

QA Test Report

PT210051STF1Q1C00

(Product Reliability Test)

Report No: 20S001A0

Report Date: January 3, 2020

Issue Stamp

Jeff Yang

Manager of QA Department

Jeff Yang

Approval

Tim Chang

Test Engineer

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QA Lab Reliability test

History

Report No.	Description	Release Date
20S001A0	First release for DVT stage	2020/01/03

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		PT2100
LCD Display	Sub-models	51ST
	Size	10.1" diagonal
	Max. Resolution	1024*600
	Type	TFT LCD with LED Backlight
	Max. Colors	16-bit
	Backlight (hr)	20,000
Touch Panel	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	About 40MB
Data File Memory	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
	Micro SD Slot	N/A
	USB Host	YES (2.0)
Communication Interface	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	Ethernet	YES
	Front Function Keys	N/A (Optional:F1~F7)
	Audio out (optional)	N/A
	Video in (optional)	N/A
	Front USB Host Port	N/A (Optional)
	Supply Voltage	24VDC ±10%
Power	Consumption	20W
	Operating Temperature	-10℃~60℃
Environment	Relative Humidity	10%~90%
	Shock (operation)	Half sine, 20G, 11ms duration
	Vibration (operation)	Random vibration 1 Grms (5 ~ 500 Hz)
	EMI	FCC Part 15 Class A
	CE	EN61000-6-2, EN61000-6-4
	UL Certification	YES(UL61010)
	Ingress Protection	NEMA 4 / IP66
	Cooling	Natural Cooling
Dimension WxHxD (mm)		270.8x 212.8x 42.5
Cutout Dimension WxH (mm)		259.5 x 201.5
Net Weight (Kg)		1.1

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

Product Config. Photo

Photo I:



PT210051STF1Q1C00 front side view

Photo II:



PT210051STF1Q1C00 rear side view

High Temperature Operation Test

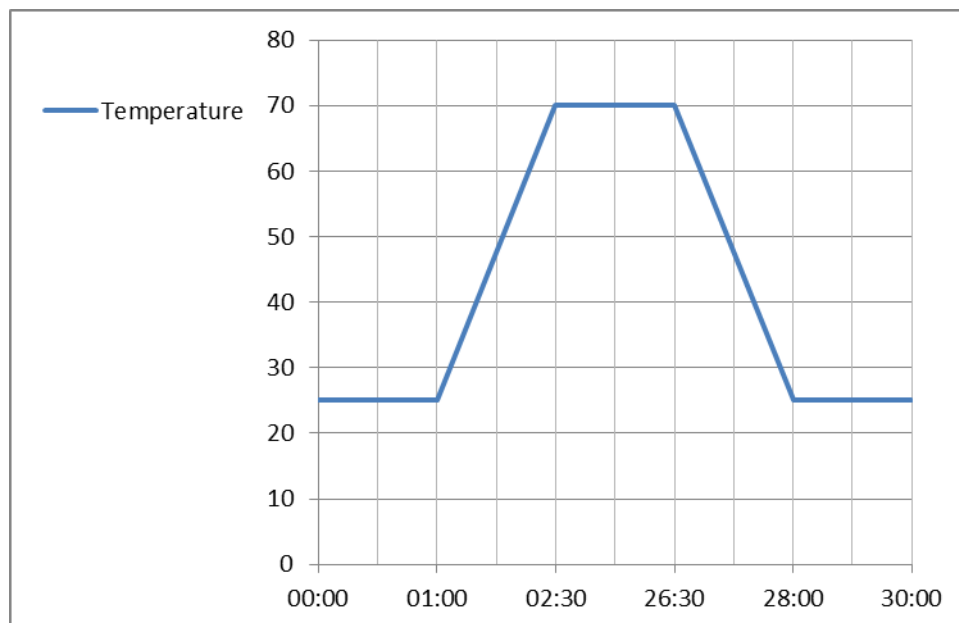
Test Date: August 21~22, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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

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 one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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:

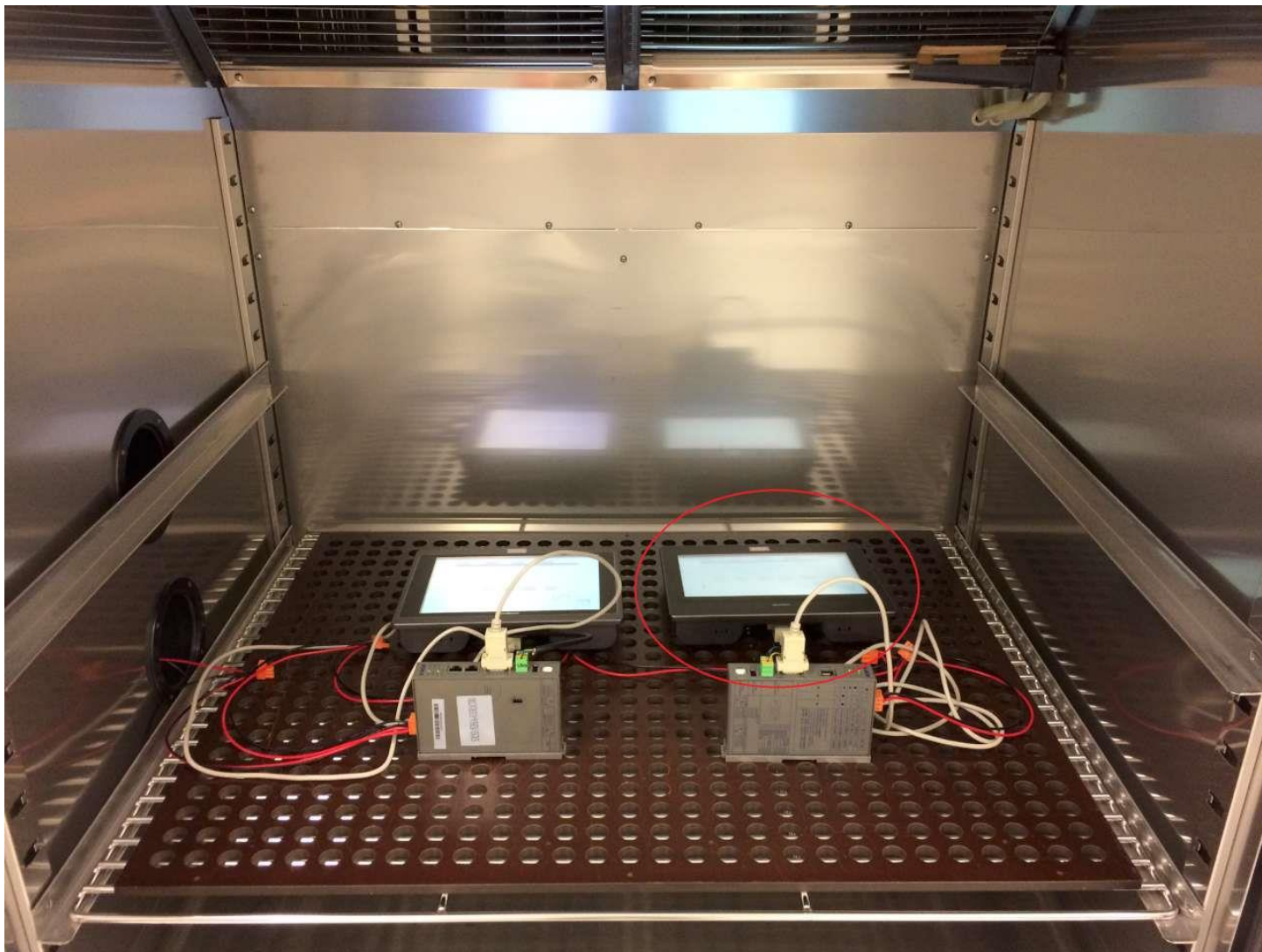
There is no damage in electronic and mechanical functions.

Degradation has not been found.

Performance is maintained with no incurable physical damage or degradation.

Conclusion:**Passed.**

The PT210051STF1Q1C00 meets high temperature operation test.

Photo :

PT210051STF1Q1C00 test in environmental chamber

Low Temperature Operation Test

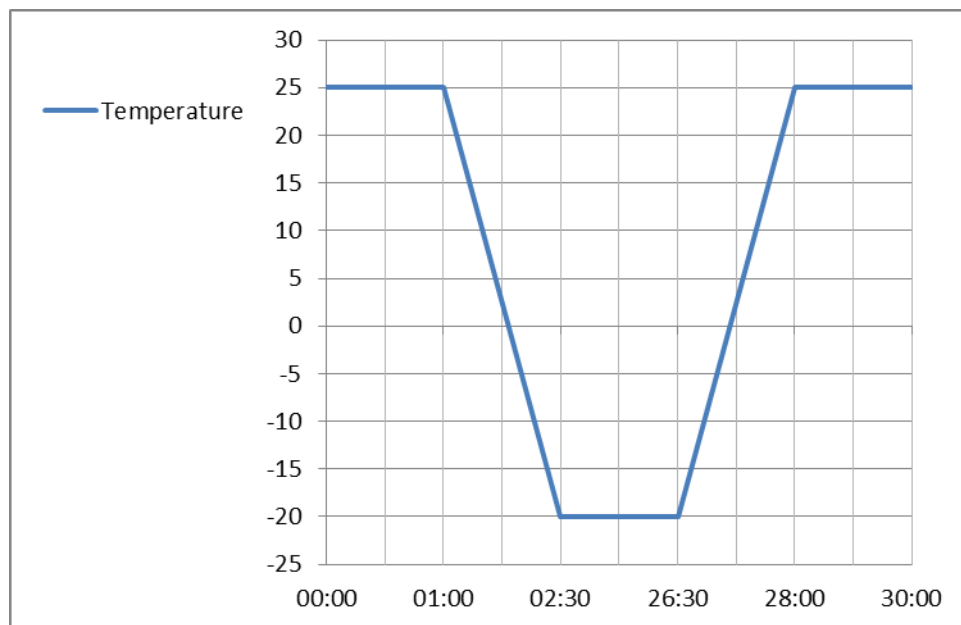
Test Date: August 20~21, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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
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 one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets low temperature operation test.

Humidity Test

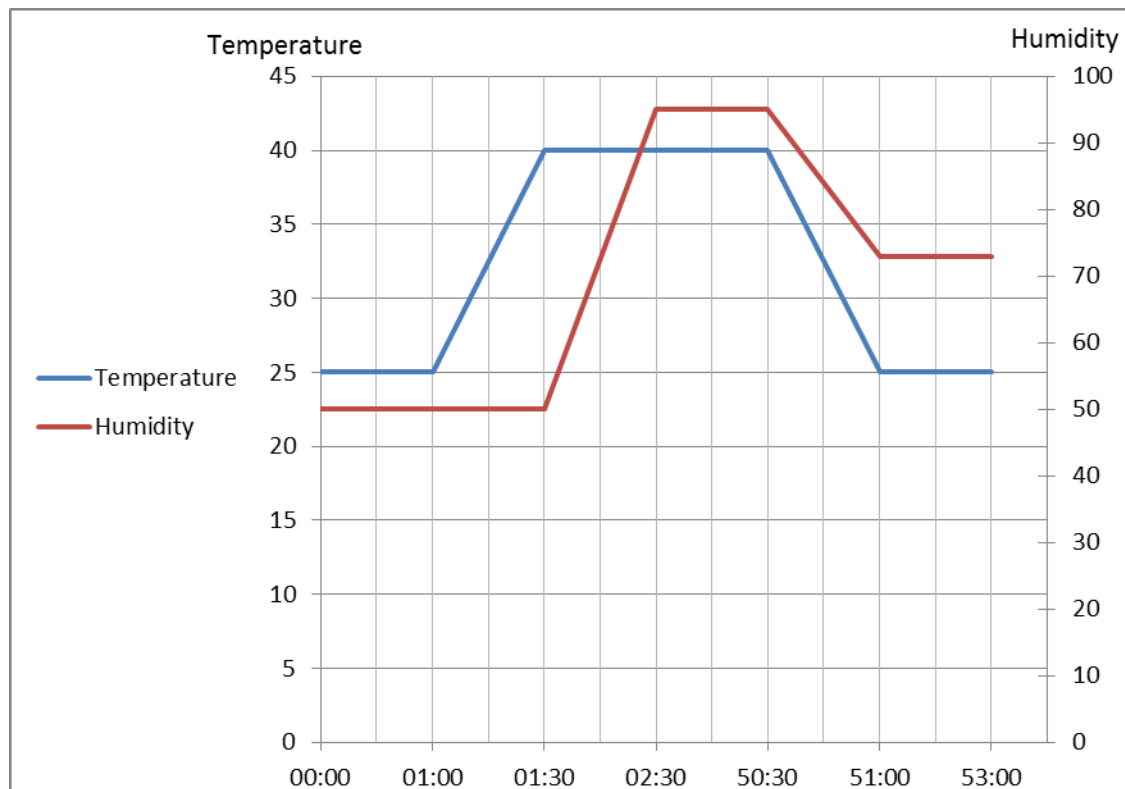
Test Date: August 22~24, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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

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 one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets humidity test.

