

# QA Test Report

**PT215051STV2Q1C00**

**(Product Reliability Test)**

**Report No: 19S141A0**

**Report Date: September 16, 2019**

Issue Stamp

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*Jeff Yang*

Manager of QA Department

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Approval

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*Tim Chang*

Test Engineer

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*QA Lab Reliability test*

# History

Report No.	Description	Release Date
19S141A0	First release for DVT stage	2019/09/16

## Test Item List

Num.	Test item	Result	Remark
1	High temperature operation test	Passed	
2	Low temperature operation test	Passed	
3	Humidity test	Passed	
4	High temperature & humidity storage test	Passed	
5	High temperature storage test	Passed	
6	Low temperature storage test	Passed	
7	Thermal shock test	Passed	
8	Power ON/OFF test	Passed	
9	Cold start test	Passed	
10	Thermal profile test	Passed	
11	Thermal step stress test	Reference	
12	Random vibration test	Passed	
13	Sine vibration test	Passed	
14	Shock test	Passed	
15	Package drop test	Passed	
16	IP66 test	Passed	

# Product Spec Entry

Model Name		PT2150
Sub-models		51ST
LCD Display	Size	15.0" diagonal
	Max. Resolution	1024*768
	Type	TFT LCD with LED Backlight
	Max. Colors	16-bit
	Backlight (hr)	50,000
	Luminance (cd/m2)	350
Touch Panel		4-wire Analog Touch Panel
CPU		RISC ARM9 32Bit
Battery Backed RAM		128KB (optional: 1MB)
Working Memory		64MB
AP Max Size for Memory		64MB
Data File Memory		64MB
Real-Time Clock (RTC)		YES (Unchargeable Battery type, 5 years battery life)
Max Quantity for SCADA		7999Pages
Max Quantity for Macro Commands		Unlimited
Communication Interface	Micro SD Slot	N/A
	USB Host	YES (2.0)
	USB Client	YES (2.0)
	Serial (Com1)	RS232 (DB9)
	Serial (Com2)	RS422/485 (DB9)
	Serial (Com3)	RS485 (DB9)
	Serial (Com4)	RS485 (5-Pin Terminal)
	Serial (Com5)	RS485 (5-Pin Terminal) (Optional:RS232)
Ethernet		YES
Front Function Keys		N/A
Audio out		N/A
Video in		N/A
Front USB Host Port		N/A
Power	Supply Voltage	24VDC ±10%
	Consumption	20W
Environment	Operating Temperature	-10℃~60℃
	Relative Humidity	10%~90%
	EMI	FCC Part 15 Class A
	CE	EN61000-6-2, EN61000-6-4
	UL Certification	UL61010 (Next Year)
	Ingress Protection	NEMA 4 (Next Year) / IP66
Cooling		Natural Cooling
Dimension WxHxD (mm)		399.1×297.6×57.5
Cutout Dimension WxH (mm)		5
Net Weight (Kg)		3

\*Depth includes COM Port & Terminal Block Height / Without front bezal thickness

## Product Config. Photo

Photo I:



PT215051STV2Q1C00 front side view

Photo II:



PT215051STV2Q1C00 rear side view

# High Temperature Operation Test

**Test Date:** July 2~3, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

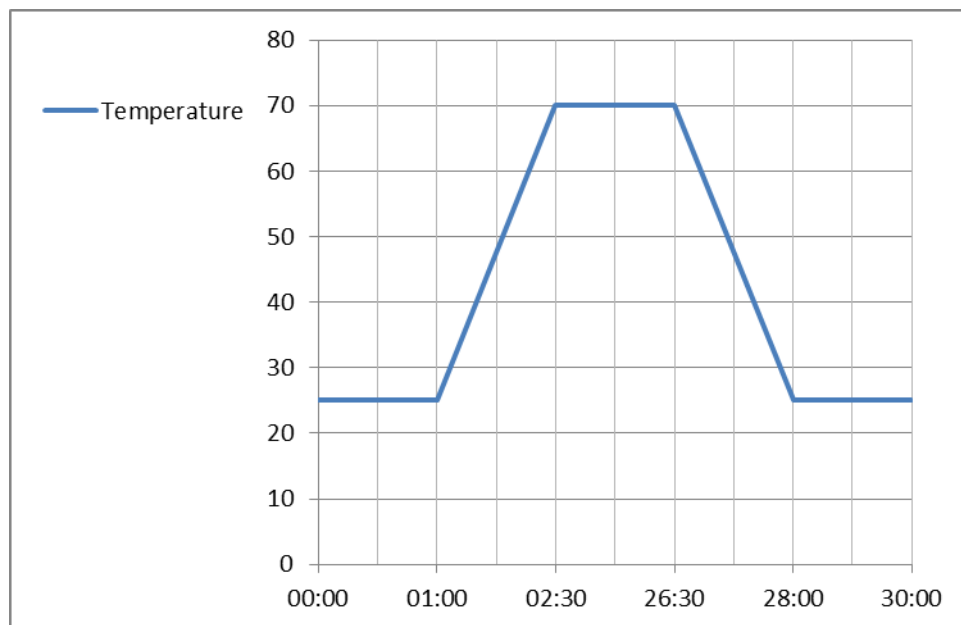
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference IEC60068-2-2:2007 Testing procedures  
Test Bb: Dry Heat Test

**Test Condition:**

1. Test Temperature: 70°C
2. Test Times: 24 hrs
3. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
4. Test Environment Curve:



**Test Equipment:** Programmable Temperature & Humidity Chamber

Giant Force Co. Ltd.

Model: GTH-800-60-CP-AR

S/N: MAA1412-004

Date of Calibration: 2019/01/29

Next Calibration Date: 2020/01/28

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The connectors and components should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no damage in electronic and mechanical functions.

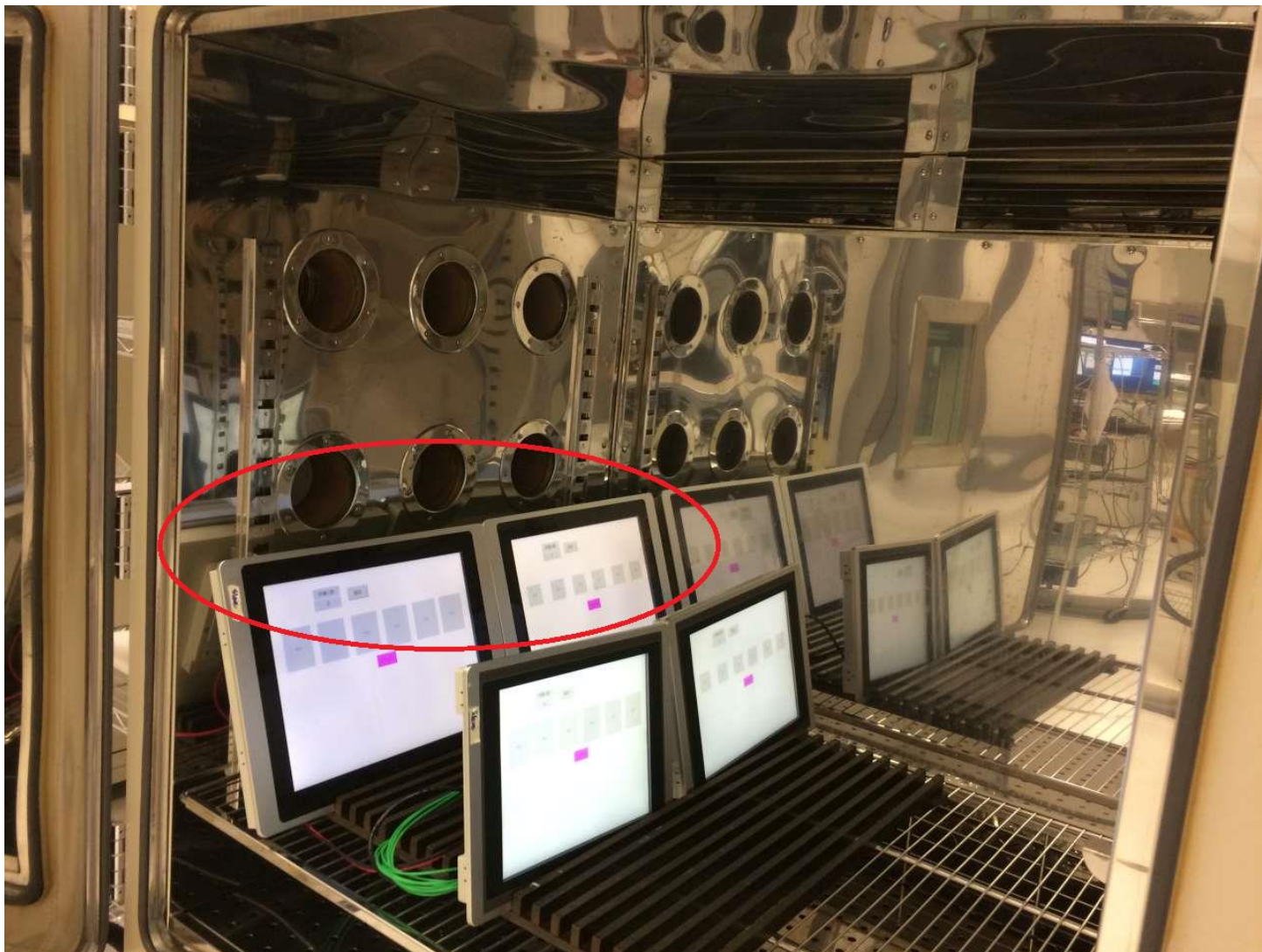
Degradation has not been found.

Performance is maintained with no incurable physical damage or degradation.



**Conclusion:****Passed.**

The PT215051STV2Q1C00 meets high temperature operation test.

**Photo :**

PT215051STV2Q1C00 test in environmental chamber

## Low Temperature Operation Test

**Test Date:** July 1~2, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

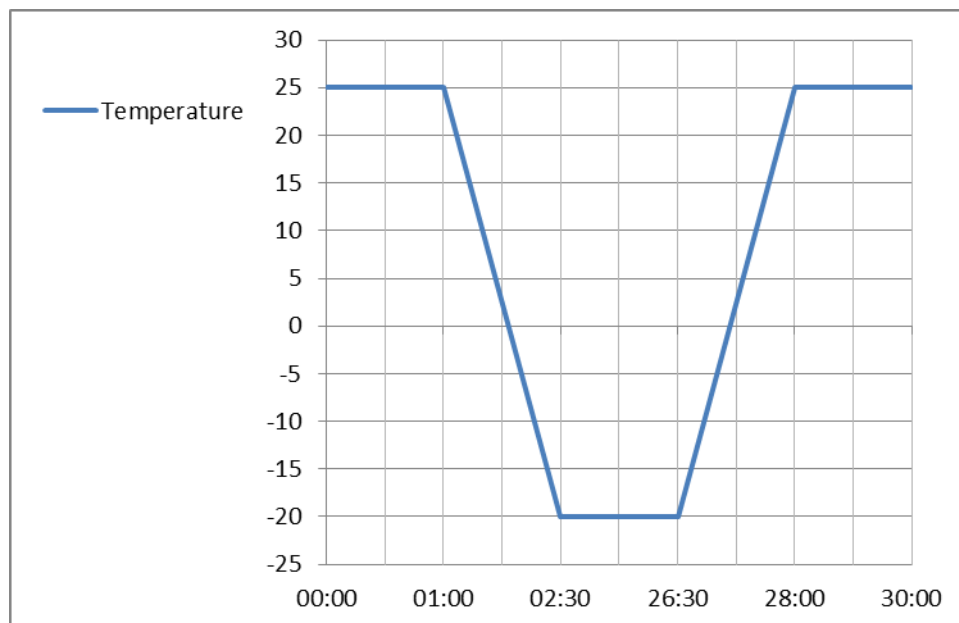
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference IEC60068-2-1:2007 Testing procedures  
Test Ab: Cold Test

**Test Condition:**

1. Test Temperature: -20°C
2. Test Times: 24 hrs
3. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
4. Test Environment Curve:



**Test Equipment:** Programmable Temperature & Humidity Chamber

Giant Force Co. Ltd.

Model: GTH-800-60-CP-AR

S/N: MAA1412-004

Date of Calibration: 2019/01/29

Next Calibration Date: 2020/01/28

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The connectors and components should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets low temperature operation test.

## Humidity Test

**Test Date:** June 28~30, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

**Performed By:** Tim Chang

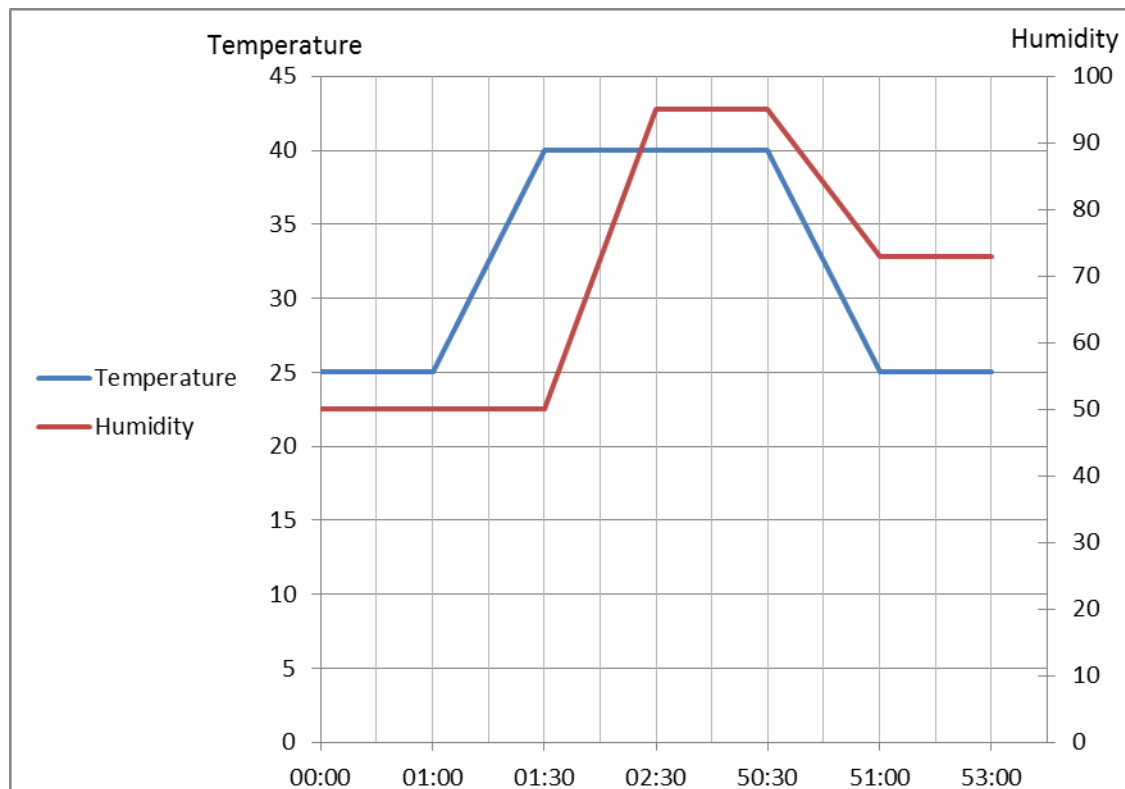
**Purpose:** The DVT test.

