

# **FWS-2350**

## **Environment Test Report**

**Report NO: 14I020015**

Summary	<input checked="" type="checkbox"/> <b>Pass</b> <input type="checkbox"/> <b>Fail</b> <input type="checkbox"/> <b>Pass with Deviation</b> Comment: _____
---------	--

**Issue date**

**2014-07-29**

**Approval**

**Tom Lin**

**Test Engineer**

**Ben Sun**

## Test item list

---

<b>1.</b>	<b><i>Test item list</i></b> -----	<b>2</b>
<b>2.</b>	<b><i>Configuration of EUT</i></b> -----	<b>3</b>
<b>3.</b>	<b><i>Temp./humidity power on/off test</i></b> -----	<b>4</b>
<b>4.</b>	<b><i>Temperature rise test</i></b> -----	<b>5</b>
<b>5.</b>	<b><i>Temperature cycle operation test</i></b> -----	<b>8</b>
<b>6.</b>	<b><i>High temperature storage test</i></b> -----	<b>9</b>
<b>7.</b>	<b><i>Low temperature storage test</i></b> -----	<b>10</b>
<b>8.</b>	<b><i>Humidity test</i></b> -----	<b>11</b>
<b>9.</b>	<b><i>Cold start and hot start test</i></b> -----	<b>12</b>

### Testing Result

<b>Num</b>	<b>Test item list</b>	<b>Result</b>	<b>Remark</b>
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	CPU	Intel Atom C2558 2.4GHz
2	CPU Board	FWS-2350
3	BIOS	FWS-2350 R0.5 (K235AM05)
4	Memory(wide temp.)	Transcend DDR3 1600MHz 8G RAM*2
5	HDD	TOSHIBA MK2576GSXZ 2.5" 250GB
6	Test Software	Windows 7 / Run PassMark Burn In Test 7.1 Pro
7	Power Supply	FSP060-DBAE1

## CPU COOLER



# Temp./humidity power on/off test

**Test Date:** 07-16 ~ 17 - 2014

**Test Site:** AAEON QE Dept.

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

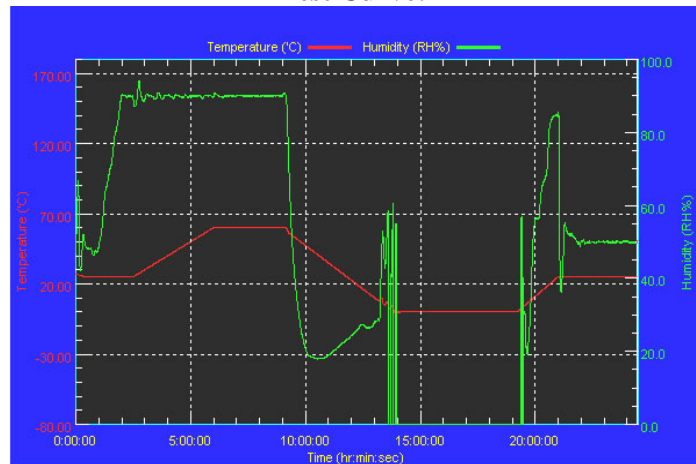
**Test Equipment:**  
Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)  
Model: THS-B6T-150+LN2  
Date of Calibration: 06/11/13  
Serial Number: 9095KT

## Temperature & Humidity Power On/Off Test:

### Testing Specification:

Step	Temperature (°C)	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	1219/times	1219/times	0 %

Note: Failure rate need to be 0%.

