

# TKS-EMB

## Environment Test Report

Report NO: 14P020021

Summary	<input checked="" type="checkbox"/> Pass			
	<input type="checkbox"/> Fail			
<input type="checkbox"/> Pass with Deviation				
Comment:				
Test Result Summary				
	Critical	Major	Minor	Enhancement
Defect Found	0	0	0	0
Defect Unsolved	0	0	0	0

**Issue date**

**2014-11-20**

**Approval**

**Tom Lin**

**Issued by**

**Jerry Chen**

# Test item list

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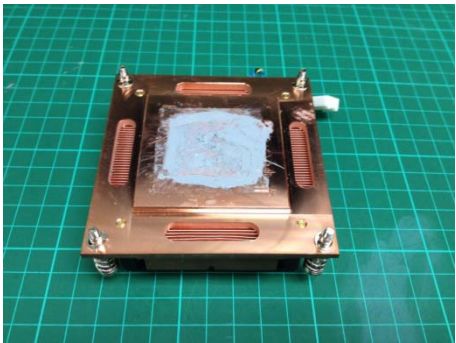
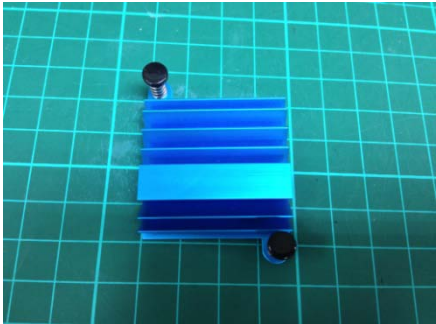
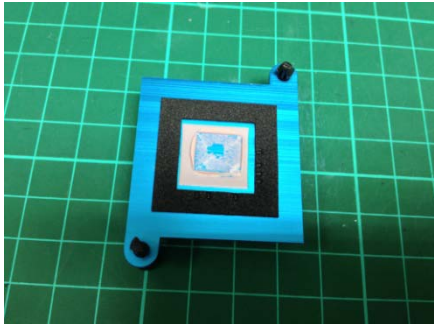
## Testing Result

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.	<b>System:</b>	TKS-EMB A1.0
	1.Main board	EMB-Q77B R1.0
	2.BIOS Ver.	R1.0 (EQ77BM10) (01/27/2014)
	3.CPU Type	Intel Core™ i7-3770S 3.10GHz
	4. Chipset	Intel PCH BD82Q77
	5. Memory	Transcend DDR3 1600 8GB (SEC K4B4G0846D)
	6. 2.5" HDD	Toshiba SATA 2.5" HDD 100GB / MK1060GSC
	7. Test Software	Windows 7/ Run PassMark BurnIn test 7.1 Pro
2.	<b>Power Supply</b>	DELTA / GPS-200AB A

## Photos

<b>System</b>	<b>System Fan</b>
	
<b>CPU Cooler</b>	<b>CPU Cooler</b>
	
<b>Heat Sink</b>	<b>Heat Sink</b>
	

# Temperature rise test

**Test Date:** 11-18 ~ 19-2014

**Test Product:** TKS-EMB

**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: 09/11/14

Serial Number: 12A323190

**IR Scanner: Infrared Camera**

NEC Avio Infrared Technologies Co., Ltd.

