

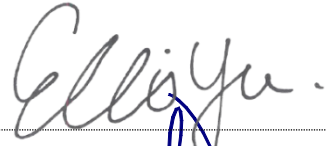
TEST REPORT
IEC 60068 Environmental Testing –
Part 2-1: Test A : Cold and
Part 2-78: Test Cab: Damp heat, steady state and
IEC 61373 Railway applications – Rolling stock equipment –
Shock and vibration tests

Report Number : **2407007**

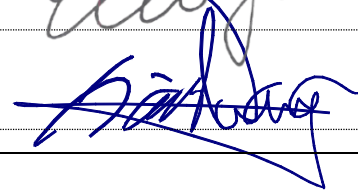
Date of issue : **2024-07-19**

Total number of pages : **19**

Tested by
(name, function, signature) : Ellis Yu /
Engineer



Approved by
(name, function, signature) : David Wang /
Reviewer



Testing Laboratory

Name : Universal Certification Technology Co. Ltd.

Address : 13F-5, No. 93, Sec. 1, Xintai 5th Rd.,
Xizhi Dist., New Taipei City 221,
Taiwan.

Test Location : Same above

Applicant

Name : Vecow Co., Ltd.

Address : 3F., No.10, Jiankang Rd., Zhonghe Dist.,
New Taipei City 23686, Taiwan (R.O.C.)

Test item description

Product name : AI Computing System

Trade mark(s) : Vecow

Model /Type reference..... : RCX-3750-PEG

Rating : DC 16-50V

Test specification

Standard : IEC 60068-2-1: Edition 6.0: 2007
 IEC 60068-2-78: Edition 2.0: 2012
 IEC 61373 Edition 2.0: 2010

Test procedure : - Examine the appearance of specimen by visual check and perform functional check after the test
- Turn on the power of specimen then execute the test program "Burning test", "Allxon Device Management", "OOB" while performing functional check

Test Result : **No visible Damage and Functional check Normal**

General disclaimer

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing Testing Laboratory.

Testing :

Dates of receipt of test item : 2024-05-17

Date(s) of performance of tests : 2024-05-31~2024-06-24

General product information and other remarks :

1. Dimension of test object : 398mm (L) by 253mm (D) by 269mm (H)
2. Weight of test object : 13.32 kg
3. Test sample :
 - Complete enclosure.
 - Individually section of enclosure (see below test method)
4. During test the EUT was operating.
5. The test sample was a pre-production sample without serial number.
6. (Client's declaration) The Configuration of Specimen(s) as shown Below :

For temperature test:

- CPU: 12th Gen Intel® Core™ i9-12900TE @1.10GHz
- RAM: Innodisk 32GB DDR5 4800 W/T UDIMM x 4
- SSD: M.2: Innodisk M.2 (P80) 3TE6 512GB x 1
- SSD: 2.5" SSD: Innodisk 2.5" SATA SSD 3ME4 128GB x 1
- Out-of-Band Module: Vecow OOB-100
- PCI Express PoE+ Expansion Card: Vecow PE-2001H
- OS: Window 11, Burnintest

For Vibration/ Shock Test:

- CPU: 12th Gen Intel® Core™ i9-12900TE @1.10GHz
- RAM: Innodisk 32GB DDR5 4800 W/T UDIMM x 4
- SSD: M.2: Innodisk M.2 (P80) 3TE6 512GB x 1
- SSD: 2.5" SSD: Innodisk 2.5" SATA SSD 3ME4 128GB x 1
- GPU:NVIDIA RTX 3090 x 2
- OS: Window 11, Burnintest

Summary of compliance with standard:

We have tested the submitted sample(s) as requested and the following results were obtained :

Test Required : (According to client's test specification , please see following sheets in detail.)

- 1. Low Temperature Test**
- 2. Damp Heat Test**
- 3. Vibration Test**
- 4. Mechanical Shock Test**

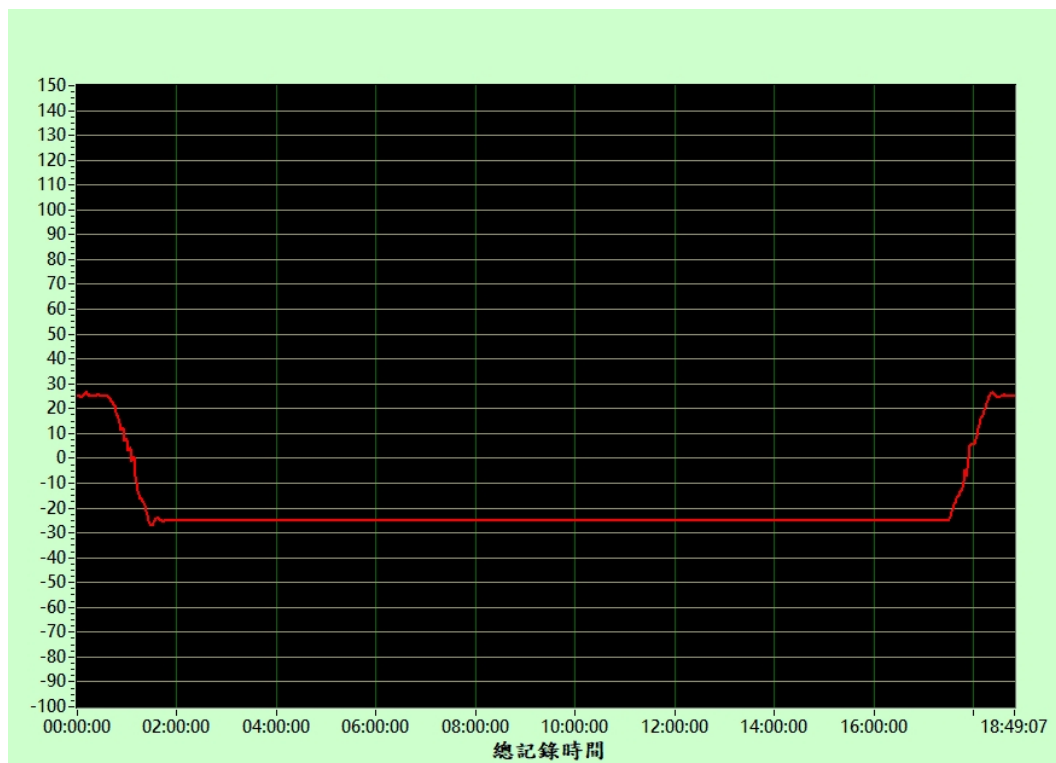
Test Results :