High Temp. & Hum. Storage Test

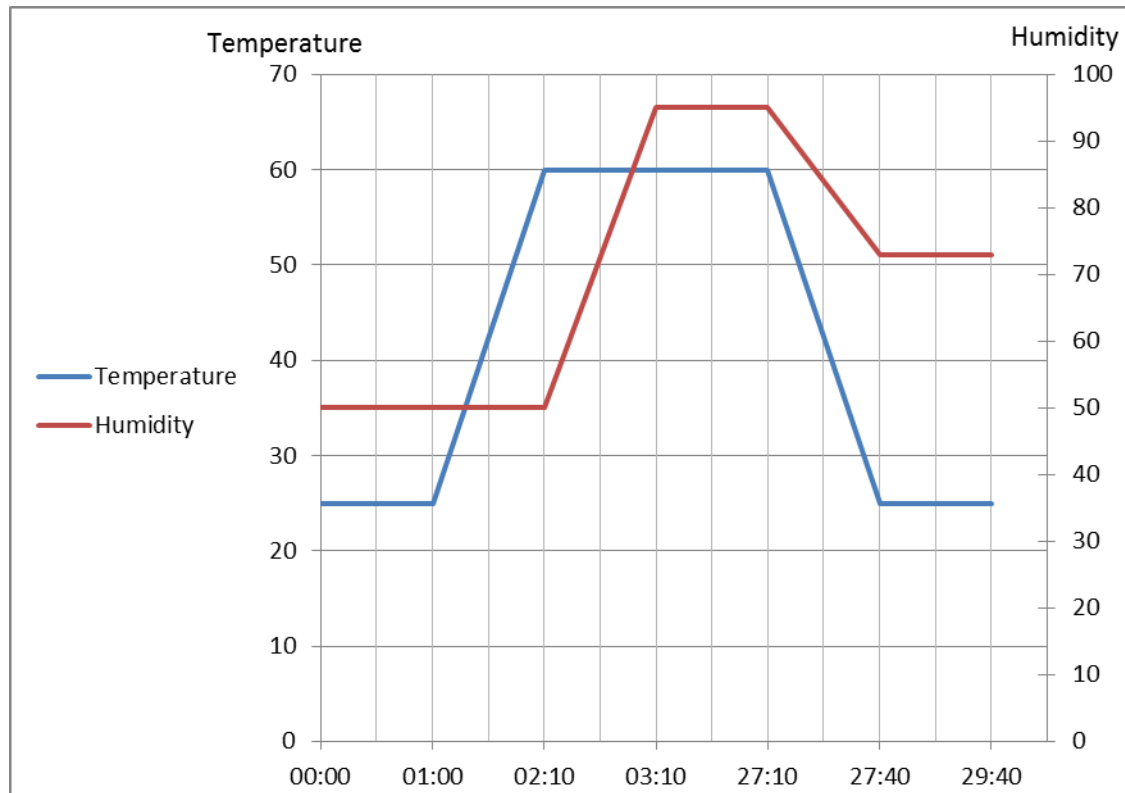
Test Date: August 19~20, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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-D4T-150

S/N: 9025KT

Date of Calibration: 2018/11/12

Next Calibration Date: 2019/11/11

Sample Configuration & Quantity Under Test:

Using one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets high temperature & humidity storage test.

High Temp. Storage Test

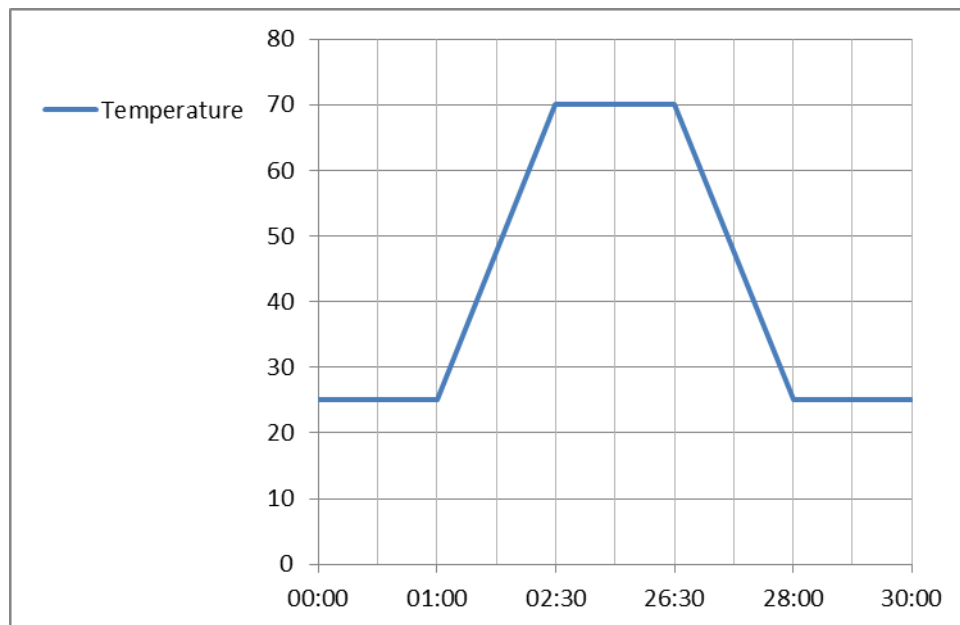
Test Date: August 17~18, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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-D4T-150
S/N: 9025KT
Date of Calibration: 2018/11/12
Next Calibration Date: 2019/11/11

Sample Configuration & Quantity Under Test:

Using one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets high temperature storage test.

Low Temp. Storage Test

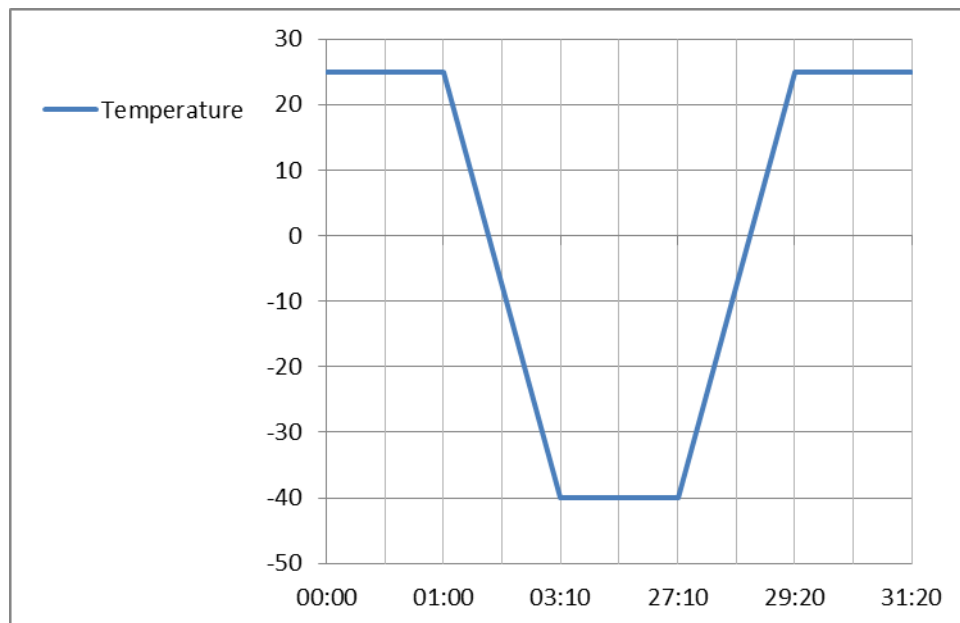
Test Date: August 16~17, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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-D4T-150
S/N: 9025KT
Date of Calibration: 2018/11/12
Next Calibration Date: 2019/11/11

Sample Configuration & Quantity Under Test:

Using one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets low temperature storage test.

Thermal Shock Test

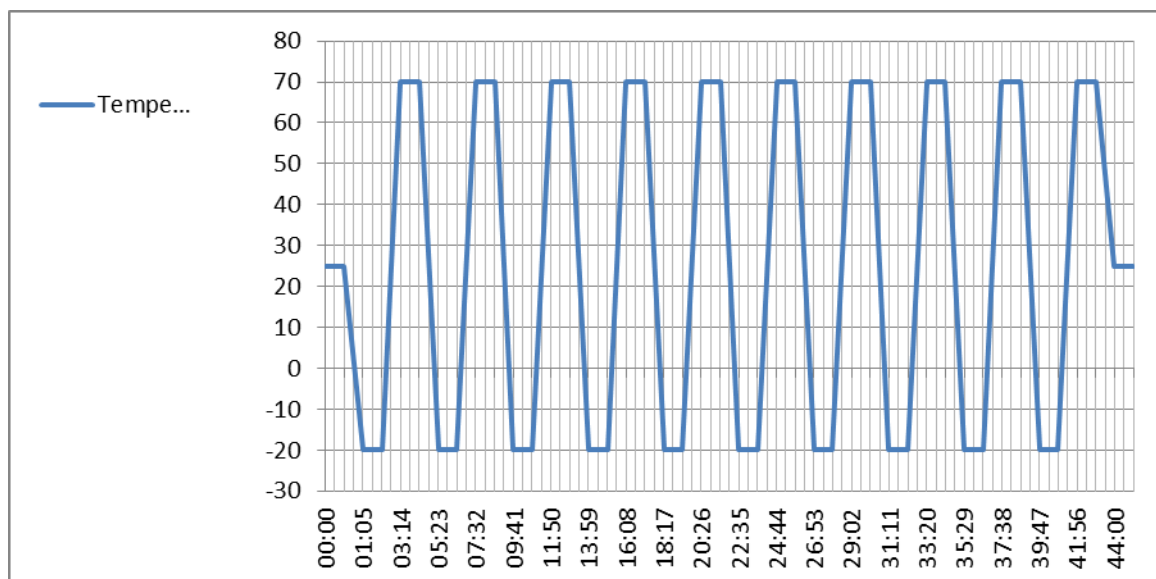
Test Date: September 16~18, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

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

KSON Co. Ltd.

Model: TH-A3C-100+LN2

S/N: 3886

Date of Calibration: 2019/04/16

Next Calibration Date: 2020/04/15

Sample Configuration & Quantity Under Test:

Using one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets thermal shock test between -20°C to 70°C.

Power ON/OFF Test

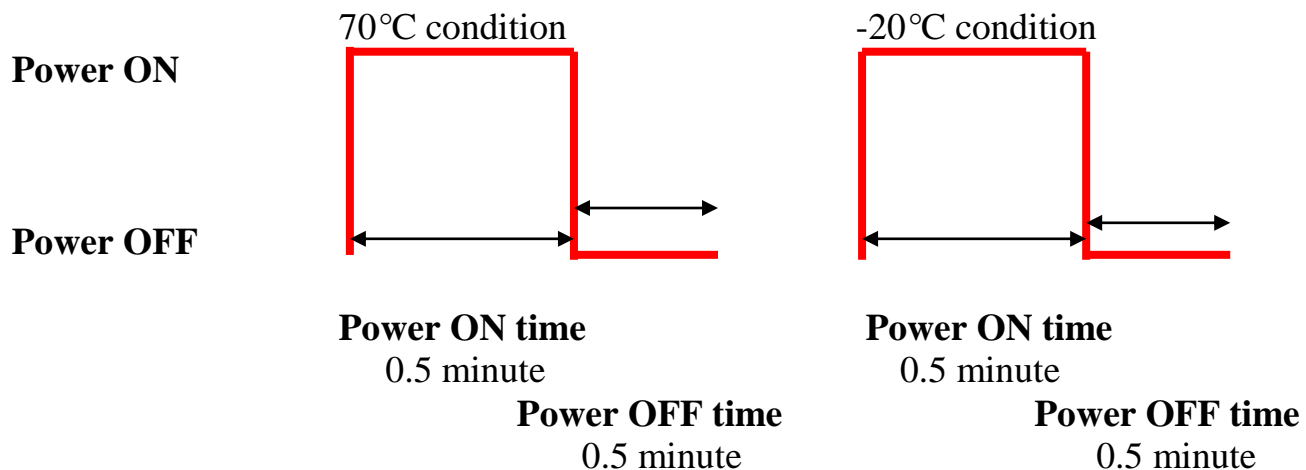
Test Date: August 26~28, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