# Temperature rise test

**Test Date:** 07-29-2014

**Test Product:** FWS-2350

**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:**

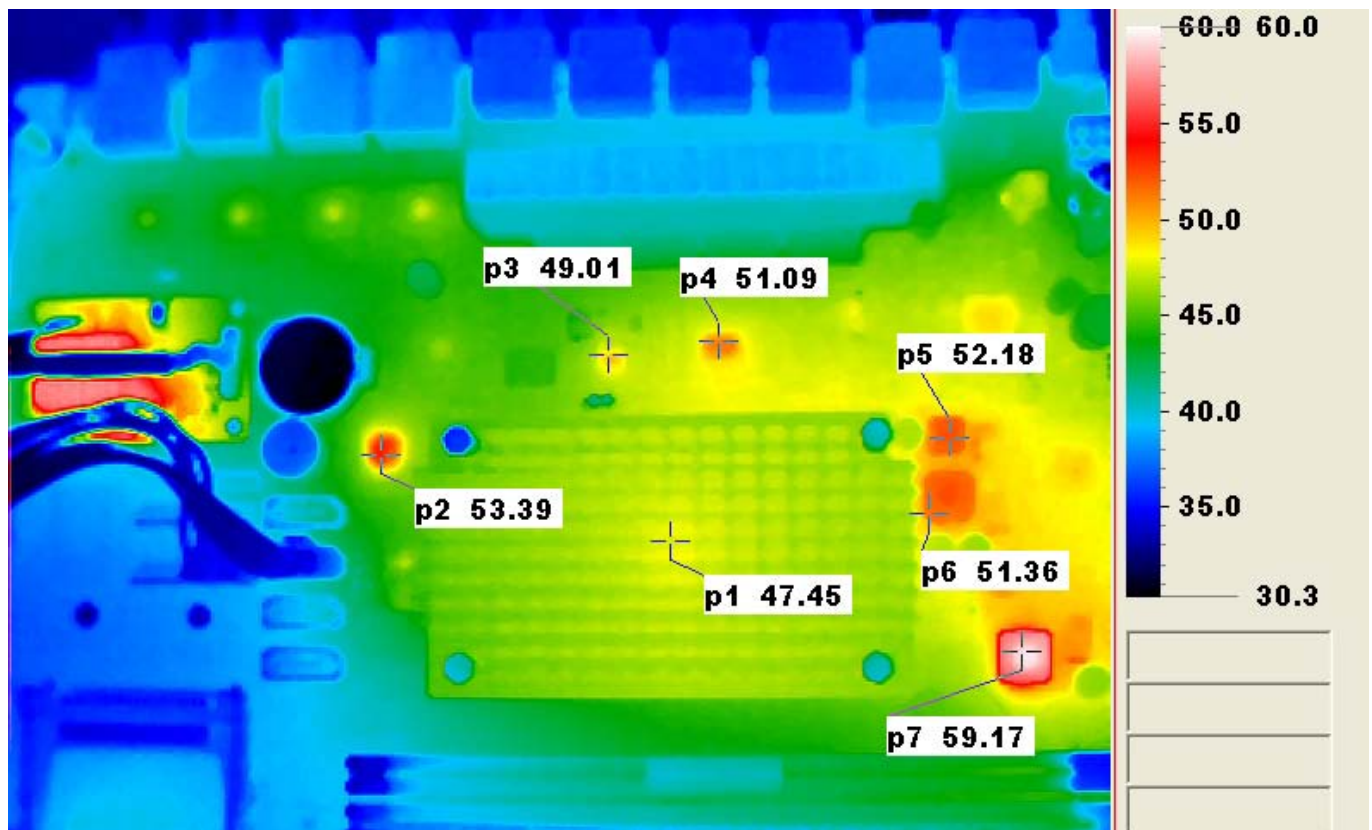
