BOXER-6421

Environment Test Report

Report NO: 16P020013

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 two temperature points marginal passed but they function are normal during the thermal test.

Issue date	QE Manager	Test Engineer
2016-08-19	**KJ Wang**	**Jerry Chen**

Test item list

Testing Result

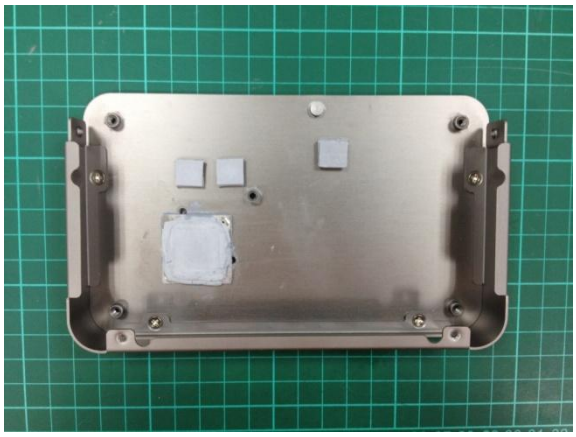
Num	Test item list	Result	Remark
1	High Temperature operation test	Pass	
2	Temp./humidity power on/off test	Pass	
3	Temperature cycle operation test	Pass	
4	High temperature storage test	Pass	
5	Low temperature storage test	Pass	
6	Humidity test	Pass	
7	Cold start and hot start test	Pass	

Configuration of EUT

Num	Item	Spec
1.	**Test Product: BOXER-6421**	
2.	**Client - BOXER-6421 (Main test of system)**	
	1. Model Name	BOXER-6421
	2. Main board	PBA-IMX6 Rev. A0.3
	3. CPU Type	Freescale i.MX6 Dual Lite-Auto grade 1.0GHz / MCIMX6Q6AVT10AC
	4. Chipset	Freescale i.MX6
	5. Memory	Onboard DDR3 1GB / SAMSUNG K4B2G1646Q-BCK0
	6. eMMC	Onboard eMMC 8GB / Greenliant.GLS85VM1008A-M-I-LFWE
	7, SD CARD	Transcend 4GB micro SD HC
	8. Test Software	Freescale Linux kernel 3.0.35 / Execute #cd test_stability #./BurnIn (BurnIn Test)
	9. Adapter	FSP / FSP060-DBAE1 12V 5.0A MAX
3.	**Server - BOXER-6421 (Aid test of system)**	
	1. Model Name	BOXER-6421
	2. Main board	PBA-IMX6 Rev. A0.3
	3. CPU Type	Freescale i.MX6 Dual Lite-Auto grade 1.0GHz / MCIMX6Q6AVT10AC
	4. Chipset	Freescale i.MX6
	5. Memory	Onboard DDR3 1GB / SAMSUNG K4B2G1646Q-BCK0
	6. eMMC	Onboard eMMC 8GB / Greenliant.GLS85VM1008A-M-I-LFWE
	7. Test Software	Freescale Linux kernel 3.0.35 / Execute #./setconf (IP connect to client IP - LAN Test)
	8. Adapter	FSP / FSP060-DBAE1 12V 5.0A MAX
4.	**Terminal manipulation - AEC-VS01 (Terminal manipulation of system)**	
	1. Model Name	AEC-VS01
	2. Main board	GENE-CV05
	3. BIOS Ver.	AEC-VS01 R0.1(AV01AM01)(06/24/2013)
	4. CPU Type	Intel Atom D2550 Processor / 1.86GHz
	5. Memory	Transcend DDR3 1333 / 2GB / SEC 231 HCKO K4B2G0846D
	6. 2.5” SATA HDD	TOSHIBA MK1060GSC SATA 2.5 HDD 100GB
	7. Test Software	Windows 7 / PuTTY Ver. 0.67
	8. Adapter	FSP / FSP120-AAB 19V 6.32A

Configuration of EUT

System Photos

System	Heat Sink
	

High Temperature Operation test

Test Date: 08-16-2016

Test Product: BOXER-6421

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-D7TS-100+LN2

Date of Calibration: 09/10/15
Due date of Calibration: 09/09/16
Serial Number: A0004

Temperature Measurement:

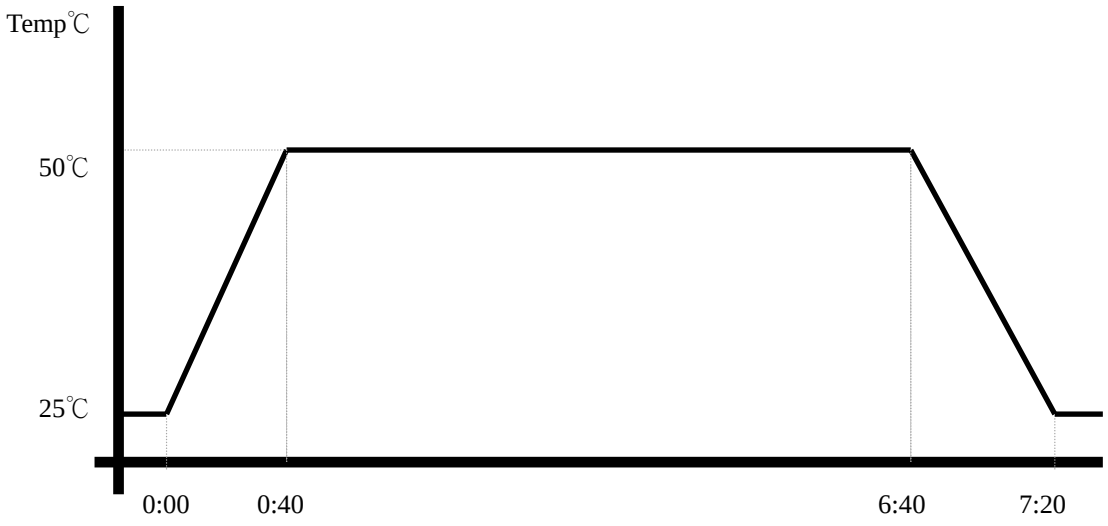
20 Channel Thermal Recorder: (OMRON Inc,)

Model: ZR-RX45

Date of Calibration: 12/18/2015
Due date of Calibration: 12/17/2016
Serial Number: H30481978

Testing Item:

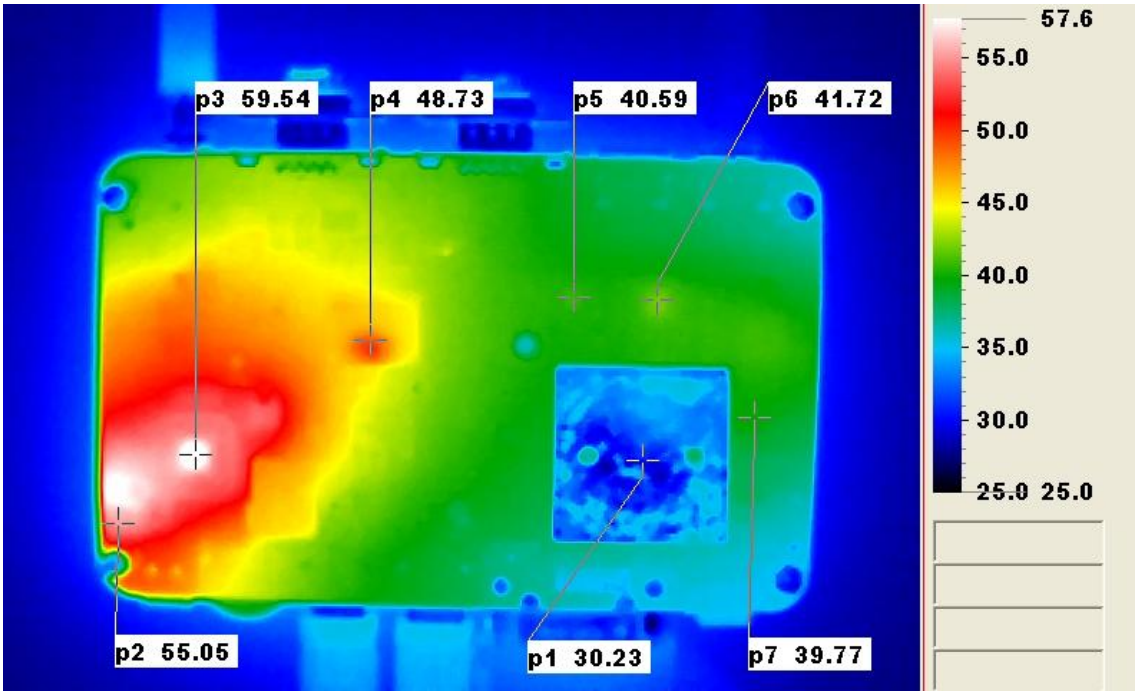
1. Test Temperature: 50℃
2. Test Times: 6Hrs
3. Test Software: Client: Linux kernel 3.0.35 / Execute #cd test_stability #./BurnIn (BurnIn Test) / BurnIn test items (LAN Port, COM Port, SDCARD)
   Server: Linux kernel 3.0.35 / Execute #./setconf (IP connect to client IP - LAN Test)
   Terminal: Windows 7 / PuTTY Ver. 0.67
4. Test Environment Curve:



High Temperature Operation test

Temperature Profile Test:

Front Side:



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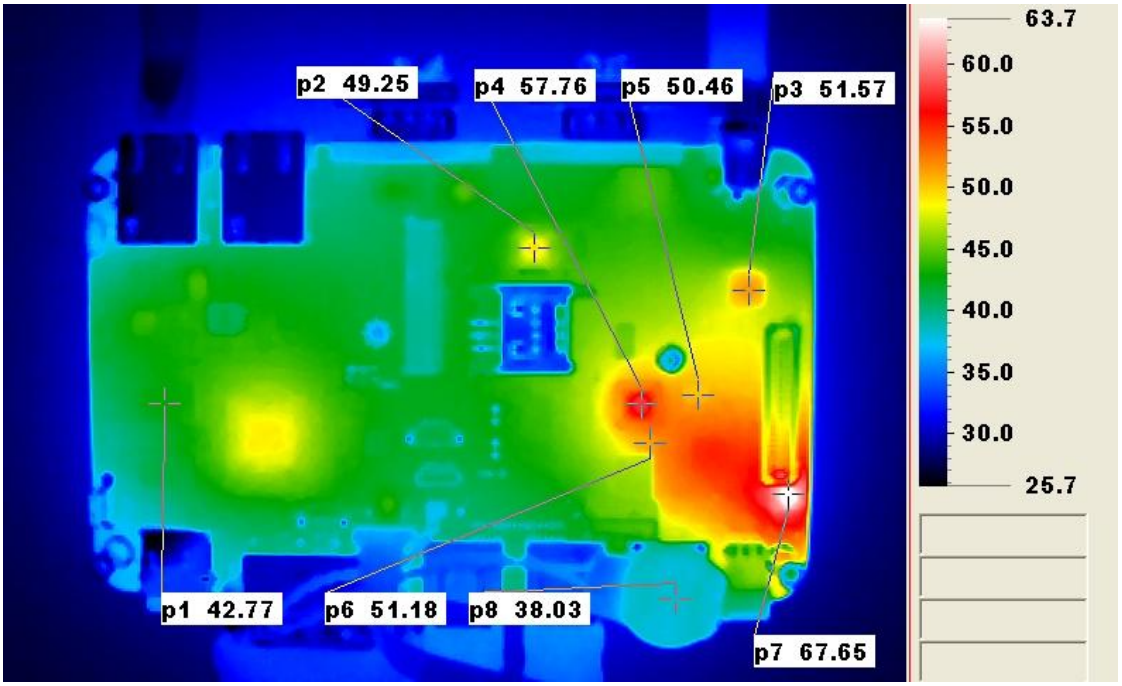
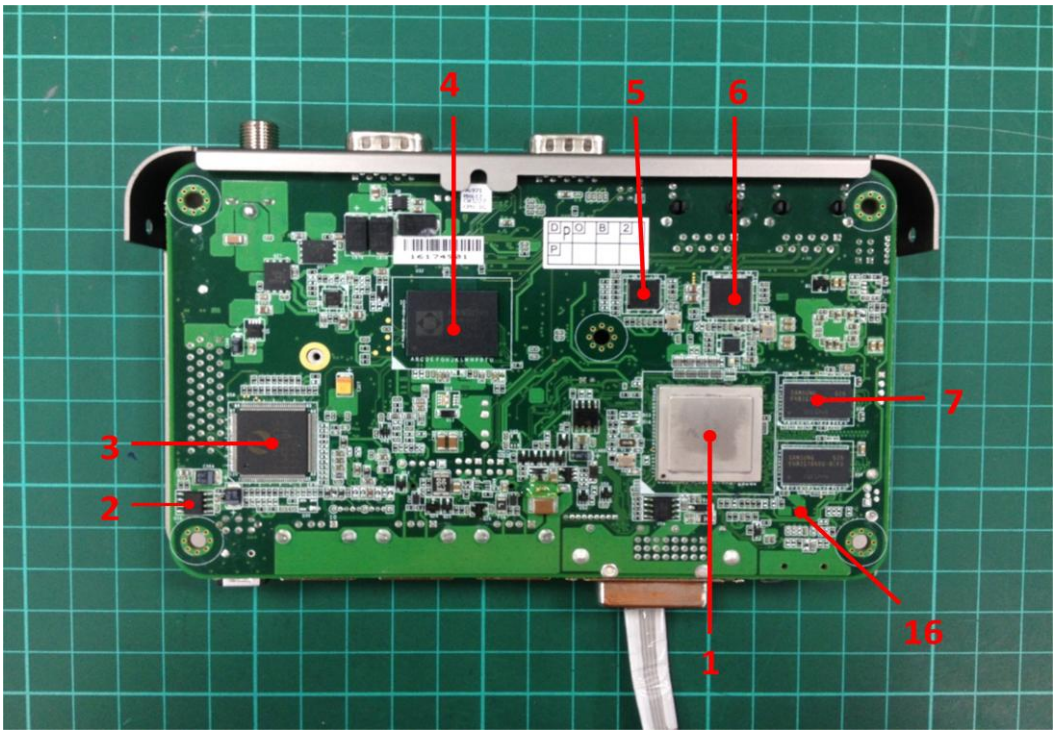


