# RTC-700M

## Environment Test Report

**Report NO: 16R020001**

| | |
|---|---|
| Summary | ☑ **Pass**<br>☐ **Fail**<br>Note : There is/are ___ defect(s) not list in the report, please check it in the DTS Website.<br>☐ **Pass with Deviation**<br>**Comment: _____** |

| Issue date | QE Manager | Test Engineer |
|---|---|---|
| **2016-05-11** | **KJ Wang** | **Ben Sun** |

# Test Item List



## Testing Result

| Num | Test item list | Result | Remark |
|---|---|---|---|
| 1 | Temp./humidity power on/off test | Pass | |
| 2 | Room temperature test | Pass | |
| 3 | Temperature rise test | Pass | |
| 4 | High temperature storage test | Pass | |
| 5 | High temperature operation test | Pass | |
| 6 | Low temperature storage test | Pass | |
| 7 | Low temperature operation test | Pass | |
| 8 | Humidity test | Pass | |
| 9 | Temperature shock operation test | Pass | |
| 10 | Temperature shock non-operation test | Pass | |
| 11 | Cold start and hot start test | Pass | |



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# Configuration of EUT

| Test Product: RTC-700M | | |
|---|---|---|
| **Sample Configuration & Quantity Under Test:** | | |
| **Num** | **Item** | **Description** |
| RTC-700M | | |
| 01. | **CPU:** | TI OMAP 4470 |
| 02. | **PCBA** | A0.3_0_1 |
| 03. | **BIOS** | none |
| 04. | **Memory** | 1GB LPDDR2 + 16GB eMMC |
| 05. | **Storage** | 16GB eMMC flash |
| 06. | **3G** | QUECTEL UC20-G |
| 07. | **WLAN + BT Module** | Jorjin WG7550 WIFI+BT_GPS module |
| 08. | **Battery** | GETAC 2S1P 1530mAh x 2 |
| 09. | **AC Adapter** | FSP036-RBBN2 |
| 10. | **Test Software** | Android Stability Test APP |


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# Room Temperature test

**Test Date:** 03-13-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

**Temperature Measurement:**

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

**Test Condition:**

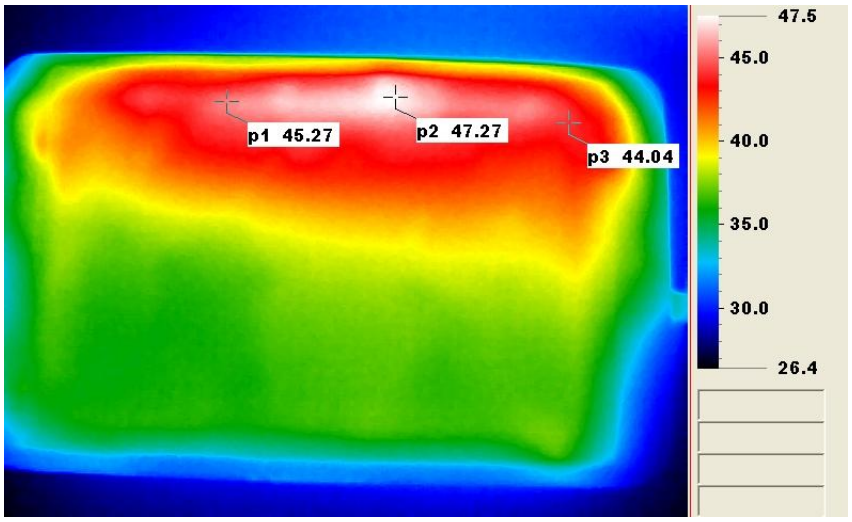
Ambient temperature: 25℃
Continuous running till temperature stable (within less than 1℃)