- Please see attached Sheets

1. Low Temperature Test

| Test Equipment : | | | |
|--|-----------------------|--------------------|-------------|
| Name | Brand | Model | Serial No. |
| Programmable Temperature & Humidity Chamber | Giant Force | GTH-408-60-CP-AR | MAA2308-003 |
| Test Laboratory Environment Condition : | | | |
| Temperature (°C) | Relative humidity (%) | Air pressure (kPa) | |
| 15 ~ 35 | 25 ~ 75 | 86 ~ 106 | |
| Test Location : | | | |
| 13F-5, No. 93, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan. | | | |
| Test Method / Specification : | | | |
| IEC 60068-2-1 Edition 6.0: 2007 and client's request | | | |

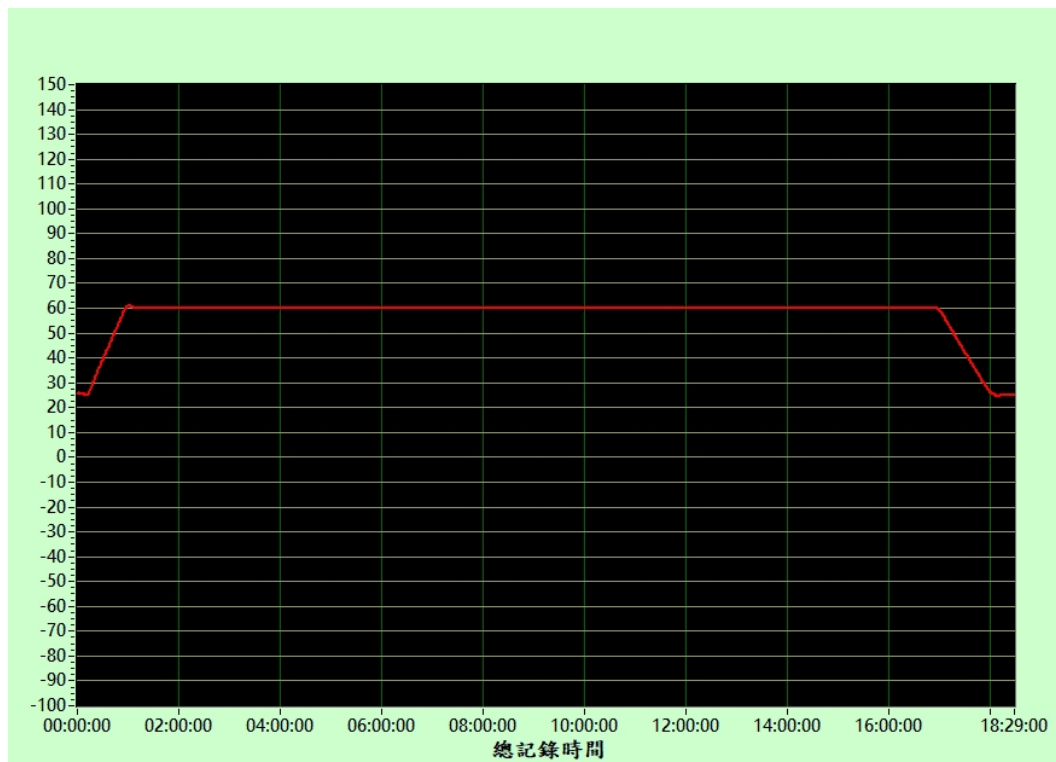
| TABLE: Low Temperature Test | | |
|-----------------------------|-----------|----------------|
| Test temperature | Durations | Curve Chart |
| -25°C | 16hr | during testing |



2. Damp Heat Test

| Test Equipment : | | | |
|--|-----------------------|--------------------|-------------|
| Name | Brand | Model | Serial No. |
| Programmable Temperature & Humidity Chamber | Giant Force | GTH-408-60-CP-AR | MAA2308-003 |
| Test Laboratory Environment Condition : | | | |
| Temperature (°C) | Relative humidity (%) | Air pressure (kPa) | |
| 15 ~ 35 | 25 ~ 75 | 86 ~ 106 | |
| Test Location : | | | |
| 13F-5, No. 93, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan. | | | |
| Test Method / Specification : | | | |
| IEC 60068-2-78 Edition 2.0: 2012 and client's request | | | |

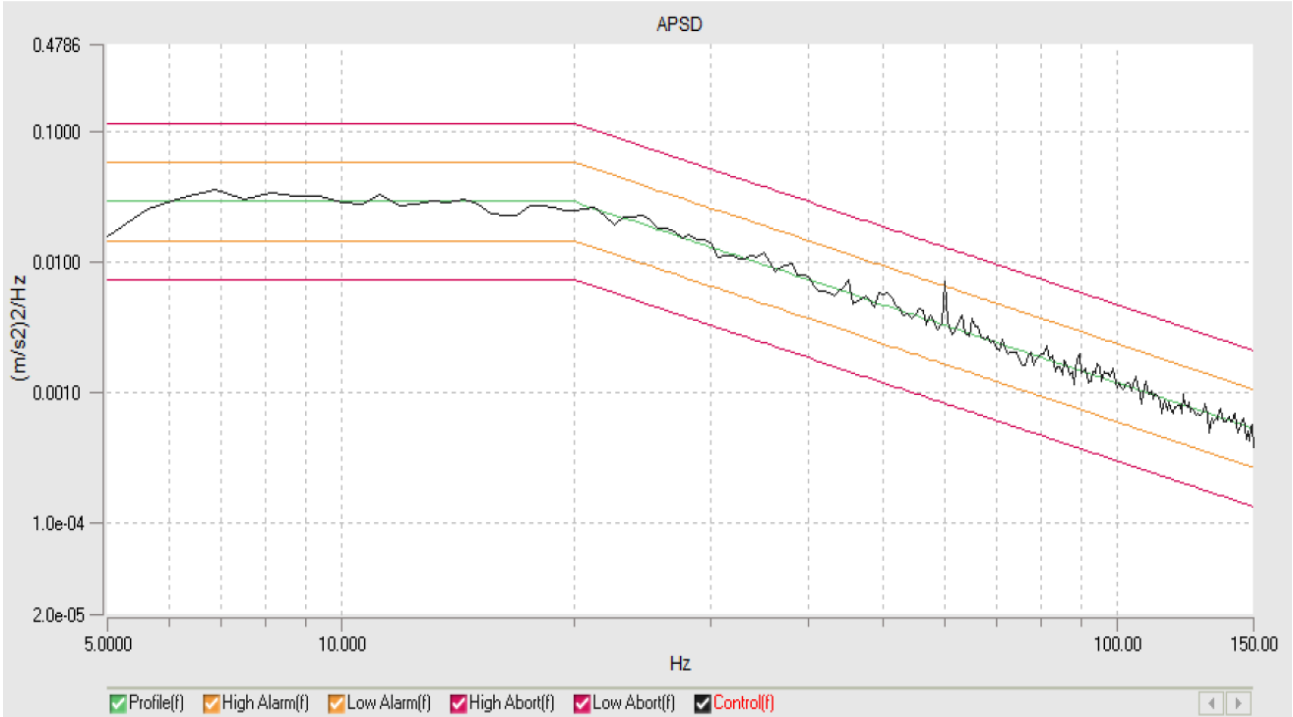
| TABLE: Damp Heat Test | | | |
|-----------------------|---------------|-----------|----------------|
| Test temperature | Test Humidity | Durations | Curve Chart |
| 60°C | 95% RH | 16hr | during testing |