High Temperature Operation test

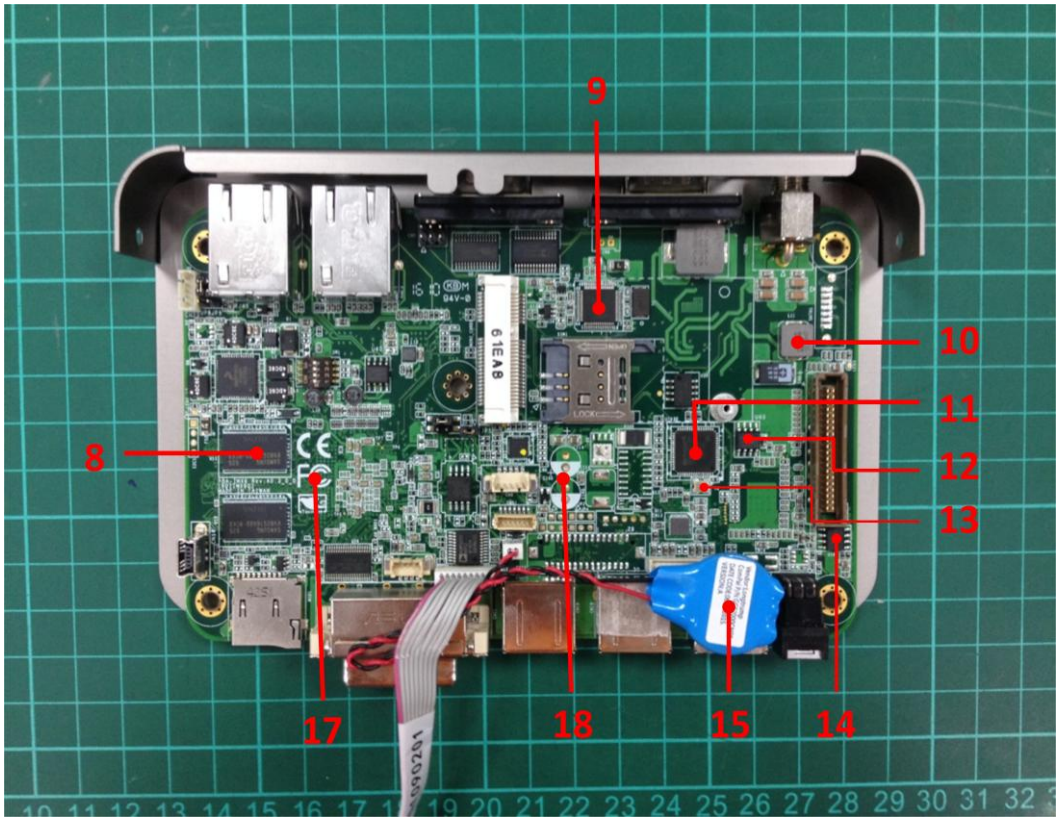
Terminal Recorder:

Measuring Thermal Couple Position：

Front Side:



Back Side:



High Temperature Operation test

High Temperature Operation test

Thermal profile data:

BOXER-6421 (With 0.5m/sec airflow)

Point / Position / Describe — Temp. Stage(℃)	Spec Tc(*1)	TAT(*2) 50	TPT(*3) 25	Note
01. U41 - CPU Freescale i.MX6 Dual Lite-Auto grade 1.0GHz / MCIMX6Q6AVT10AC	100	57.9	32.9	
02. U14 - RICHTEK.RT9025-25PSP	85	72.5	47.5	
03. U58 - PERICOM.PI7C9X2G404SLBFDE	85	79.3	54.3	
04. U32 - eMMC / Onboard eMMC 8GB / Greenliant.GLS85VM1008A-M-I-LFWE	85	63.7	38.7	
05. U7 - Qualcomm.AR8033-AL1A	70	57.8	32.8	
06. U61 - ASIX.AX88178AQF	70	58.9	33.9	
07. U56 - Memory / Onboard DDR3 1GB / SAMSUNG.K4B2G1646Q-BCK0	95	60.7	35.7	
08. U38 - Memory / Onboard DDR3 1GB / SAMSUNG.K4B2G1646Q-BCK0	95	60.7	35.7	
09. U3 - Fintek.F81532U	70	67	42	**Note 5**
10. L11 - COIL.1.0Uh CYNTEC.PCMB063T-1R0MS	125	72.8	47.8	
11. U10 - HUB CONTROLLER.QFN 64.SMD.SMSC.USB2517i-JZX	85	79.3	54.3	
12. U60 - Serial EEPROM.Microchip.24LC04BISN	85	71.6	46.6	
13. Y4 - ARGO.AGX-24.000M-16-S3225-E-Z-TR	85	72	47	
14. U16 - RICHTEK.RT9025-25PSP	85	83.5	58.5	**Note 5**
15. BAT - Battery	70	59.6	34.6	
16. Control Box Inside Air Temperature-1	N/A	57.1	32.1	
17. Control Box Inside Air Temperature-2	N/A	59.1	34.1	
18. Control Box Inside Air Temperature-3	N/A	59.2	34.2	
19. Control Box External Surface Temperature	N/A	57	32	
20. Chamber Air Temperature	N/A	50	25	

Note(*):
1. "Tc" indicates the component's case maximum temperature value specified in its datasheet.
2. "TAT" indicates the actual measured temperature in chamber.
3. "TPT" indicates the predicted temperature by offset from TAT.
4. Judgment Criteria:
- **Fail** : Tm > Tc; The measured value is over specification plus margin.
- **Margin** : 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.

5. Defect NO. P150303LABD04

Sample Configuration & Quantity Under Test:

Quantity: 1 (BOXER-6421)

Test Result:

No issues were found during the temperature rise operation test.

Temp./humidity power on/off test

Test Date: 08-10 ~ 11-2016

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-D7TS-100+LN2
Date of Calibration: 09/10/2015
Due date of Calibration: 09/09/2016
Serial Number: A0004

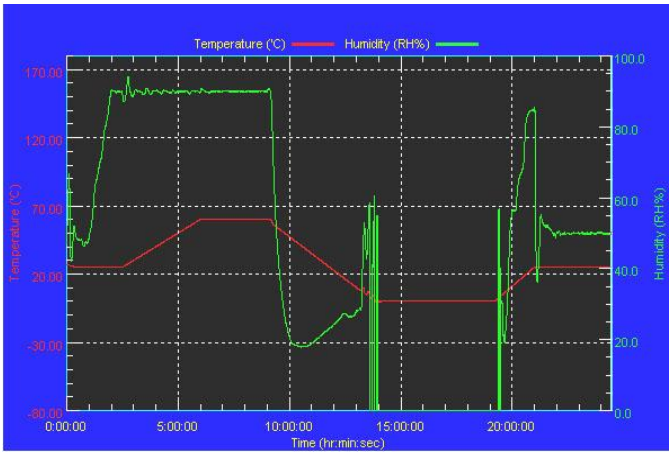
Temperature & Humidity Power On/Off Test:

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: Linux Mode / Automatically execute Linux tool: boot_count

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:

	Actual	Successful	Failure rate	Test Result
Power On/Off	1337/times	1335/times	0.15 %	Pass with deviation

Note: 1. Power on/off fixture setting: on time 60sec. and off time 5 sec.