Model: Thermo GEAR G100W2-D

Date of Calibration: 12/29/13

Serial Number: 1051444

## Test Condition:

Ambient temperature: 40°C

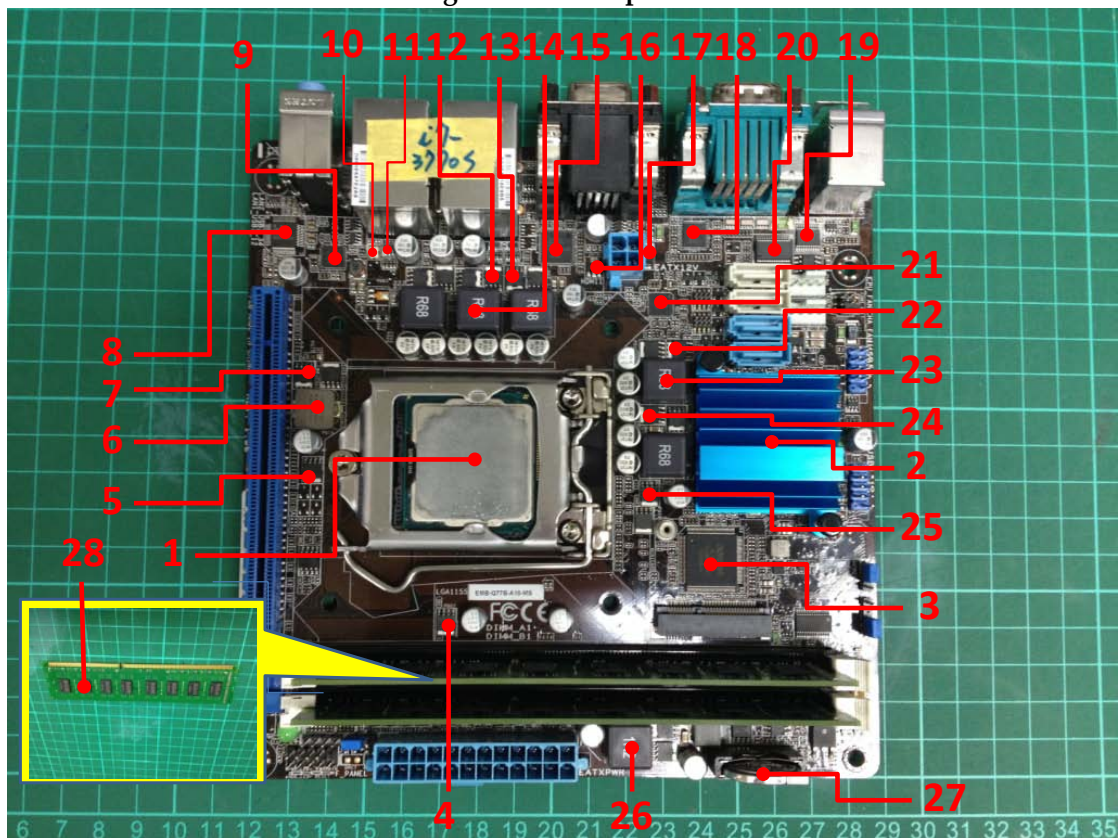
Continuous running till thermal stability (within less than 1°C)