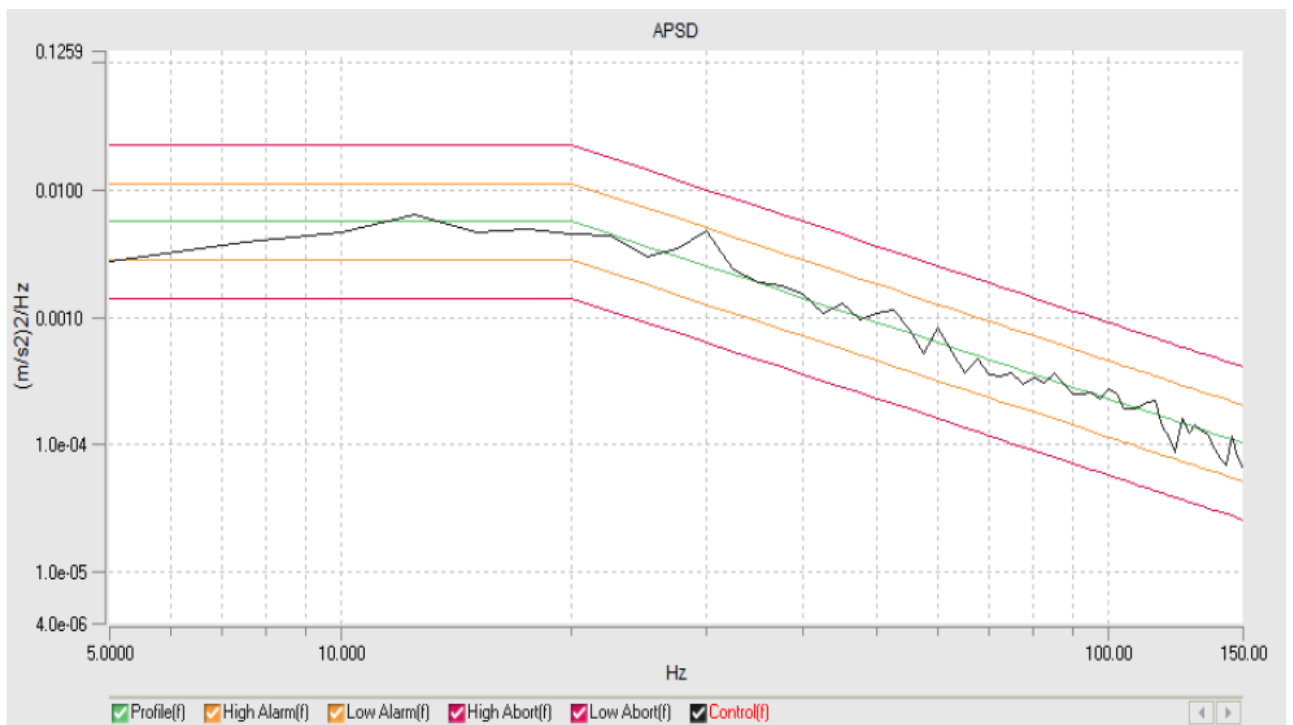
3. Vibration Test

| Test Equipment : | | | | | | | |
|--|--------------------------|-----------------------------|--------------------------|----------------------------|--------------------------|------------|--|
| Name | | Brand | | Model | | Serial No. | |
| Electrodynamics Type Vibration Tester | | Vibration Source Technology | | VS-1000V | | T1001 | |
| Test Laboratory Environment Condition : | | | | | | | |
| Temperature (°C) | | Relative humidity (%) | | Air pressure (kPa) | | | |
| 15 ~ 35 | | 25 ~ 75 | | 86 ~ 106 | | | |
| Test Location : | | | | | | | |
| 13F-5, No. 93, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan. | | | | | | | |
| Test Method / Specification : | | | | | | | |
| IEC 61373 Edition 2.0: 2010 and client's request | | | | | | | |
| Wave form: Random Wave | | | | | | | |
| Frequency: (5~150) Hz | | | | | | | |
| Vertical | | Transverse | | Longitudinal | | | |
| Frequency (Hz) | PSD (g ² /Hz) | Frequency (Hz) | PSD (g ² /Hz) | Frequency (Hz) | PSD (g ² /Hz) | | |
| 5 | 0.007 | 5 | 0.00138 | 5 | 0.0033 | | |
| 150 | 0.007 | 150 | 0.00138 | 150 | 0.0033 | | |
| rms= 0.99 m/s ² | | rms= 0.44 m/s ² | | rms= 0.68 m/s ² | | | |
| Direction: X, Y, Z axes | | | | | | | |
| Duration: 30 minutes/ axis | | | | | | | |