Purpose: The DVT test

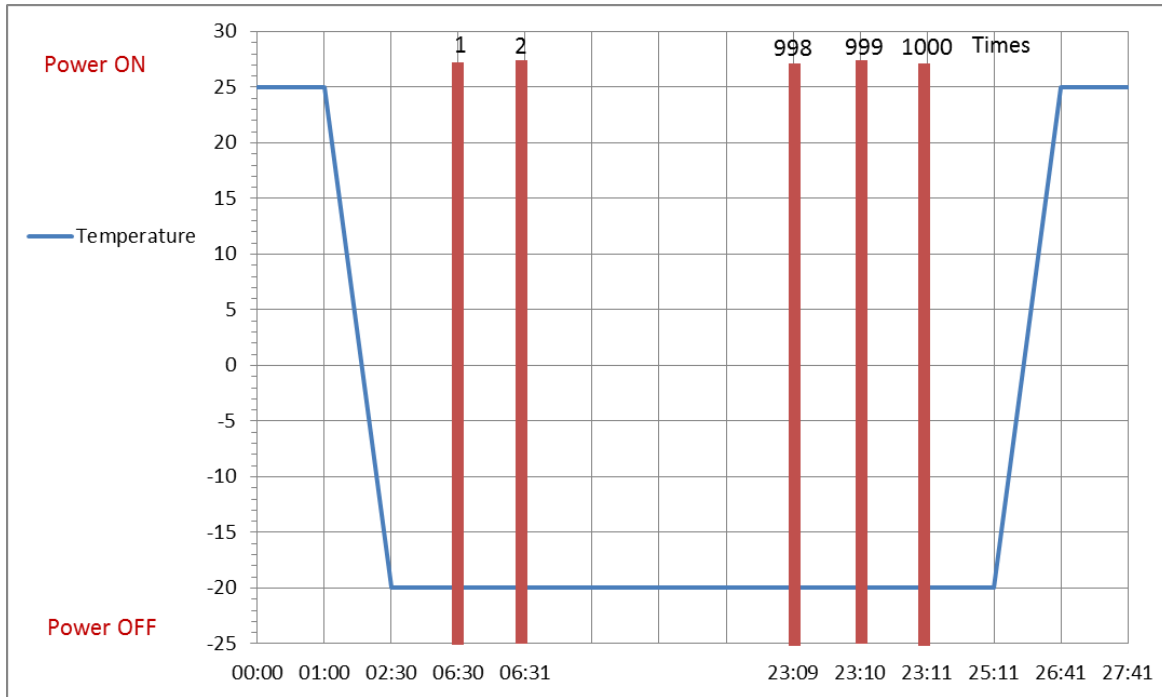
Test Standard: Reference IEC60068-2-2:2007 Testing procedures
Test Bb: Dry Heat Test
Reference IEC60068-2-1:2007 Testing procedures
Test Ab: Cold Test

Test Condition:

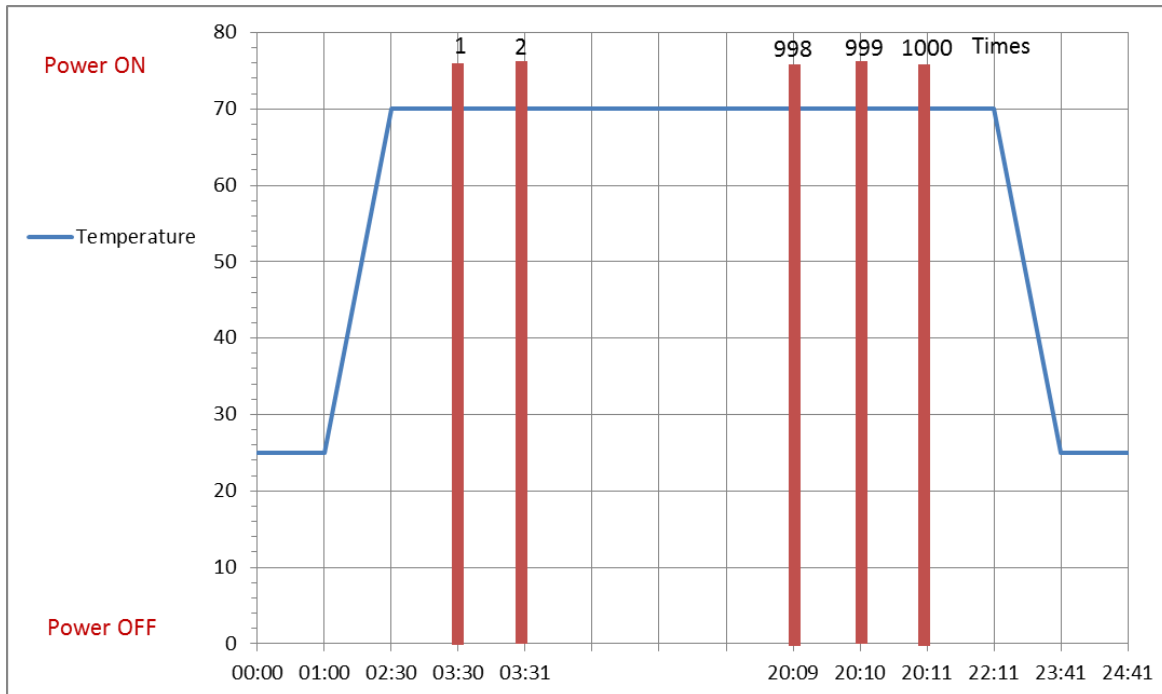
1. Test Temperature: High temperature 70°C / Low temperature -20°C
2. Power ON / OFF time interval: On 0.5 minute, off 0.5 minute at high temperature
On 0.5 minute, off 0.5 minute at low temperature
3. Number of test: 1000 times for each temperature
4. Test program: power counter program for RTOS
5.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



7. Test Environment Curve: (-20°C)



8. Test Environment Curve: (70°C)



Test Equipment: 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 one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets power on/off test.

Cold Start Test

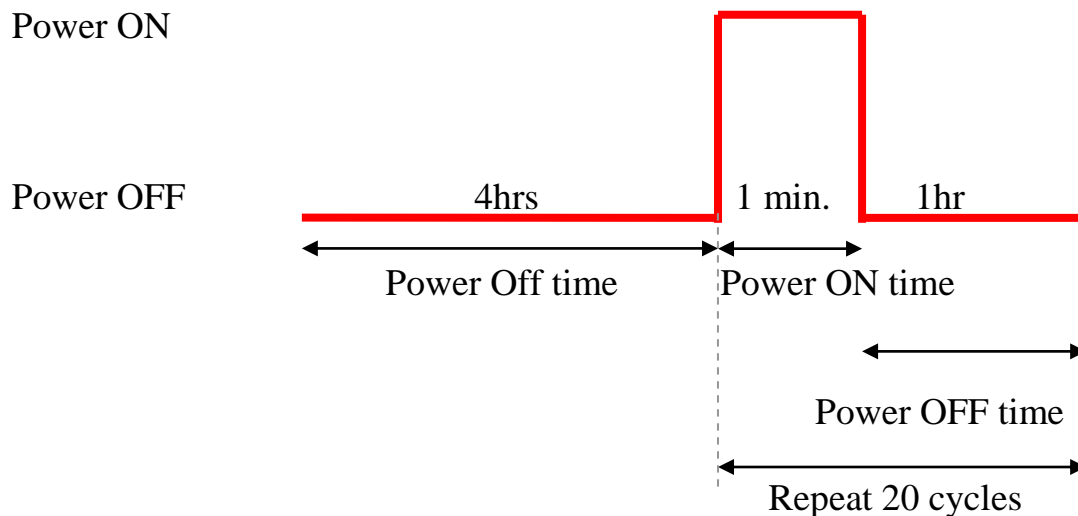
Test Date: August 28~29, 2019
Test Site: Advantech QA Laboratory (Linkou Campus)
Performed By: Tim Chang

Purpose: The DVT test.

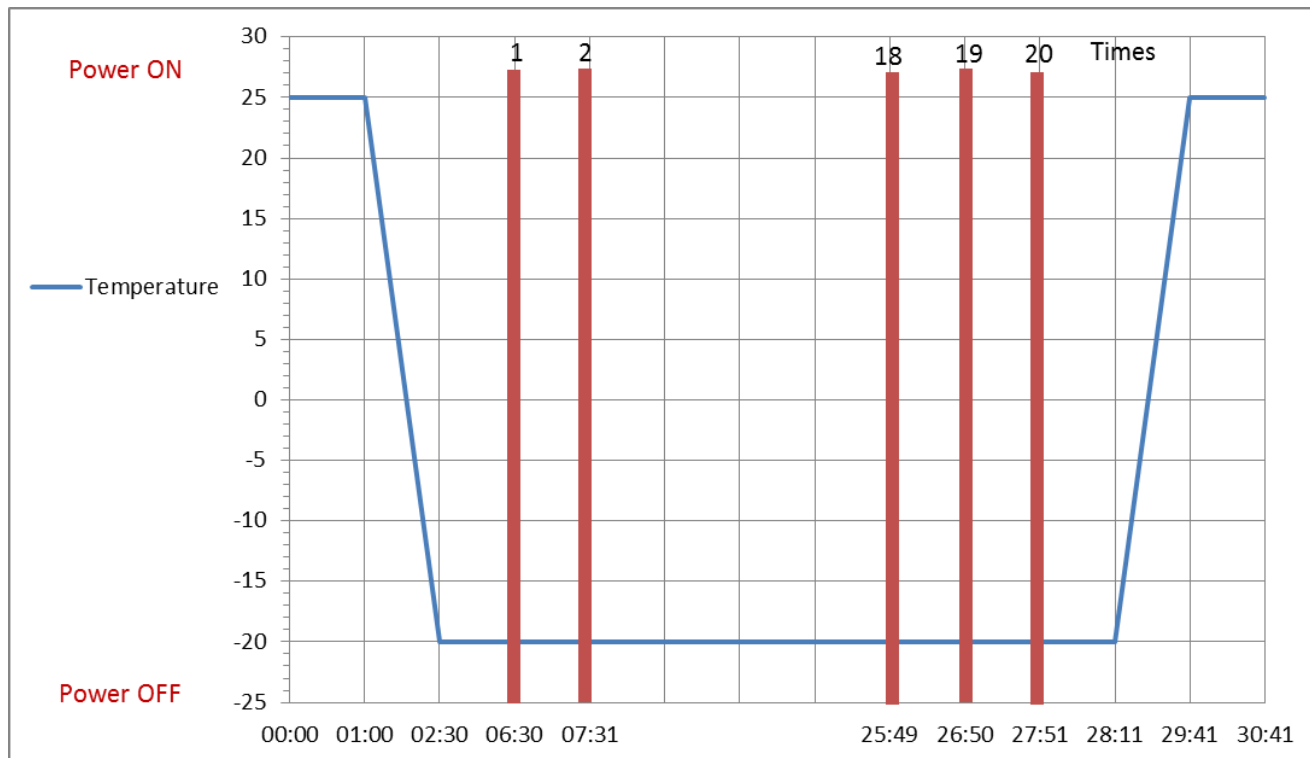
Test Standard: Reference IEC60068-2-1:2007 Testing procedures
Test Ab: Cold Test

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 one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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 PT210051STF1Q1C00 meets cold start test.