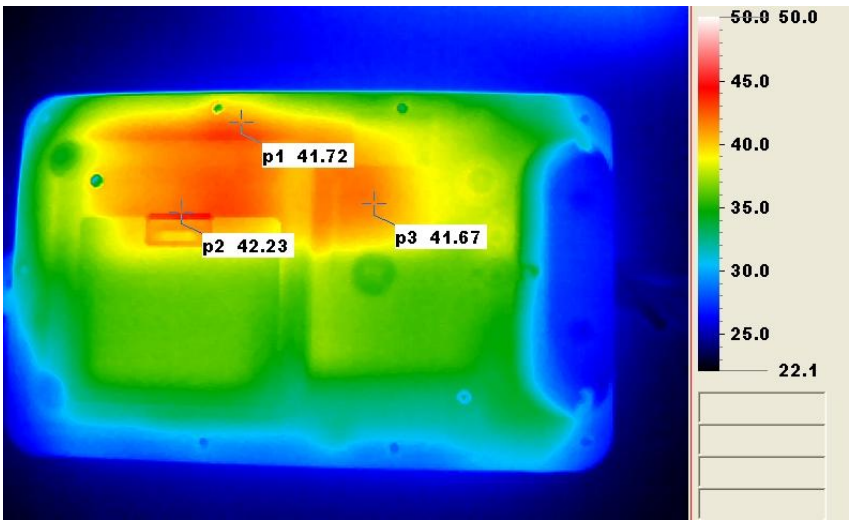
**Test Software:**

Android 4.2.2 / Run Stability Test App

**Terminal Recorder:**

Measuring Thermal Couple Position：



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# Room Temperature test





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**Thermal profile data:**

**RTC-700M**

| Point / Temp. Stage(℃) | Spec | 25 |
|---|---|---|
| 1. Point 1 | | 44.6 |
| 2. Point 2 | | 44.5 |
| 3. Point 3 | △T | 44.7 |
| 4. Point 4 | ≦25 | 43.8 |
| 5. Point 5 | ℃ | 47.3 |
| 6. Point 6 - | | 44.7 |
| Room Temperature | | 24.9 |
| **Any Tm value showed in red words which meaning the value over the Tc degree Cof this device specification.** | | |