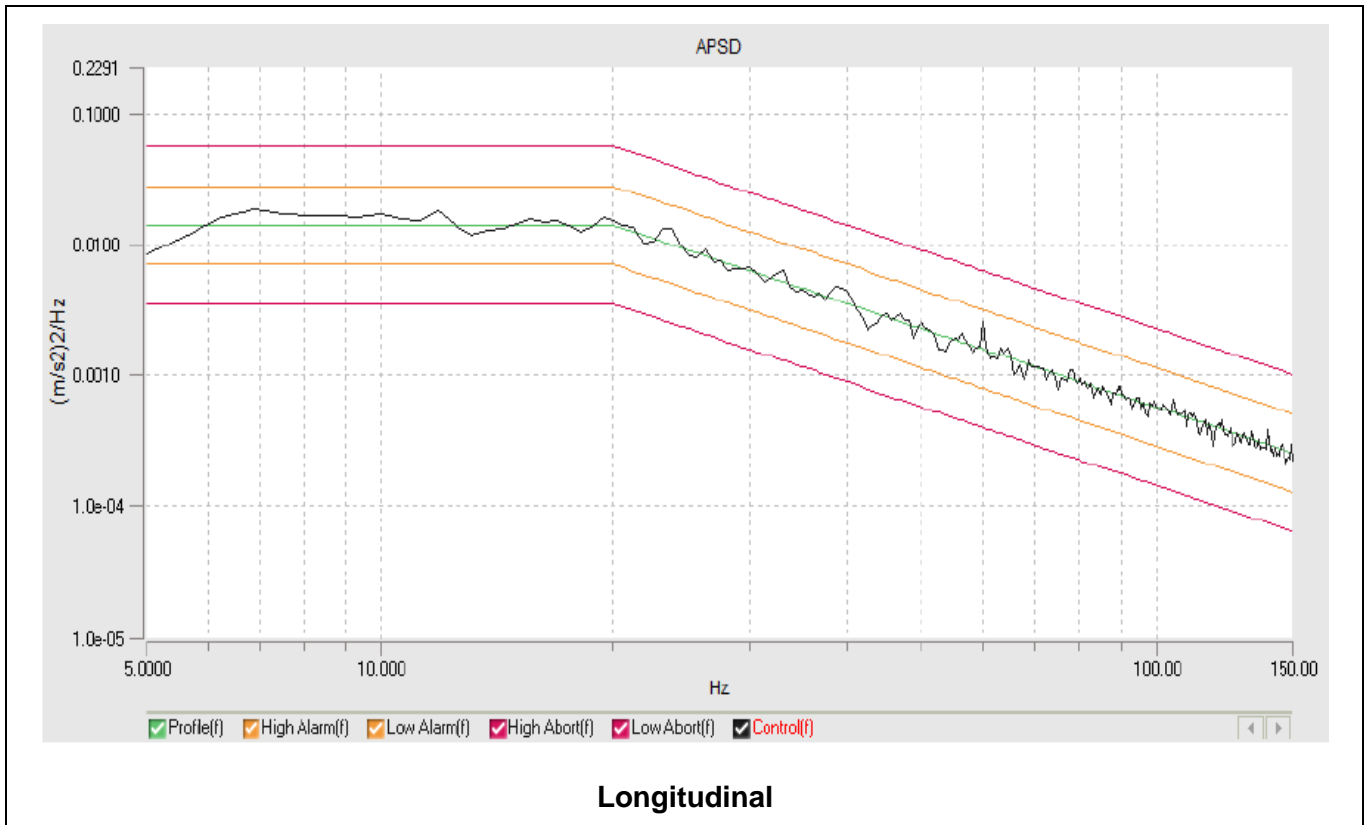
TABLE: Vibration Test



Vertical



Transverse



4. Mechanical Shock Test

| Test Equipment : | | | |
|--|-----------------------------|--------------------|------------|
| Name | Brand | Model | Serial No. |
| Electrodynamics Type Vibration Tester | Vibration Source Technology | VS-1000V | T1001 |
| Test Laboratory Environment Condition : | | | |
| Temperature (°C) | Relative humidity (%) | Air pressure (kPa) | |
| 15 ~ 35 | 25 ~ 75 | 86 ~ 106 | |