## Test Software:

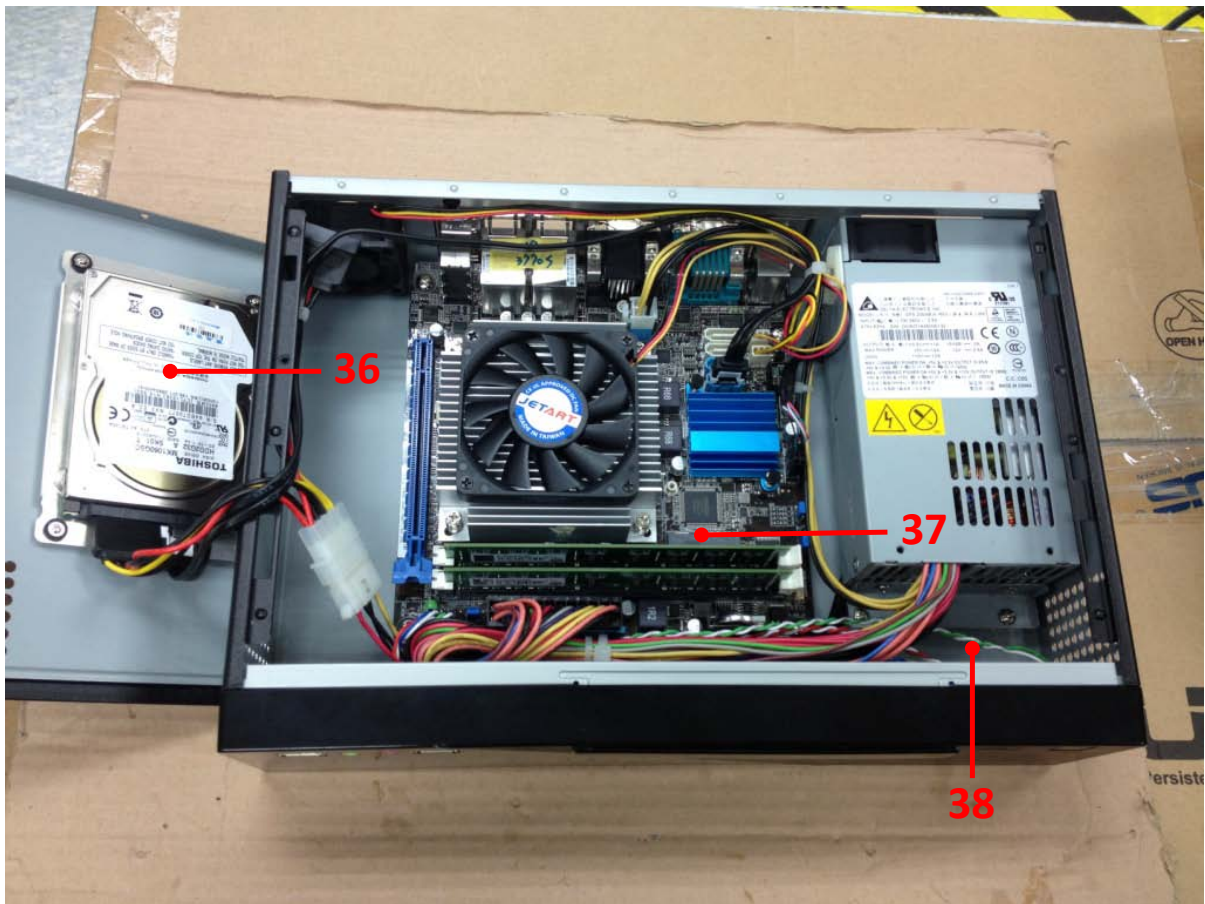
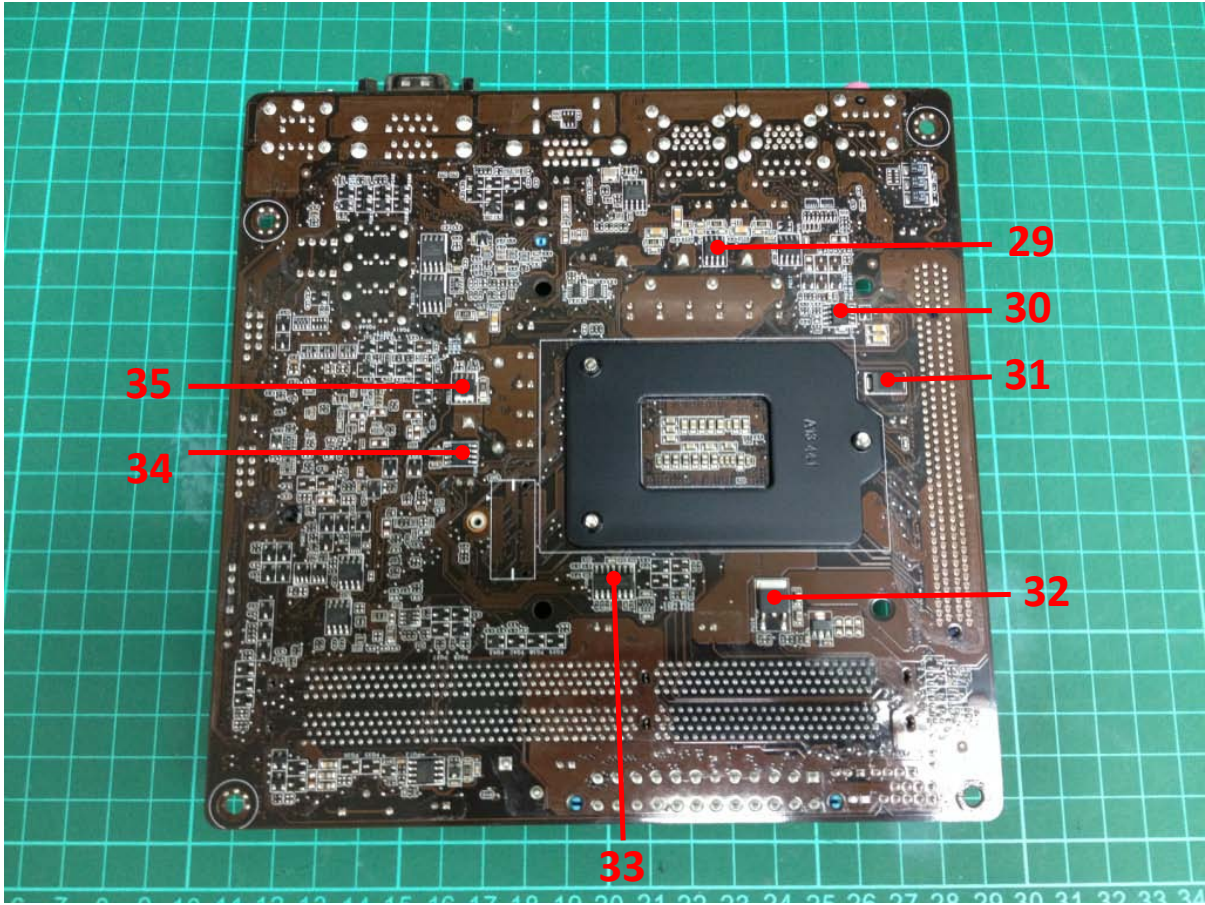
Windows 7 / Run PassMark Burn In Test 7.1 Pro