**Test Standard:** Reference IEC60068-2-78:2012 Testing procedures

Test Cab: Damp Heat steady state Test

**Test Condition:**

1. Test Temperature : 40°C
2. Test Humidity: 95%
3. Test Times: 48 hrs
4. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
5. Test Environment Curve:



**Test Equipment:** Programmable Temperature & Humidity Chamber

Giant Force Co. Ltd.

Model: GTH-800-60-CP-AR

S/N: MAA1412-004

Date of Calibration: 2019/01/29

Next Calibration Date: 2020/01/28

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The cover and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets humidity test.

## High Temp. & Hum. Storage Test

**Test Date:** June 27~28, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

**Performed By:** Tim Chang

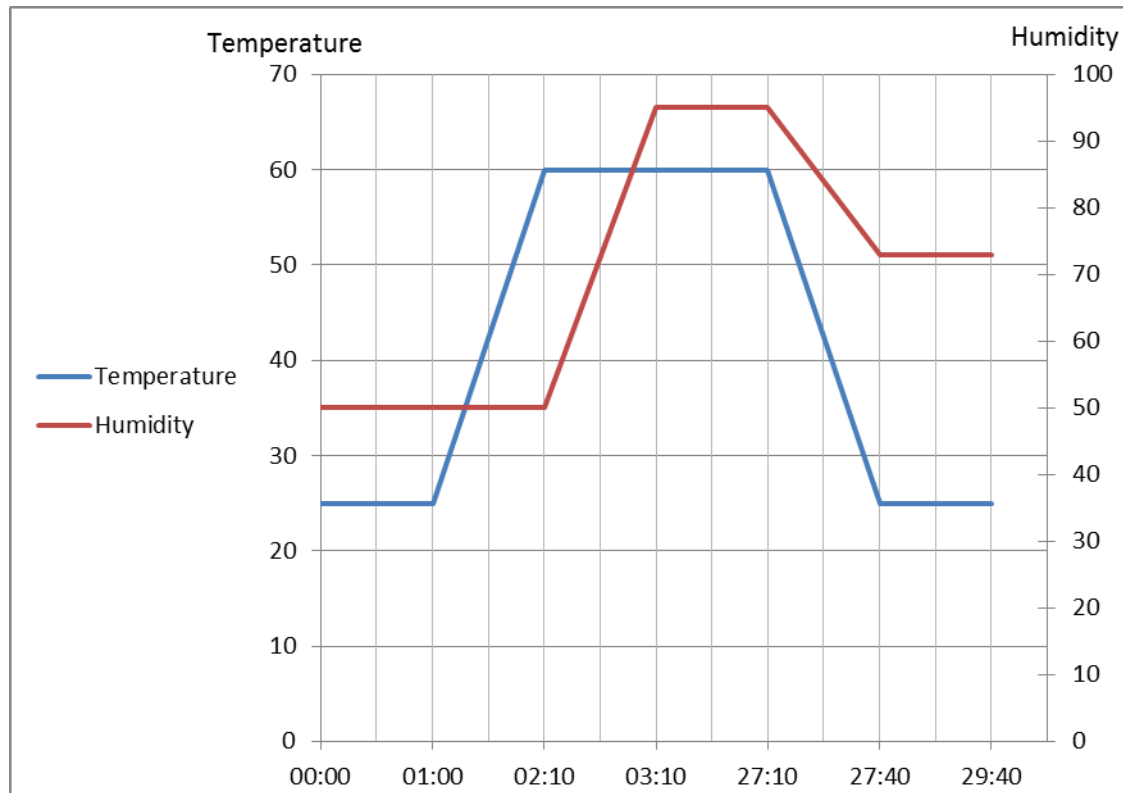
**Purpose:** The DVT test

**Test Standard:** Reference IEC60068-2-78:2012 Testing procedures

Test Cab: Damp Heat Steady State Test

**Test Condition:**

1. Test Temperature: 60°C
2. Test Humidity: 95%
3. Test Times: 24 hrs
4. Test Environment Curve:





**Test Equipment:** Programmable Temperature & Humidity Chamber

KSON Co. Ltd.

Model: THS-D4L+\_100

S/N: 1497

Date of Calibration: 2019/03/21

Next Calibration Date: 2020/03/20

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The connectors and components should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets high temperature & humidity storage test.

## High Temp. Storage Test

**Test Date:** June 26~27, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

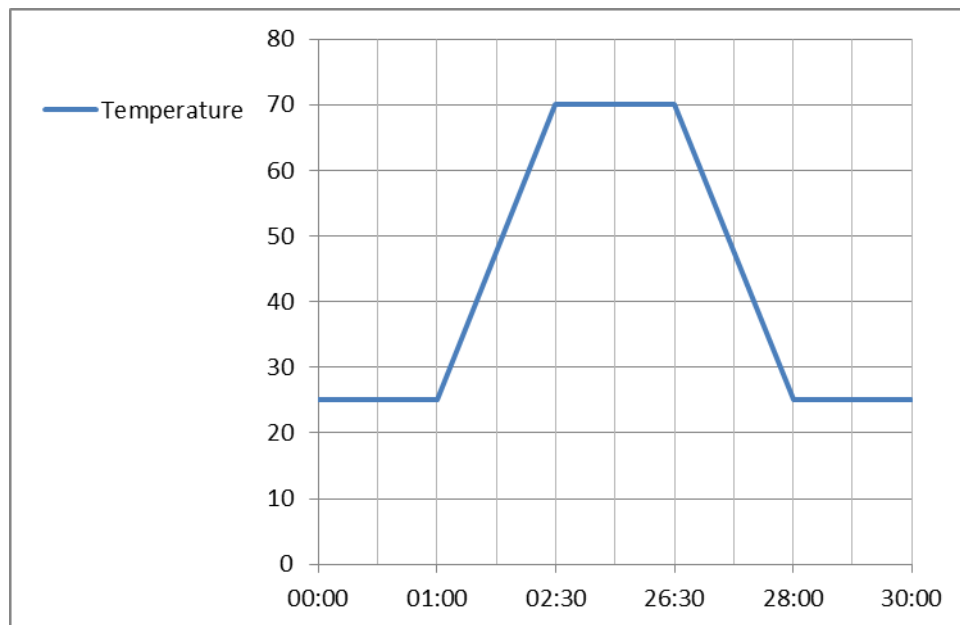
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference IEC60068-2-2:2007 Testing procedures  
Test Bb: Dry Heat Test

**Test Condition:**

1. Test Temperature: 70°C
2. Test Times: 24 hrs
3. Test Environment Curve:



**Test Equipment:** Programmable Temperature & Humidity Chamber  
KSON Co. Ltd.  
Model: THS-D4L+\_100  
S/N: 1497  
Date of Calibration: 2019/03/21  
Next Calibration Date: 2020/03/20

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The connectors and components should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets high temperature storage test.

## Low Temp. Storage Test

**Test Date:** June 25~26, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

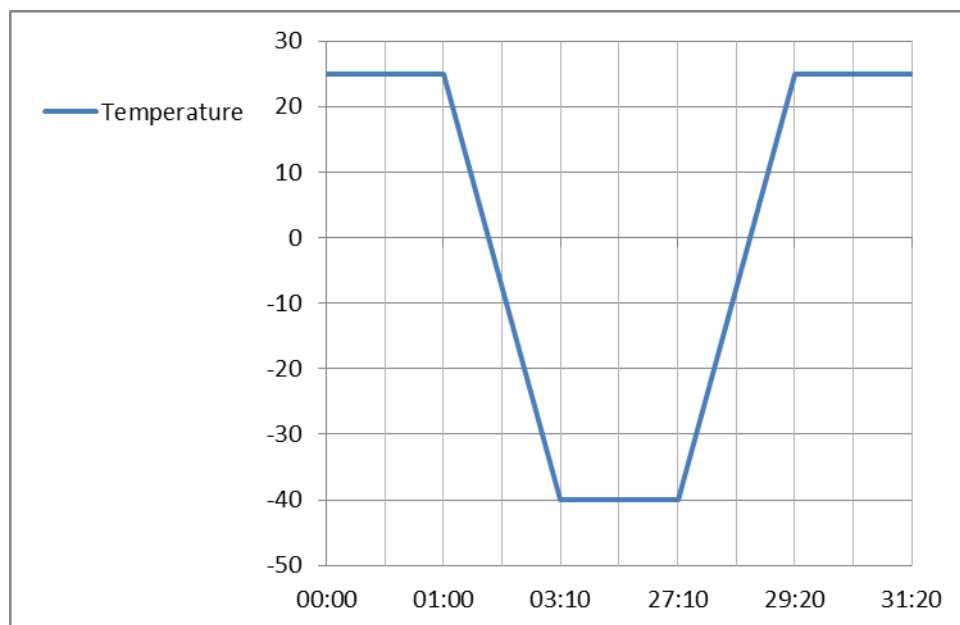
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference IEC60068-2-1:2007 Testing procedures  
Test Ab: Cold Test

**Test Condition:**

1. Test Temperature: -40°C
2. Test Times: 24 hrs
3. Test Environment Curve:



**Test Equipment:** Programmable Temperature & Humidity Chamber  
KSON Co. Ltd.  
Model: THS-D4L+\_100  
S/N: 1497  
Date of Calibration: 2019/03/21  
Next Calibration Date: 2020/03/20

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The connectors and components should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets low temperature storage test.

## Thermal Shock Test

**Test Date:** July 9~11, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

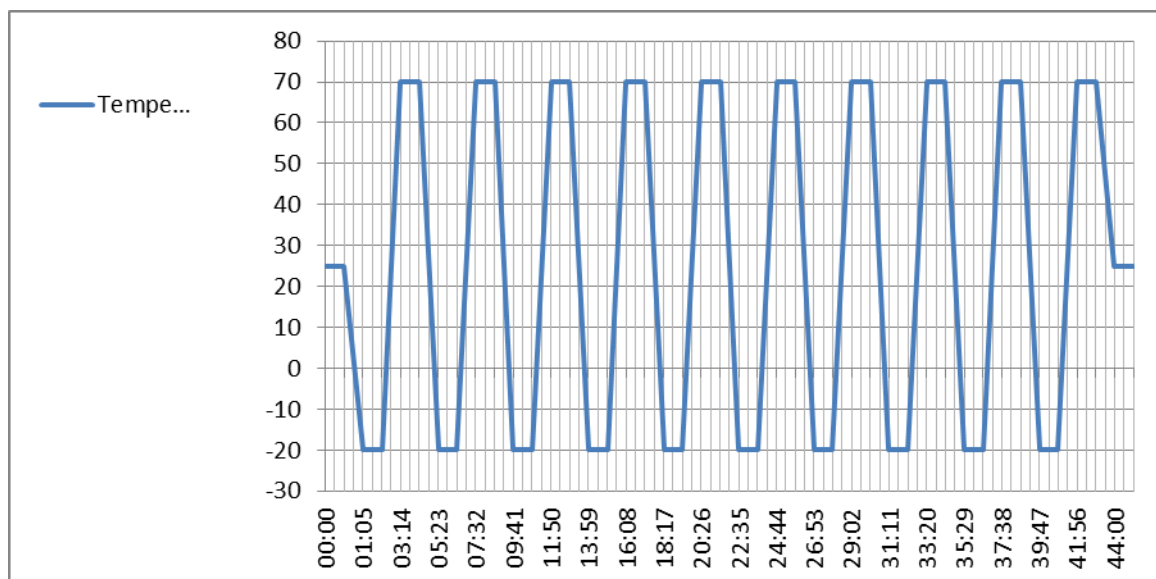
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference to the IEC 60068-2-14:2009 testing procedures  
Test N: Change of temperature.

**Test Condition:**

1. Test mode: Operation
2. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
3. Test High Temperature: 70°C
4. Test Low Temperature: -20°C
5. Test dwell time: 2 hrs
6. Temperature slope: 10°C/minute
7. Test cycle: 10 cycles
8. Test Environment Curve:



**Test Equipment:** Programmable Temperature & Humidity Chamber

Giant Force Co. Ltd.

Model: GTH-800-60-CP-AR

S/N: MAA1412-006

Date of Calibration: 2019/01/07

Next Calibration Date: 2020/01/06

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The connectors and components should work properly without any interference.
2. All screws should be tightened up appropriately.



**Test Result:**

There is no damage in electronic and mechanical functions.

Degradation has not been found.

Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets thermal shock test between -20°C to 70°C.

## Power ON/OFF Test

**Test Date:** July 3~7, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference IEC60068-2-2:2007 Testing procedures