Thermal Profile Test

Test Date: October 8, 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 PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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:**PT210051STF1Q1C00 Thermal profile**

NUM	Parts List	Measurement 60°C	Spec. from Datasheet	Spec. reference to Tc (°C)
1	D2	75.4	125(Tj)	100
2	U11	63.7	85(Ta)	105
3	U12	81.1	150(Tj)	120
4	U13	66.5	85(Ta)	105
5	Q10	71.4	150(Tj)	120
6	Battery	63.5(Ta)	125(Ta)	125
7	Battery	64.2(Tc)	-	-
System Power		5.5 W	-	-

Remark:

Ta: Ambient temperature specification

Tc: Device Case temperature specification

Tj: Device Junction temperature specification

Test Result:

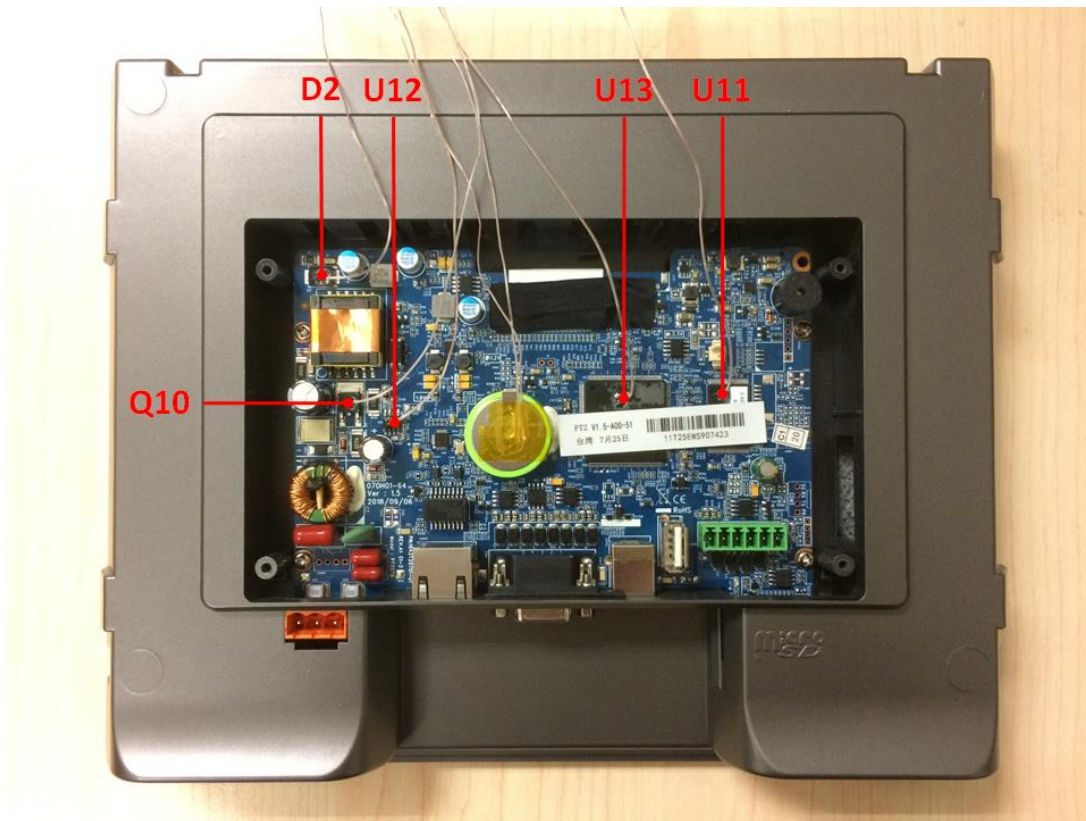
1. The temperature of all the measurement points are under themselves' thermal specification when ambient is at 60 degree C without airflow environment.
2. There is no damage in electronic functions.

Conclusion:

Passed

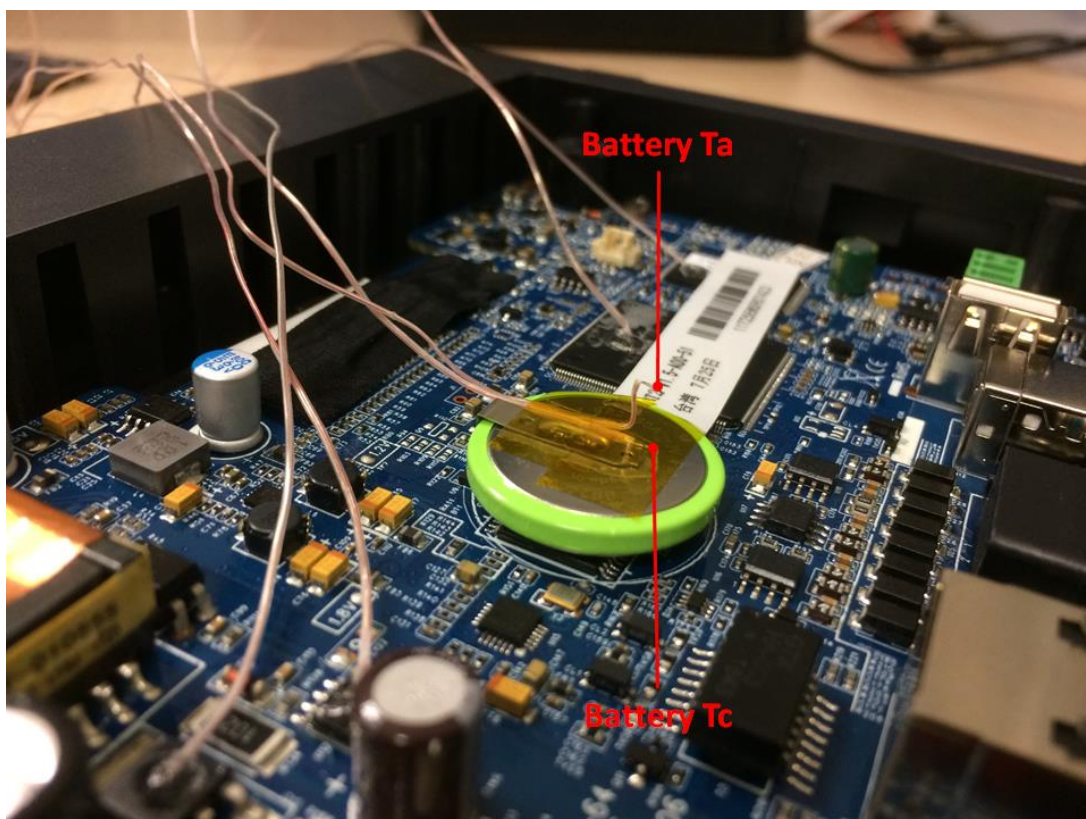
The PT210051STF1Q1C00 meets thermal profile test.

Photo I:

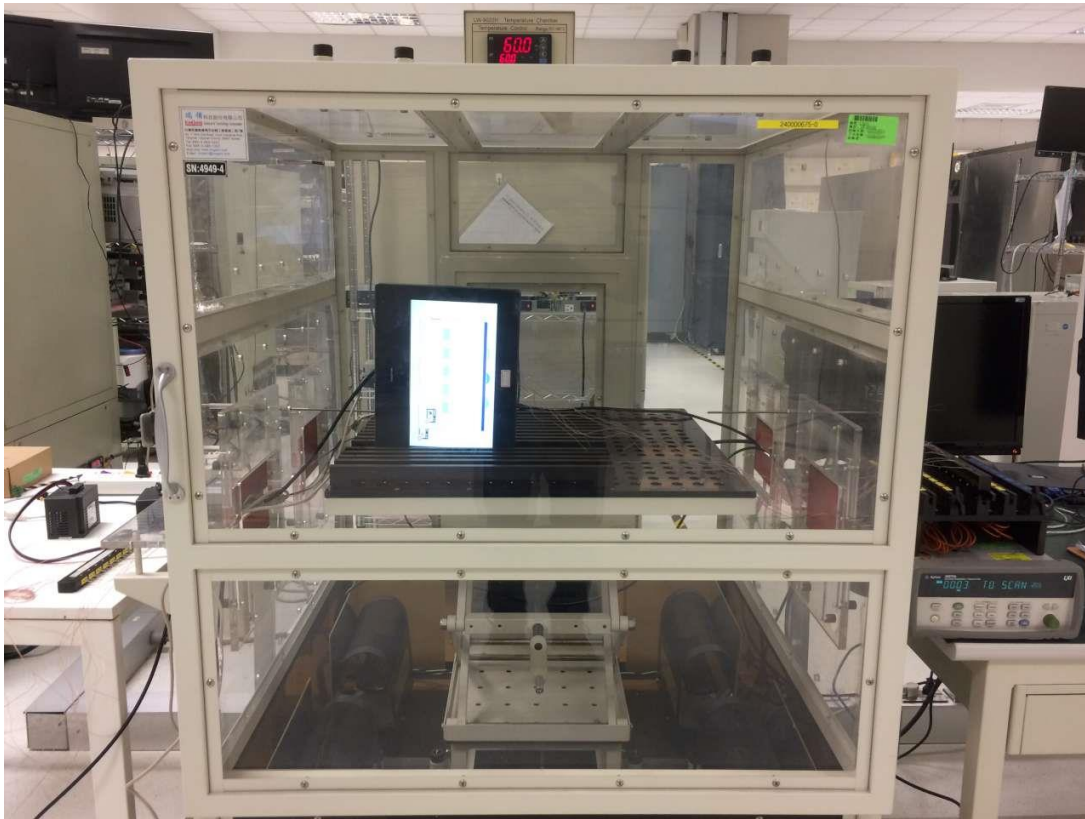


Main board measurement points

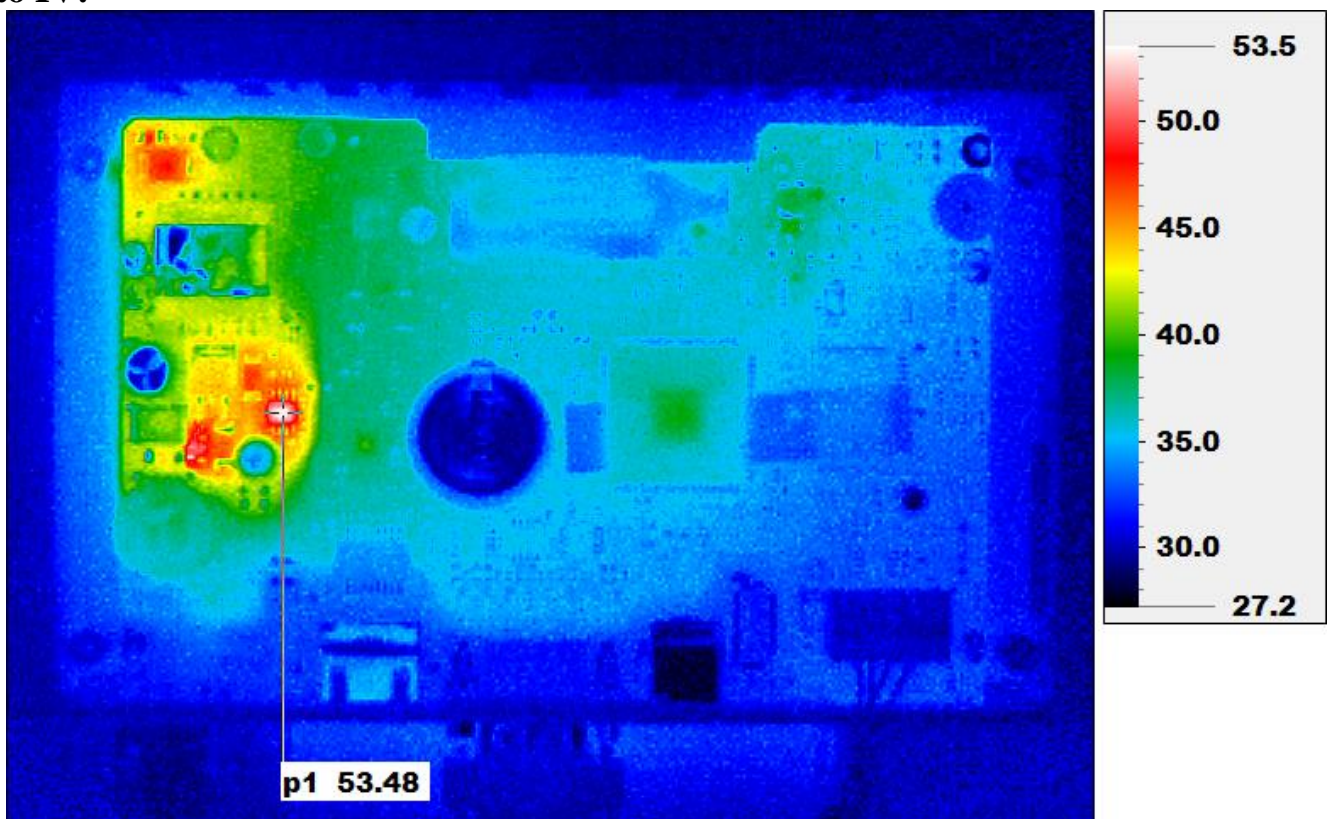
Photo II:



Battery measurement points

*QA Lab Reliability test***Photo III:**

PT210051STF1Q1C00 – thermal profile test in natural convection chamber without air flow
Photo IV:



IR photo at room temperature - MB top side

Thermal Step Stress Test

Test Date: September 19, 2019

Test Site: Advantech QA Laboratory (Linkou Campus)

Performed By: Tim Chang

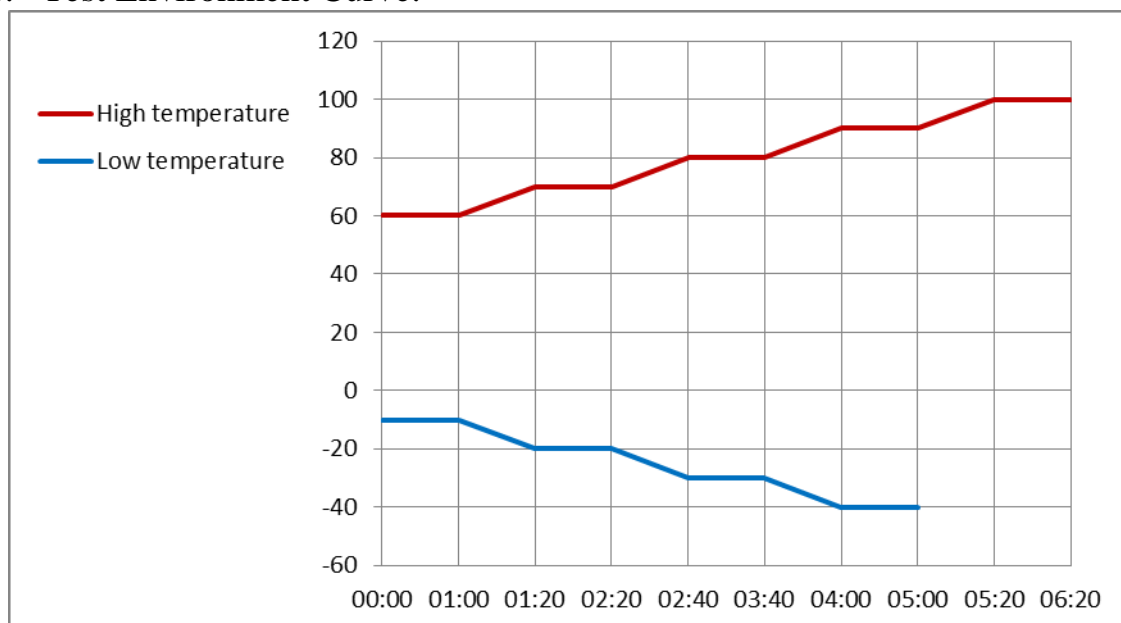
Purpose: The DVT test.