## Terminal Recorder:

Measuring Thermal Couple Position :



# Temperature rise test



# Temperature rise test

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# Temperature rise test

## TKS-EMB

Point		Temp. Stage(°C)	Spec	40°C	25°C	Note
01.	CPU	Intel Core I7-3770S 3.10GHz CPU	69.1	55.9	40.9	
02.	SU1	Intel PCH BD82Q77	108	62.3	47.3	
03.	OU1	NUVOTON NCT6779D	95	55.7	40.7	
04.	PQ22	NXP PH7030AL N-MOSFET	150	63.4	48.4	
05.	PQ18	NXP PH7030AL N-MOSFET	150	53.8	38.8	
06.	PL7	CYNTEC INDUCTOR 0.56UH/25A SMD 20%	125	56	41	
07.	PQ15	NXP PH2530ALSOT-669	150	55.9	40.9	
08.	AU1	REALTEK C.S ALC887-VD2-CG LQFP-48	85	57.5	42.5	
09.	L1U1	INTEL C.S WG82579LM (C0) QFN-48	106	61	46	
10.	UD101	AOS TVS ARRAY 6V/5A SOT23-6	100	56.5	41.5	
11.	L1X1	EPSON XTAL 25MHZ SMD 10PF/20PPM	85	57.9	42.9	
12.	PQ5	NXP PH7030AL N-MOSFET	150	66	51	
13.	PQ4	NXP PH2530AL SOT-669	150	68.5	53.5	
14.	PL4	CHUNG SHUO INDUCTOR 1.2UH/30A 1.5 $\phi$ DIP	125	52.9	37.9	
15.	L2U1	INTEL C.S WG82583V (A1) QFN64	109	67.4	52.4	
16.	L2Q1	ST STF826 SOT-89	125	65	50	
17.	GD2	YS SS14 SMA	125	54.6	39.6	
18.	GU11	ASMEDIA C.S ASM1442K (A1) QFN-48	125	56.6	41.6	
19.	BU4	BCD INTERFACE AZ75232GTR-E1	100	63.2	48.2	
20.	BU3	A.D. INTERFACE ADM213EARSZ SSOP-28	100	54.4	39.4	
21.	PU1	UPI PWM CONTROLLER UP1625SQGK	100	65.8	50.8	
22.	PQ2	NXP PH2530AL SOT-669	150	62.2	47.2	
23.	PL2	CHUNG SHUO INDUCTOR 0.68UH/35A 1.5 $\phi$ DIP	125	60.6	45.6	
24.	PQ9	NXP PH7030AL SOT-669	150	60.8	45.8	
25.	PQ21	NXP PH7030AL N-MOSFET	150	62.2	47.2	
26.	PL9	CHUNG SHUO INDUCTOR 1.2UH/30A 1.5 $\phi$ DIP	125	49.2	34.2	
27.	BATTERY2	maxell CR2032 3V	85	42.3	27.3	
28.	DIMM_A1	Transcend DDR3 1600 8GB (SEC K4B4G0846D)	85	48.7	33.7	
29.	PU4	UPI UP6281BSU8	100	66.6	51.6	
30.	PU7	RICHTEK PWM CONTROLLER RT8120HGSP	100	59.6	44.6	
31.	PCE14	PANASONIC 330UF/2V (7343/D)20%	105	53.6	38.6	
32.	PU16	UTC UZ2085G-AD-TN3-R	100	63.8	48.8	
33.	PU10	AAC AS324MTR-E1 SOIC-14	100	53	38	
34.	PU6	UPI UP6281BSU8	100	61.8	46.8	
35.	PQ11	NXP PH2530AL SOT-669	150	66.2	51.2	