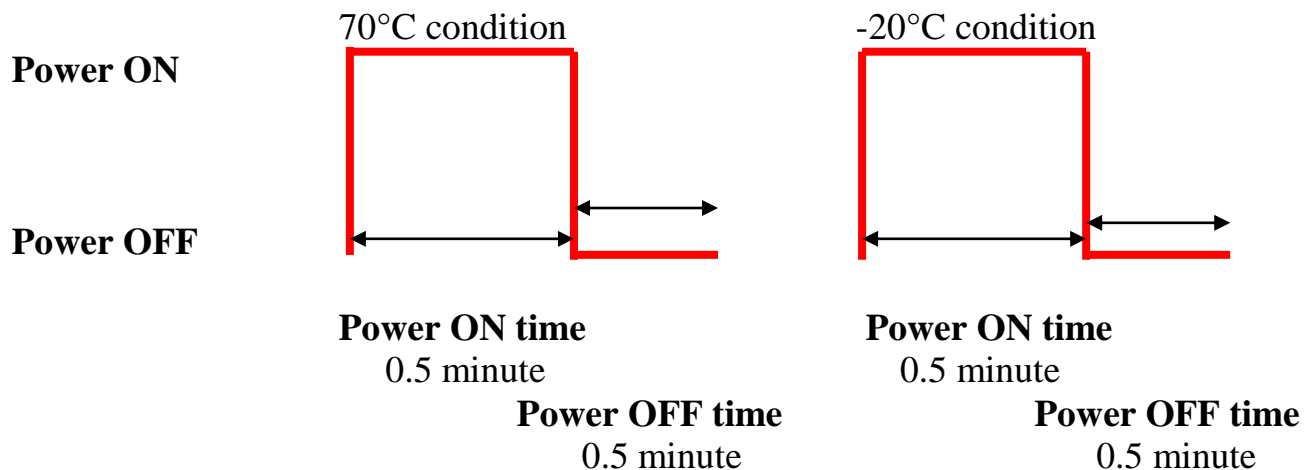
Test Bb: Dry Heat Test

Reference IEC60068-2-1:2007 Testing procedures

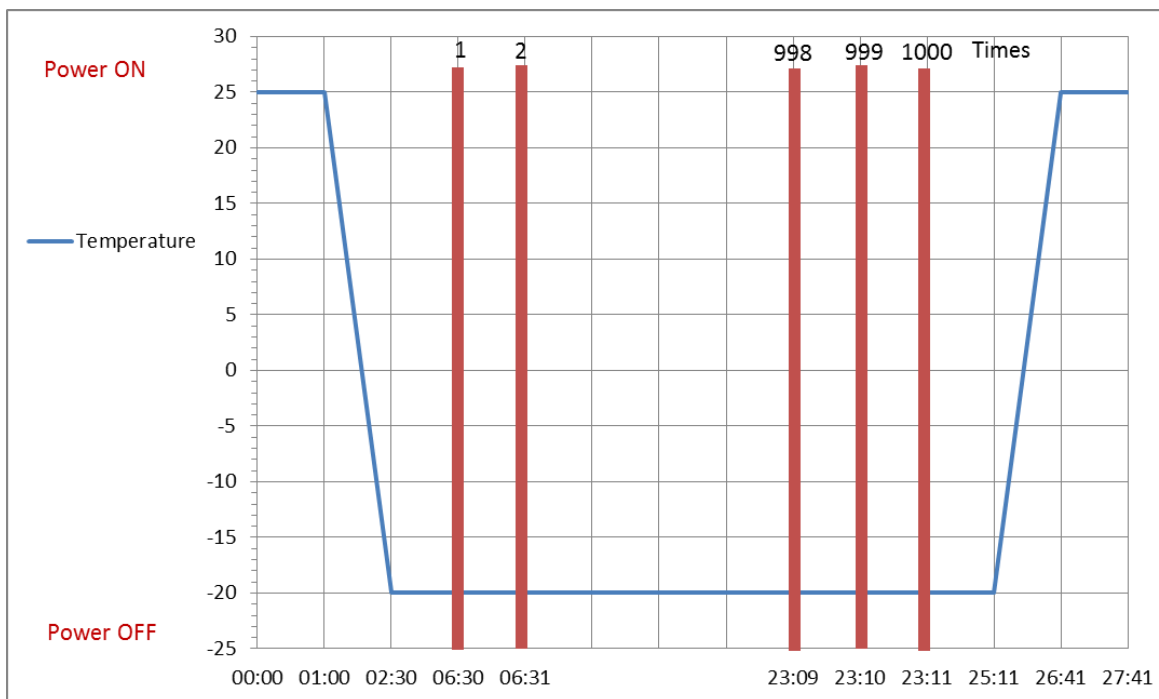
Test Ab: Cold Test

### Test Condition:

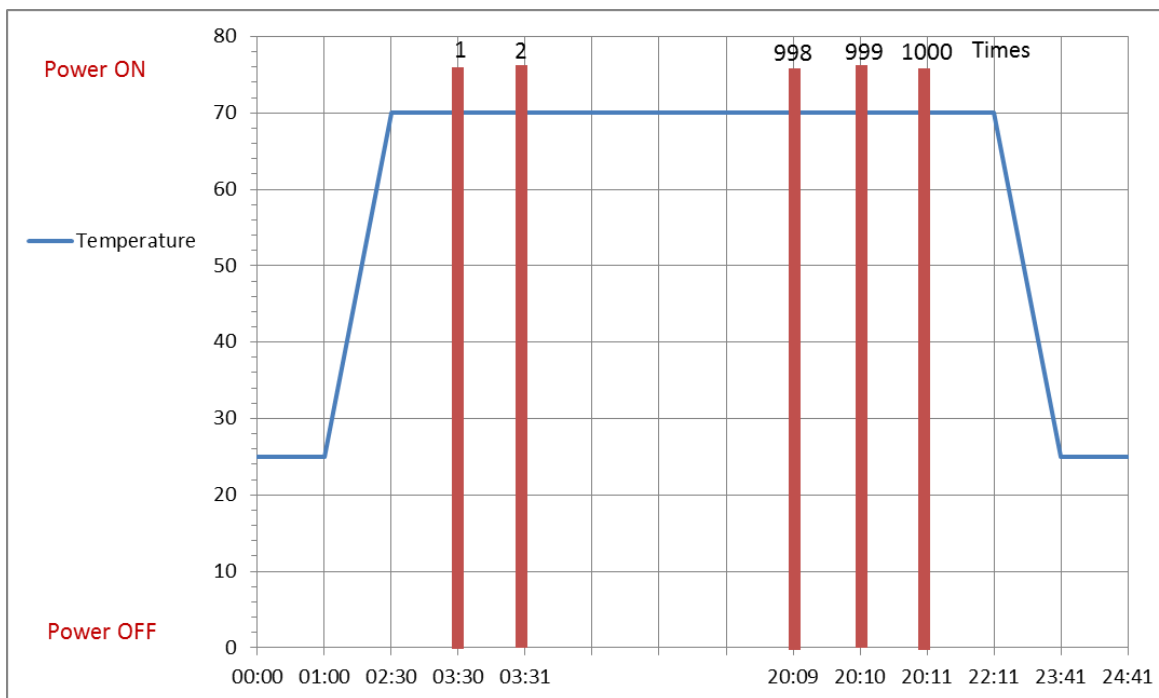
1. Test Temperature: High temperature 70°C / Low temperature -20°C
2. Power ON / OFF time interval: On 0.5 minute, off 0.5 minute at high temperature  
On 0.5 minute, off 0.5 minute at low temperature
3. Number of test: 1000 times for each temperature
4. Test program: power counter program for RTOS
5. Test mode: AT
6. Power ON / OFF time interval curve:



## 7. Test Environment Curve: (-20°C)



## 8. Test Environment Curve: (70°C)



**Test Equipment:** 1. Programmable Temperature & Humidity Chamber

Giant Force Co. Ltd.

Model: GTH-800-60-CP-AR

S/N: MAA1412-004

Date of Calibration: 2019/01/29

Next Calibration Date: 2020/01/28

## 2. Programmable Temperature &amp; Humidity Chamber

KSON Co. Ltd.

Model: THS-D4T-150

S/N: 9025KT

Date of Calibration: 2018/11/12

Next Calibration Date: 2019/11/11

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Test Data:**

Test temperature	Test times	Test Result
-20 °C	1000 times	1000 times passed
70 °C	1000 times	1000 times passed

**Performance Criteria:**

Electronic function check:

1. It could not fail any time during testing.
2. All system functions must be checked with appropriate testing programs and should pass the inspection.

Mechanical function check:

1. The components and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no any failure during power on/off testing.

There is no damage in electronic and mechanical functions.

Degradation has not been found.

Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets power on/off test.

## Cold Start Test

**Test Date:** July 8~9, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

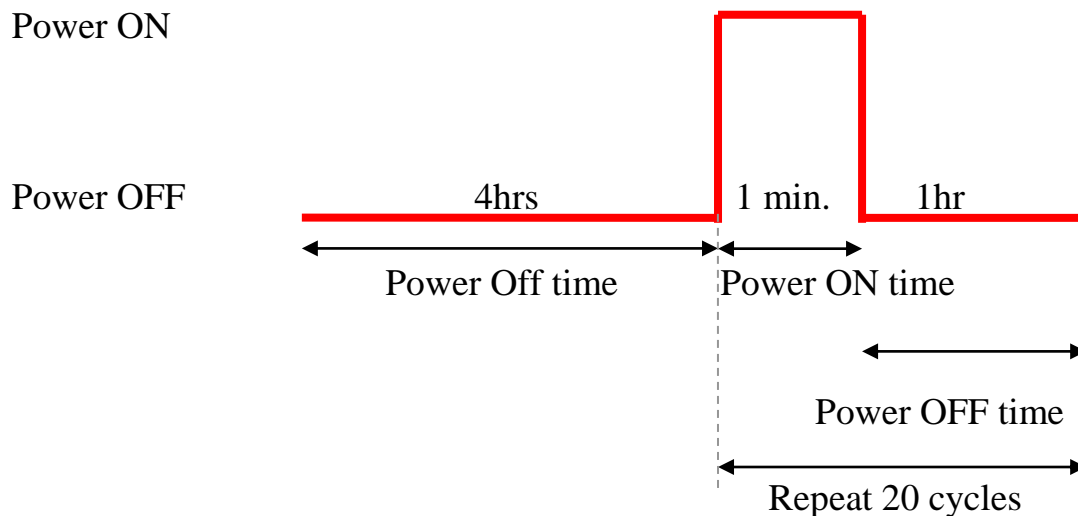
**Performed By:** Tim Chang

**Purpose:** The DVT test.

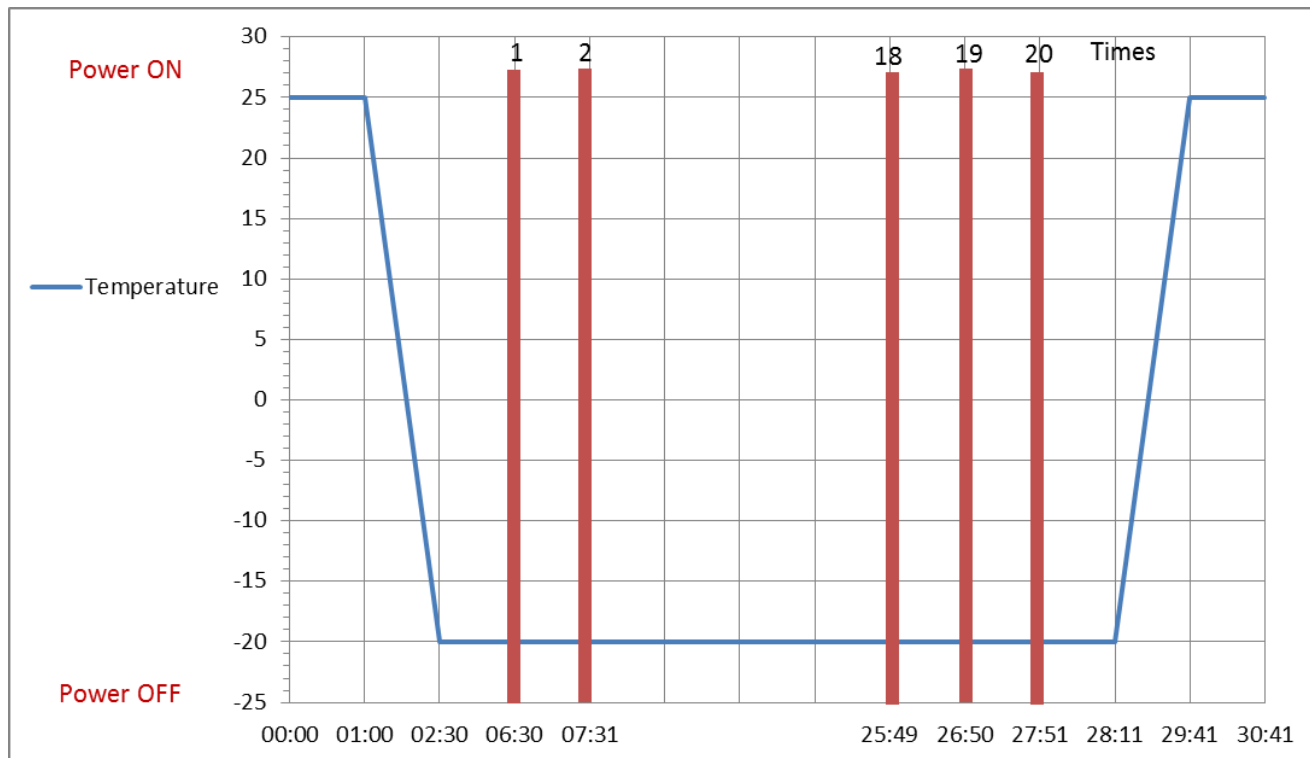
**Test Standard:** Reference IEC60068-2-1:2007 Testing procedures  
Test Ab: Cold Test

**Test Condition:**

1. Test Temperature: -20°C
2. Storage times: 4 hrs
3. Power ON / OFF time interval: On 1 minute, off 1hour
4. Number of test: 20 times
5. System OS: RTOS
6. Power ON / OFF time interval curve



## 7. Test Environment Curve:

**Test Equipment:** Programmable Temperature & Humidity Chamber

KSON Co. Ltd.

Model: THS-D4T-150

S/N: 9025KT

Date of Calibration: 2018/11/12

Next Calibration Date: 2019/11/11

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Test Data:**

Test temperature	Test times	Test Result
-20 °C	20 times	20 times passed

**Performance Criteria:**

Electronic function check:

1. It could not fail any time during testing.
2. All system functions must be checked with appropriate testing programs and should pass the inspection.
3. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The cover and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.

**Test Result:**

There is no any time failure during testing.

There is no damage in electronic and mechanical functions.

Degradation has not been found.

Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets cold start test.



## Thermal Profile Test

**Test Date:** September 10, 2019  
**Test Site:** Advantech QA Laboratory (Linkou Campus)  
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference Advantech QAL\_PC053 Testing procedures  
Test B: Thermal Profile Test without air flow

**Test Condition:**

1. Test Temperature: 60°C
2. Test Times: 4 hrs
3. Test EUT in the natural convection chamber without air flow condition.
4. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)

**Test Equipment:**

DATA LOGGER  
AGILENT  
Model: 34972A  
Date of Calibration: 2019/02/01  
Next Calibration date: 2020/01/31

Natural Convection Chamber  
Long Win Corp.  
Model: LW-9022H  
Date of Calibration: 2019/02/27  
Next Calibration date: 2020/02/26

Thermocouple OMEGA K type AWG No.36  
Thermal glue Satlon D3/PRIMER 606

**Sample Configuration & Quantity Under Test:**

Using one piece of PT215051STV2Q1C00 with the following options installed:

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Electronic function check:

1. The temperature of the measurement points should not over the thermal specification of each component.
2. All system functions must be checked with appropriate testing programs and should pass the inspection.

**Test Data:****PT215051STV2Q1C00 Thermal profile:**

NUM	Parts List	Measurement 60°C	Spec. from Datasheet	Spec. reference to Tc (°C)
1	D7	89.5	150(Tj)	120
2	U10	68.2	85(Ta)	105
3	U11	72.4	85(Ta)	105
4	U13	89.2	150(Tj)	120
5	Battery	63.7(Ta)	125(Ta)	125
5	Battery	66.7(Tc)	-	-
6	T ambient	66.5	-	-
System Power		12.1 W	-	-

**Remark:**

Ta: Ambient temperature specification

Tc: Device Case temperature specification

Tj: Device Junction temperature specification

**Test Result:**

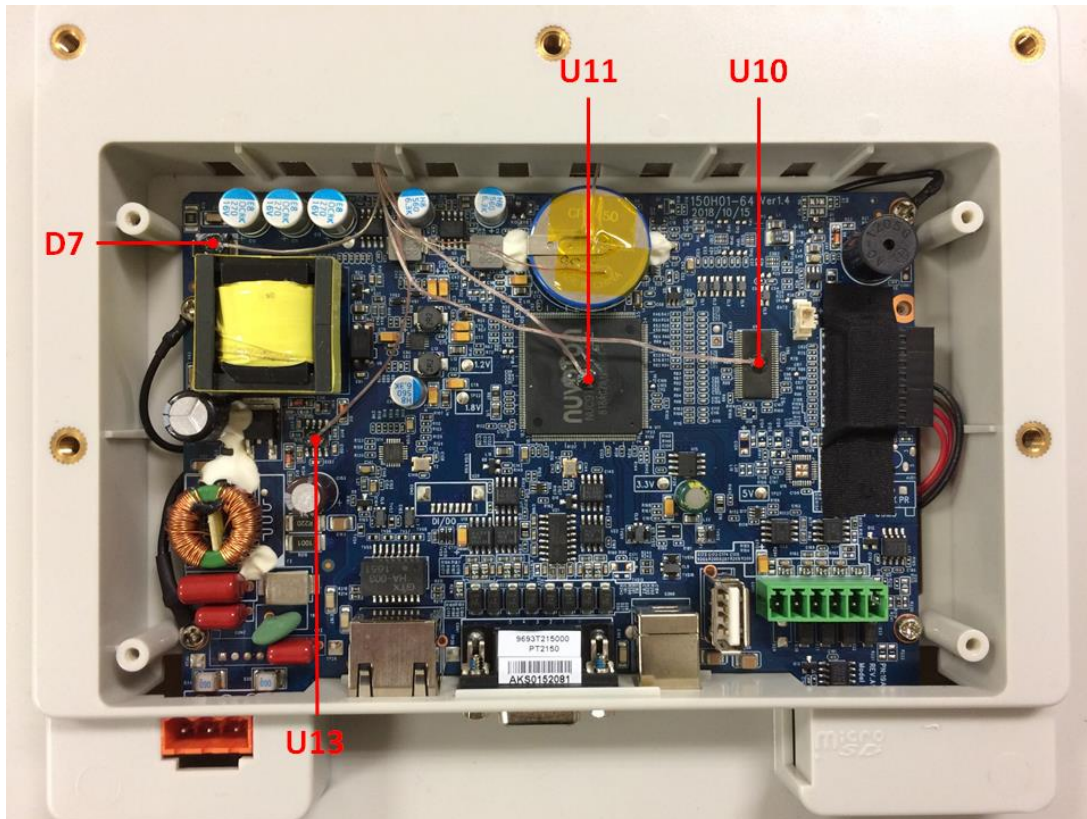
1. The temperature of all the measurement points are under themselves' thermal specification when ambient is at 60 degree C without airflow environment.
2. There is no damage in electronic functions.

