FWS-2160
Environment Test Report

Report NO: 13I020030

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

Issue date	Approval	Test Engineer
2013-11-01	**Tom Lin**	**Juno Cheng**

Test item list

Testing Result

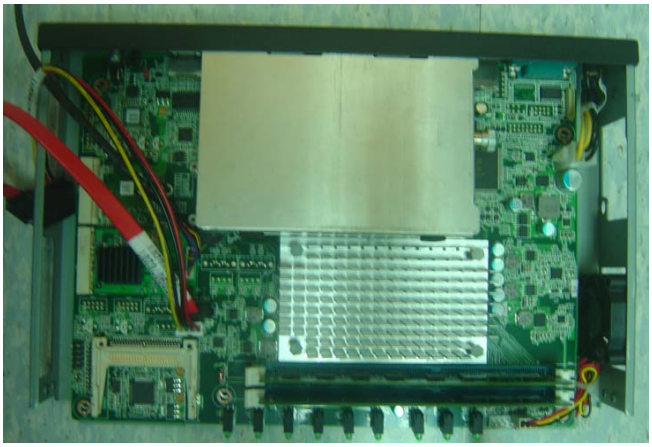
Num	Test item list	Result	Remark
1	Temperature rise test	Pass	
2	Temperature cycle operation test	Pass	
3	High temperature storage test	Pass	
4	Low temperature storage test	Pass	
5	Humidity test	Pass	
6	Cold start and hot start test	Pass	

Configuration of EUT

Num	Item	Spec
1	CPU	AMD G-T24L Processor 1.00GHz
2	CPU Board	FWS-2160 REV: A0.2
3	BIOS	FWS-2160 R0.5(K216AM05)(09/04/2013)
4	Chipset	AMD A50M
5	Memory(wide temp.)	DSL DDR3 1333 4GB CL9 ELPIDA J2108BDBG-GN-F*2
6	HDD	Western Digital WD1600BEVT 2.5” 160GB
7	Test Software	Windows 7 / Run PassMark Burn In Test 7.0 Pro

HDD

Heat Sink



Temperature rise test

Test Date: 10-31-2013

Test Product: FWS-2160

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

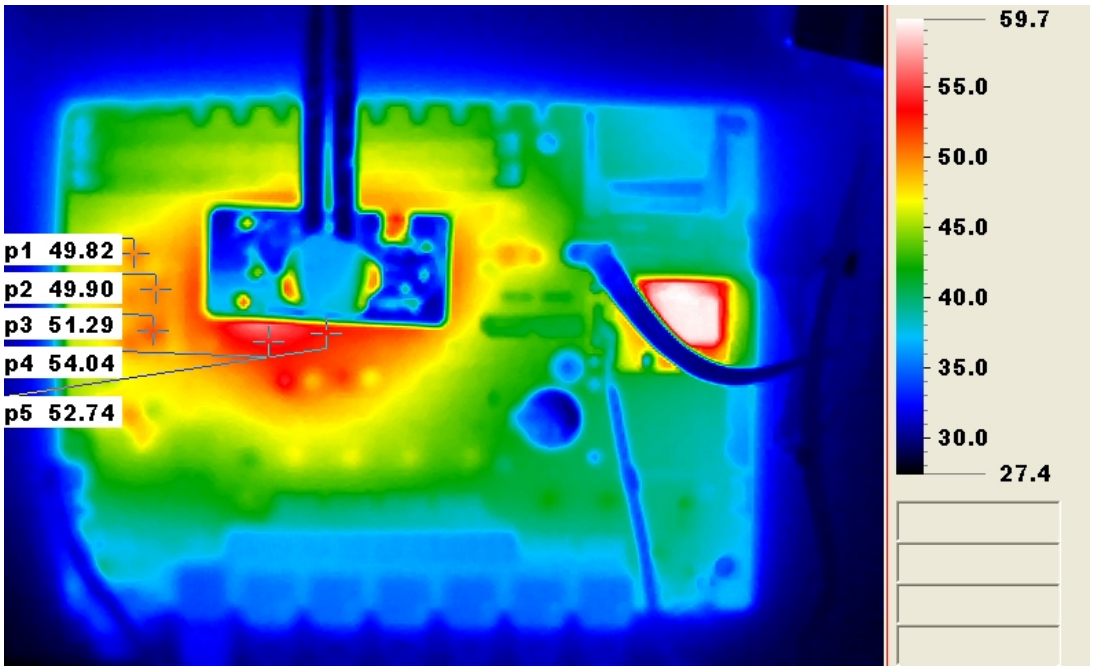
Test Condition:

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

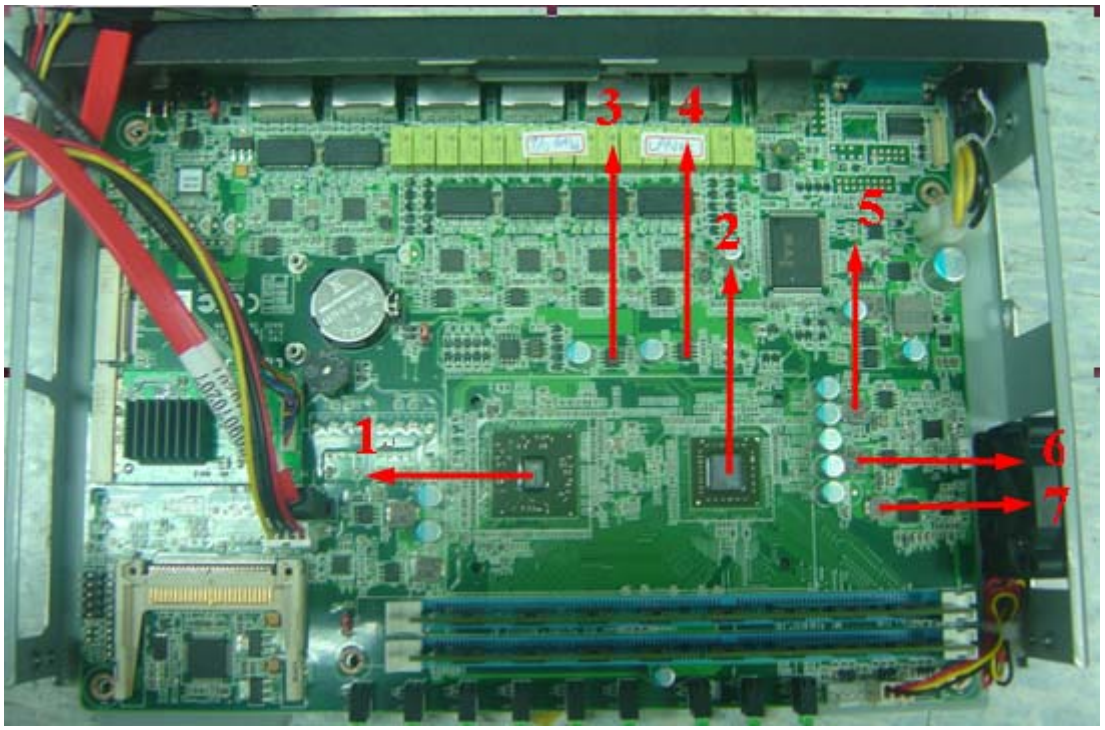
Test Software:

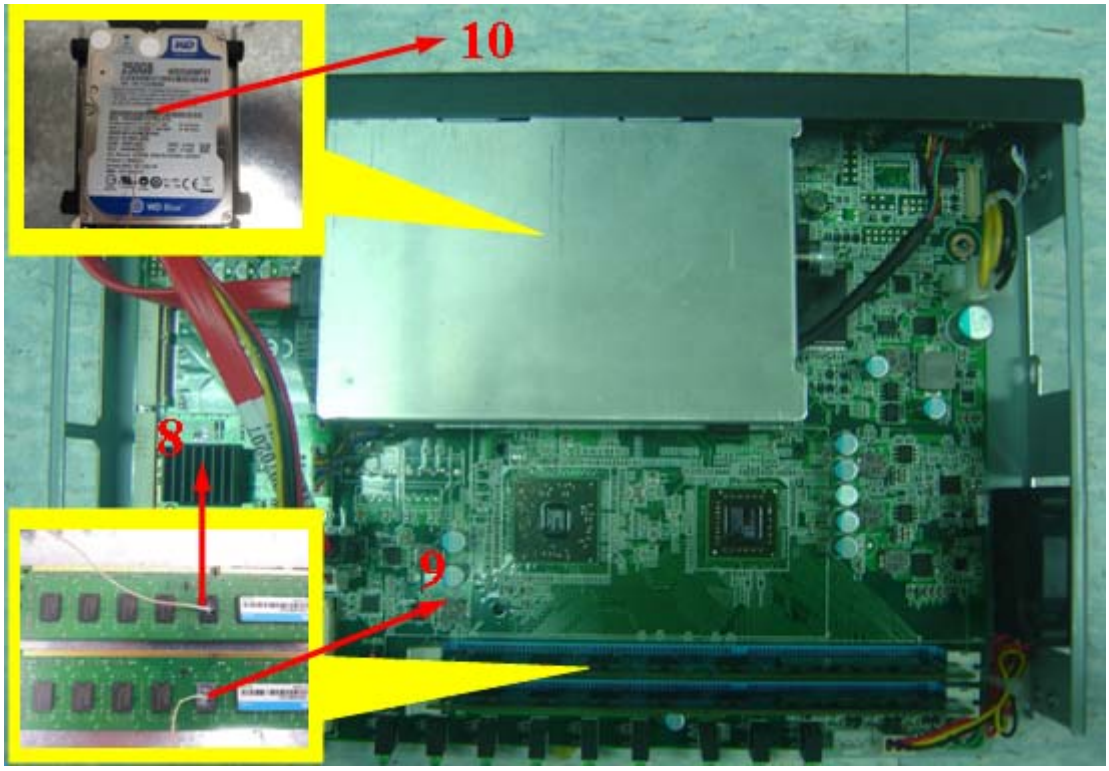
Windows 7 / Run PassMark Burn In Test 7.0 Pro

Terminal Recorder:



Temperature rise test





Temperature rise test

Thermal profile data:

Point	Describe	Tc (*1) (℃)	Tm (*2) Measured Under		Note
			25℃	40℃	
1	U6 - (TF)AMD APU.G-series.1.0GHz.	90	60.2	75.2	
2	U7 - (TF)AMD.Hudson-M1 Fusion. Controller Hub..AMD.A50M	105	57.4	72.4	
3	U11 - (TF)Low dropout Linear Regulator.GMT.G9731F11U	100	47.9	62.9	
4	U9 - (TF)Low dropout Linear Regulator.GMT.G9731F11U	100	52.4	67.4	
5	L8 - (TF)COIL.2.2uH.Panasonic.ETQP3W2R2WFN	125	45.2	60.2	
6	L6 (TF)COIL.2.2uH. Panasonic.ETQP3W2R2WFN	125	45.9	60.9	
7	L3(TF)COIL.1uH. Panasonic.ETQP3W1R0WFN	125	47.1	62.1	
8	Memory - 1	95	42.2	57.2	
9	Memory - 2	95	43.0	58.0	
10	2.5” HDD surface	60	33.9	48.9	
11	System inside air temperature	N/A	29.9	44.9	
12	Housing surface temperature	N/A	31.5	46.5	

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.

Temperature rise test

Sample Configuration & Quantity Under Test:

Quantity: 1 (FWS-2160)

Test Result:

No issues were found during the temperature rise operation test.

Temperature cycle test

Test Date: 10-29 ~ 31-2013

Test Product: FWS-2160

Test Site: AAEON QE Dept.