**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found during the room temperature operation test.



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# Temperature rise test

**Test Date:** 03-08~10-2016

**Test Product:** RTC-700M

**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: 09/10/15
Serial Number: 12A323190

**Test Condition:**

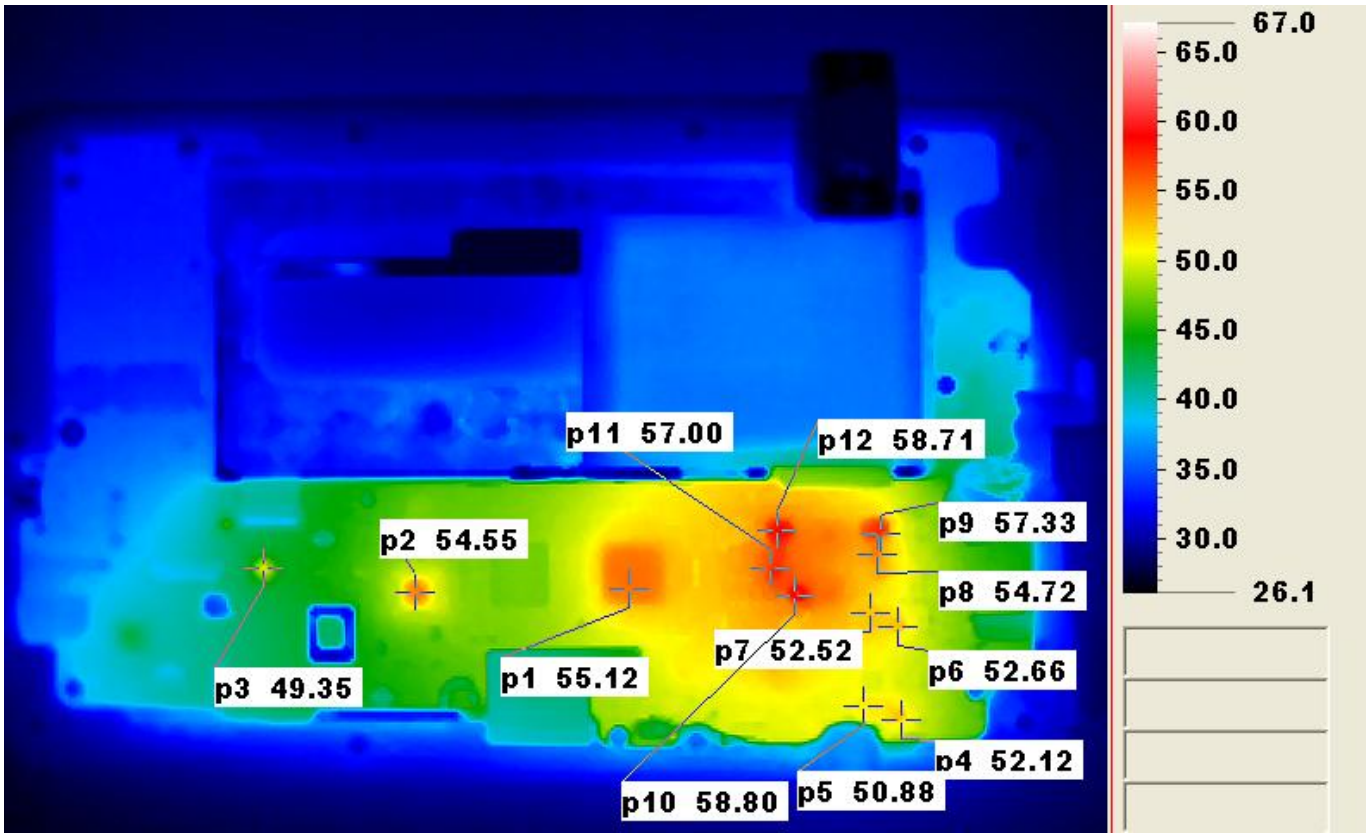
Ambient temperature: 35℃
Continuous running till thermal stability (within less than 1℃)