**Conclusion:**

**Passed**

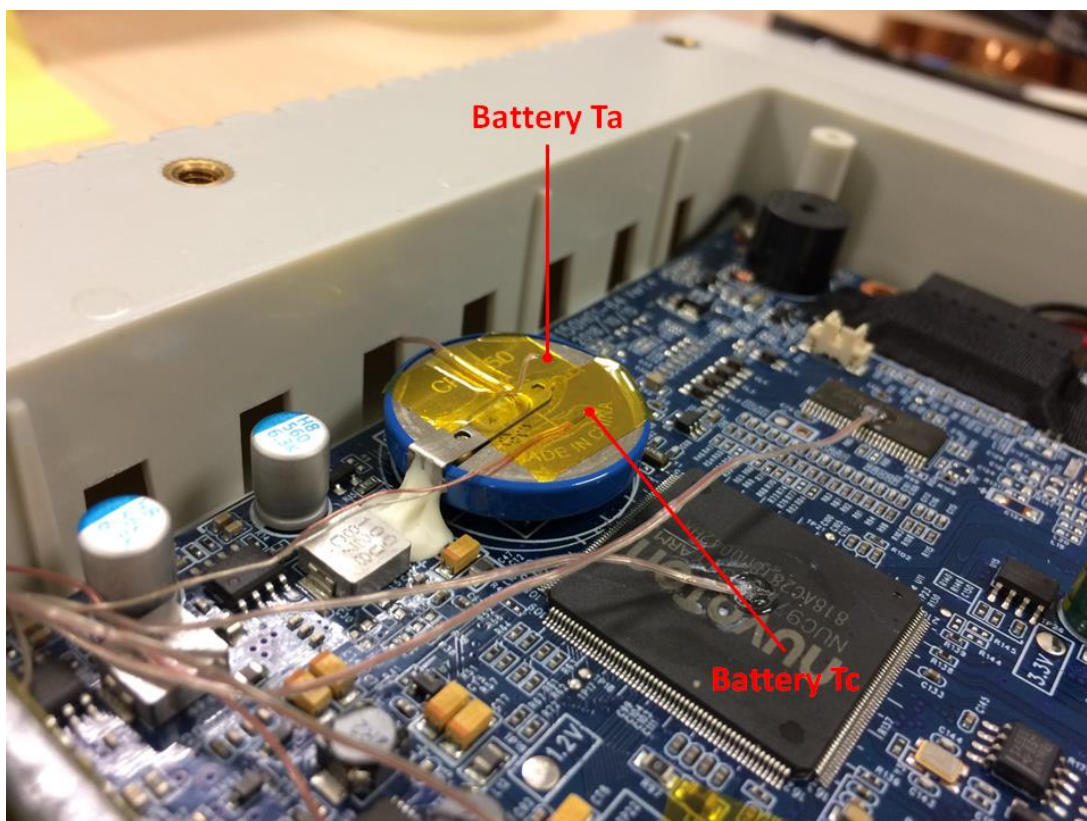
The PT215051STV2Q1C00 meets thermal profile test.

Photo I:



Main board measurement points

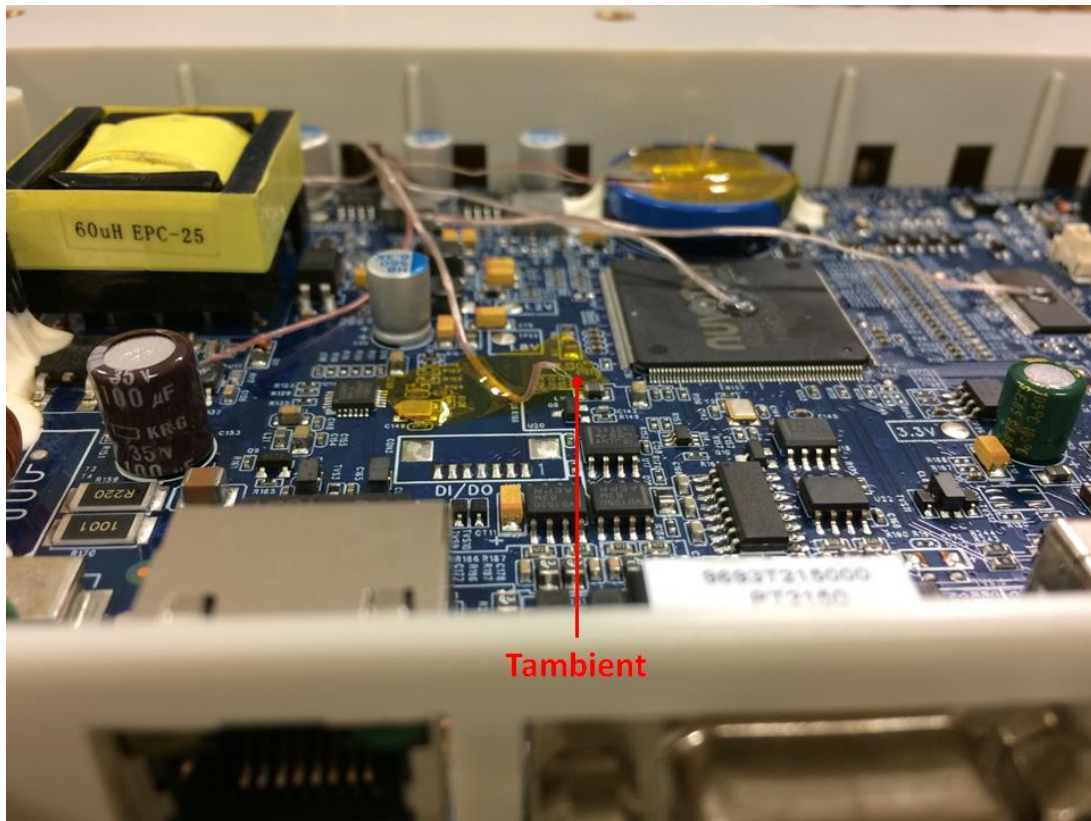
Photo II:



Battery measurement points

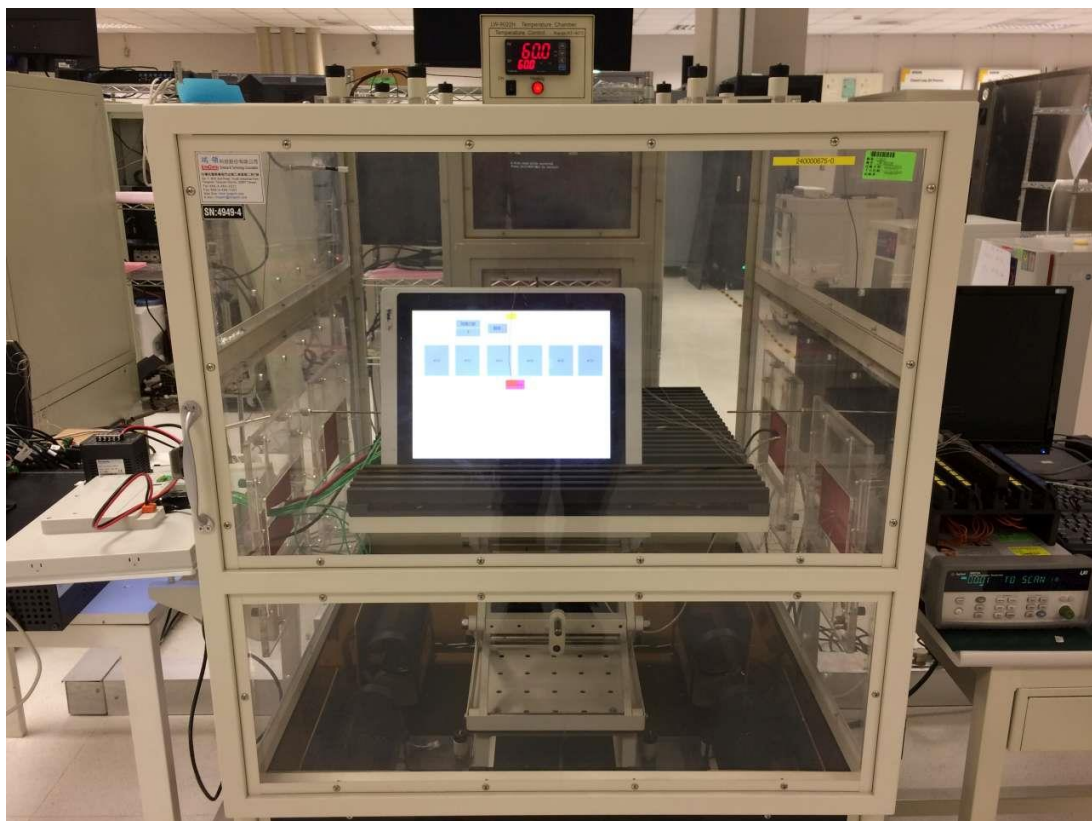


Photo III:

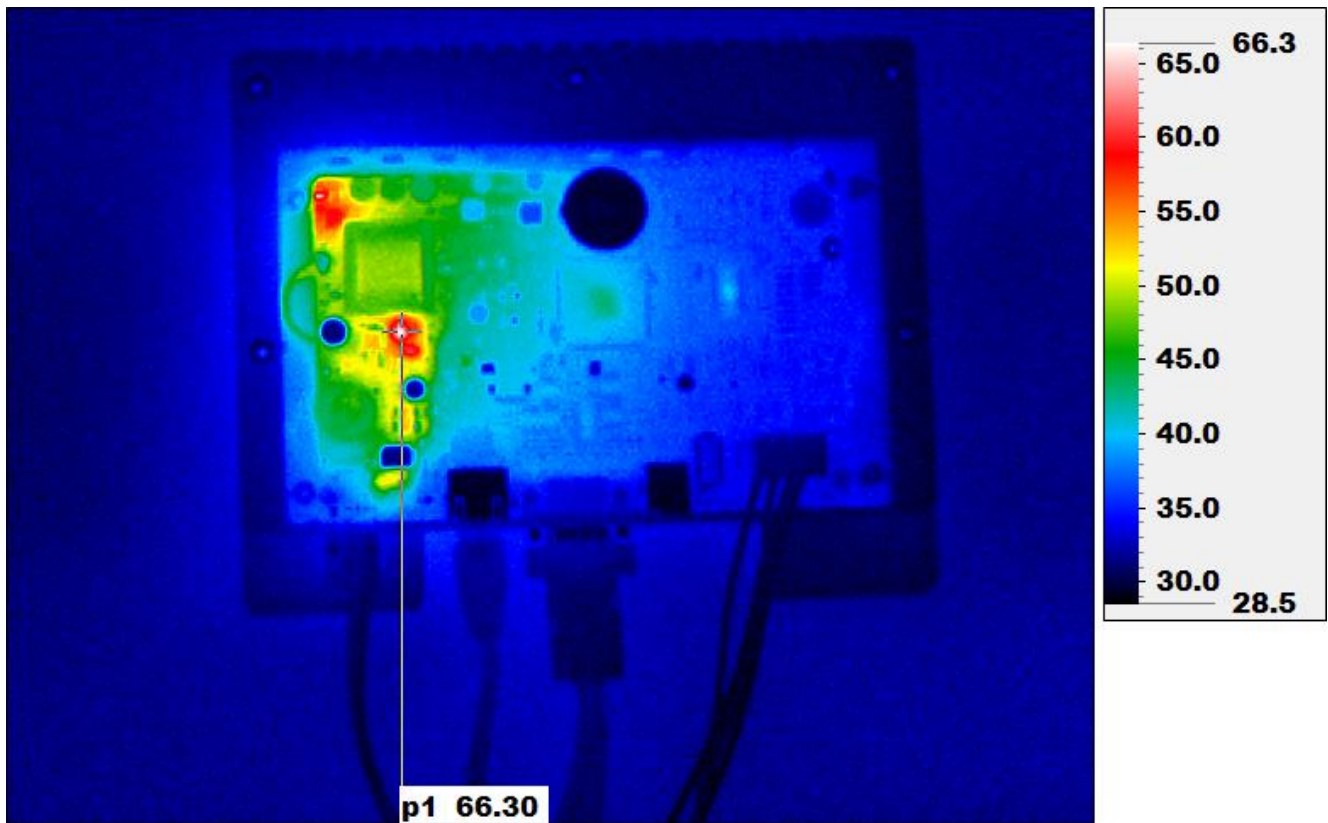


T ambient measurement points

Photo IV:



PT215051STV2Q1C00 – thermal profile test in natural convection chamber without air flow

**Photo V:**

IR photo at room temperature - MB top side

## Thermal Step Stress Test

**Test Date:** July 15, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

**Performed By:** Tim Chang

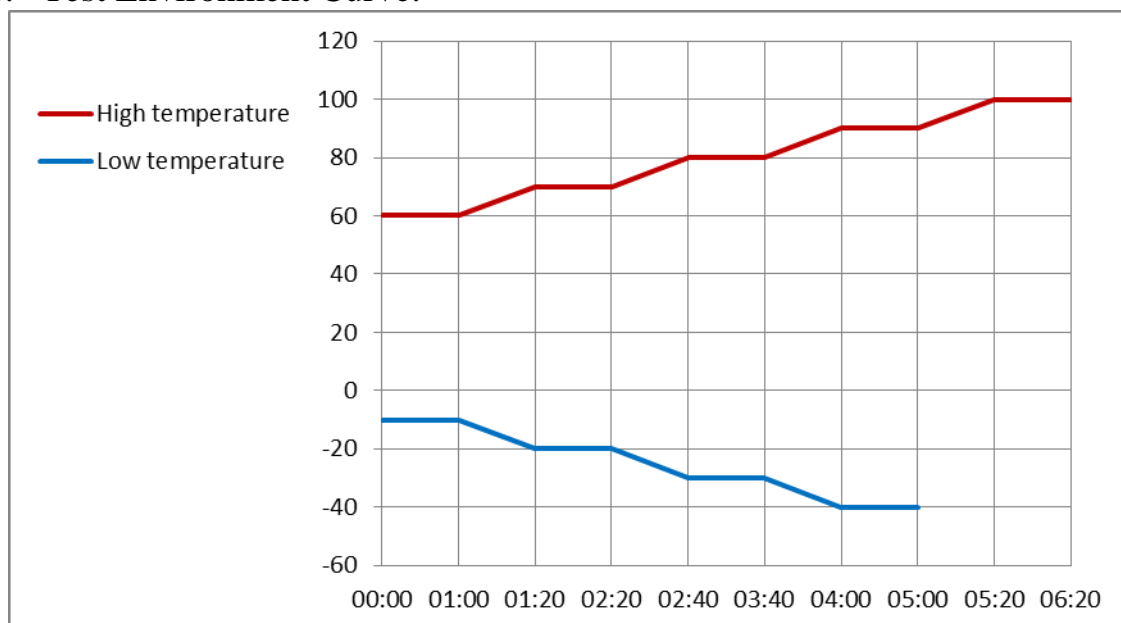
**Purpose:** The DVT test.