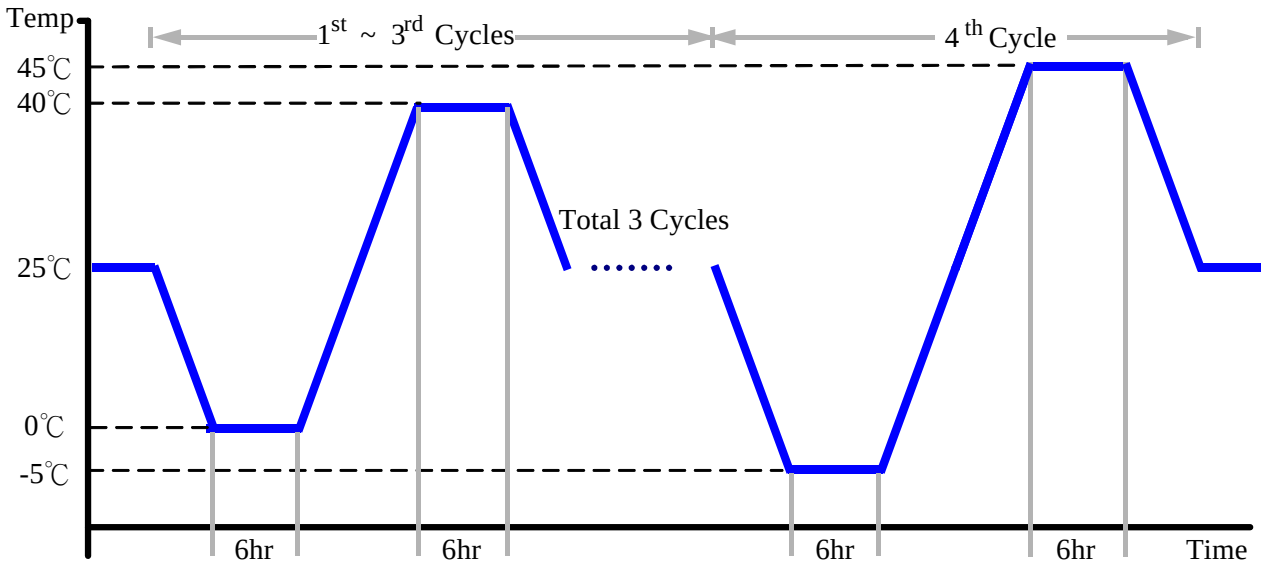
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

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 (FWS-2160)

Test Result:

No issues were found during the temperature operation cycle test.

High temperature storage test

Test Date: 10-27 ~ 29-2013

Test Product: FWS-2160

Test Site: AAEON QE Dept.

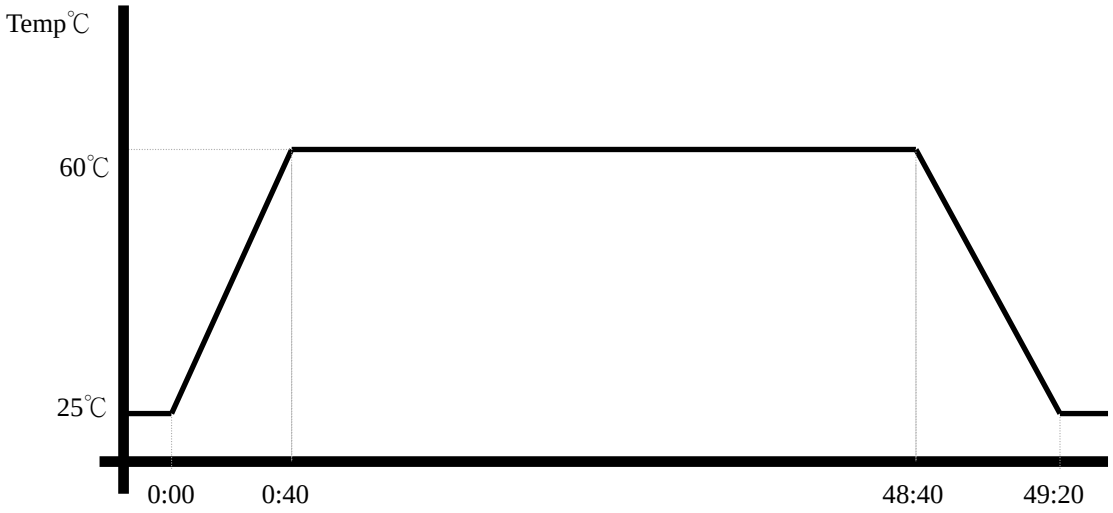
Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bb: Dry Heat Test (Non-operation)

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 7.0 Pro
4. Test Environment Curve:



Sample Configuration & Quantity Under Test:

Quantity: 1 (FWS-2160)

Test Result:

No issues were found after the high temperature storage test.