36.	HDD	Toshiba SATA 2.5" HDD 100GB / MK1060GSC	85	46.8	31.8	
37.	N/A	Control Box Inside Air Temperature-1	N/A	50.5	35.5	
38.	N/A	Control Box Inside Air Temperature-2	N/A	46.2	31.2	
39.	N/A	Control Box External Surface temperature	N/A	44.6	29.6	
40.	N/A	Chamber Air Temperature	N/A	40	25	

**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** :  $T_m > T_c$ ; The measured value is over specification.
- **Margin Pass** :  $T_c > T_m > T_c - 5^\circ\text{C}$ ; The measured value is within specification with margin.  
It is strongly recommended to add thermal dissipation design for better reliability.
- **Pass** :  $T_m < T_c - 5^\circ\text{C}$ ; The measured value is with safety margin.

**4. Defect NO. N/A**

**Sample Configuration & Quantity Under Test:**

Quantity: 1 (TKS-EMB)

**Test Result:**

No issues were found during the temperature rise operation test.



# Temperature cycle test

**Test Date :** 11-14 ~ 17-2014

**Test Product :** TKS-EMB

**Test Site:** AAEON QE Dept.

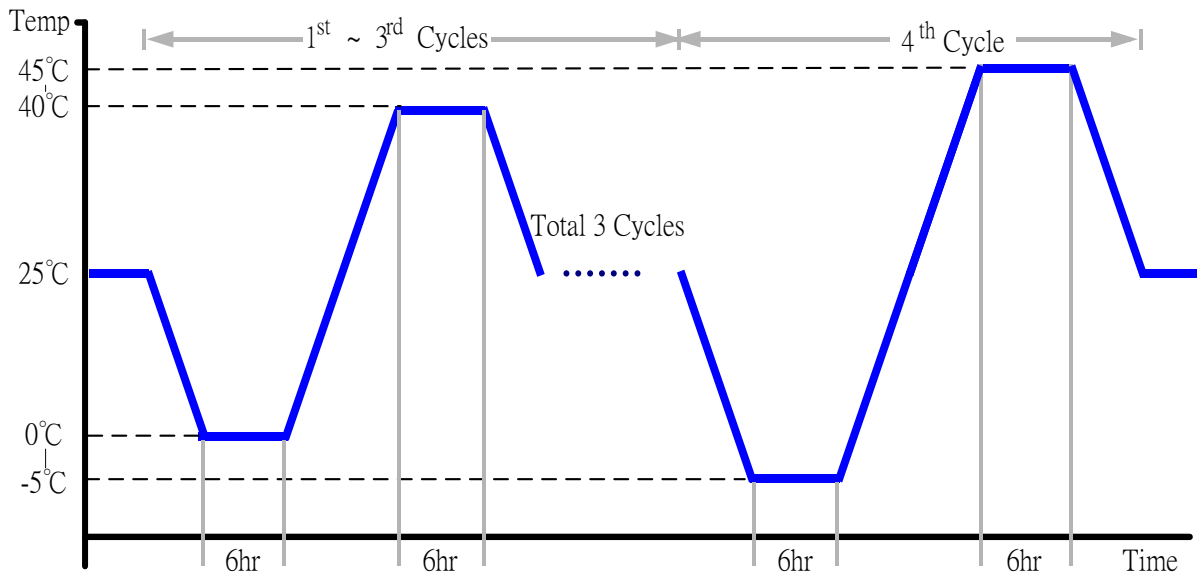
**Test Standard:** Refer to IEC68-2-14 Testing procedures  
Test N: Change of temperature Test