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)
2. Low temperature: -10C~-XX C (the lowest to -40C)
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:



Test Equipment: Programmable Temperature & Humidity Chamber

KSON Co. Ltd.

Model: TH-A3C-100+LN2

S/N: 3886

Date of Calibration: 2019/04/16

Next Calibration Date: 2020/04/15

Sample Configuration & Quantity Under Test:

Using one piece of PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

Test Data:

Number	Criteria	Result	Judgement
1	-10C	Passed	Passed
2	-20C	Passed	Passed
3	-30C	Passed	Passed
4	-40C	Passed	Passed (Note 1)
5	60C	Passed	Passed
6	70C	Passed	Passed
7	80C	Passed	Passed
8	90C	Passed	Passed
9	100C	Passed	Passed (Note 2)

Note 1: The lowest temperature of chamber ability is at -40°C.

Note 2: The highest temperature of chamber ability is at 100°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. System of the temperature lower operational limit is at -40°C .
2. System of the temperature upper operational limit is at 100°C .
3. 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.
4. 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: October 2, 2019

Test Site: Advantech QA Laboratory (Linkou Campus)

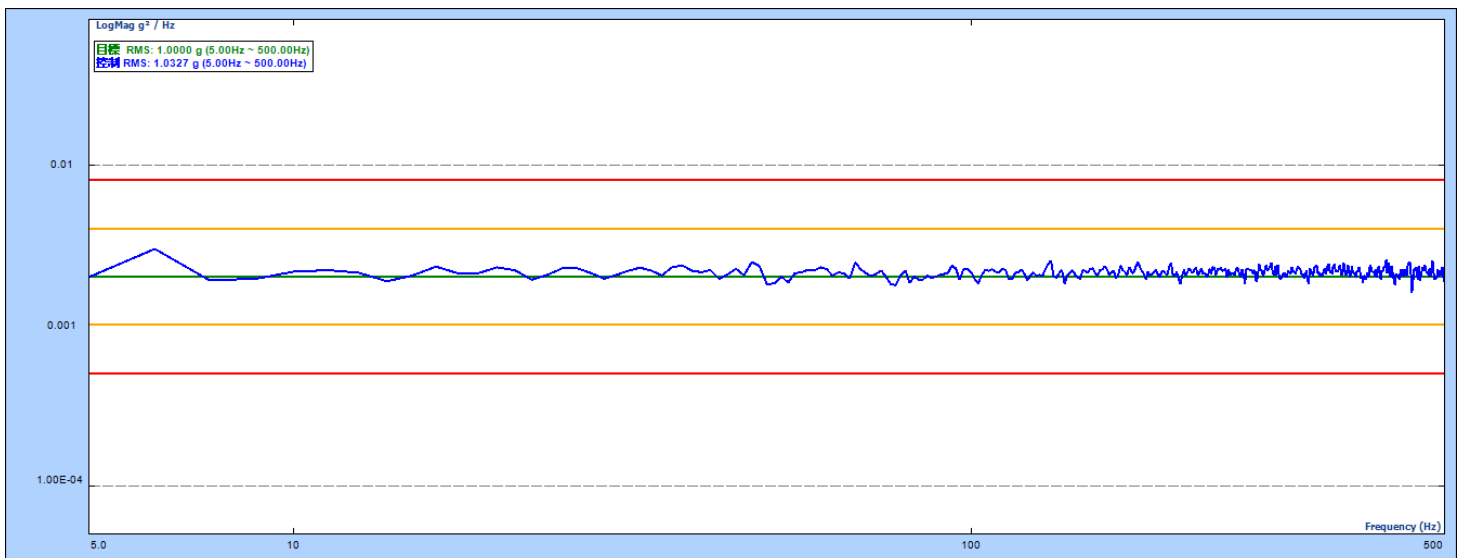
Performed By: Tim Chang

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 PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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.

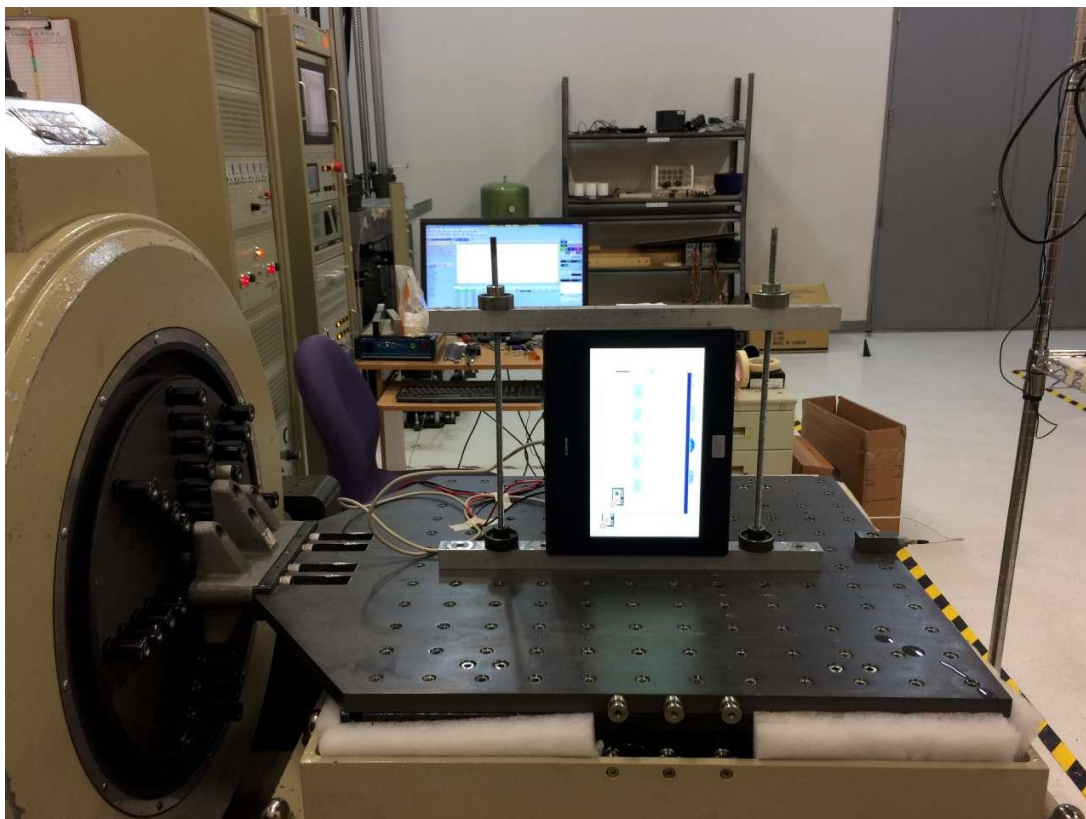
Test Result:

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

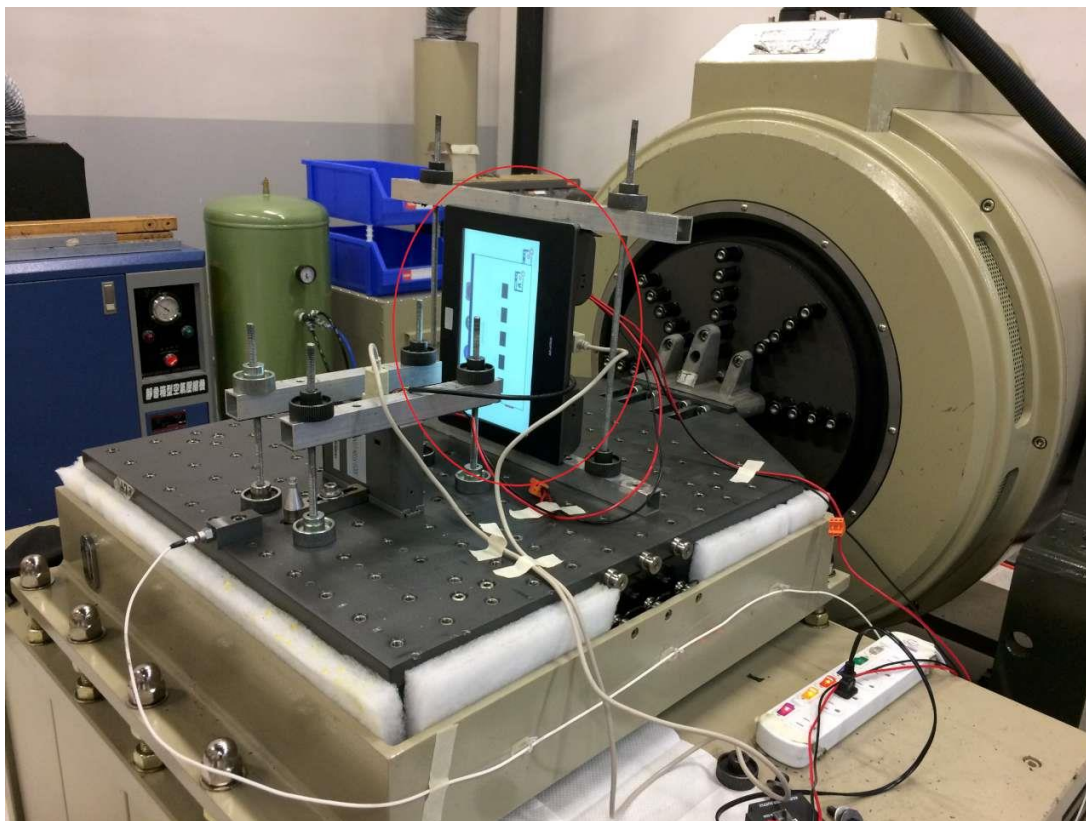
Conclusion:

Passed.

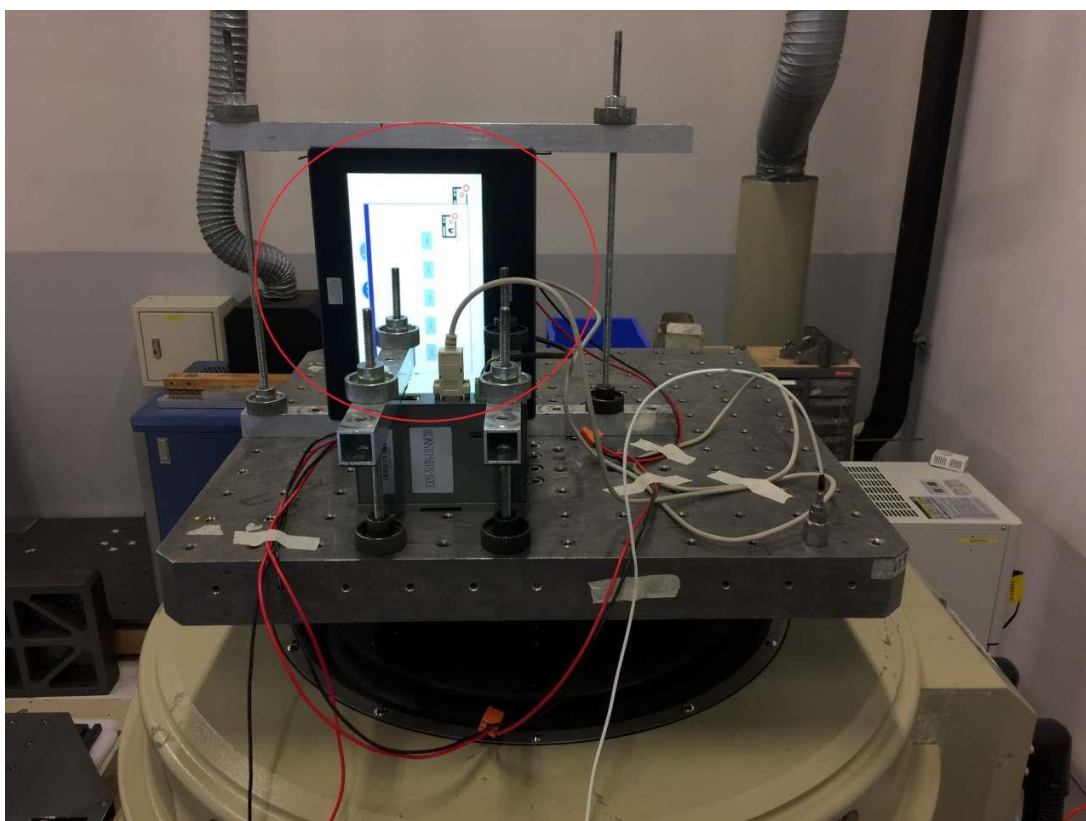
The PT210051STF1Q1C00 meets random vibration operation test.