| Test Location : | | | |
| 13F-5, No. 93, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan. | | | |
| Test Method / Specification : | | | |
| IEC 61373 Edition 2.0: 2010 and client's request Pulse shape: Half-sine Acceleration: Vertical: 3g Transverse: 3g Longitudinal: 5g Pulse duration: 30 ms Shock direction: ±x, ±Y, ±Z axes No. of shock: 3 shocks/ axis (total 6 shocks) | | | |

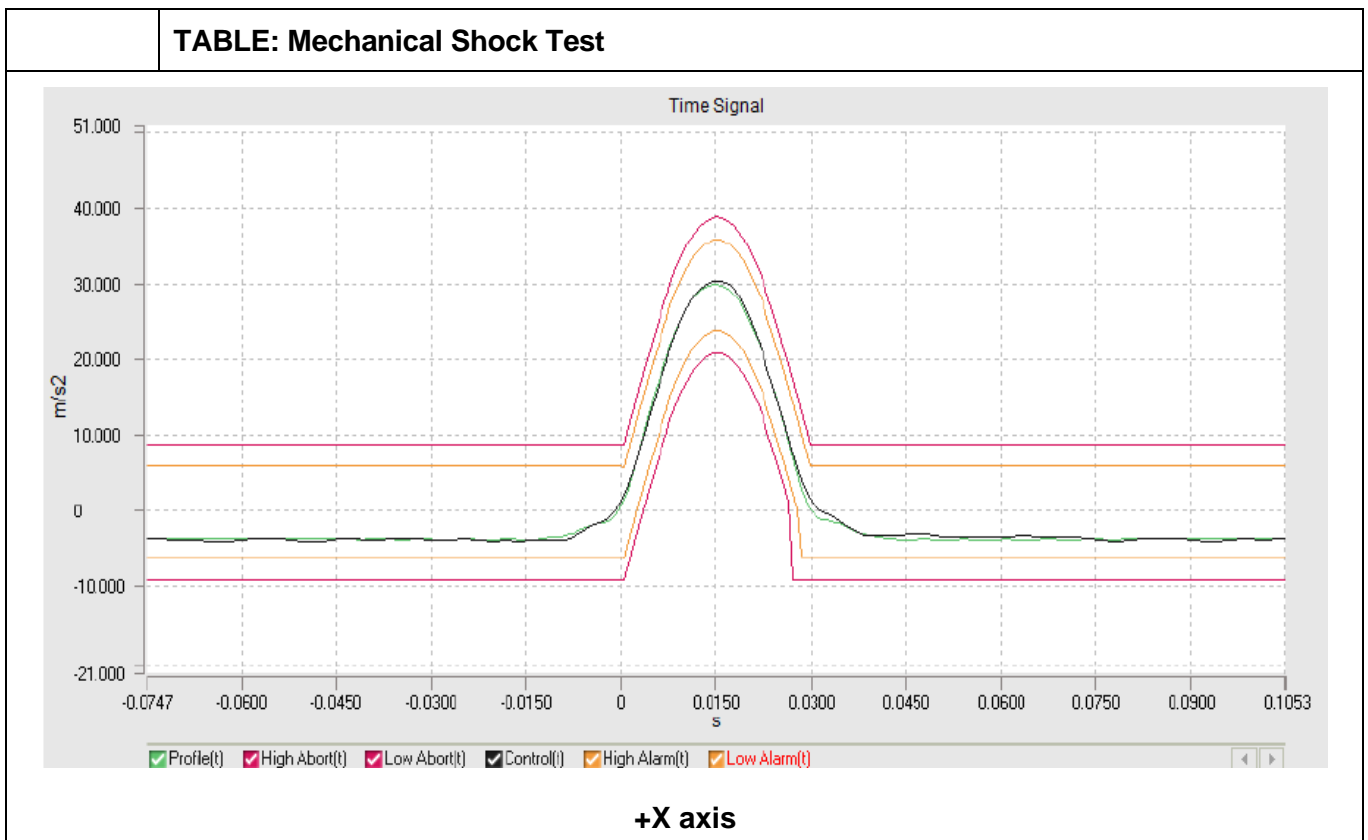
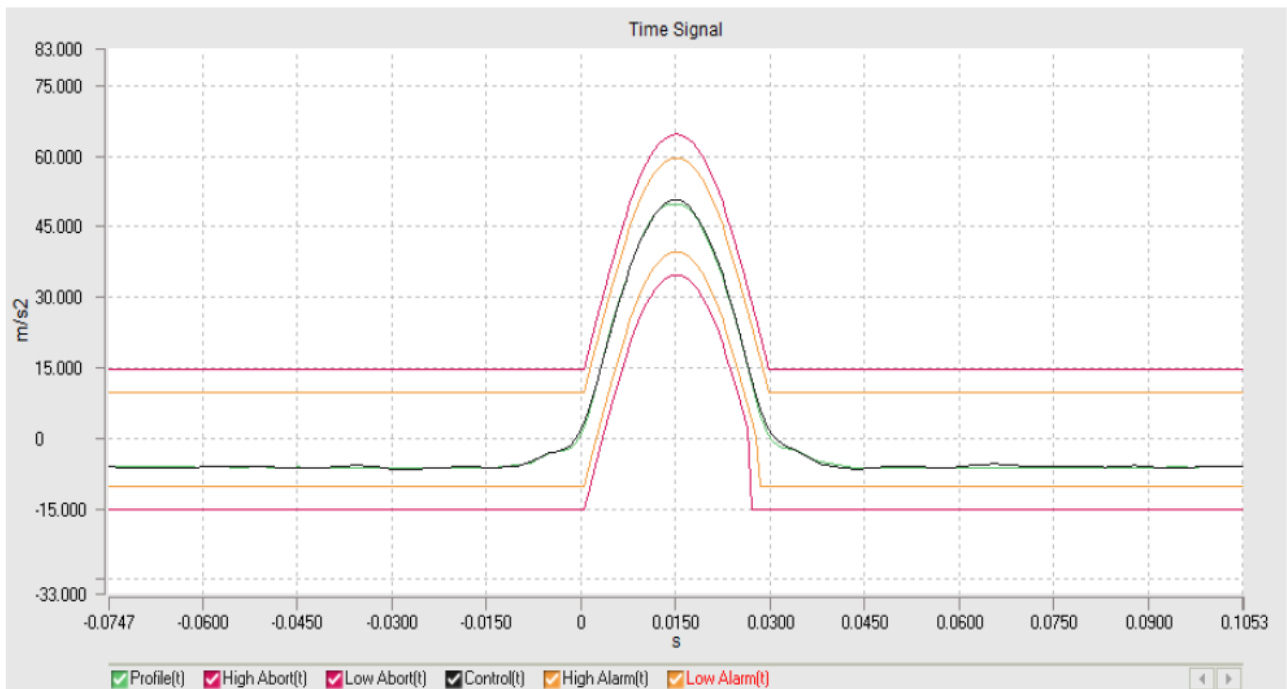