**Test Standard:** Reference to the Advantech HALT procedure.

### Test Condition:

To find the temperature upper/lower operational limit

1. High temperature: 60C~ XX C ( the highest to 100C of chamber ability)
2. Low temperature: -10C~-XX C ( the lowest to -60C of chamber ability)
3. Temperature step scale: 10C each level
4. Power ON/OFF test 1 time for each temperature
5. Dwell time: 1 hour each level
6. Temperature gradient: 0.5C/min
7. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
8. Test Environment Curve:



*QA Lab Reliability test***Test Equipment:** Programmable Temperature & Humidity Chamber

Giant Force Co. Ltd.

Model: GTH-800-60-CP-AR

S/N: MAA1412-006

Date of Calibration: 2019/01/07

Next Calibration Date: 2020/01/06

**Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 with the following options installed:

EUT.1~2

1. M/B : 150H01-64

2. CPU : NUC972DF61Y

3. RAM : SRAM= LY62W6416ML-70LLI

4. Flash : NAND Flash=MX30LF1G18AC-TI

5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)

6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001

7. AC/DC Power Supply : DPS-30W-DC24

**Test Data:**

Number	Criteria	Result	Judgement
1	-10C	Passed	Passed
2	-20C	Passed	Passed
3	-30C	Passed	Passed
4	-40C	Passed	Passed
5	-50C	Passed	Passed
6	-60C	Note1	-
7	60C	Passed	Passed
8	70C	Passed	Passed
9	80C	Passed	Passed
10	90C	Note2	-

**Note 1:** Two units display abnormal at -60°C.

**Note 2:** One unit display light-leaking at 90°C.



**Performance Criteria:**

Electronic function check:

1. The thermal step stress test is to find the temperature limit of product in the development phase.
2. The test result is for RD engineer reference to decide whether or whether not to carry out modifications of the product, and to decide the nature of the modification.

**Test Result:**

1. The system display abnormal when operation temperature at  $-60^{\circ}\text{C}$  .
2. The system display light-leaking when operation temperature at  $90^{\circ}\text{C}$  .
3. System of the temperature lower operational limit is at  $-50^{\circ}\text{C}$  .
4. System of the temperature upper operational limit is at  $80^{\circ}\text{C}$  .
5. The thermal step stress test is only to find the temperature limit of product; it is not intended to be used under such extreme temperatures.
6. In extreme high temperature environment, the components are derating that will result in product reliability and the MTBF. Please only operate the system/ board with the temperature listed in the datasheet.

**Conclusion:**

**Reference.**

## Random Vibration Test

**Test Date:** July 22, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

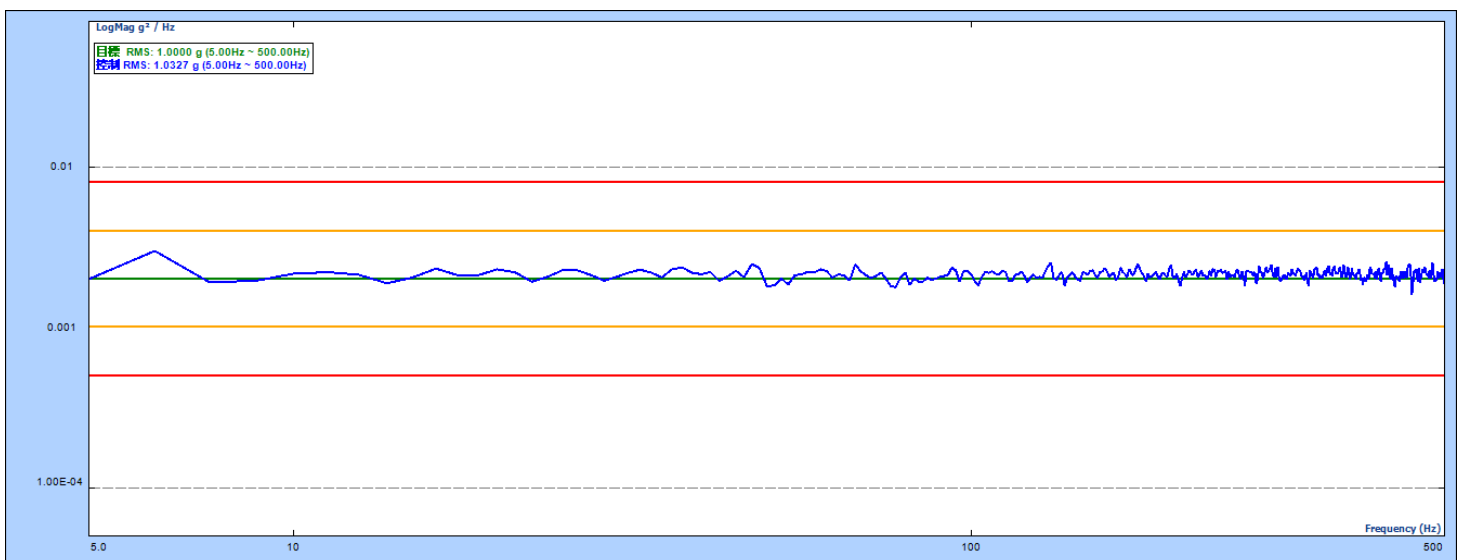
**Performed By:** Tim Chang

**Purpose:** The DVT test.

**Test Standard:** Reference IEC60068-2-64:2008 Testing procedures  
Test Fh: Vibration broadband random test

### Test Condition:

1. Test PSD:  $0.002\text{G}^2/\text{Hz}$ , 1.0 Grms
2. System condition: Operation mode
3. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
4. Test Frequency: 5-500Hz
5. Test Axis: X,Y and Z axis
6. Test Time: 1 hour per axis
7. Test curve:



**Test Equipment:** Vibration Simulator System  
KING DESIGN Co. LTD.  
Model: EM-2000F2K-75N250  
S/N: UC104240401  
Date of Calibration: 2018/11/15  
Next Calibration Date: 2019/11/14

### **Sample Configuration & Quantity Under Test:**

Using one piece of PT215051STV2Q1C00 with the following options installed:

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

### **Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

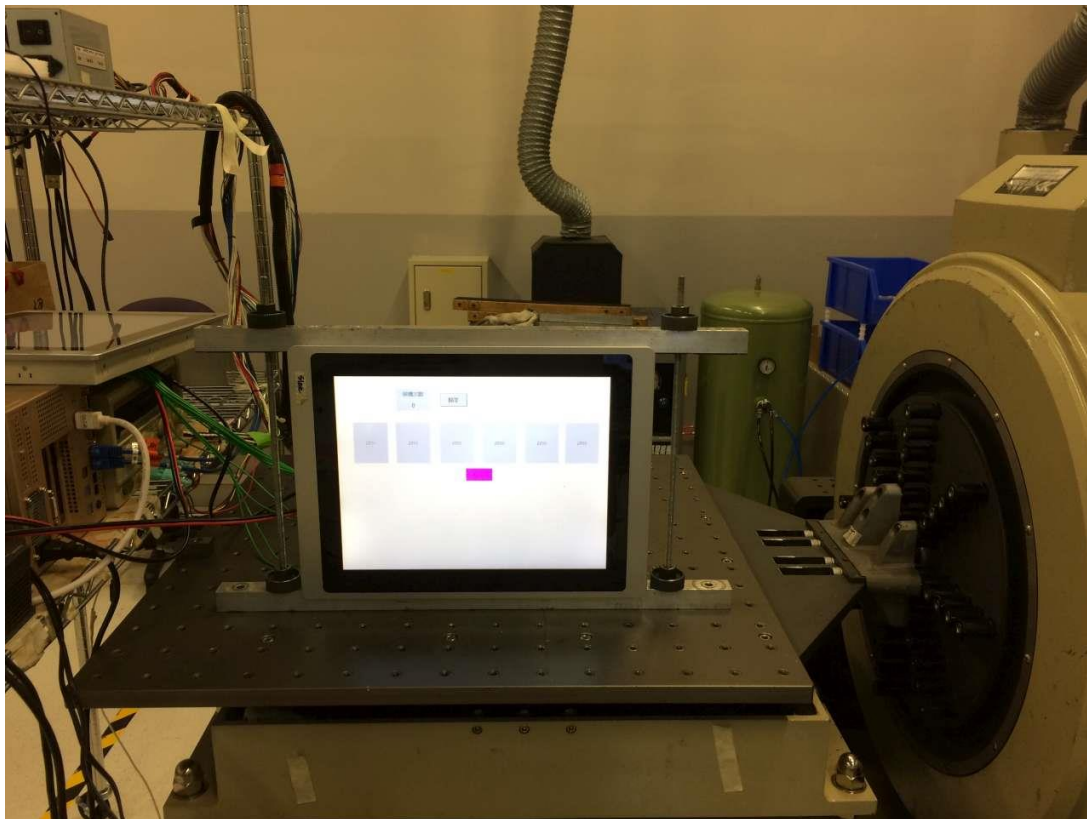
1. The cover and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.
3. All gaps on the surface are appropriately.
4. The assembling/disassembling of the system enclosure or mechanical parts must be smooth and no deformed parts should be found.

**Test Result:**

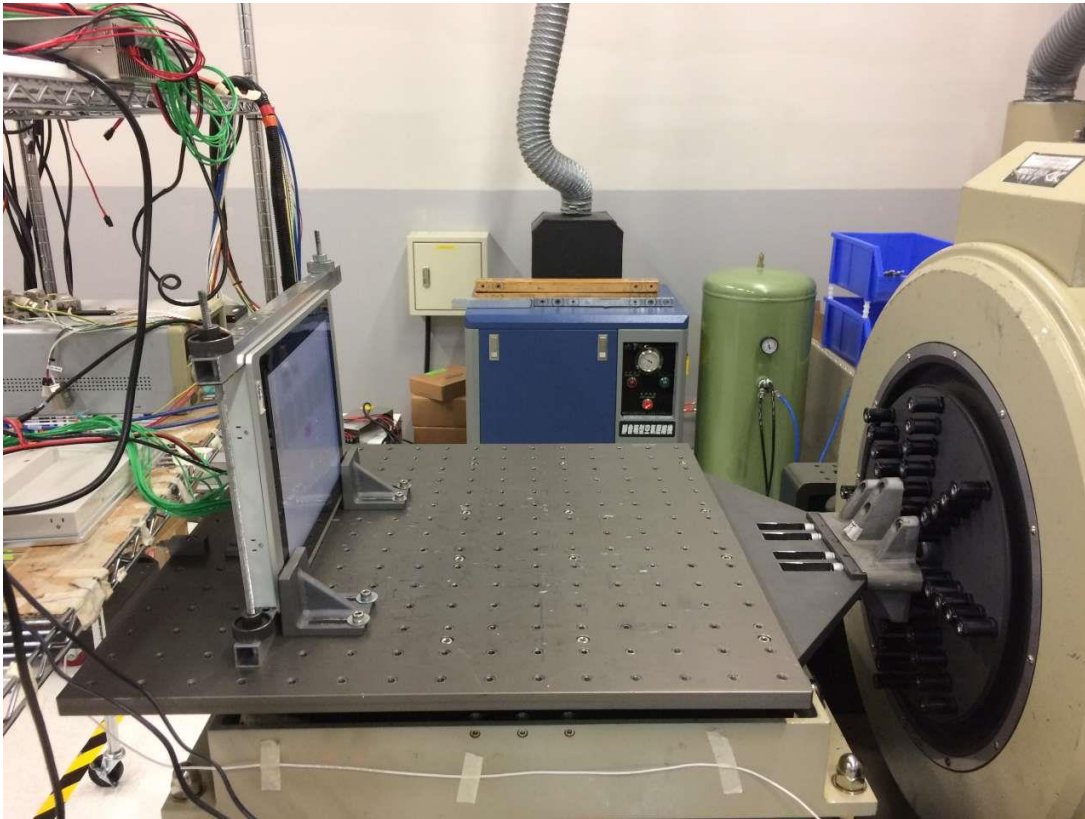
There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:****Passed.**

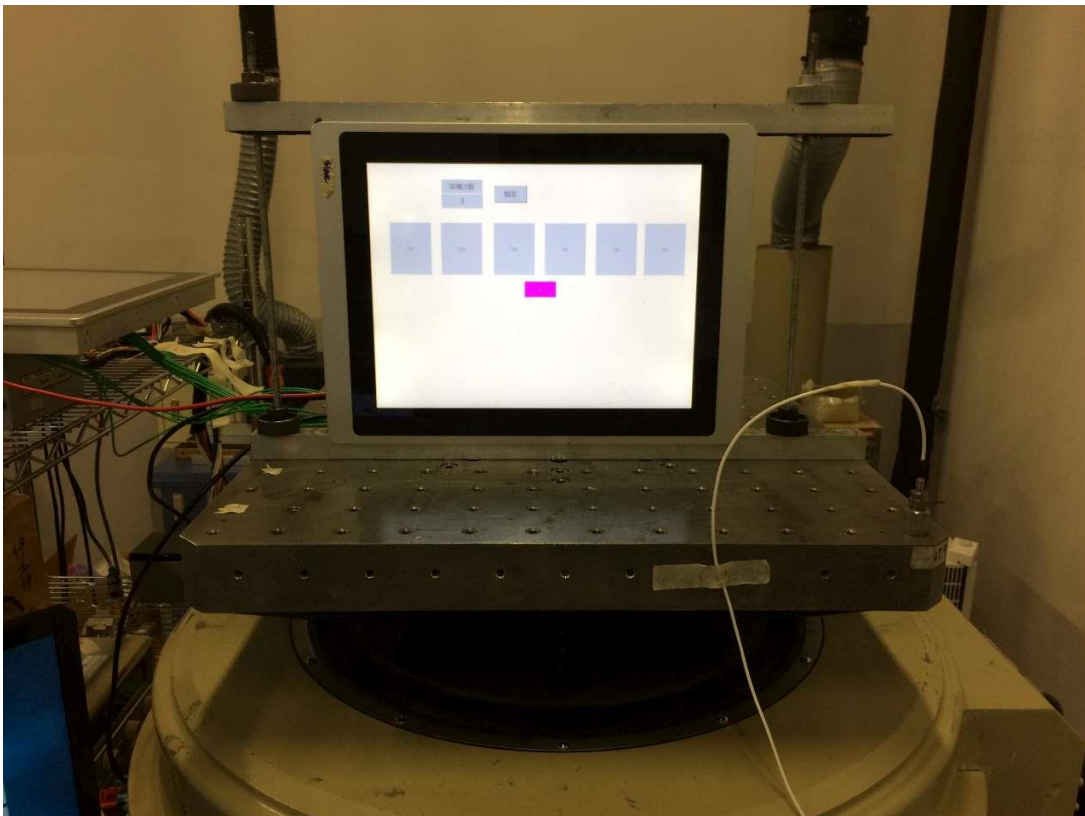
The PT215051STV2Q1C00 meets random vibration operation test.