Photo I:

PT210051STF1Q1C00 random vibration test for X-axis

Photo II:

PT210051STF1Q1C00 random vibration test for Y-axis

Photo III:

PT210051STF1Q1C00 random vibration test for Z-axis

Sine Vibration Test

Test Date: October 3, 2019

Test Site: Advantech QA Laboratory (Linkou Campus)

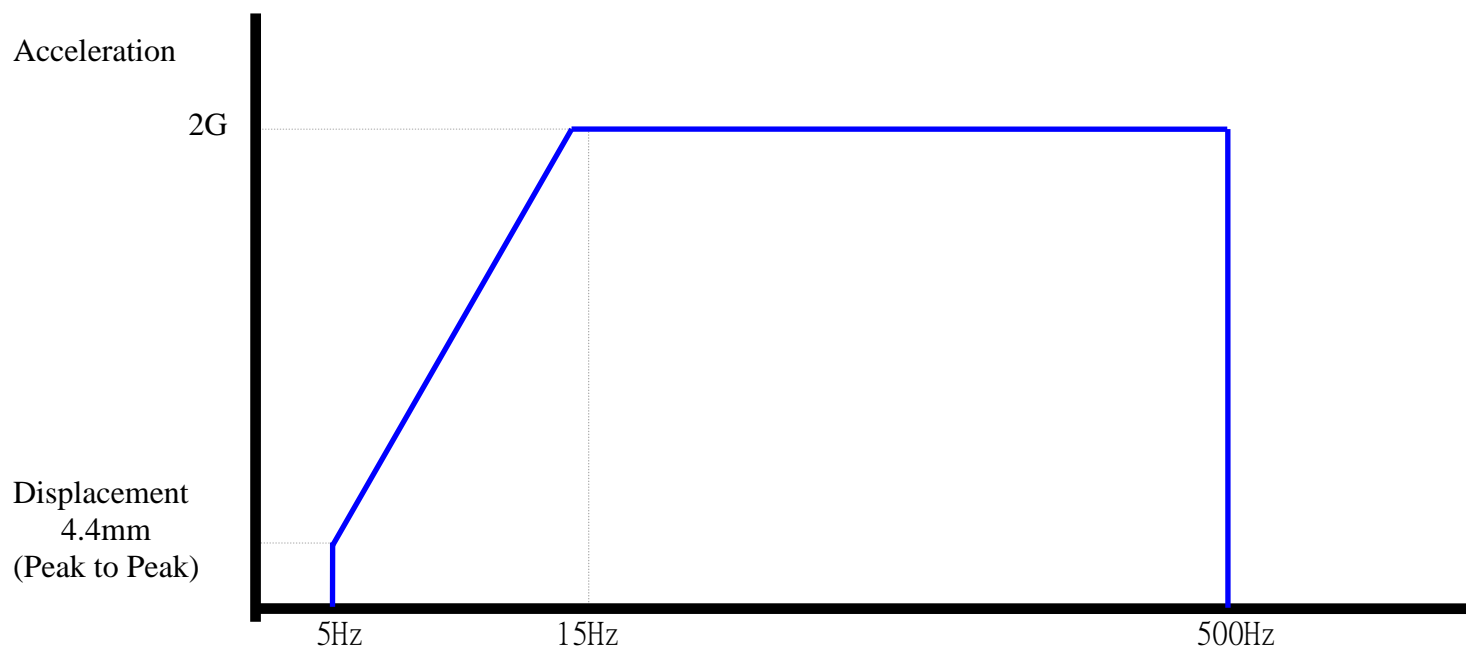
Performed By: Tim Chang

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 PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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.

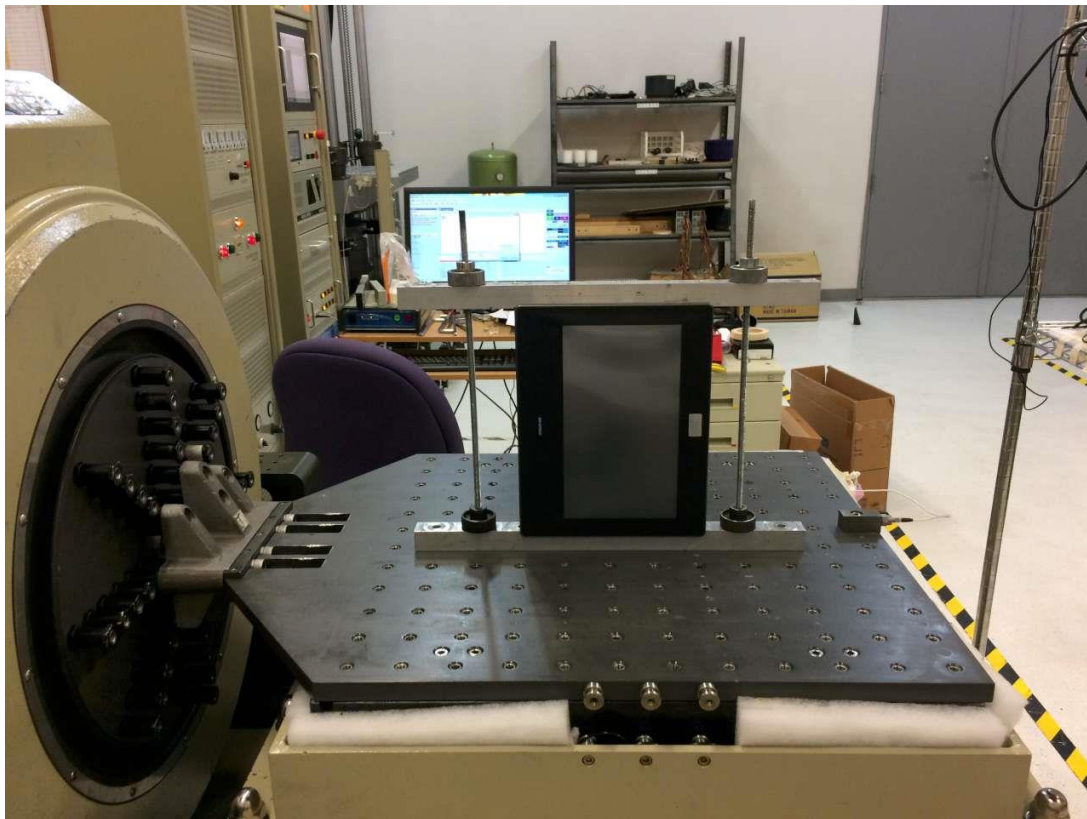
Test Result:

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

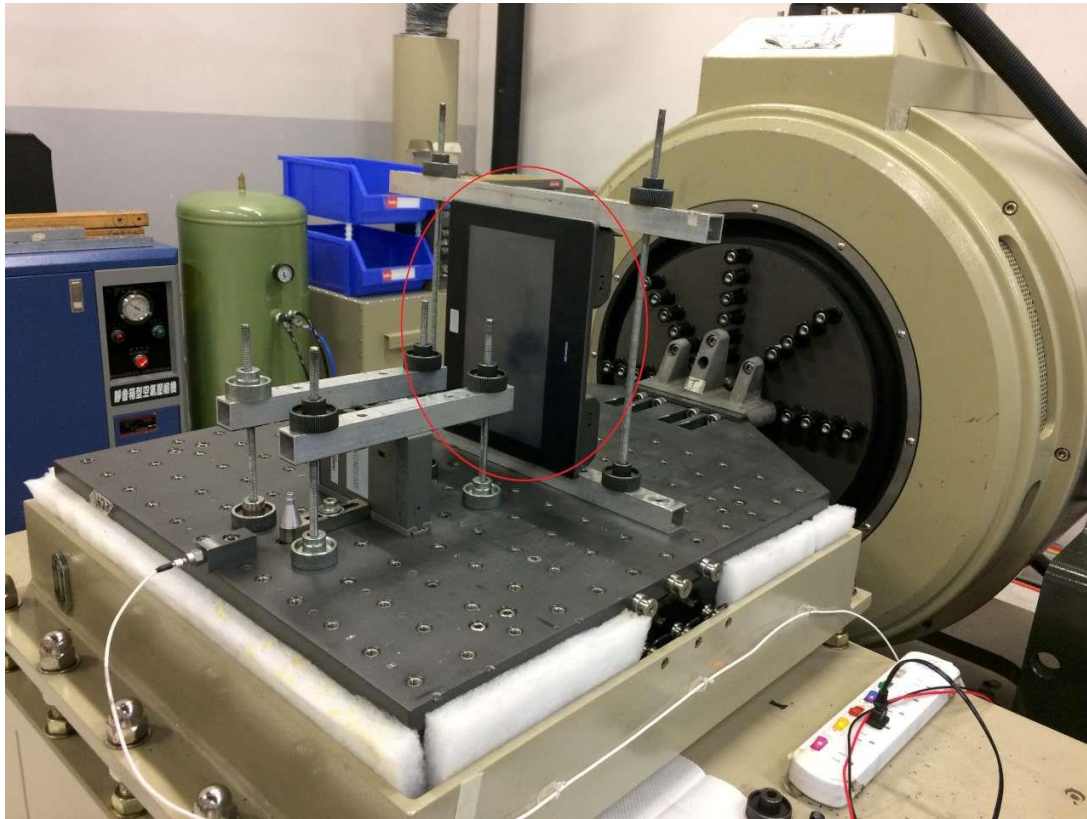
Conclusion:

Passed.

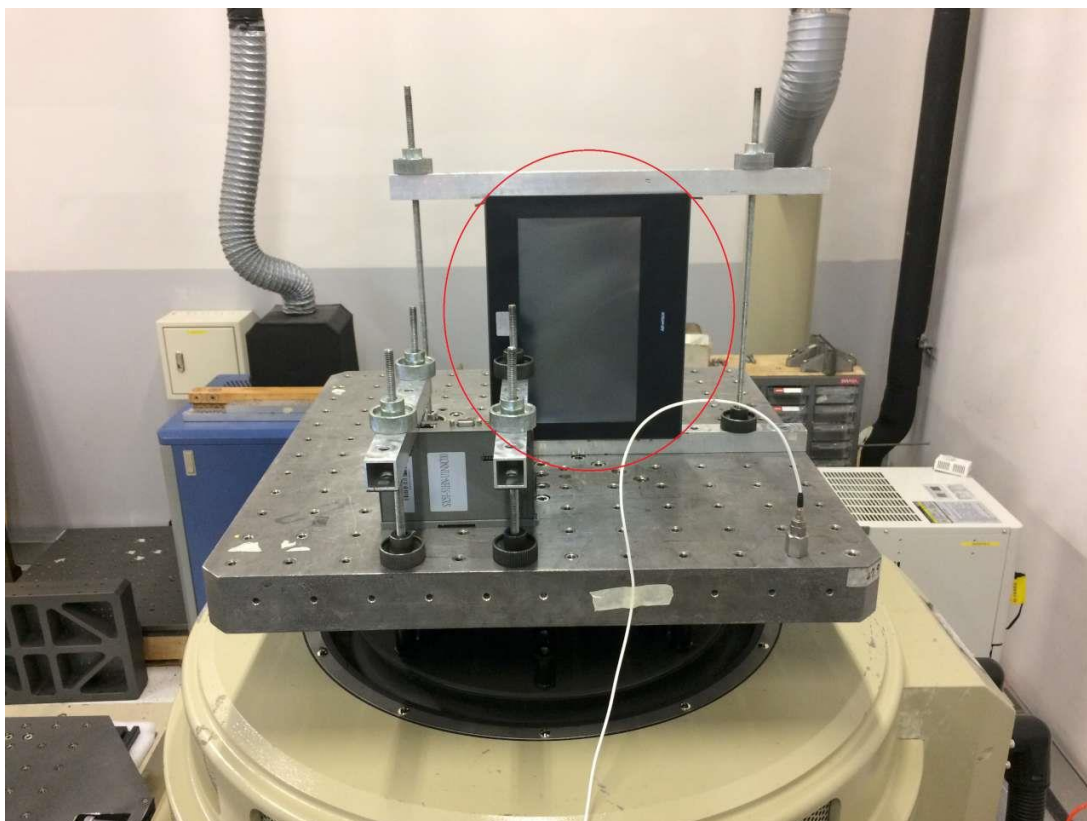
The PT210051STF1Q1C00 meets sine vibration non-operation test.