**Test Software:**

Android 4.2.2 / Run Stability Test App

**Terminal Recorder:**

Measuring Thermal Couple Position：



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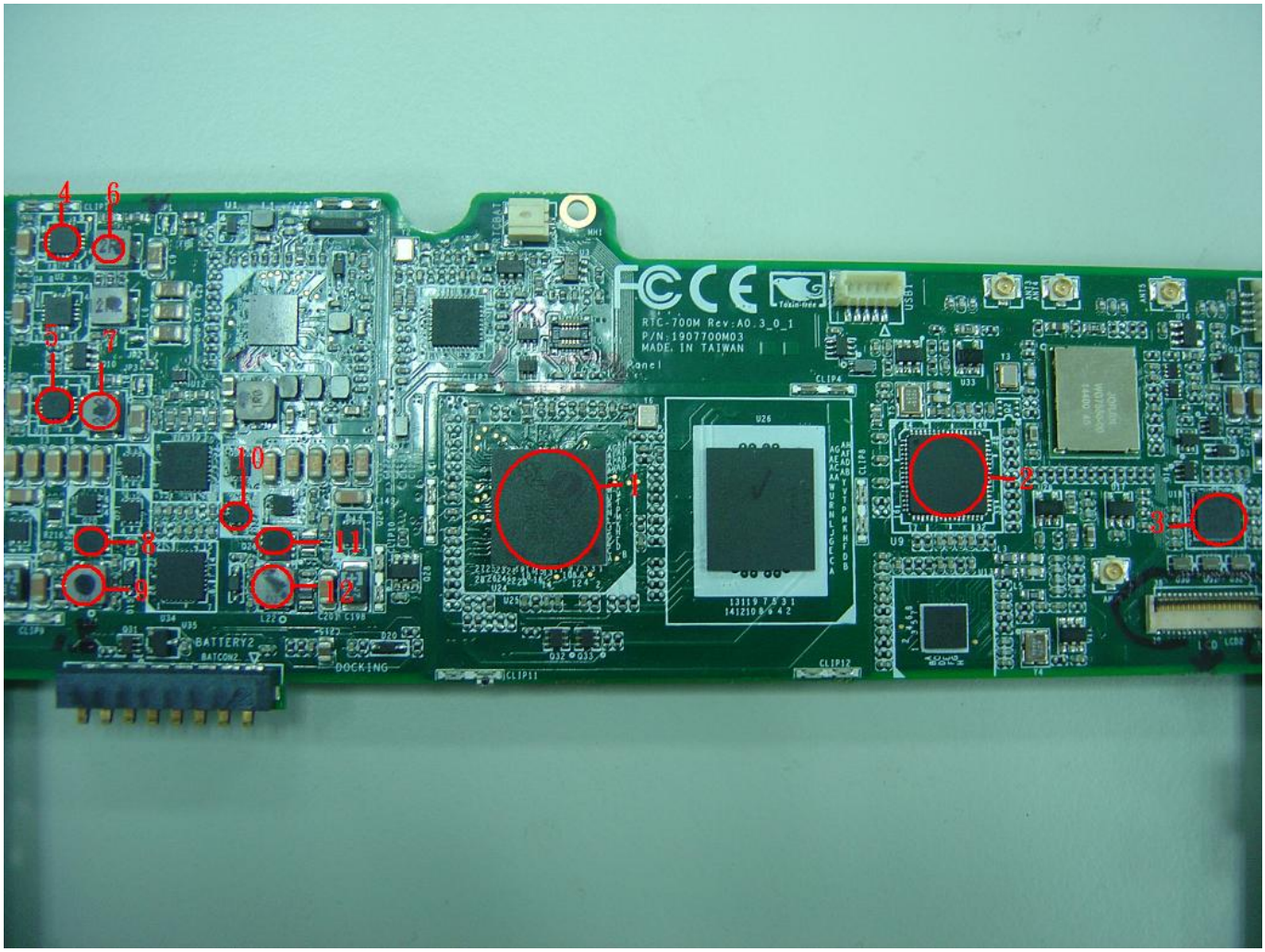




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**Thermal profile data:**

**RTC-700M**

| Point | Position | Describe | Tc (*1) (℃) | Tm (*2) Measured Under 35.0℃ | Note |
|---|---|---|---|---|---|
| 1 | U25 | (TF)TI CPU.OMAP4470.1.5GHz.PBGA 547P.SMD.44705GPCBS | 100 | 75.0 | |
| 2 | U9 | (TF)IC.USB2.0 7-PORT HUB CONTROLLER.QFN 64.SMD.SMSC USB2517i-JZX | 100 | 68.0 | |
| 3 | U18 | (TF)IC.DSI2LVDS Bridge.BGA 49P.SMD.Toshiba.TC358764XBG | 100 | 61.8 | |
| 4 | U2 | (TF)IC.Step-Down Converter.2.5MHz.QFN-16.SMD TI TPS62130RGT | 100 | 68.6 | |
| 5 | U16 | (TF)IC.Step-Down Converter.2.5MHz QFN-16.SMD TI TPS62130RGT | 100 | 66.7 | |
| 6 | L2 | (TF)COIL.2.2uH.DCR=52mohm.Idc=3Amp.20%.SMD.4.45*4.05*2.0mm.Zenithtek.ZPWM-4020M-2R2M | 150 | 67.3 | |
| 7 | L18 | (TF)COIL.2.2uH.DCR=52mohm.Idc=3Amp.20%.SMD.4.45*4.05*2.0mm.Zenithtek.ZPWM-4020M-2R2M | 150 | 63.0 | |
| 8 | Q23 | (TF)PWR.Dual P-Channel MOSFET.Vds=-30V.Vgs=±25V Id=-3.3A SMD.FAIRCHILD.FDMA3027PZ | 150 | 62.0 | |
| 9 | L21 | (TF)COIL.8.2uH.DCR=188mΩ.Irms=1.8Amp.20%.SMD.4.5*4.0*1.8mm.GOTREND.GSTD4020PM-8R2M | 150 | 66.8 | |
| 10 | Q22 | (TF)PWR.Dual P-Channel MOSFET.Vds=-30V Vgs=±25V Id=-3.3A SMD FAIRCHILD.FDMA3027PZ | 150 | 66.6 | |
| 11 | Q24 | (TF)PWR.Dual P-Channel MOSFET.Vds=-30V Vgs=±25V Id=-3.3A.SMD.FAIRCHILD.FDMA3027PZ | 150 | 66.4 | |
| 12 | L22 | (TF)COIL.8.2uH.DCR=188mΩ.Irms=1.8Amp.20%.SMD.4.5*4.0*1.8mm.GOTREND.GSTD4020PM-8R2M | 150 | 43.5 | |
| 13 | | System Ta (Inside) | | 38.6 | |