**Photo I:**

PT215051STV2Q1C00 random vibration test for X-axis

**Photo II:**

PT215051STV2Q1C00 random vibration test for Y-axis

**Photo III:**

PT215051STV2Q1C00 random vibration test for Z-axis

## Sine Vibration Test

**Test Date:** July 23, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

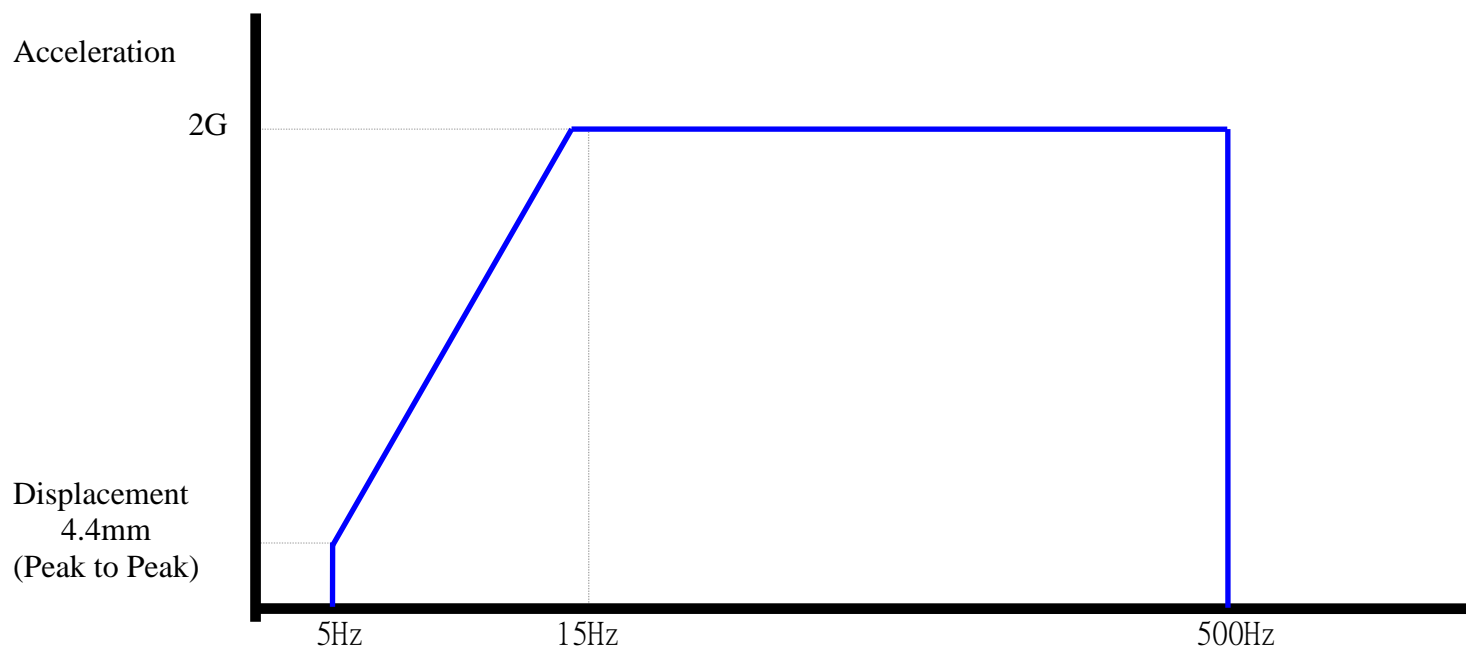
**Performed By:** Tim Chang

**Purpose:** The DVT test.

**Test Standard:** Reference IEC60068-2-6:2007 Testing procedures  
Test Fc : Vibration Sinusoidal Test

**Test Condition:**

1. System condition: Non-operation mode
2. Test acceleration: 2G
3. Test Frequency: 5~500Hz
4. Test Velocity: 1 Octave / min
5. Test Axis: X,Y and Z axis
6. Test Time: 1 hour per axis
7. Test curve:



**Test Equipment:** Vibration Simulator System  
KING DESIGN Co. LTD.  
Model: EM-2000F2K-75N250  
S/N: UC104240401  
Date of Calibration: 2018/11/15  
Next Calibration Date: 2019/11/14

### **Sample Configuration & Quantity Under Test:**

Using one piece of PT215051STV2Q1C00 with the following options installed:

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

### **Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The cover and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.
3. All gaps on the surface are appropriately.
4. The assembling/disassembling of the system enclosure or mechanical parts must be smooth, and no deformed parts should be found.



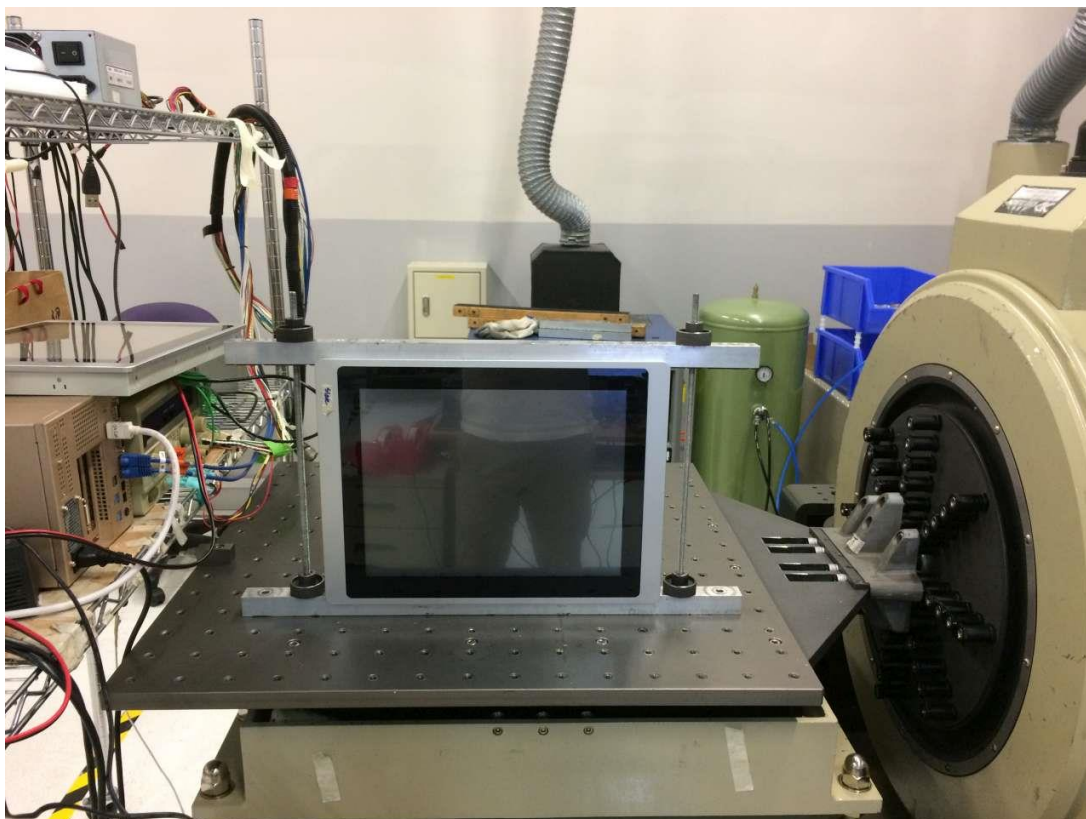
**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

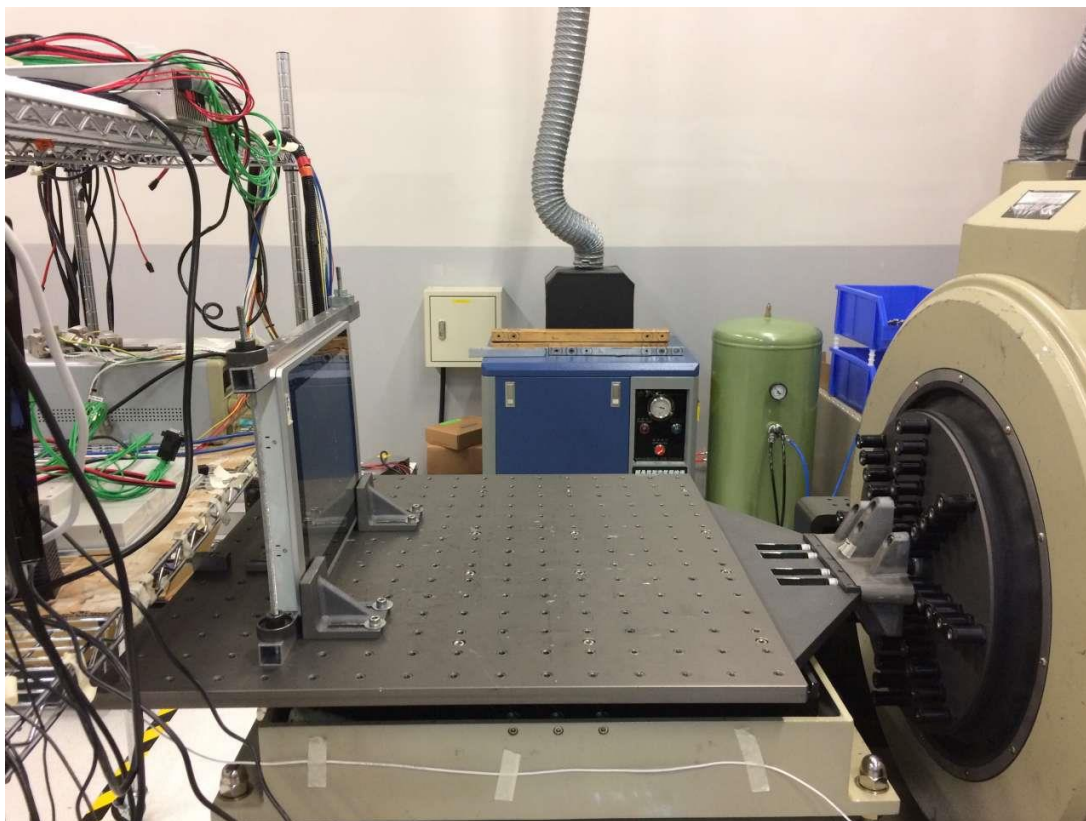
**Passed.**

The PT215051STV2Q1C00 meets sine vibration non-operation test.

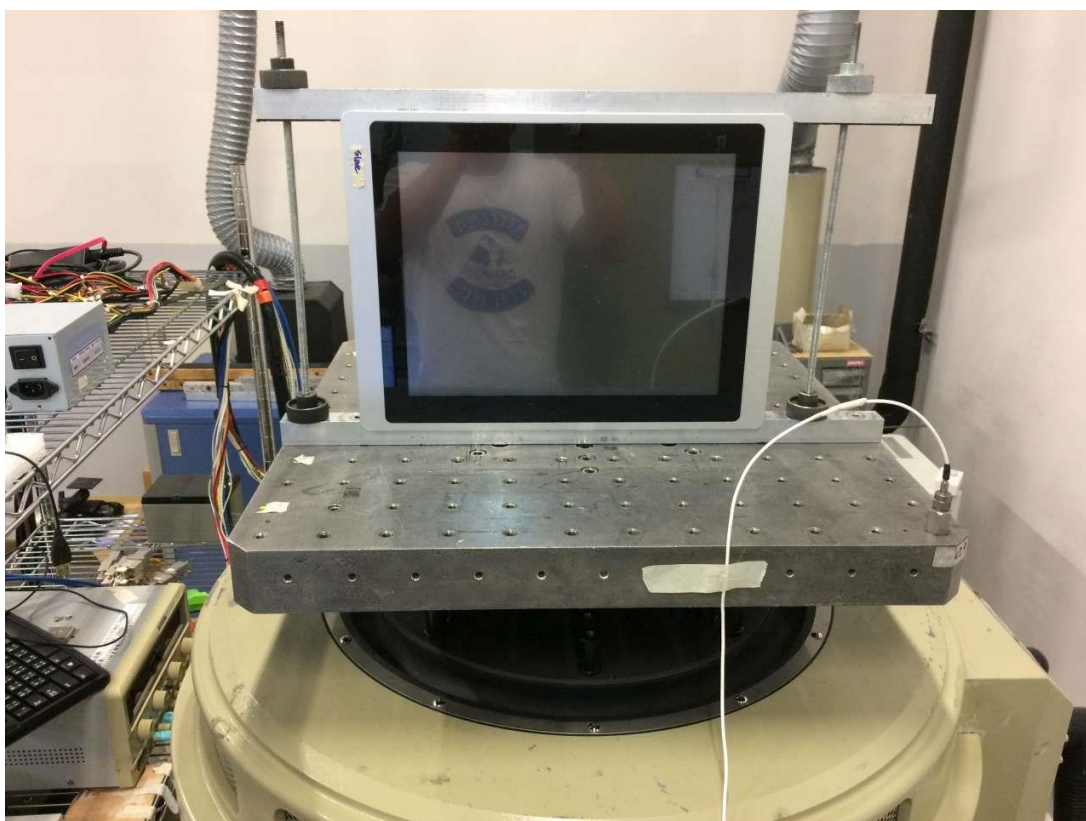
**Photo I:**

PT215051STV2Q1C00 sine vibration test for X-axis



**Photo II:**

PT215051STV2Q1C00 sine vibration test for Y-axis

**Photo III:**

PT215051STV2Q1C00 sine vibration test for Z-axis

## Shock Test

**Test Date:** July 29, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

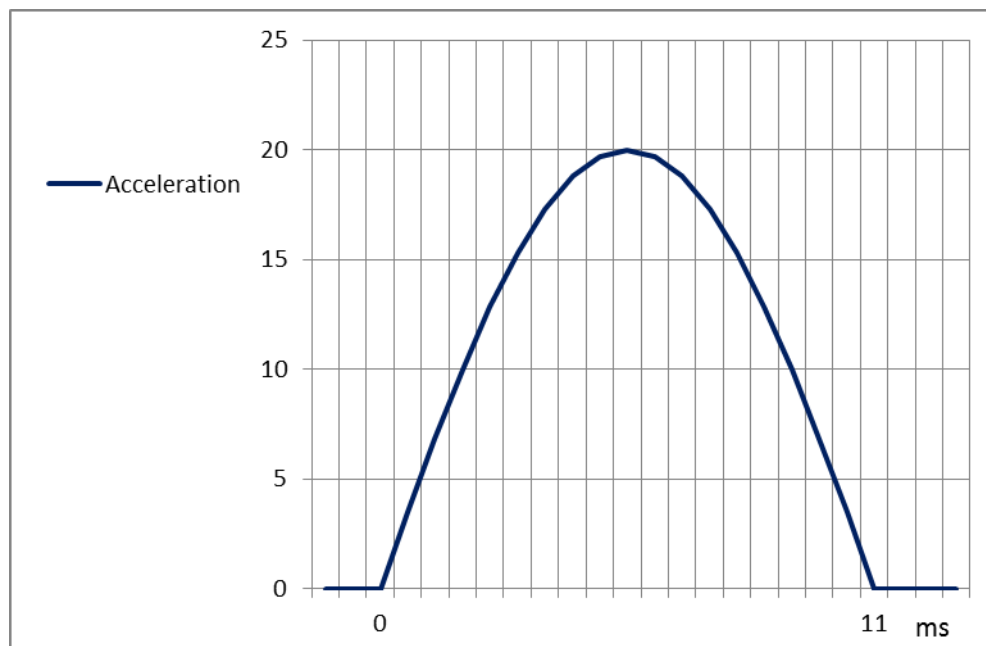
**Performed By:** Tim Chang

**Purpose:** The DVT test.

**Test Standard:** Reference IEC60068-2-27:2008 testing procedures  
Test Ea: Shock test

**Test Condition:**

1. System condition: Operation mode
2. Test pulse shape: half sine wave
3. Test acceleration: 20G
4. Test pulse duration: 11 ms
5. Test face: Six face with front, rear, left, right, top & bottom
6. Test times: three times in each face
7. Test Software: Running burnin test program in RTOS.(Serial signal self communication, test confirms that the communication signal and LCD display are normal)
8. Test Curve:



**Test Equipment:** Vibration Simulator System  
KING DESIGN Co. LTD.  
Model: EM-2000F2K-75N250  
S/N: UC104240401  
Date of Calibration: 2018/11/15  
Next Calibration Date: 2019/11/14

### **Sample Configuration & Quantity Under Test:**

Using one piece of PT215051STV2Q1C00 with the following options installed:

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

### **Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system should not have degradation in its performance.

Mechanical function check:

1. The cover and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.
3. All gaps on the surface are appropriately.
4. The assembling/disassembling of the system enclosure or mechanical parts must be smooth and no deformed parts should be found.

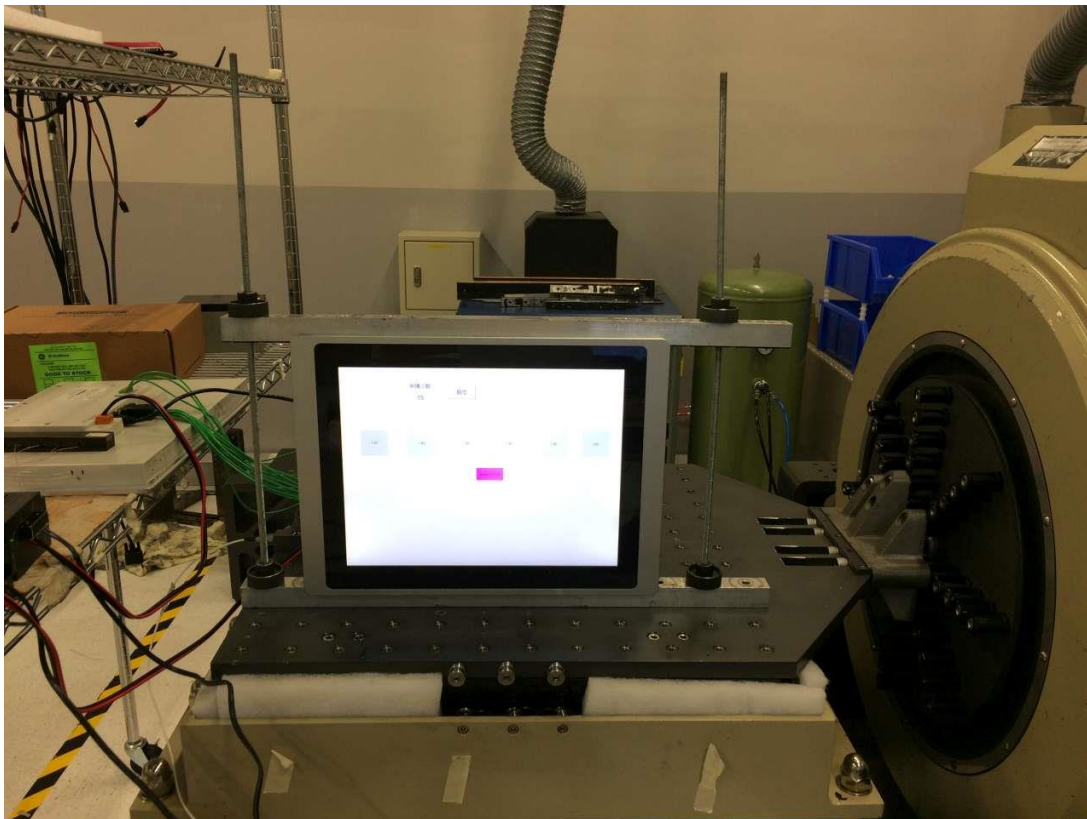
**Test Result:**

There is no damage in electronic and mechanical functions.  
Degradation has not been found.  
Performance is maintained with no incurable physical damage or degradation.

**Conclusion:**

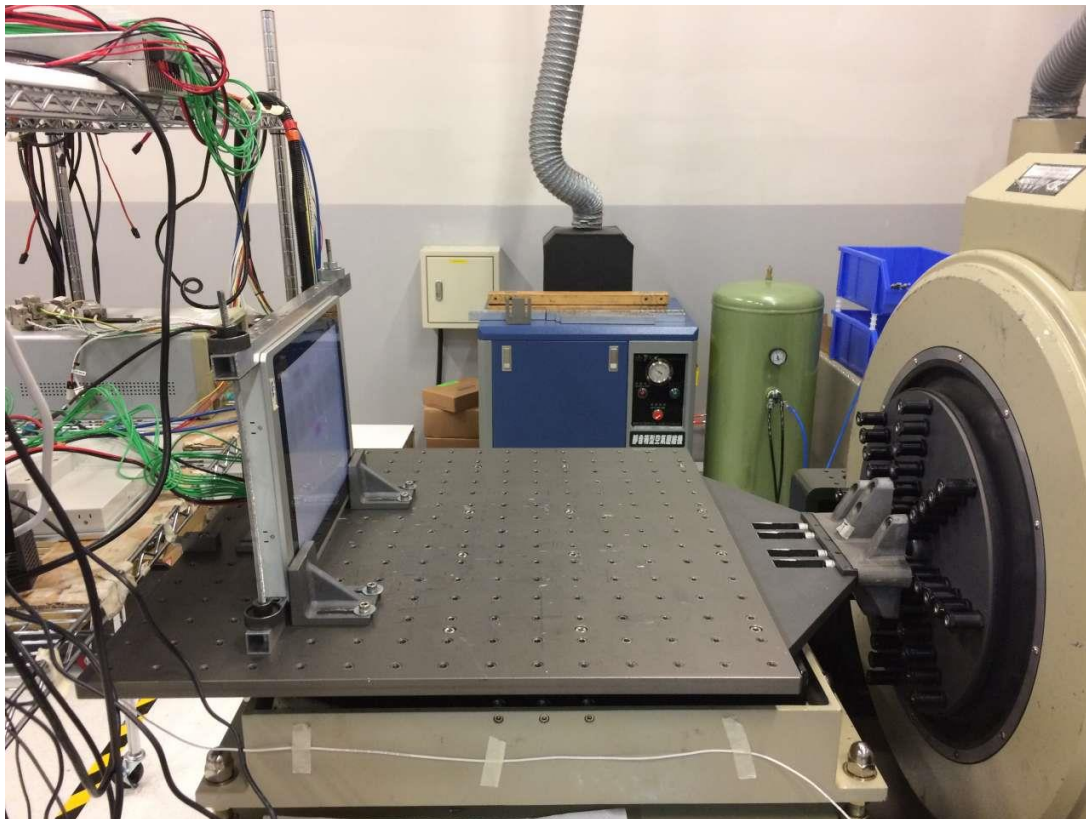
**Passed.**

The PT215051STV2Q1C00 meets shock test.

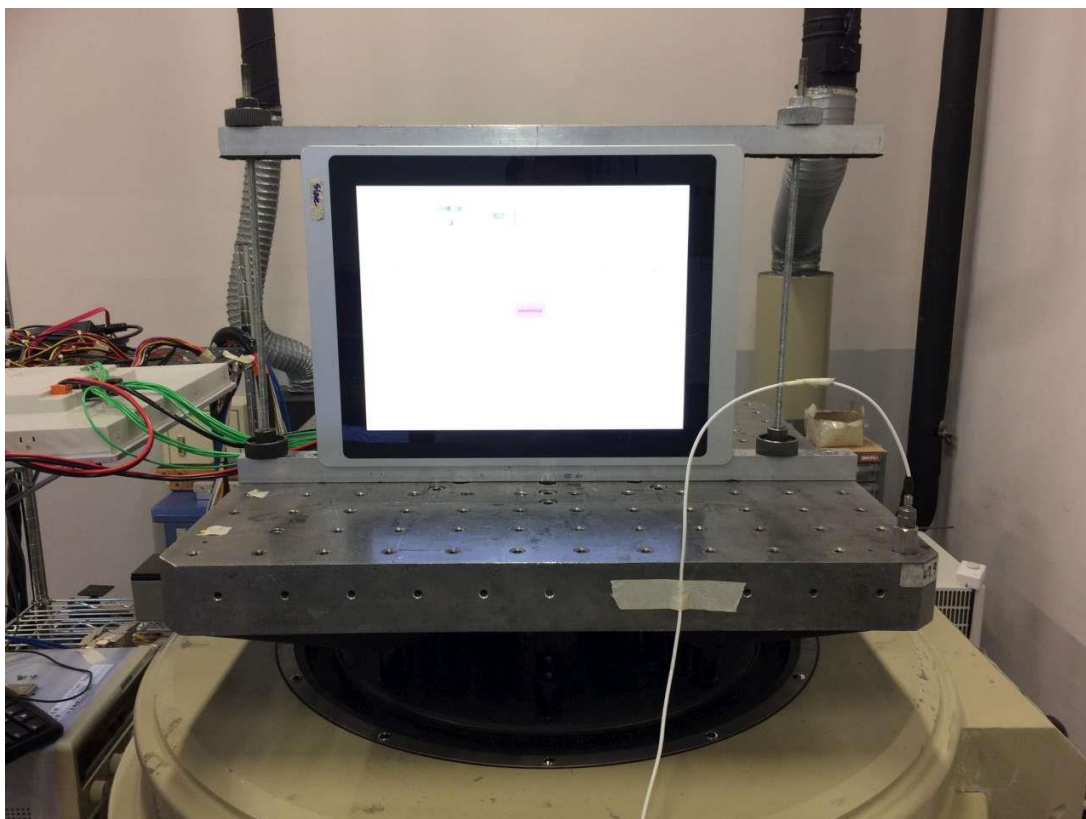
**Photo I:**

PT215051STV2Q1C00 shock test for +/- X-axis



**Photo II:**

PT215051STV2Q1C00 shock test for +/- Y-axis

**Photo III:**

PT215051STV2Q1C00 shock test for +/- Z-axis

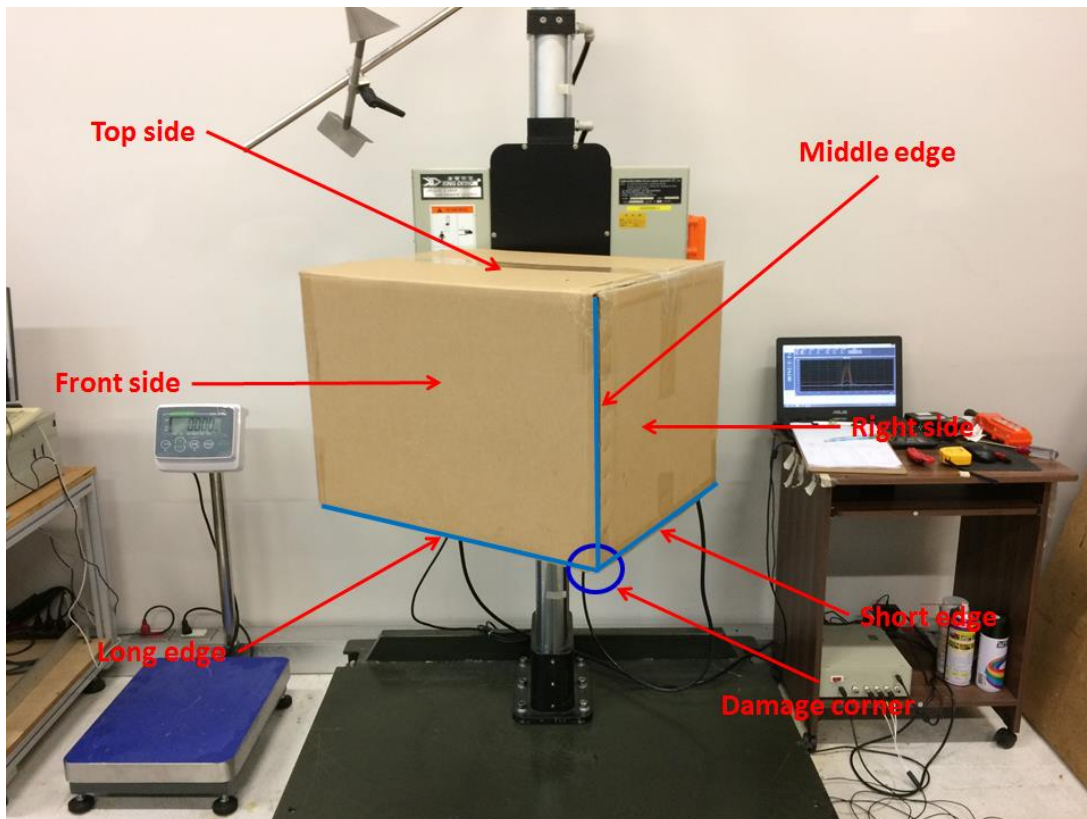
## Package Drop Test

**Test Date:** August 15, 2019  
**Test Site:** Advantech QA Laboratory (Linkou Campus)  
**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference Federal Standard 101 Method 5007 Testing procedure B  
Test Ea: Drop Test

**Test Condition:** 1. Test Phase: 1 corner, 3 edges, 6 faces  
2. Test Height: 76cm  
3. Package Weight: 11.160kg  
4. Package Dimension: 570\*450\*440mm (L\*W\*H)  
5. Test Drawing:



**Test Equipment:** Drop Tester machine  
King Design Ltd. Corp.  
Model: KD-2768  
Serial: UC104240301

### **Sample Configuration & Quantity Under Test:**

Using two pieces of PT215051STV2Q1C00 in one carton and package material as below:

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768  
350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24
8. Outer Carton P/N: 2100018471N000
9. Inner Carton P/N: 2100018204N000
10. Partition P/N: 2100018205T000
11. Box P/N: 2100015740T010
12. PE Bag P/N: 2160000659
13. EPE Foam P/N: 2130020008T000 、 2130020009T000

### **Performance Criteria:**

Electronic function check:

1. All system functions must be checked with appropriate testing programs and should pass the inspection.
2. Running RTOS for OS, the system performance should not degradation of the performance.