Photo I:

PT210051STF1Q1C00 sine vibration test for X-axis

Photo II:

PT210051STF1Q1C00 sine vibration test for Y-axis

Photo III:

PT210051STF1Q1C00 sine vibration test for Z-axis

Shock Test

Test Date: October 3, 2019

Test Site: Advantech QA Laboratory (Linkou Campus)

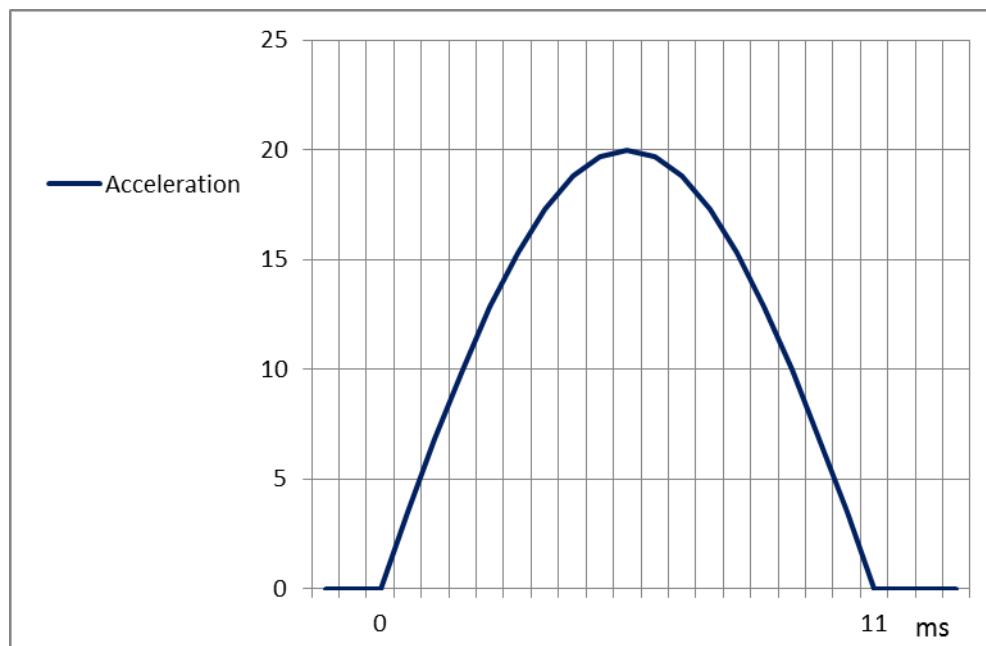
Performed By: Tim Chang

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 PT210051STF1Q1C00 with the following options installed:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

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.

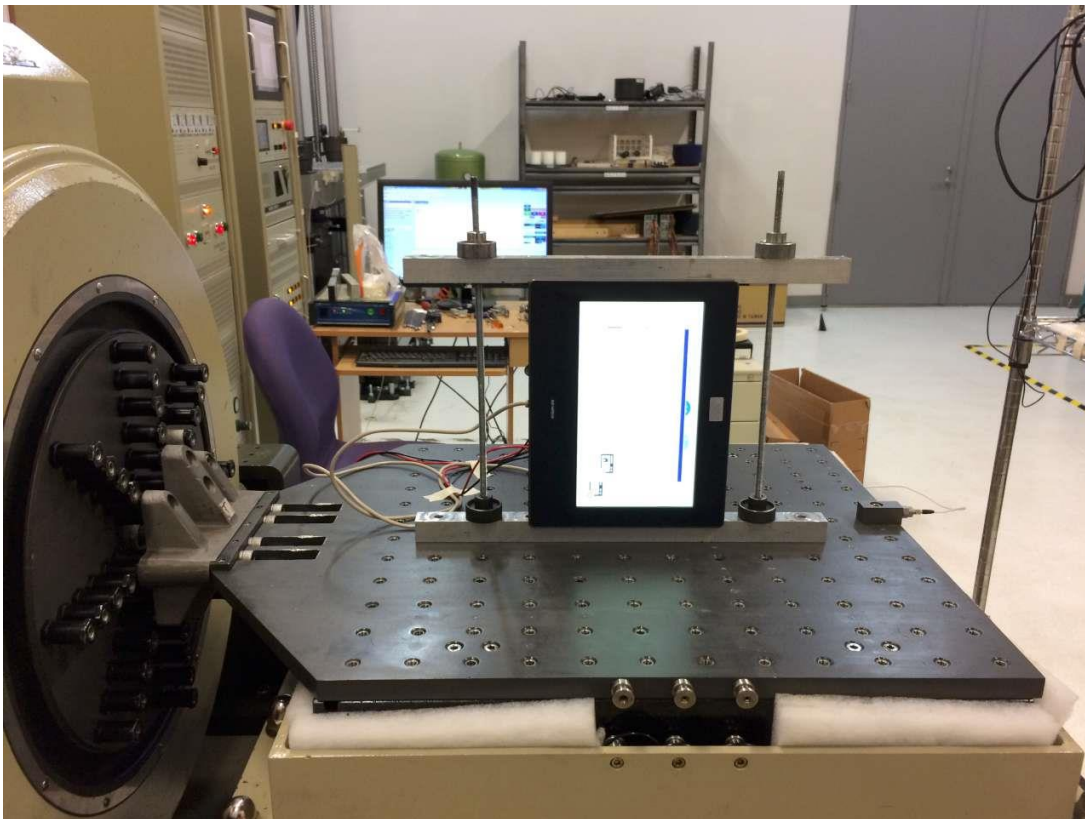
Test Result:

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

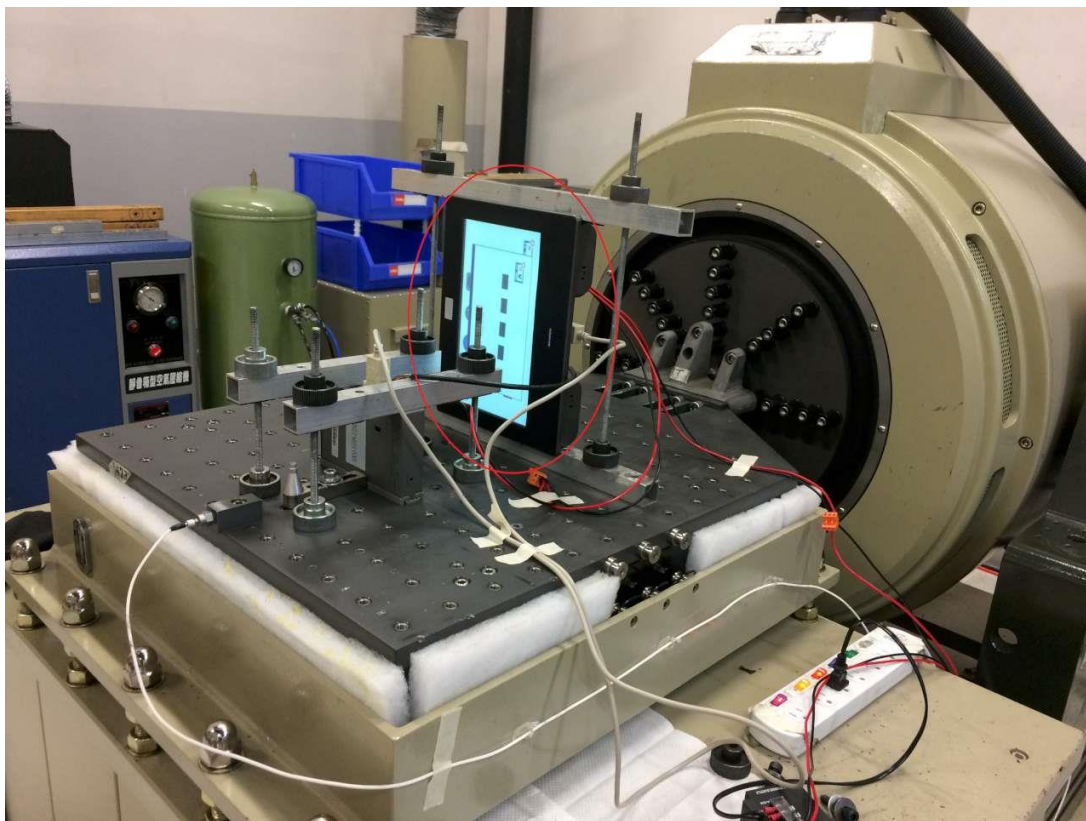
Conclusion:

Passed.

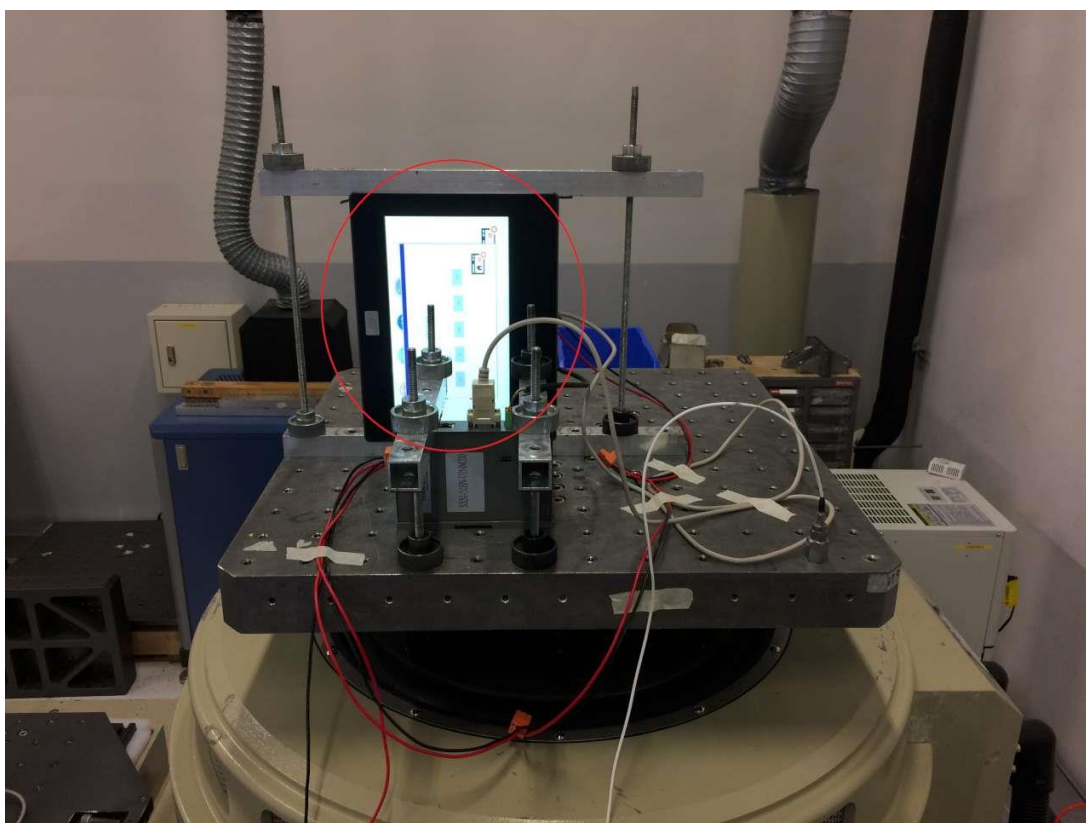
The PT210051STF1Q1C00 meets shock test.