**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.
- **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.

**5. Defect NO.**

**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found during the temperature rise operation test.



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# High temperature storage test

**Test Date:** 02-15 ~ 21-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

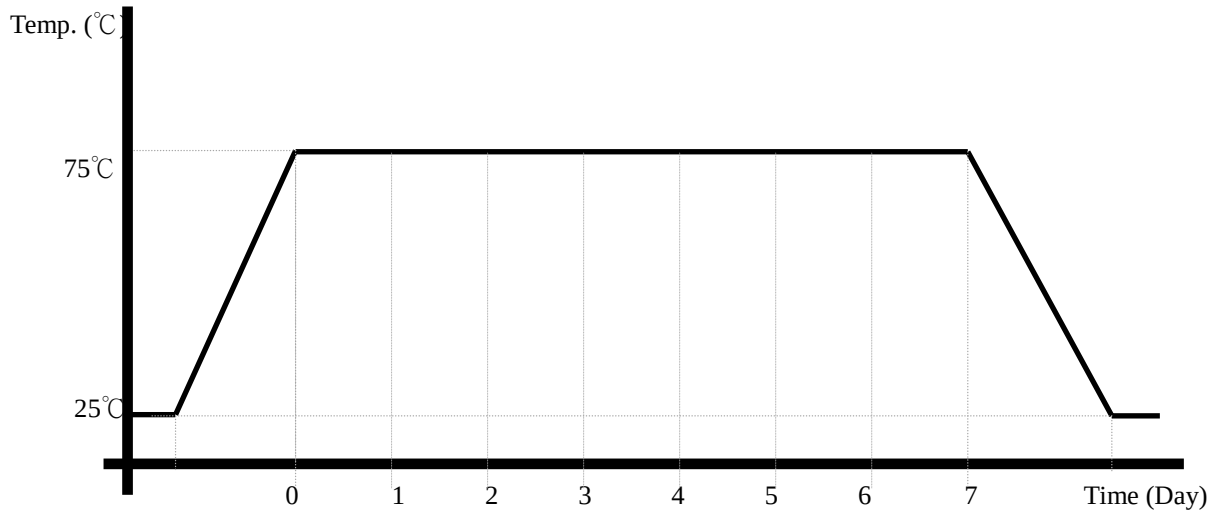
**Test Standard:** Refer to MIL-STD 810G Method 501.5 High Temperature
Procedure I - Storage

**Test Equipment:**

Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: 75℃
2. Test Time: 7days
3. Test Environment Curve:




**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found after the high temperature storage test.



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# High temperature operation test