Low temperature storage test

Test Date: 10-25 ~ 27-2013

Test Product: FWS-2160

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 7.0 Pro
4. Test Environment Curve:

Sample Configuration & Quantity Under Test:
Quantity: 1 (FWS-2160)

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

Humidity test

Test Date : 10-23~25-2013

Test Product: FWS-2160

Test Site: AAEON QE Dept.

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

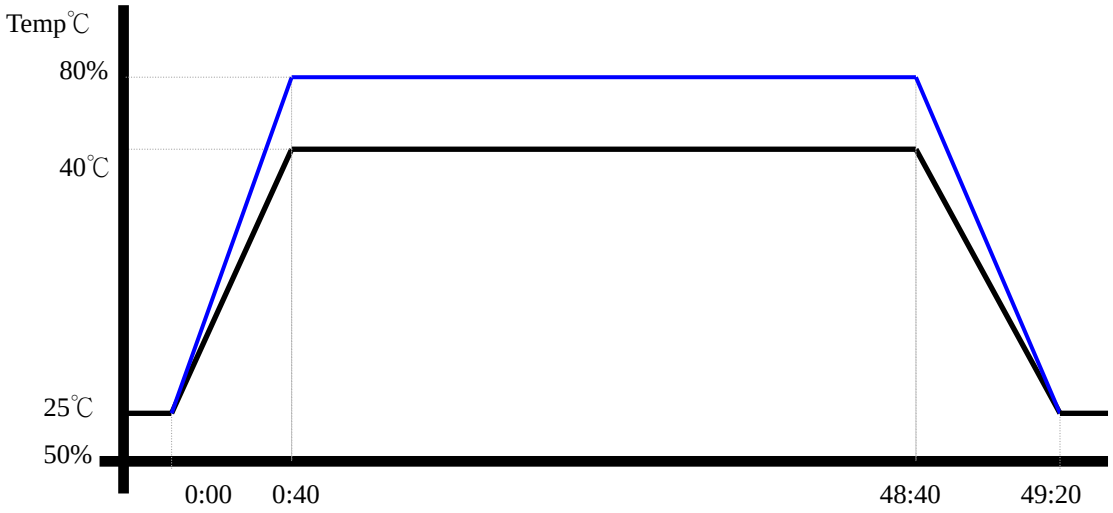
Test Equipment:

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 7.0 Pro
5. Test Environment Curve:

Humidity %



Sample Configuration & Quantity Under Test:

Quantity: 1 (FWS-2160)

Test Result:

No issues were found after the humidity storage test.

Cold start and hot start test

Test Date: 10-21~ 23-2013

Test Product: FWS-2160

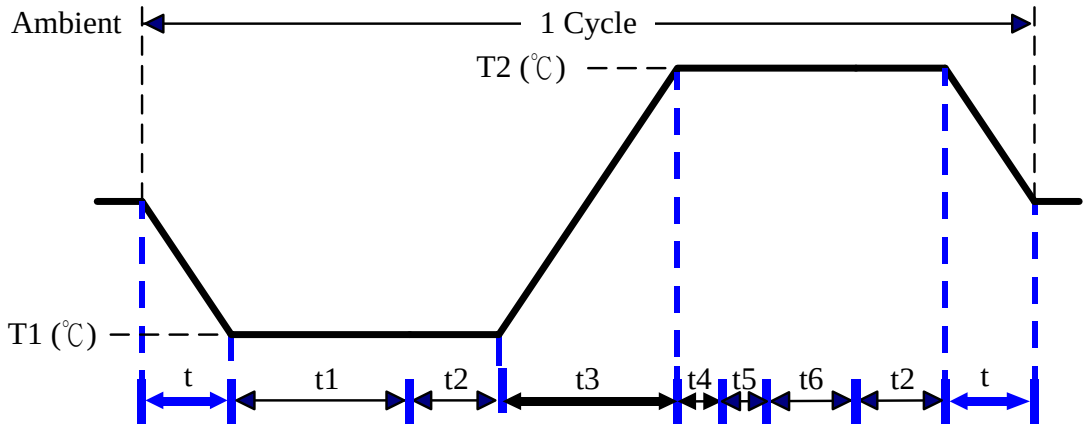
Test Site: AAEON QE Dept.

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.