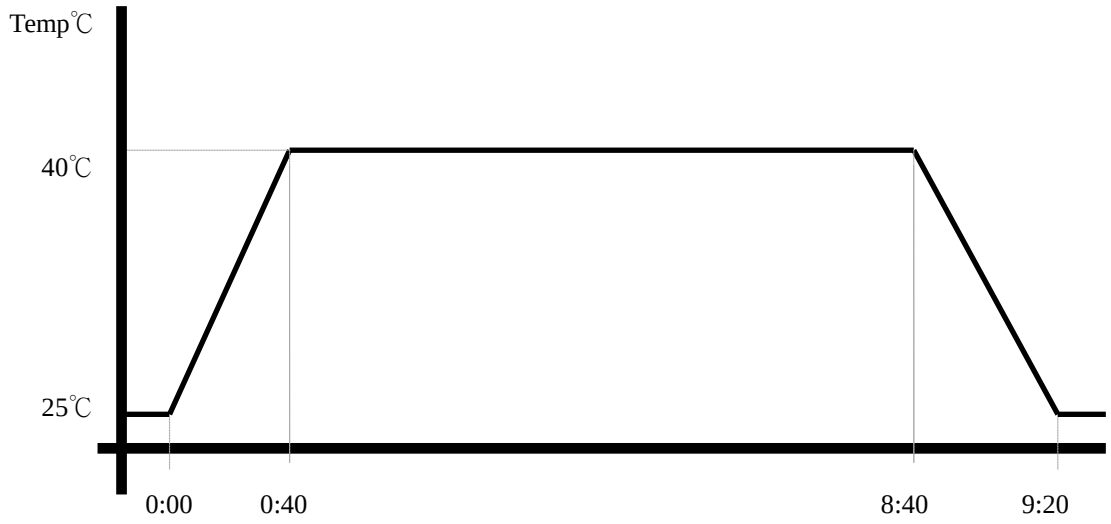
Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7S-100+L N2
Date of Calibration: 10/08/15
Serial Number: 3898

Temperature Measurement:

40 Channel Thermal Recorder:
YOKOGAWA Inc,
Model: DA100-13-1D
Date of Calibration: 09/10/15
Serial Number: 12A323190

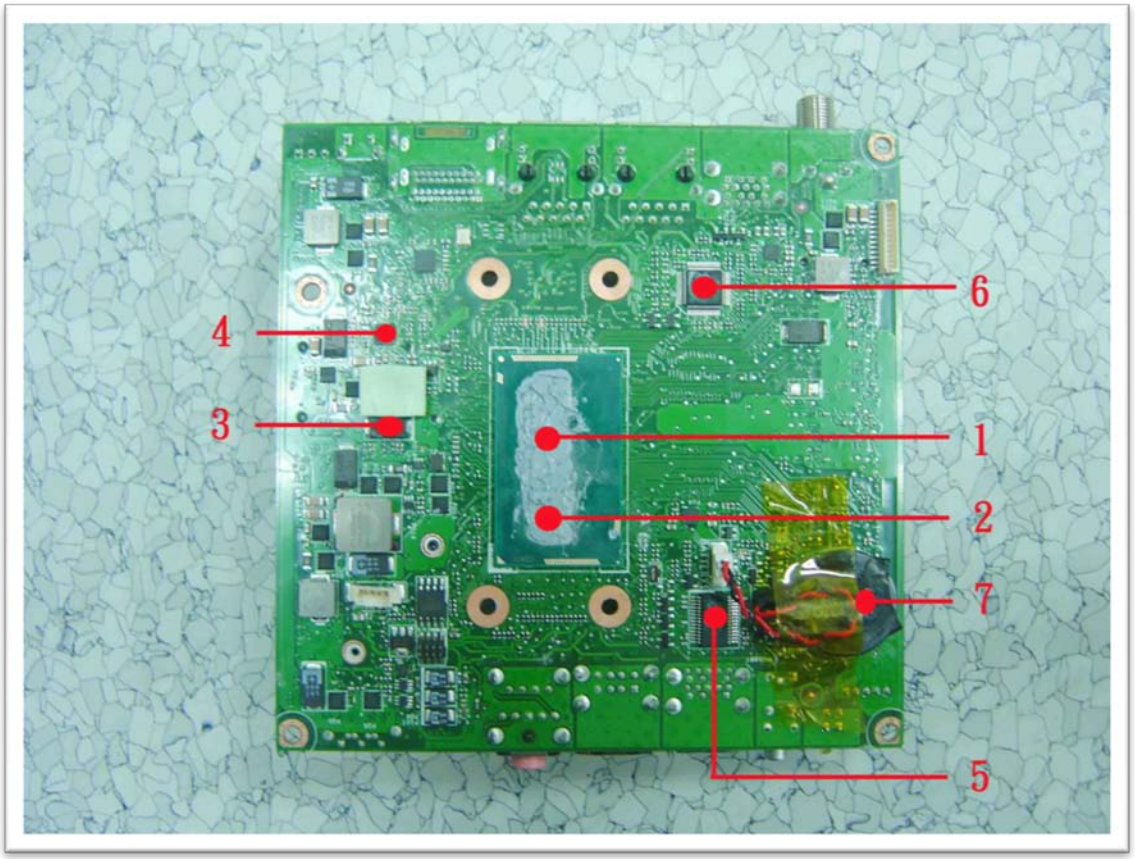
Testing Item:

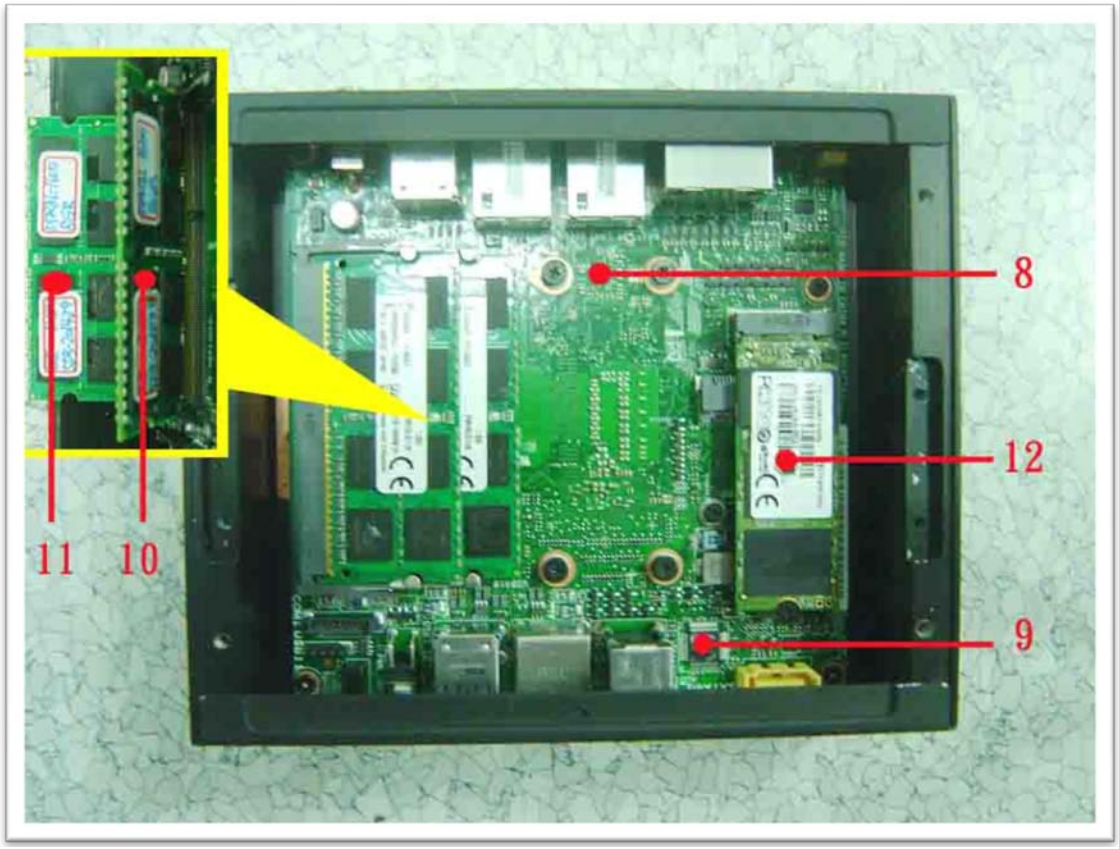
1. Test Temperature: 40℃
2. Test Times: 8Hrs
3. Test Software: Windows 8 / Run PassMark Burn In Test 8.0 Pro
4. Test Environment Curve:



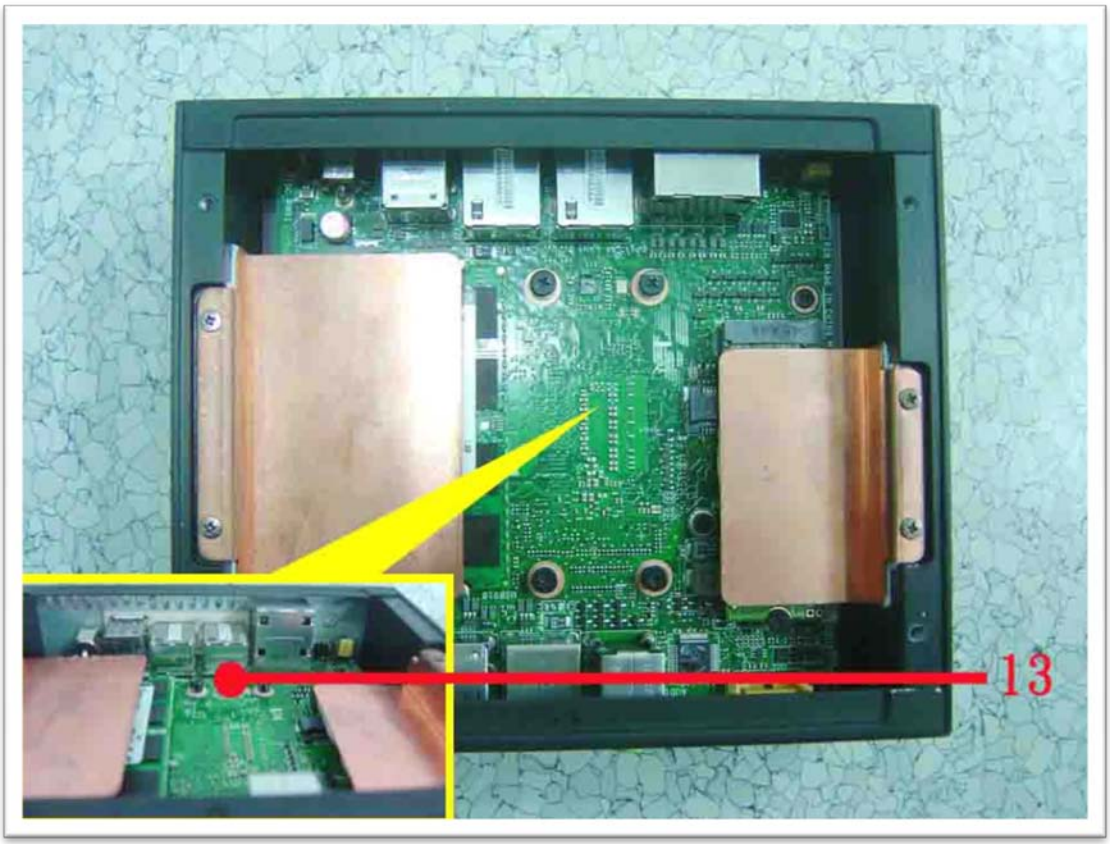
High Temperature Operation test

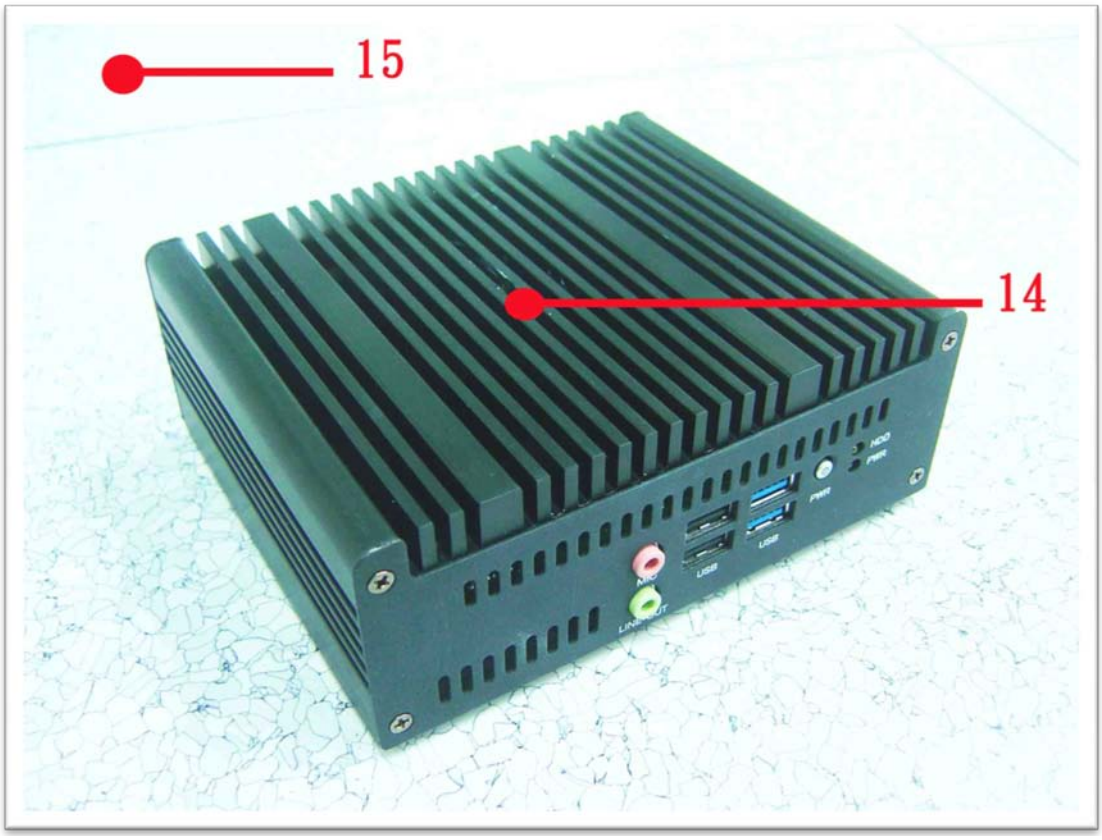
Terminal Recorder:





High Temperature Operation test





High Temperature Operation test

Thermal profile data:

NANO-001N (With 0.5m/sec airflow)

Point / Temp. Stage(℃)	Spec Tc(*1)	TAT(*2) 40	TPT(*3) 25	Note
01. U0301 - CPU Intel Core I7-5650U 2.2GHz - 1	105	56.8	41.8	
02. U0301 - CPU Intel Core I7-5650U 2.2GHz - 2	105	58.4	43.4	
03. PCE8 - PL TAN 470UF/2.5V // NEC-TOKIN/TEPSGV0E477M9-12R	105	60.1	45.1	
04. PU5 - PWM CONTROLLER NCP81101AMNTXG // ONSEMI QFN28	100	59.6	44.6	
05. BU4 - INTERFACE ADM213EARSZ SSOP-28 // A.D.	85	54.7	39.7	
06. U20 - SUPER IO NCT5538D-A LQFP-64 // NUVOTON	70	57.6	42.6	
07. BATTERY1_1 - BATT-LI CR2032 3V/220mAH // KTS/BCR2032H7.2AM1UB	70	54.2	39.2	
08. U13 - C.S RTL8111G-CG QFN-32 // REALTEK	100	62.7	47.7	
09. AU1 - C.S ALC887-VD2-CG LQFP-48 // REALTEK	100.5	61.9	46.9	
10. Memory - 1	70	65.3	50.3	Note 4
11. Memory - 2	70	59.1	44.1	
12. mSATA - Transcend 64G M.2 SSD (TS64GMTS600)	70	49.8	34.8	
13. Air Temp-1 - Control Box Inside Air Temperature - 1	N/A	49.9	34.9	
14. Control Box External Surface Temperature	N/A	49.6	34.6	
15. Chamber Air Temperature	N/A	40.0	25.0	

Note(*):
Note(*):
1. **"Tc"** indicates the component's case maximum temperature value specified in its datasheet.
2. **"TAT"** indicates the actual measured temperature under product specification.
3. **"TPT"** indicates the predicted temperature under 25℃ working environmental.
4. Judgment Criteria:
- Fail **:** Tm > Tc; The measured value is over specification.
- Margin Pas **:** 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.
4. Defect NO. W150912QED01

Sample Configuration & Quantity Under Test:

Quantity: 1 (NANO-001N)

Test Result:

No issues were found during the temperature rise operation test.

Temperature cycle test

Test Date: 12-18 ~ 21-2015

Test Product: NANO-001N

Test Site: AAEON QE Dept.