**Test Date:** 02-04 ~ 09-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

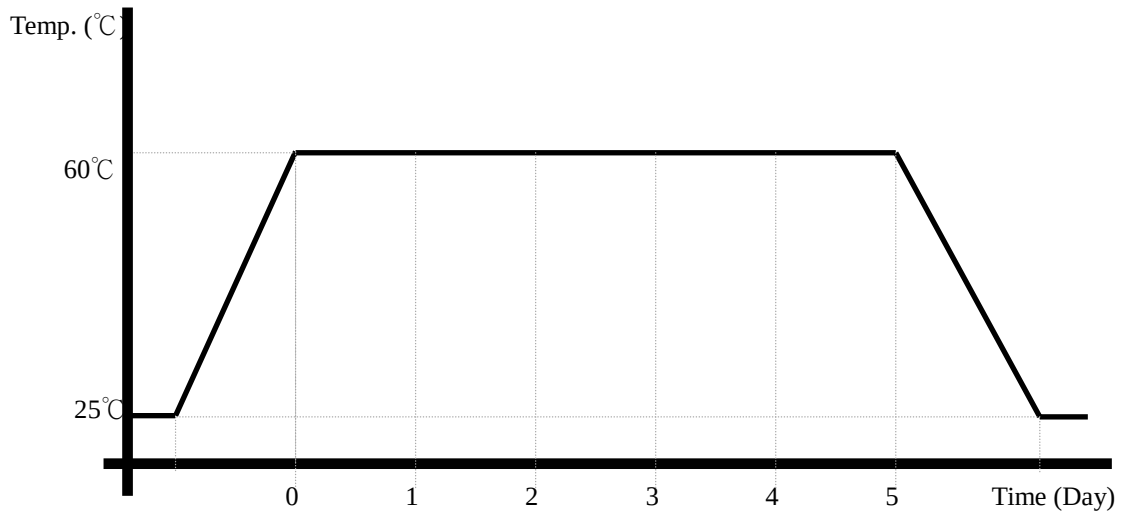
**Test Standard:** Refer to MIL-STD 810G Method 501.5 High Temperature
Procedure II - Operation

**Test Equipment:**

Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: 60℃
2. Test Time: 5days
3. Test Software: Android 4.2.2 / Run Stability Test App
4. Test Environment Curve:




**Sample Configuration & Quantity Under Test:**
Quantity: 1 (RTC-700M)

**Test Result:**
No issues were found during the high temperature operation test.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# Low temperature storage test

**Test Date:** 02-03~04-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

**Test Standard:** Refer to MIL-STD 810G Method 502.5 Low Temperature
Procedure I - Storage

**Test Equipment:**

Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: -55℃
2. Test Times: 24Hrs
3. Test Environment Curve:


**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found after the low temperature storage test.



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# Low temperature operation test

**Test Date:** 02-02~03-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

**Test Standard:** Refer to MIL-STD 810G Method 502.5 High Temperature
Procedure II - Operation

**Test Equipment:**

Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: -23℃
2. Test Times: 24Hrs
3. Test Software: Android 4.2.2 / Run Stability Test App
4. Test Environment Curve:


**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found during the low temperature operation test.



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# Humidity test

**Test Date:** 05-09~11-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

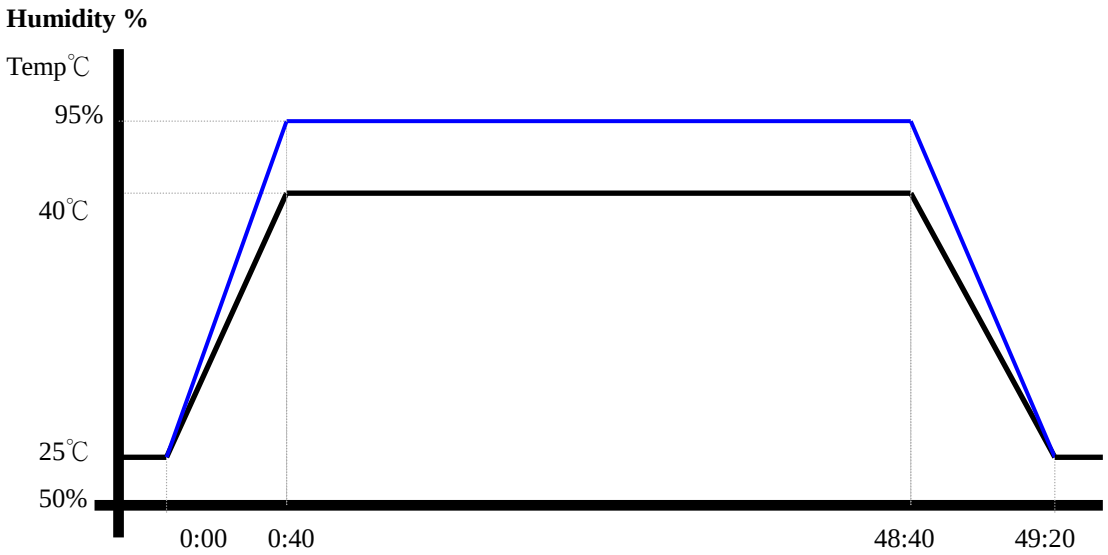
**Test Standard:** Refer to IEC 68-2-3 Testing procedures
Test Ca: Damp heat, steady state (Non-operation)

**Test Equipment:**

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: 40℃
2. Test Humidity: 95%RH
3. Test Times: 48Hrs
4. Test Environment Curve:




**Sample Configuration & Quantity Under Test:**
Quantity: 1 (RTC-700M)

**Test Result:**
No issue was found after the humidity storage test.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# Temperature shock operation test

**Test Date:** 03-02~03-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

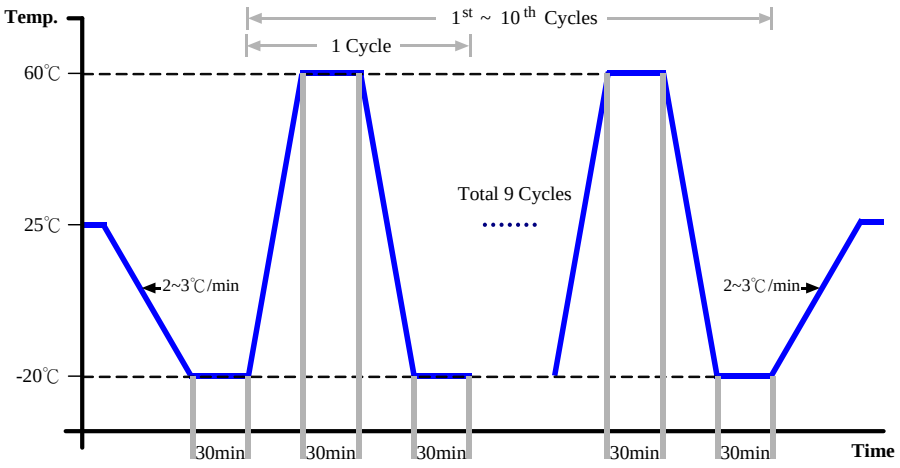
**Test Standard:** Refer to MIL-STD 810G Method 503.5 Temperature Shock
Procedure I - Shock from constant extreme temperatures

**Test Equipment:**

Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Test Condition:**

1. Test Low Temperature: -20℃
2. Test High Temperature: 60℃
3. Test dwell time: 30min
4. Temperature slope: 5 min
5. Test cycle: 10 cycles
6. Test Software: Android 4.2.2 / Run Stability Test App
7. Test Environment Curve:




**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found during the variation temperature operation test.



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# Temperature shock non-operation test