TABLE: Mechanical Shock Test

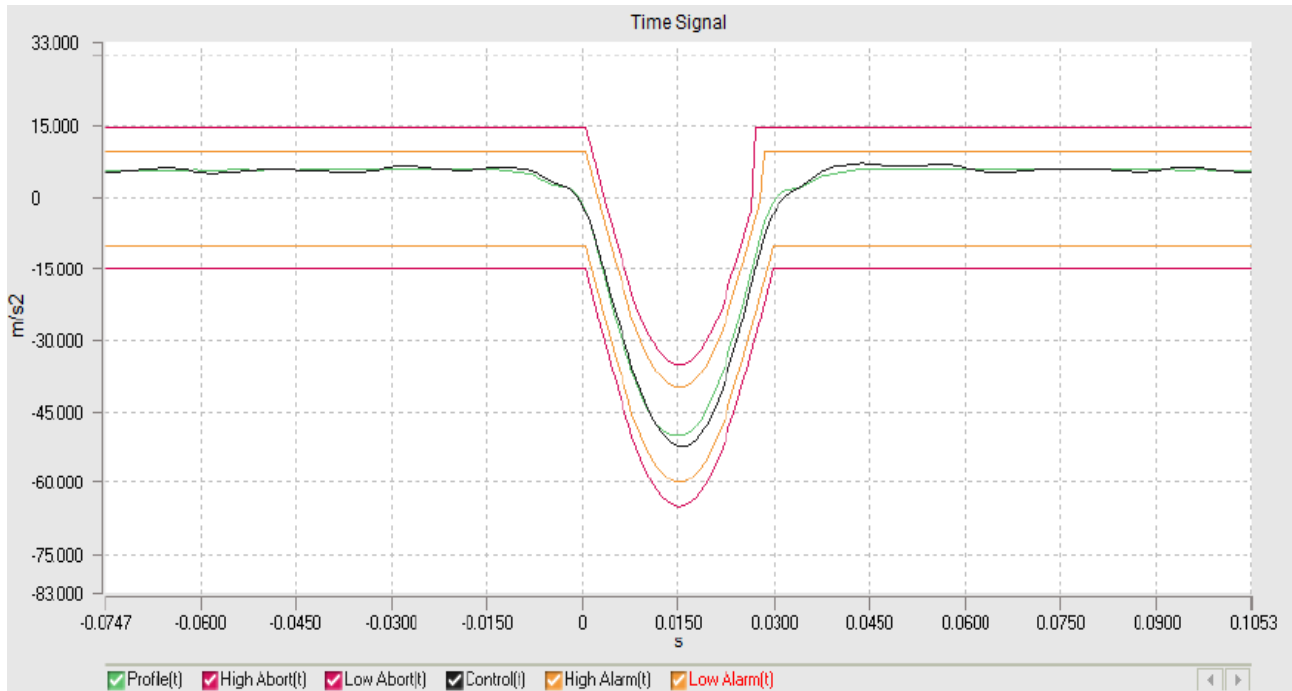


-X axis



+Y axis

TABLE: Mechanical Shock Test

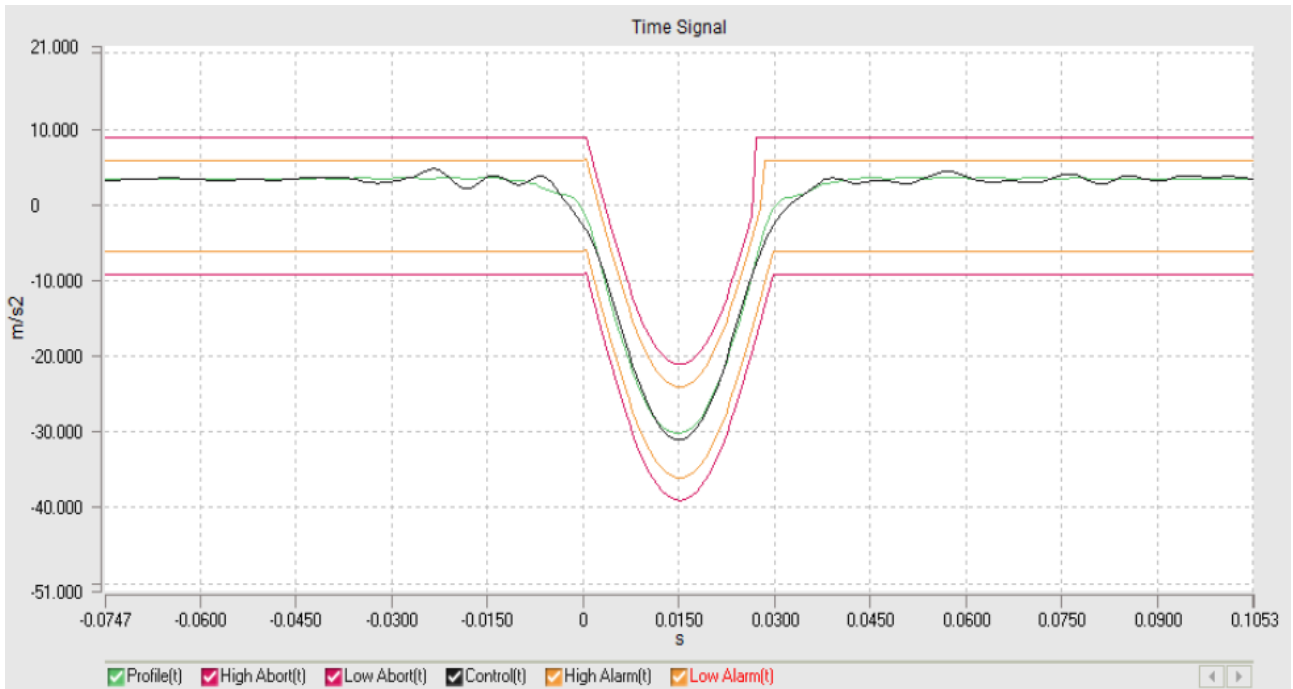


-Y axis