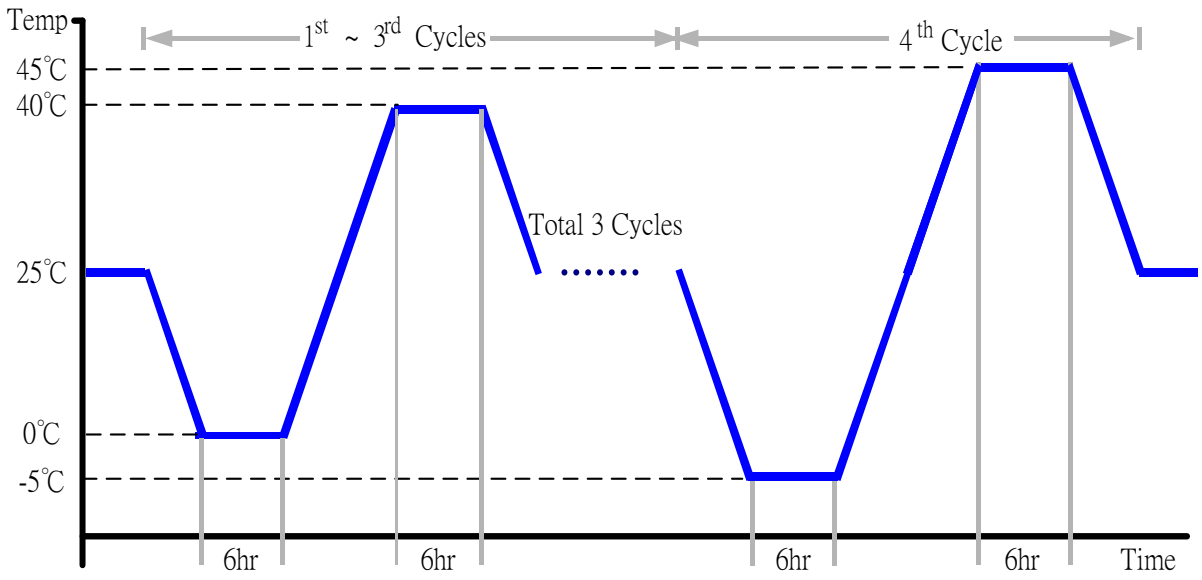
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7S-100+L N2
Date of Calibration: 10/08/15
Serial Number: 3898

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 (NANO-001N)

Test Result:

No issues were found during the temperature operation cycle test.

Cold start and hot start test

Test Date: 12-17 ~ 18-2015

Test Product: NANO-001N

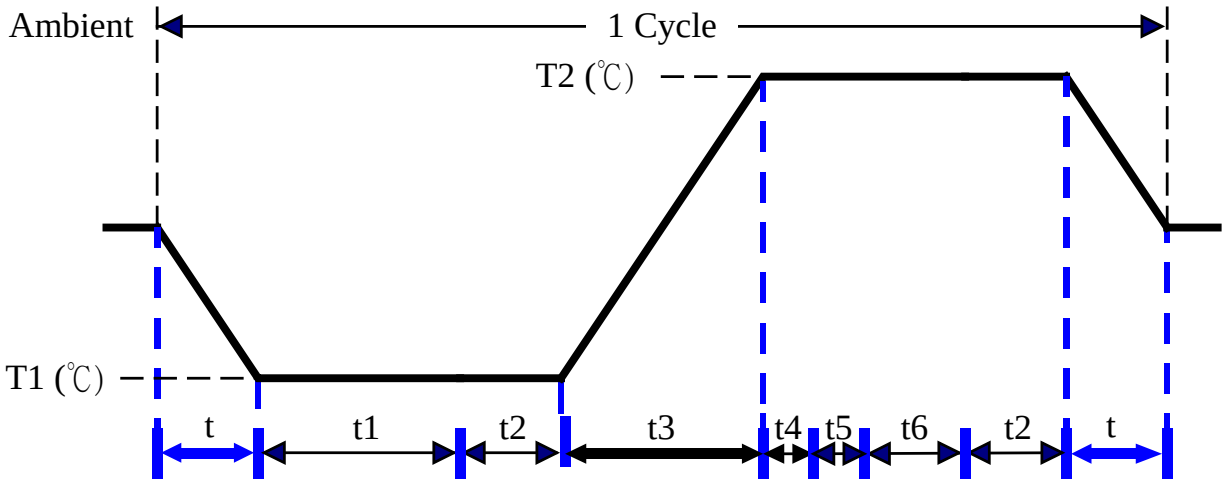
Test Site: AAEON QE Dept.

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-D7S-100+L N2
Date of Calibration: 10/08/15
Serial Number: 3898

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 PassMark Burn In Test
t5: Win 8 Software restart test 2 times
Test Software:Windows 8

Test Result:

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