**Test Date:** 03-03~05-2016

**Test Product:** RTC-700M

**Test Site:** AAEON QE Dept.

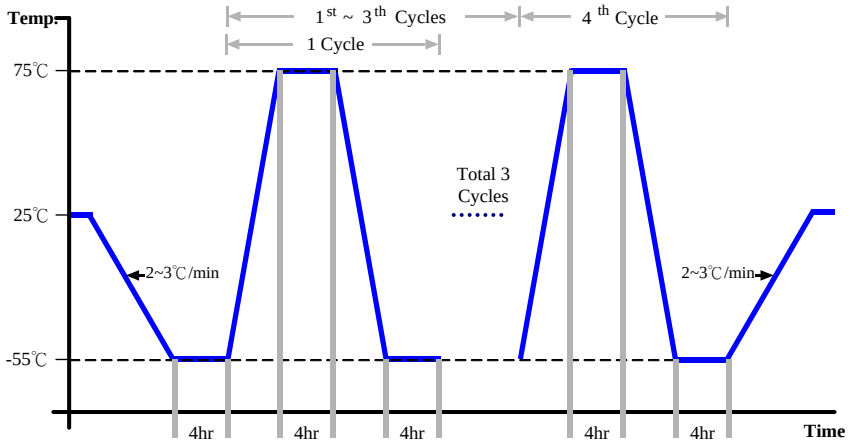
**Test Standard:** Refer to MIL-STD 810G Method 503.5 Temperature Shock
Procedure I - Shock from constant extreme temperatures

**Test Equipment:**

Programmable Temperature & Humidity Chamber (K.SON. INS. TECH. CORP.)
Model: THS-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**Test Condition:**

1. Test Low Temperature: -55℃
2. Test High Temperature: 75℃
3. Test dwell time: 4Hrs
4. Temperature slope: 10 min
5. Test cycle: 4 cycles
6. Test Environment Curve:




**Sample Configuration & Quantity Under Test:**

Quantity: 1 (RTC-700M)

**Test Result:**

No issues were found after the variation temperature non-operation test.



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# Cold start and hot start test

**Test Date:** 02-01~02-2016

**Test Product:** RTC-700M

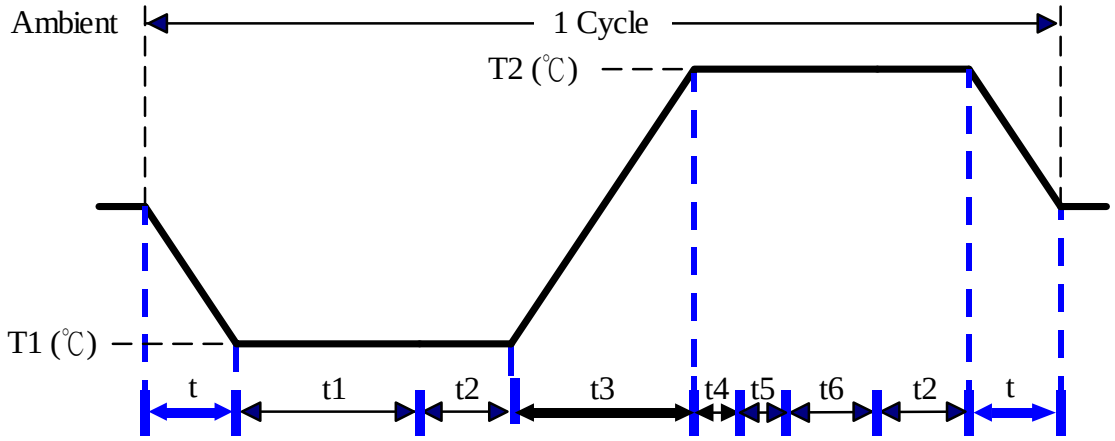
**Test Site:** AAEON QE Dept.

**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-B6T-150+LN2
Date of Calibration: 06/05/15
Serial Number: 9095KT

**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: Stability Test
t5: Android Software restart test 3 times
Test Software:Android 4.2.2

**Test Result:**

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