Ambient temperature: 40°C

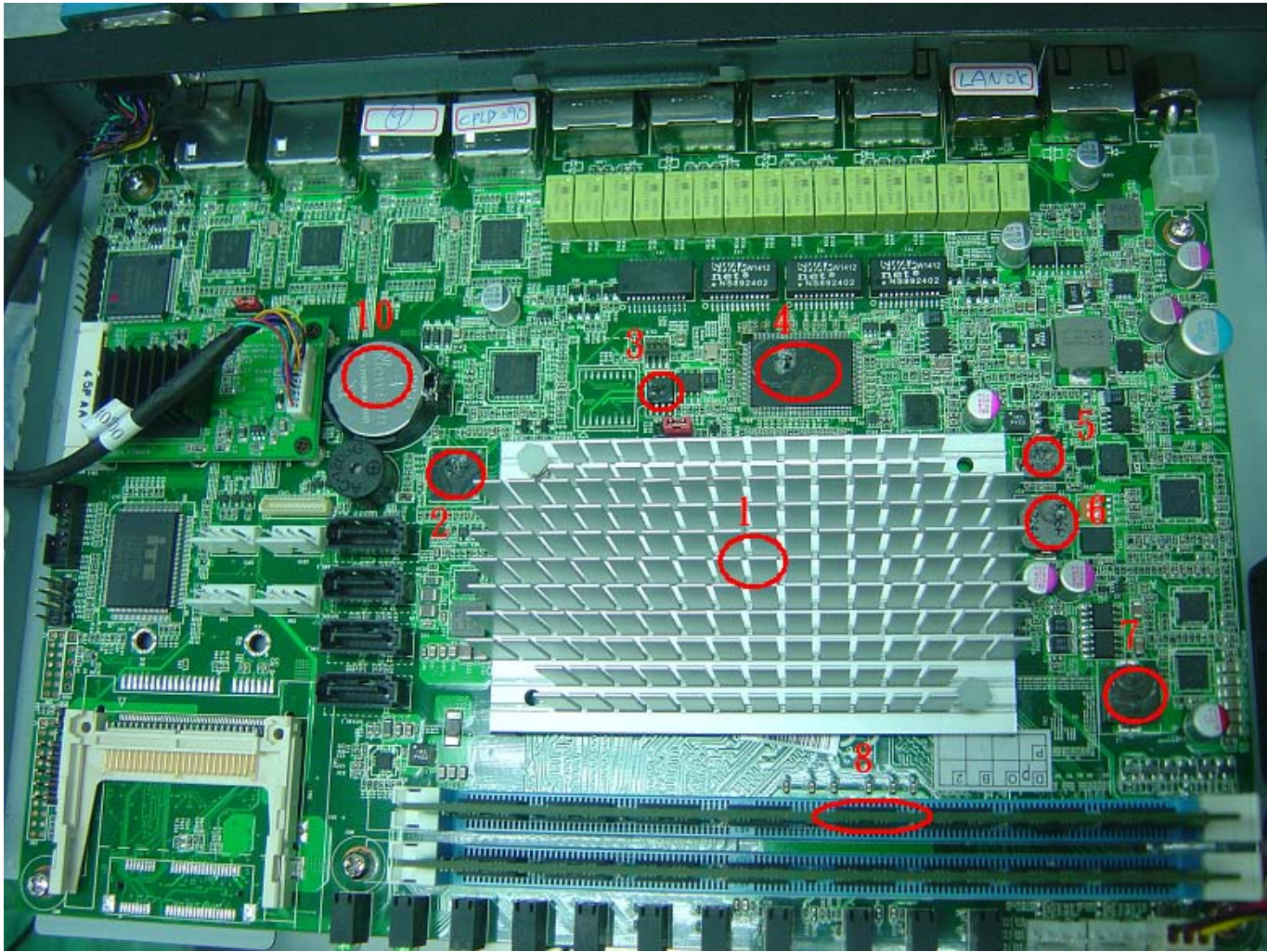
Continuous running till thermal stability (within less than 1°C)