**Test Equipment:**

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)  
Model: THS-B6T-150+1 N2  
Date of Calibration: 06/05/'14  
Serial Number: 9095KT

**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 (TKS-EMB)

**Test Result:**

No issues were found during the temperature operation cycle test.

# High temperature storage test

**Test Date:** 11-10 ~ 12-2014

**Test Product:** TKS-EMB

**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.)

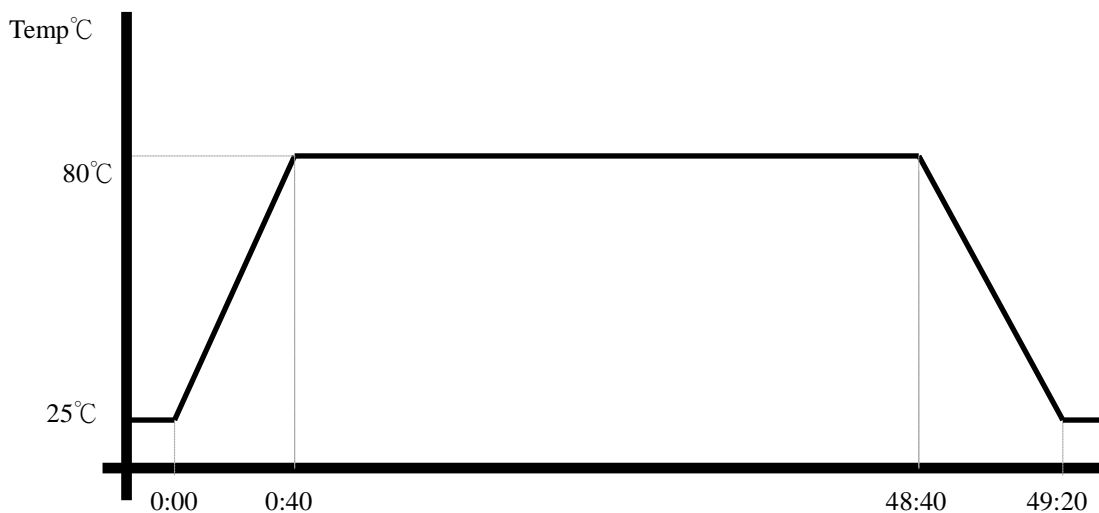
Model: THS-B6T-150+1 N2

Date of Calibration: 06/05/'14

Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: 80°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 (TKS-EMB)

**Test Result:**

No issues were found after the high temperature storage test.

# Low temperature storage test

**Test Date:** 11-07~10-2014

**Test Product:** TKS-EMB

**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-B6T-150+1 N2  
Date of Calibration: 06/05/'14  
Serial Number: 9095KT

**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 (TKS-EMB)

**Test Result:**

No issues were found after the low temperature storage test.