2. There are two times boot loss after the power on/off test, but we determine it "pass with deviation" by e-mail explanation of the PM & RD as below.

(1). The IMX6 original manufacturer has been replied that boot loss issue should be the OS stability issue.

(2). It does not relate hardware design or software bug of AAEON.

To more detail explanation please see the DTS Numbers "E140604QEE09" & "P150303LABD02"

Temperature cycle test

Test Date: 08-12 ~ 15-2016

Test Product: BOXER-6421

Test Site: AAEON QE Dept.

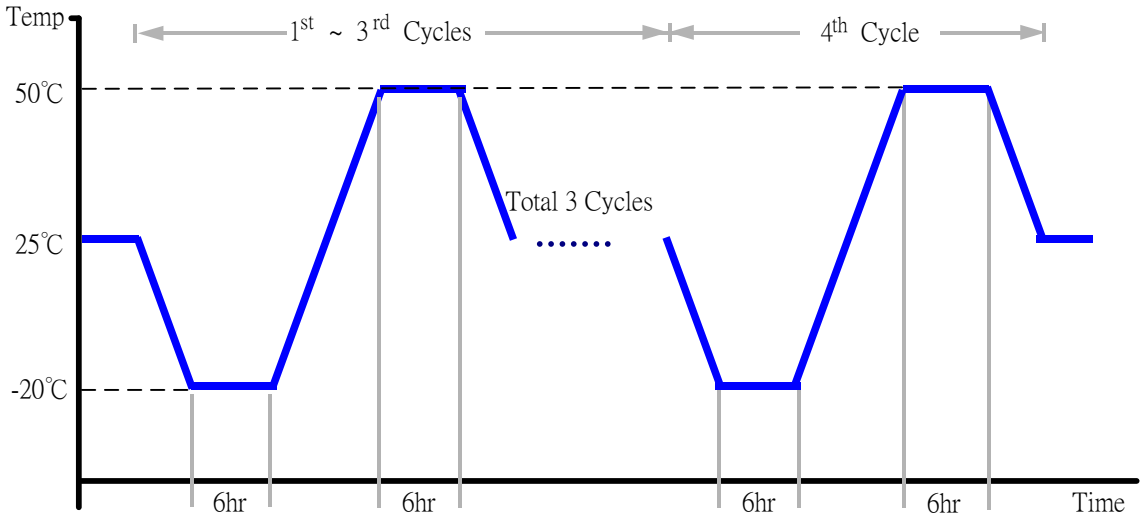
Test Standard: Refer to IEC68-2-14 Testing procedures
Test N: Change of temperature Test

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/10/15
Due date of Calibration: 09/09/16
Serial Number: A0004

Test Condition:

1. Test Low Temperature: -20℃
2. Test High Temperature: 50℃
3. Test dwell time: 6Hrs
4. Temperature slope: 2℃/min
5. Test cycle: 4 cycles
6. Test Software: Client: Linux kernel 3.0.35 / Execute #cd test_stability #./BurnIn (BurnIn test) / BurnIn test items (LAN Port, COM Port, SDCARD)
   Server: Linux kernel 3.0.35 / Execute #./setconf (IP connect to client IP - LAN Test)
   Terminal: Windows 7 / PuTTY Ver. 0.67
7. Test Environment Curve:



Sample Configuration & Quantity Under Test:

Quantity: 1 (BOXER-6421)

Test Result:

Test result	☐ **Pass** ☐ **Fail** Note : There is/are ___ defect(s) not list in the report, please check it in the DTS Website. ☑ **Pass with Deviation** **Comment:** We have found video testing hang in the burn-in test during the temperature variation operation test. By e-mail explanation of the PM & RD: The Freescale has announced that it is known limitation as the document “6.3 Known issues and limitations for multimedia”. Therefore, we decide changing test items of the burn-in test, the video testing changed to LAN transmission testing in Burn-in test and then increase LAN test loading with server connection to client. And then test again for temperature variation operation test, we have found issues, but we determine them "pass with deviation" by e-mail explanation of the PM & RD. Issues description as below: 1. We have found the server LAN transmission stopped and disconnected with client in burn-in test during the temperature variation operation test, but the client LAN testing still normally work in burn-in test. 2. The COM Port test result: There are 16854 times success and 1 fail in the burn-in test, during the temperature variation operation test. To more PM & RD detail explanation, please see the DTS numbers as below: “P150303LABD03”

High temperature storage test

Test Date: 08-03 ~ 05-2016

Test Product: BOXER-6421

Test Site: AAEON QE Dept.

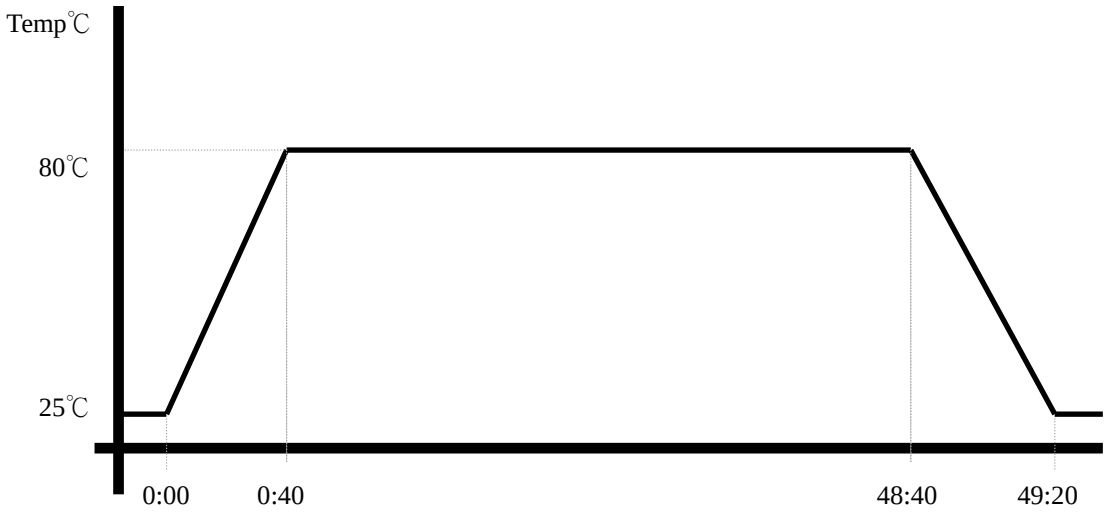
Test Standard: Refer to IEC 68-2-2 Testing procedures
Test Bb: Dry Heat Test (Non-operation)

Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/10/15
Due date of Calibration: 09/09/16
Serial Number: A0004

Testing Item:

1. Test Temperature: 80℃
2. Test Times: 48Hrs
3. Test Environment Curve:



Sample Configuration & Quantity Under Test:
Quantity: 1 (BOXER-6421)

Test Result:

No issue was found after the high temperature storage test.

Low temperature storage test

Test Date: 08-05 ~ 08-2016

Test Product: BOXER-6421

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: 09/10/15
Due date of Calibration: 09/09/16
Serial Number: A0004

Testing Item:

1. Test Temperature: -30℃
2. Test Times: 48Hrs
3. Test Environment Curve:

Sample Configuration & Quantity Under Test:

Quantity: 1 (BOXER-6421)

Test Result:

No issue was found after the low temperature storage test.

Humidity test

Test Date: 08-08 ~ 10-2016

Test Product: BOXER-6421

Test Site: AAEON QE Dept.