**Test Software:**

Windows 7 / Run PassMark Burn In Test 7.1 Pro

**Terminal Recorder:**





# Temperature rise test

## Thermal profile data:

Point	Position	Describe	Tc (*1) (°C)	Tm (*2) Measured Under	Note
				40°C	
1	U10	(TF)INTEL CPU C2558 2.4GHz	100	78.3	
2	U18	IC.PCIe-2.0 4port Switch.QFP-136P.SMD.PLX.PEX8605-AB50NI G	100	78.1	
3	U28	IC.3A.Ultra Low Dropout LDO.SOP-8.SMD.YOBON.YB1283PSP8	100	67.9	
4	U29	IC.Quad-Serial.Gigabit Ethernet Transceiver.LQFP128.SMD.MARVELL.88E1543-XX-LKJ2C000	85	69.8	
5	L6	COIL.0.36uH.DCR=1.35mohm.Irms=20Amp.20%.SMD.8.7*7.0* 4.0mm.Panasonic.ETQP4LR36AFM	100	65.6	
6	L5	COIL.0.36uH.Irms=34A.20%.MD(11.5x10x4.0).2pin.RDC=0.76m Ohm.Panasonic.ETQP4LR36AFC	100	64.2	
7	L2	COIL.0.19uH.DCR=0.88mohm.Irms=40Amp.+/-20%.SMD.12.5*1 1*4.0mm.GOTREND.GSTD1040PE-R19M	100	65.7	
8		Memory Surface Temperature	85	69.1	
9		HDD Surface Temperature	75	59.4	
10		RTC Battery	75	44.3	

### Note(\*):

- "Tc" indicates the component's case maximum temperature value specified in its datasheet.
- "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°C; The measured value is within specification with margin.  
It is strongly recommended to add thermal dissipation design for better reliability.
- **Pass** : Tm < Tc-5°C; The measured value is with safety margin.

## Sample Configuration & Quantity Under Test:

Quantity: 1 (FWS-2350)

## Test Result:

No issues were found during the temperature rise operation test.

# Temperature cycle test

**Test Date:** 07-18 ~ 19-2014

**Test Product:** FWS-2350

**Test Site:** AAEON QE Dept.

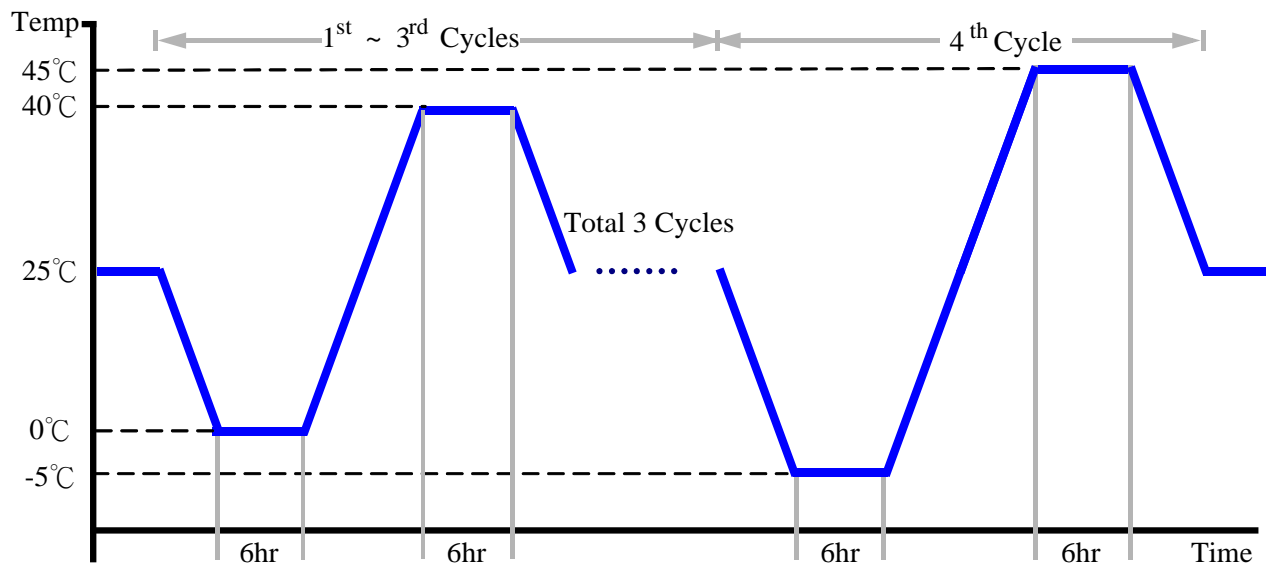
**Test Standard:** Refer to IEC68-2-14 Testing procedures  
Test N: Change of temperature Test