# Humidity test

**Test Date:** 11-12 ~ 14-2014

**Test Product:** TKS-EMB

**Test Site:** AAEON QE Dept.

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

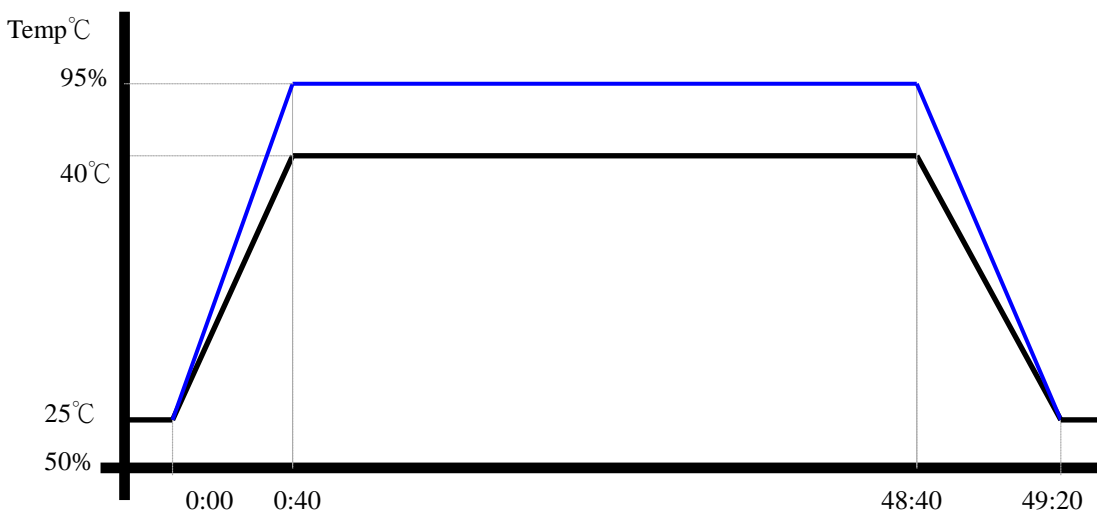
**Test Equipment:**

Programmable Temperature & Humidity Chamber: (K.SON. INS. TECH. CORP.)  
Model: THS-B6T-150+1 N2  
Date of Calibration: 06/05/'14  
Serial Number: 9095KT

**Testing Item:**

1. Test Temperature: 40°C
2. Test Humidity: 95%RH
3. Test Times: 48Hrs
4. Test Software: Windows 7 / Run PassMark Burn In Test 7.1 Pro
5. Test Environment Curve:

**Humidity %**



**Sample Configuration & Quantity Under Test:**

Quantity: 1 (TKS-EMB)

**Test Result:**

No issues were found after the humidity storage test.

# Cold start and hot start test

**Test Date:** 11-17 ~ 18-2014

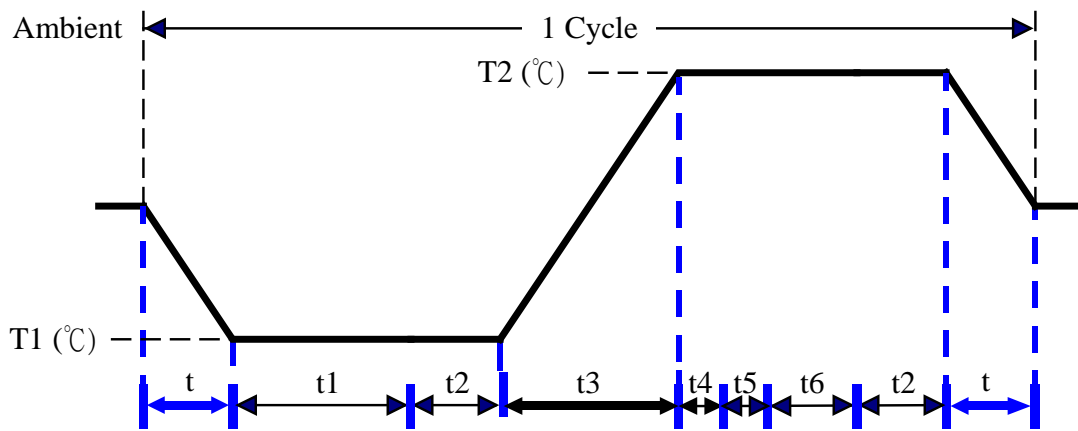
**Test Product:** TKS-EMB

**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+1 N2  
Date of Calibration: 06/05/'14  
Serial Number: 9095KT

**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 = 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 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.