Mechanical function check:

1. The cover and connectors should work properly without any interference.
2. All screws should be tightened up appropriately.
3. All gaps on the surface are appropriately.
4. The assembling/disassembling of the system enclosure or mechanical parts must be smooth and no deformed parts should be found.

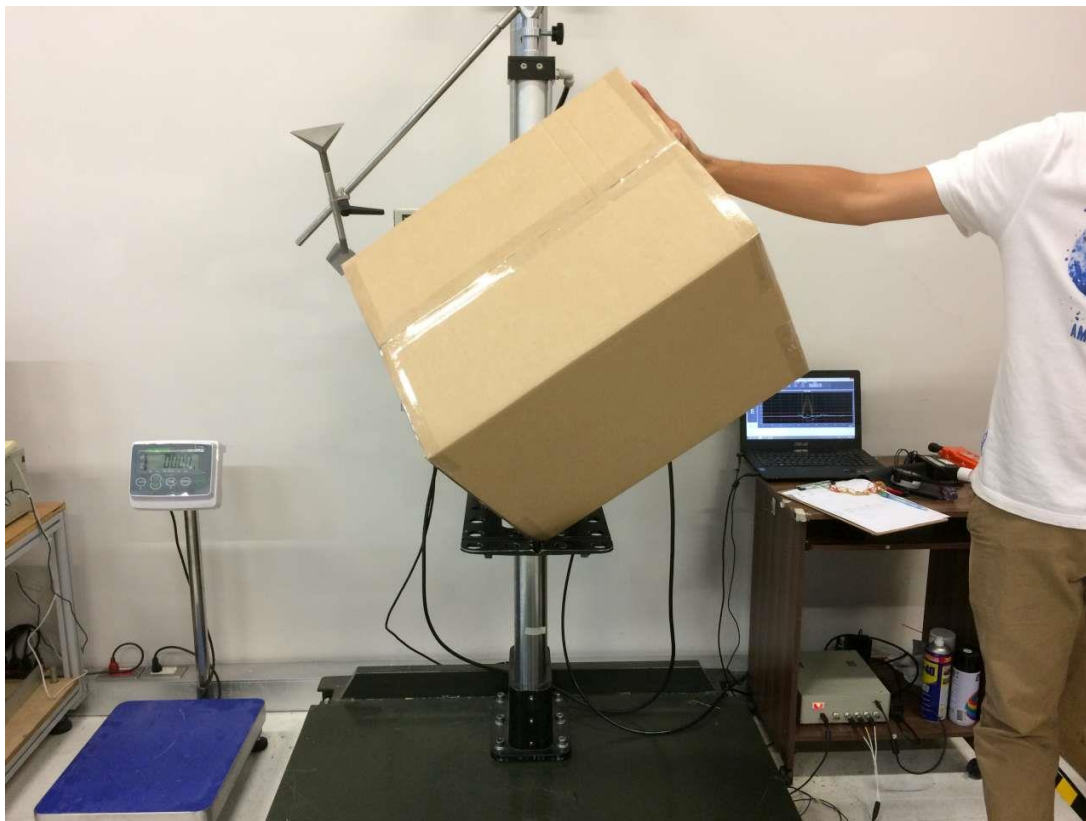
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*QA Lab Reliability test***Test Result:**

1. There is no damage in electronic and mechanical functions.
2. Degradation has not been found.
3. Performance is maintained with no incurable physical damage or degradation.

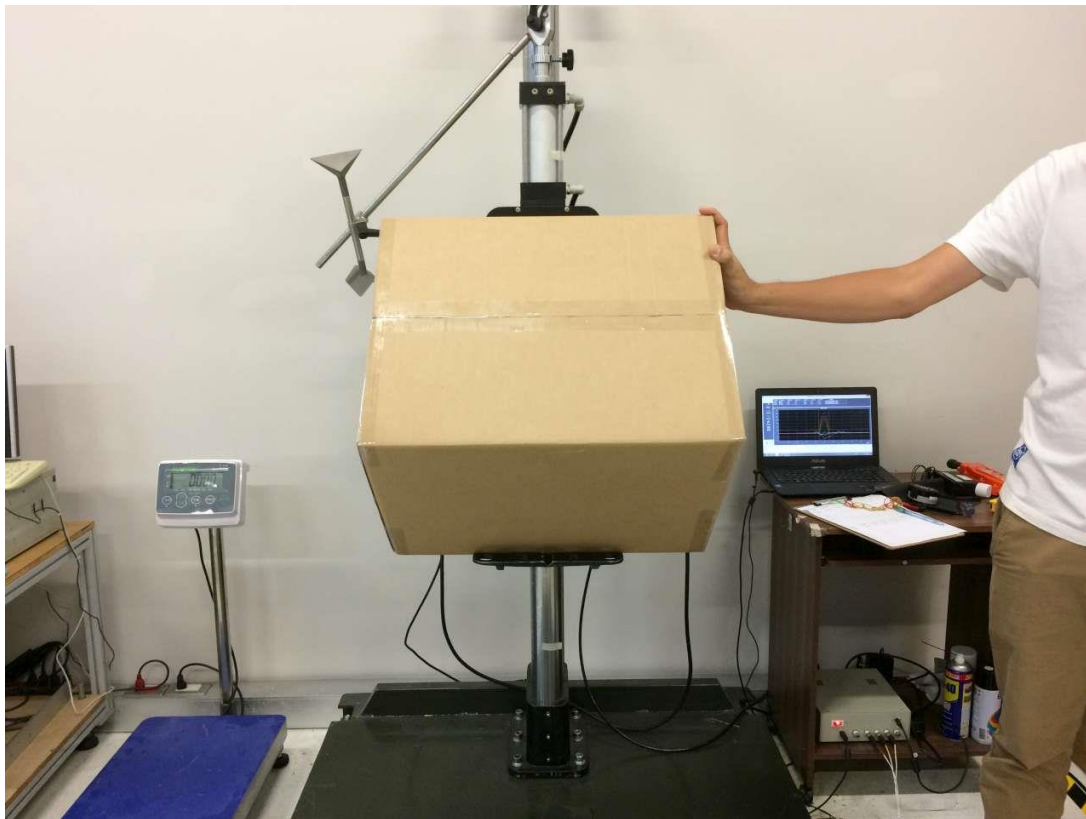
**Conclusion:****Passed.**

The PT215051STV2Q1C00 meets package drop test.

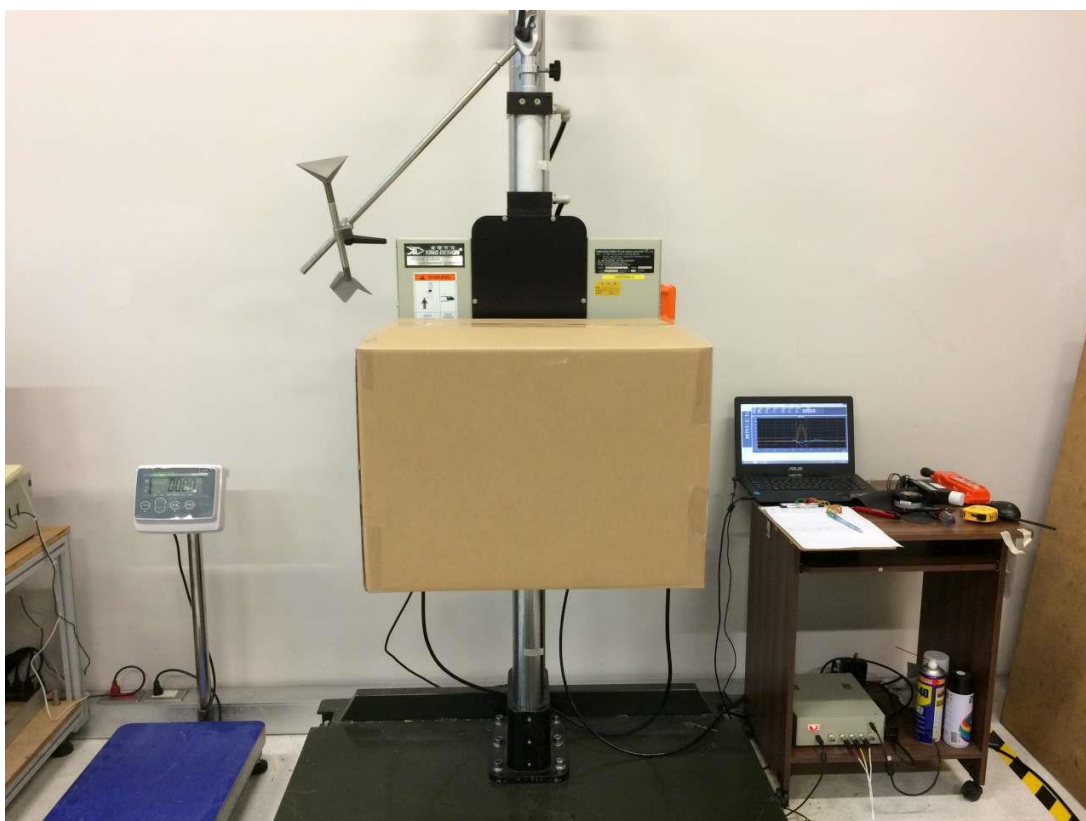
**Photo I:**

Shipment package drop test for one corner



**Photo II:**

Shipment package drop test for three edges

**Photo III:**

Shipment package drop test for six faces

**Photo IV:**



Shipment package inside parts

**Photo V:**



Shipment package inside parts

## IP66 Test

**Test Date:** July 16~18, 2019

**Test Site:** Advantech QA Laboratory (Linkou Campus)

**Performed By:** Tim Chang

**Purpose:** The DVT test

**Test Standard:** Reference IEC60529 Edition 2.1: 2001-02

### Test Condition:

- I. Test for protection against solid foreign objects (IEC60529 IP6X)
  1. Test method: Dust test
  2. Test area: Front panel
  3. System condition: Non-operation
  4. Type of dust: Talcum powder
  5. The amount of dust:  $2\text{kg}/\text{m}^3$
  6. Test duration: Maximum depression is 2KPa. (20Mbar)
  7. Test duration: 8 hours
- II. Test for protection against water (IEC60529 IPX6)
  1. Test method: Waterproof test
  2. Test area: Front panel
  3. System condition: Non-operation
  4. Internal diameter of the nozzle: 12.5mm
  5. Delivery rate: 100 liter/minute  $\pm 5\%$
  6. Distance from nozzle to enclosure surface: Between 2.5m and 3m.
  7. Test time: 3 minutes

**Test Equipment:**

Waterproof Test Chamber  
T-MACHINE  
Model: TMJ-9710C  
S/N: T-10-140204  
Date of Calibration: 2019/05/08  
Next Calibration date: 2020/05/07

Dust Tester chamber  
T-MACHINE  
Model: TMJ-9723C  
S/N: T-23-140205  
Date of Calibration: 2019/05/08  
Next Calibration date: 2020/05/07

**Sample Configuration & Quantity Under Test:**

Using one piece of PT215051STV2Q1C00 testing for IP66

1. M/B : 150H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM= LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : InfoVision Optoelectronics(Kunshan) Co.,LTD. Ltd / 15" 1024x768 350nits(96CM-P3L-IVO-001)
6. Touch : Holitech Technology Corp. Ltd / 15" HR4 10001
7. AC/DC Power Supply : DPS-30W-DC24

**Performance Criteria:**

Visual check after test:

1. No water permeates into the enclosure.
2. No dust deposit inside the enclosure.

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*QA Lab Reliability test*

**Test Result:**

1. No trace of water was found inside the enclosure.
2. No trace of dust was found inside the enclosure.

**Conclusion:**

**Passed.**

The PT215051STV2Q1C00 meets the IP66 test.

## Photo:

## Dust Test (IEC60529 IP6X)



IP6X - Dust test.

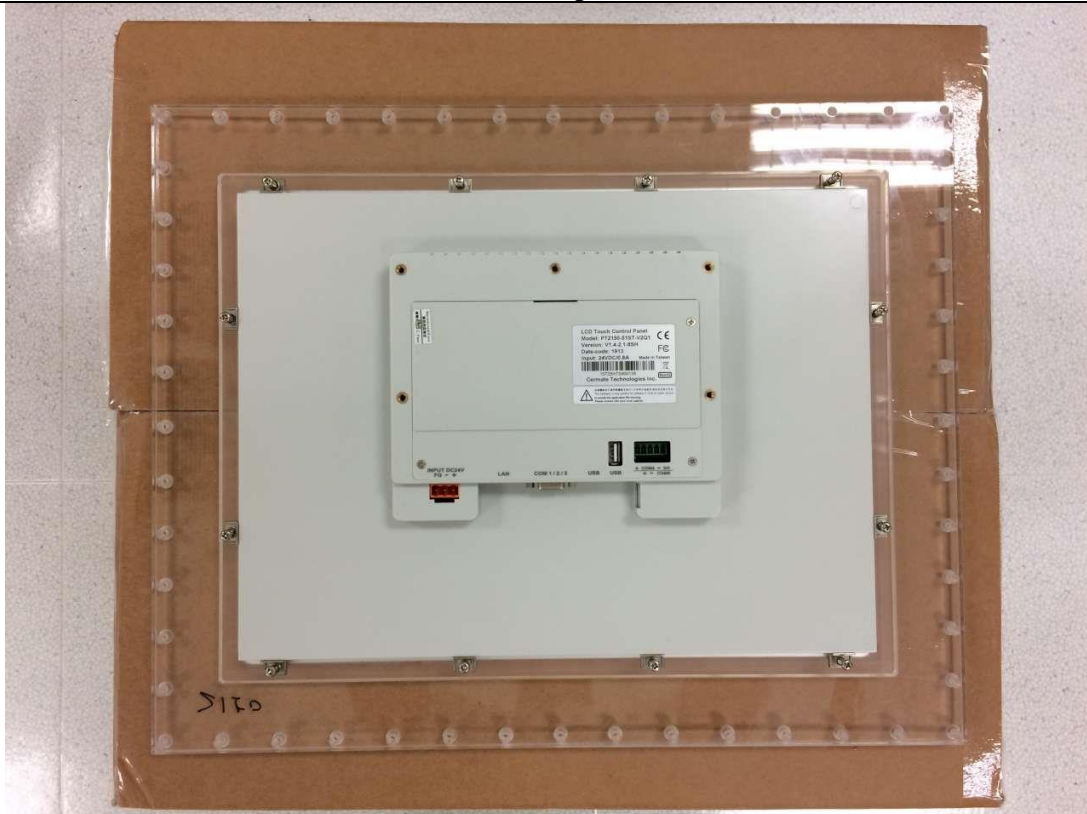


IP6X - System internal test status after dust test



**Waterproof Test - (IEC60529 IPX6)**

IPX6 - Waterproof test



IPX6 - System internal test status after dust test