**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°C (1~3 cycles)  
-5°C (4<sup>th</sup> cycle)
2. Test High Temperature: 40°C (1~3 cycles)  
45°C (4<sup>th</sup> cycle)
3. Test dwell time: 6Hrs
4. Temperature slope: 2°C/min
5. Test cycle: 4 cycles
6. Test Environment Curve:



**Sample Configuration & Quantity Under Test:**

Quantity: 1 (FWS-2350)

**Test Result:**

No issues were found during the temperature operation cycle test.



# High temperature storage test

---

**Test Date:** 07-21 ~ 22-2014

**Test Product:** FWS-2350

**Test Site:** AAEON QE Dept.

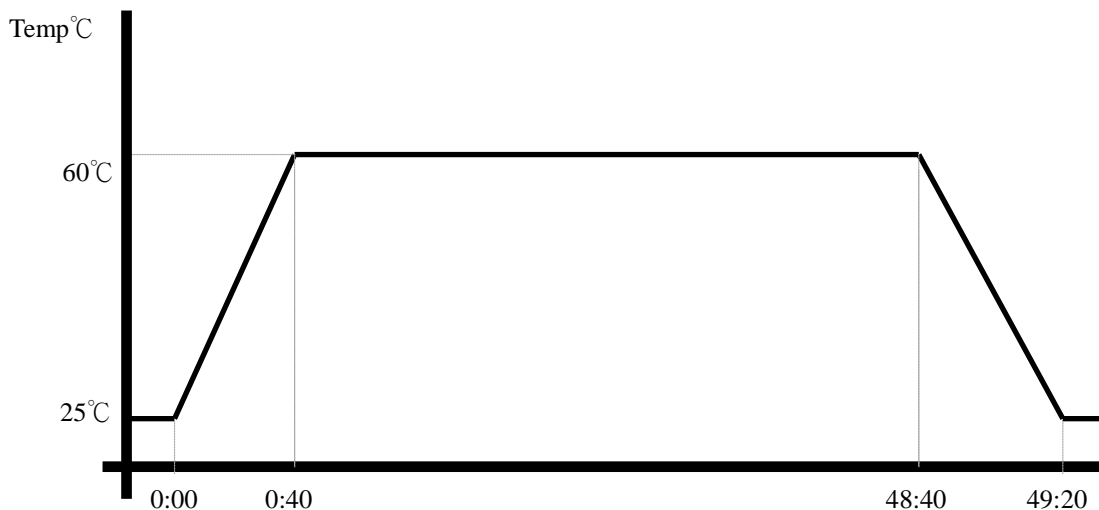
**Test Standard:** Refer to IEC 68-2-2 Testing procedures  
Test Bb: Dry Heat Test (Non-operation)

**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°C
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 (FWS-2350)

**Test Result:**

No issues were found after the high temperature storage test.

# Low temperature storage test

---

**Test Date:** 07-23 ~ 24-2014

**Test Product:** FWS-2350

**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°C
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 (FWS-2350)

**Test Result:**

No issues were found after the low temperature storage test.