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

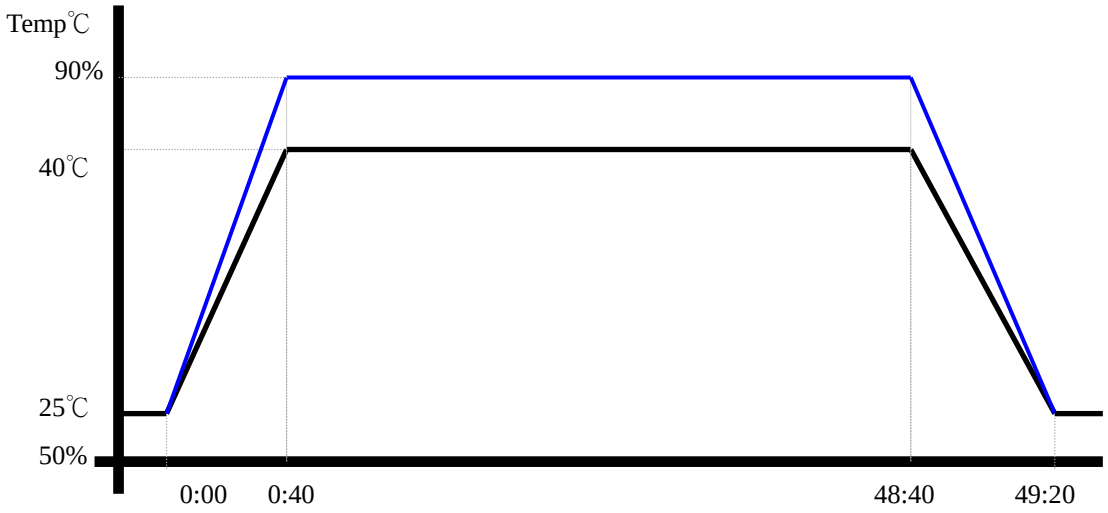
Test Equipment:

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-D7TS-100+LN2
Date of Calibration: 09/10/15
Due date of Calibration: 09/09/16
Serial Number: A0004

Testing Item:

1. Test Temperature: 40℃
2. Test Humidity: 90%RH
3. Test Times: 48Hrs
4. Test Environment Curve:

Humidity %



Sample Configuration & Quantity Under Test:
Quantity: 1 (BOXER-6421)

Test Result:
No issue was found after the humidity storage test.

Cold start and hot start test

Test Date: 08-11~ 12-2016

Test Product: BOXER-6421

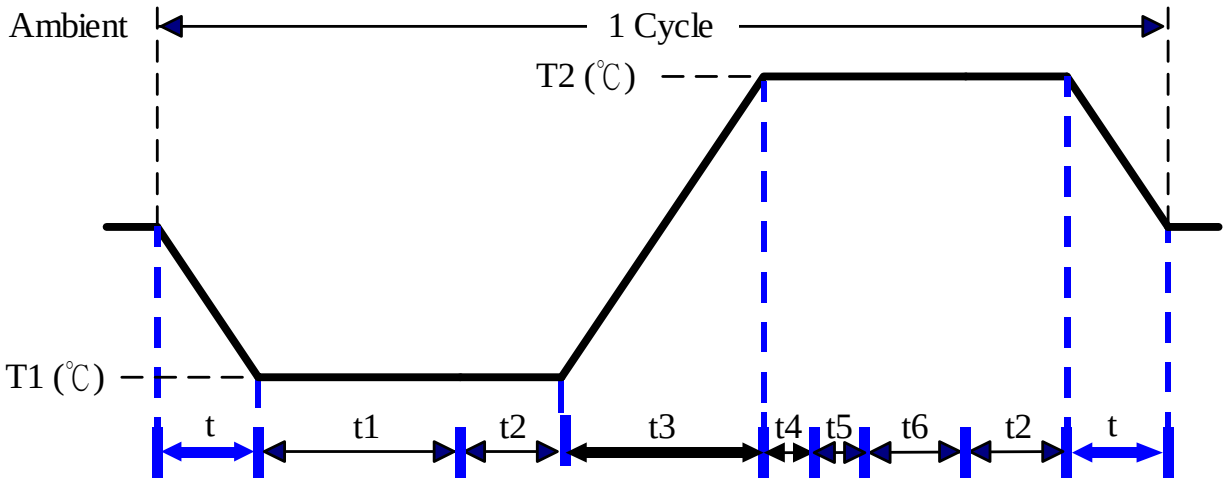
Test Site: AAEON QE Dept.

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: 09/10/15
Due date of Calibration: 09/09/16
Serial Number: A0004

Test Condition:



Parameters	Description
T1	-20℃
T2	50℃
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: Execute #cd test_stability #./BurnIn
t5: Linux kernel 3.0.35 Software restart test 3 times
Test Software:Linux kernel 3.0.35

Test Result:

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