Photo I:

PT210051STF1Q1C00 shock test for +/- X-axis

Photo II:

PT210051STF1Q1C00 shock test for +/- Y-axis

Photo III:

PT210051STF1Q1C00 shock test for +/- Z-axis

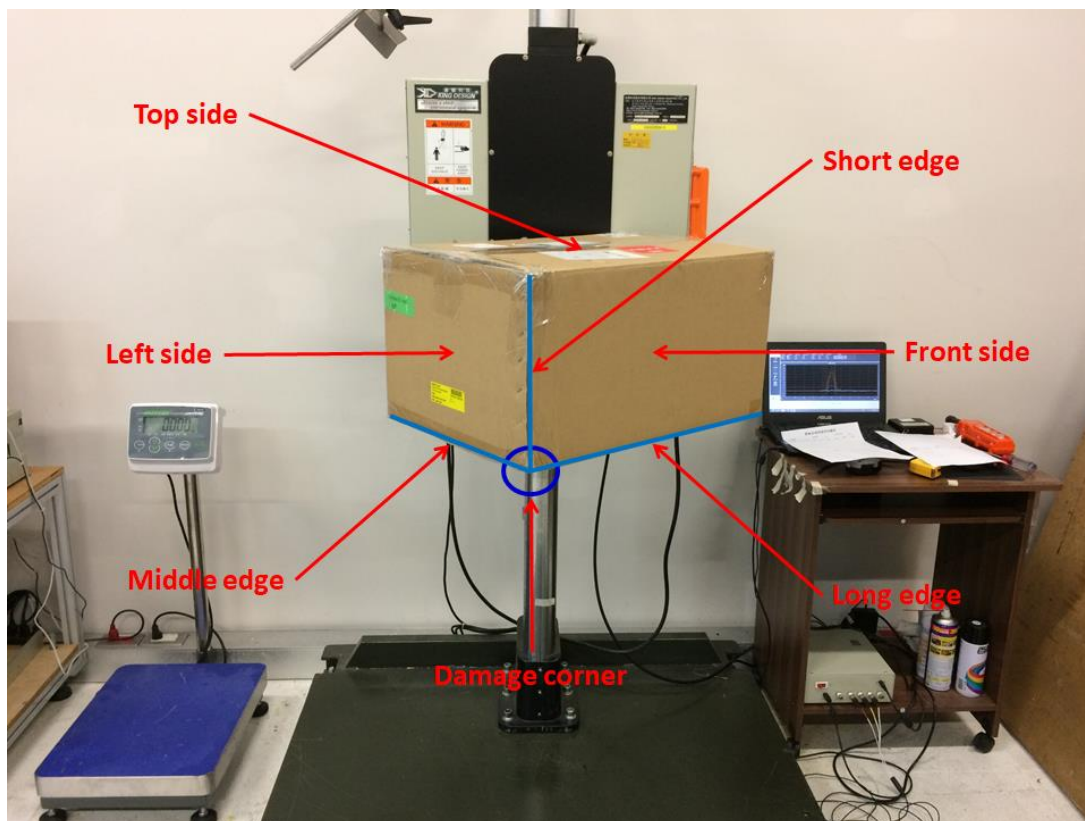
Package Drop Test

Test Date: September 16, 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: 92cm
3. Package Weight: 8.365kg
4. Package Dimension: 540*385*290mm (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 five pieces of PT210051STF1Q1C00 in one carton and package material as below:

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)
8. Carton P/N: 2100015745N000
9. Box P/N: 2100015735T020
10. PE Bag P/N: 2160000619
11. EPE Foam P/N: 2130020444T000

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.

*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.**

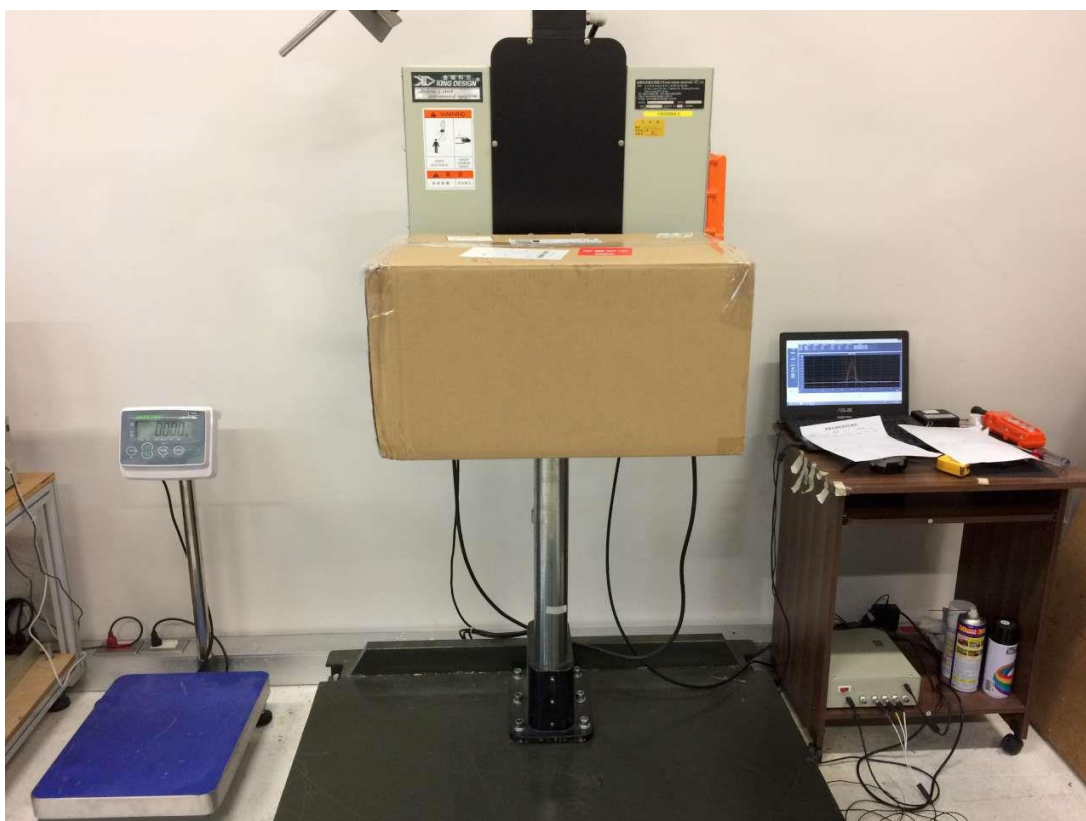
The PT210051STF1Q1C00 meets package drop test.

Photo I:

Shipment package drop test for one corner

*QA Lab Reliability test***Photo II:**

Shipment package drop test for three edges

Photo III:

Shipment package drop test for six faces

QA Lab Reliability test

Photo IV:



Shipment package inside parts

Photo V:



Shipment package inside parts

IP66 Test

Test Date: October 5, 2019 ; October 7, 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 PT210051STF1Q1C00 testing for IP66

1. M/B : 070H01-64
2. CPU : NUC972DF61Y
3. RAM : SRAM=LY62W6416ML-70LLI
4. Flash : NAND Flash=MX30LF1G18AC-TI
5. Panel : All Win Photoelectric Co., Ltd /LCD TC101BM05-08E(96CRP3L-CT1-005)
6. Touch : Guangzhou Easy Touch Co., Ltd / 10.24"AMT 10574 TOUCH
PANEL(96CRP4T-ET0-004)
7. AC/DC Power Supply : DPS-02A-D24 (48W, DC 24V/2.0A)

Performance Criteria:

Visual check after test:

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

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 PT210051STF1Q1C00 meets the IP66 test.

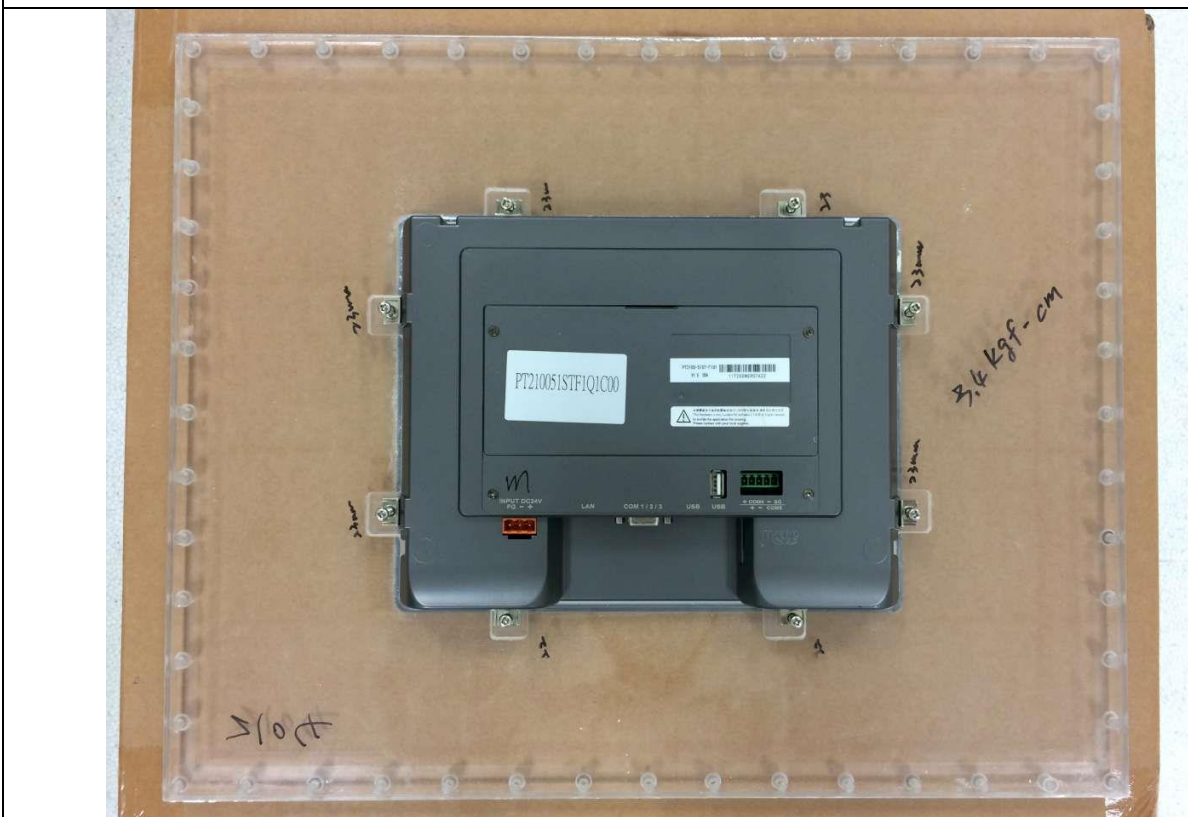
QA Lab Reliability test

Photo:

Dust Test (IEC60529 IP6X)



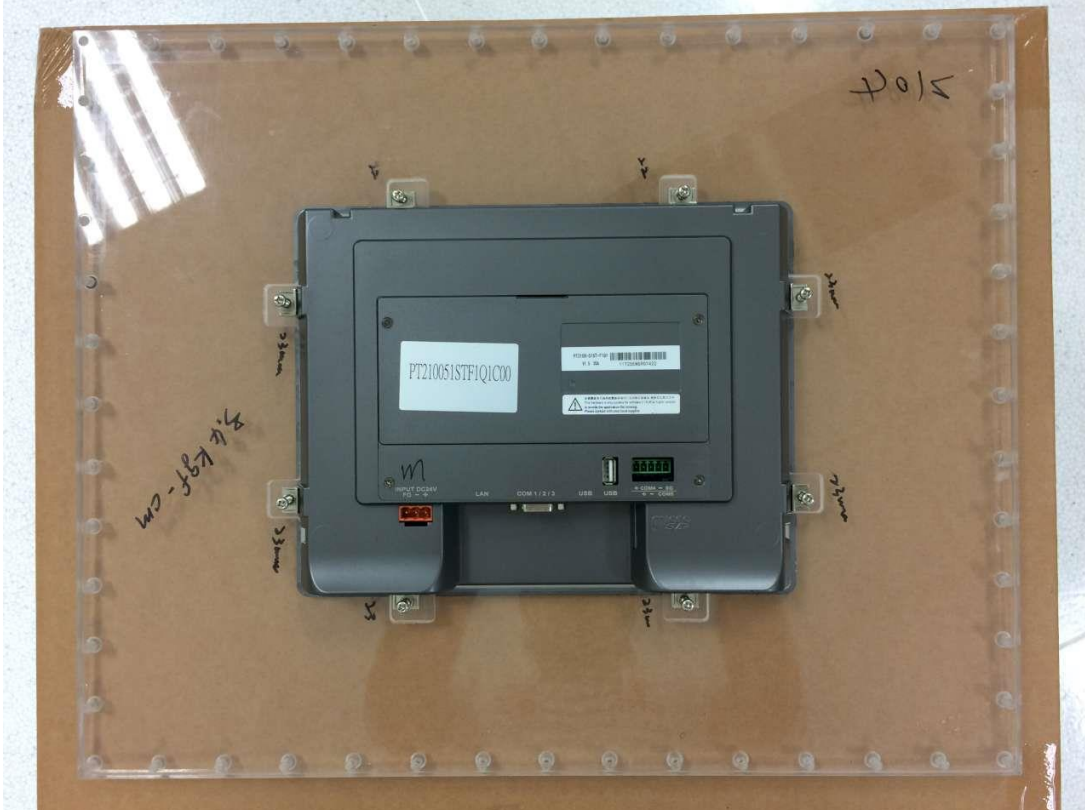
IP6X - Dust test.



IP6X - System internal test status after dust test

Waterproof Test - (IEC60529 IPX6)

IPX6 - Waterproof test



IPX6 - System internal test status after waterproof test