# Humidity test

**Test Date:** 07-25~26-2014

**Test Product:** FWS-2350

**Test Site:** AAEON QE Dept.

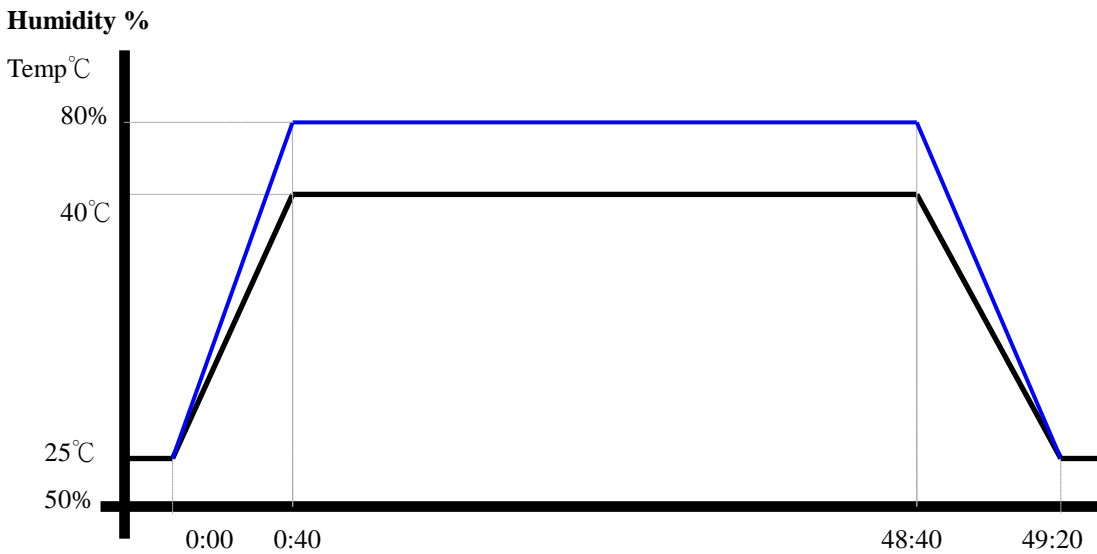
**Test Standard:** Refer to IEC 68-2-3 Testing procedures  
Test Ca: Damp heat, steady state (Non-operation)

**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°C
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:



**Sample Configuration & Quantity Under Test:**  
Quantity: 1 (FWS-2350)

**Test Result:**

No issues were found after the humidity storage test.

# Cold start and hot start test

**Test Date:** 07-28-2014

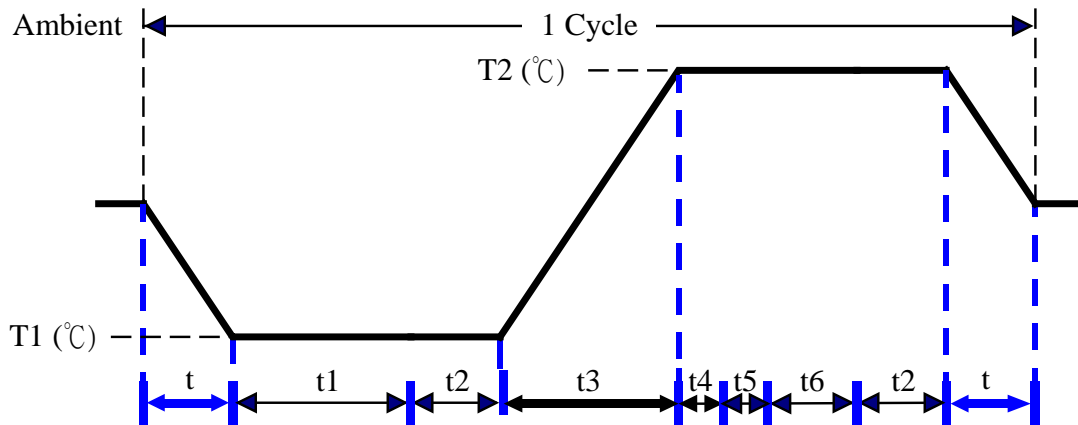
**Test Product:** FWS-2350

**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°C
T2	45°C
t1	4 hrs
t2, t6	2 hrs
t4, t5	1hrs
t, t3	2°C/min
n (Cycle)	1

t = temperature slope  
t, t1, t6: Power Off  
t2: Power on/off test 10 times (on 2 min / off 5min)  
t3, t4: Run burn in test 7.1  
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.