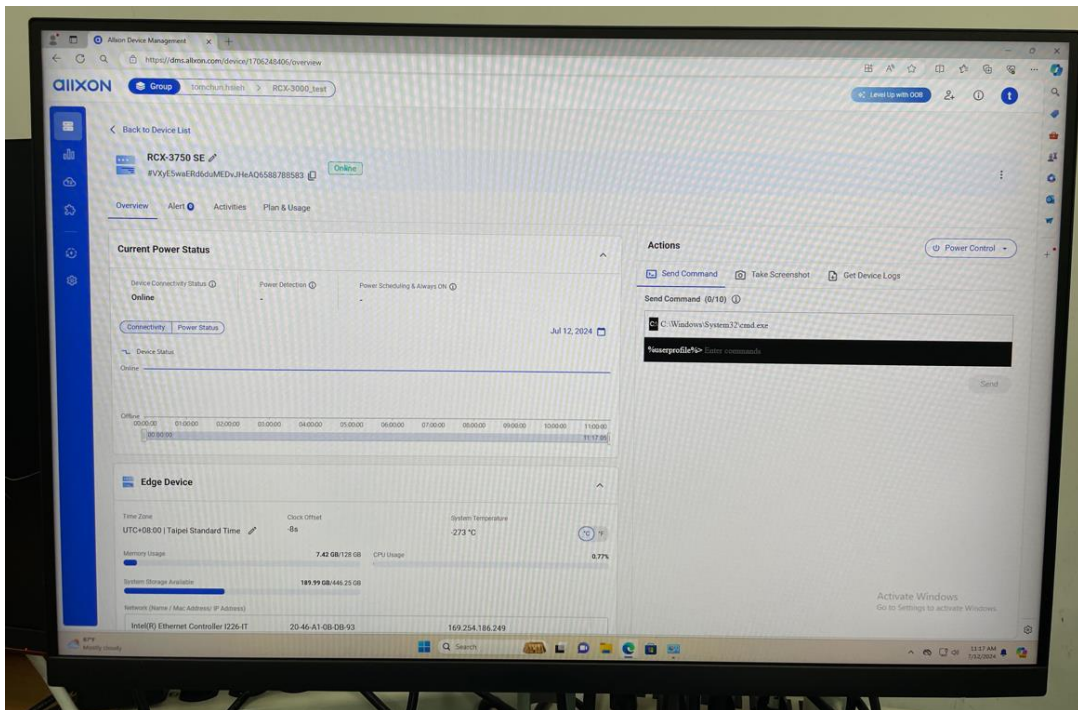
+Z axis

TABLE: Mechanical Shock Test

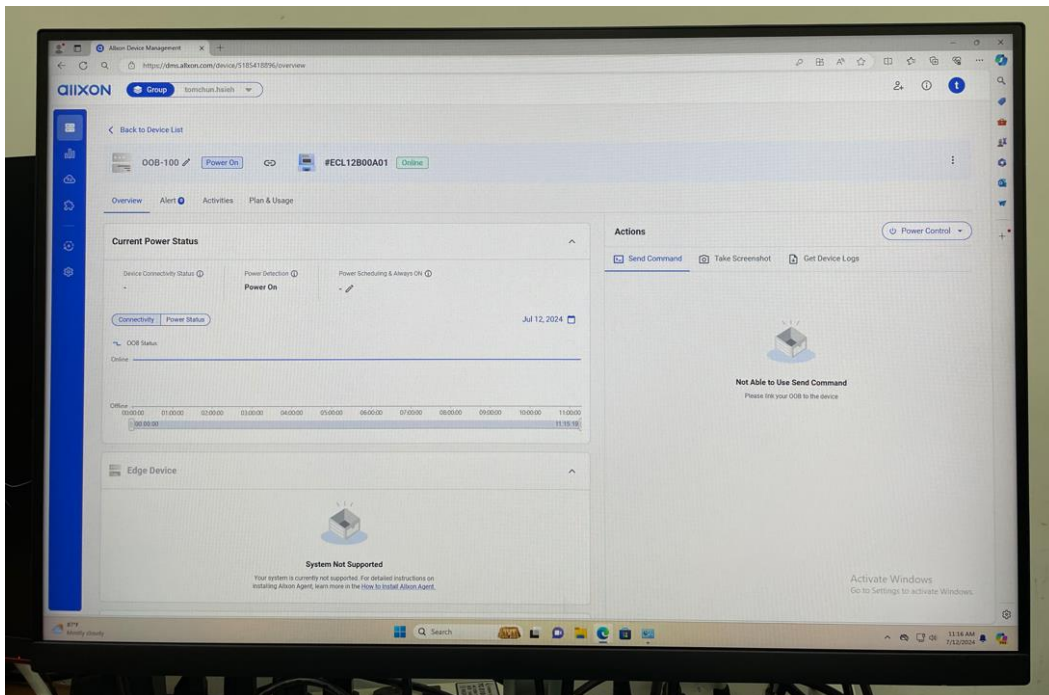


-Z axis

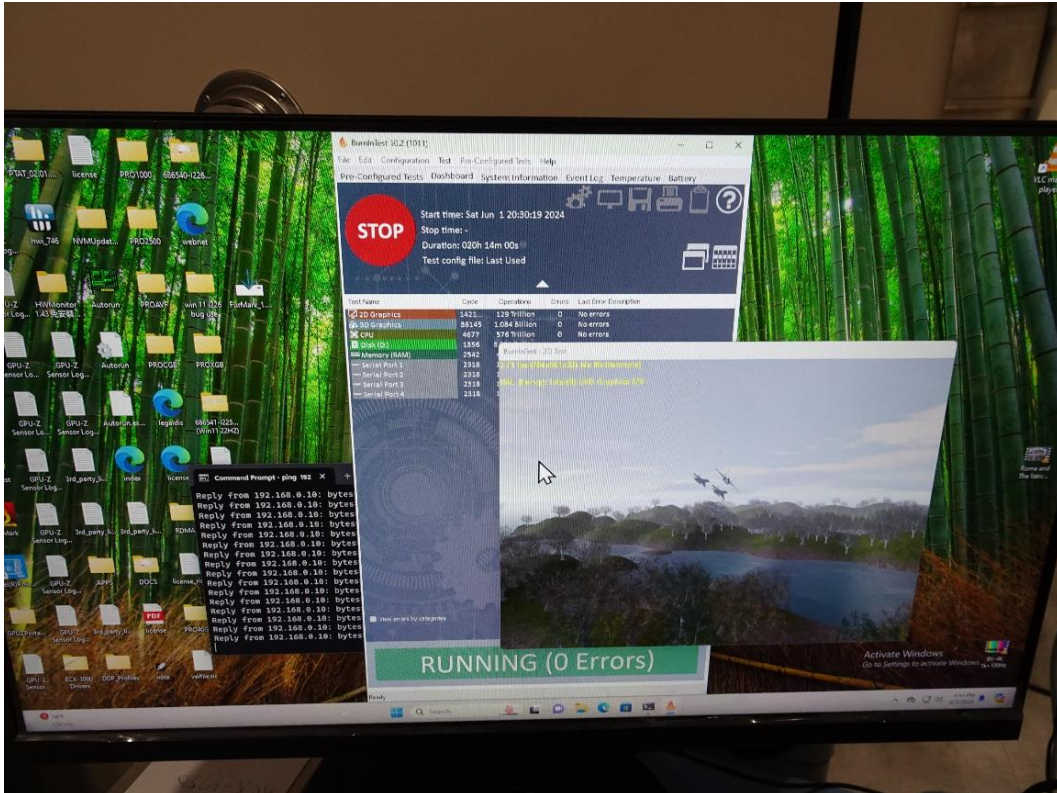
Test photos:



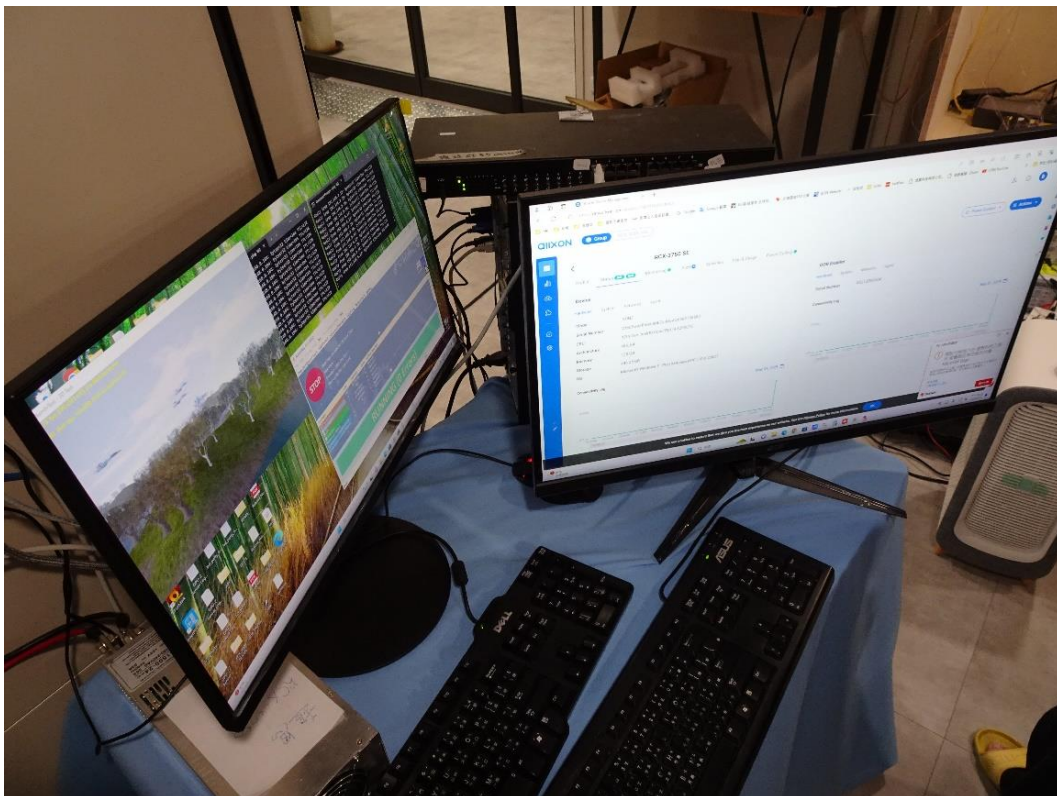
Functional Check



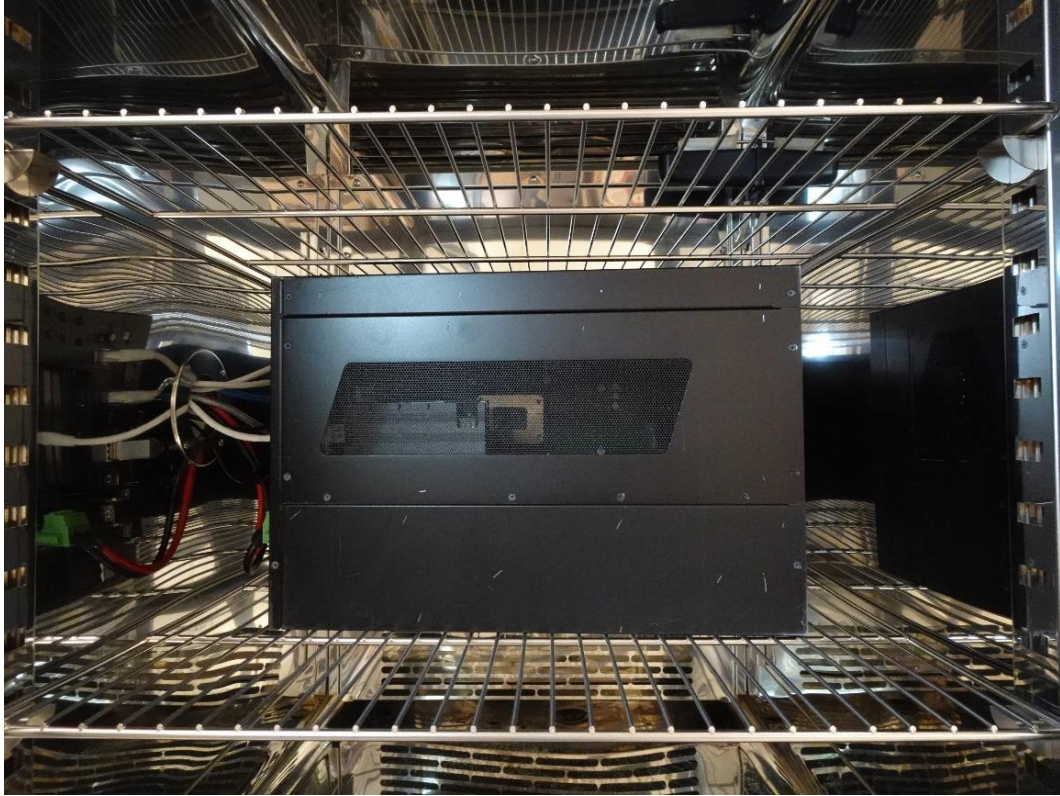
Functional Check



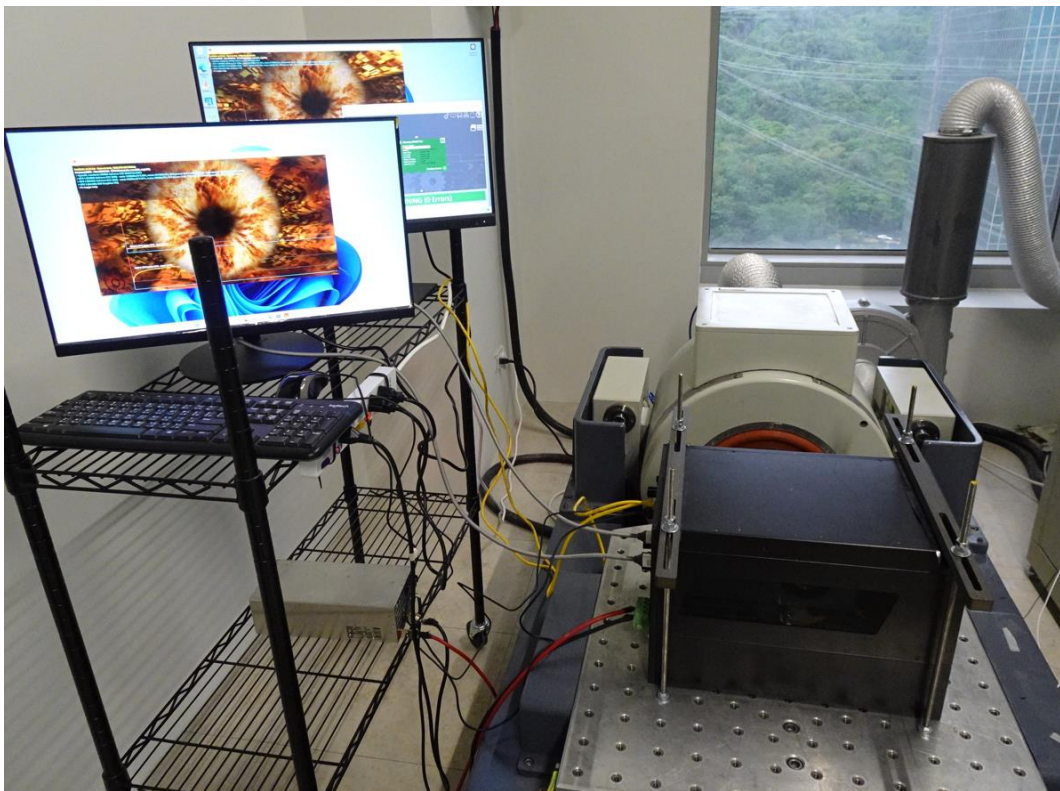
Functional Check



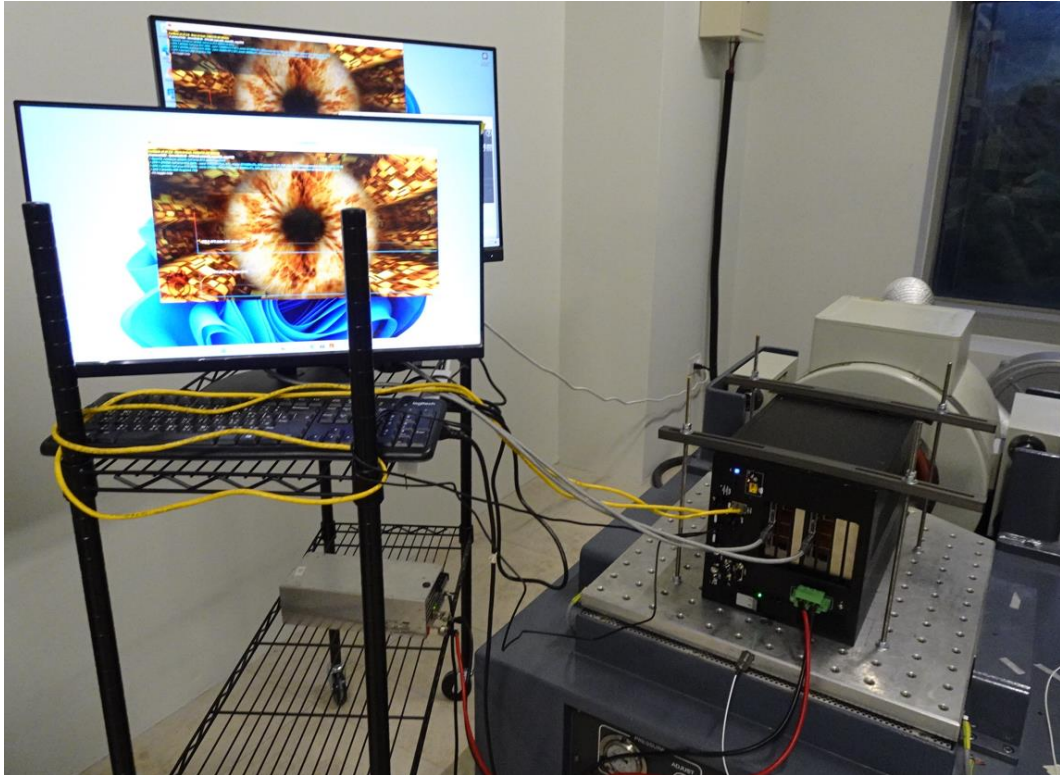
Functional Check



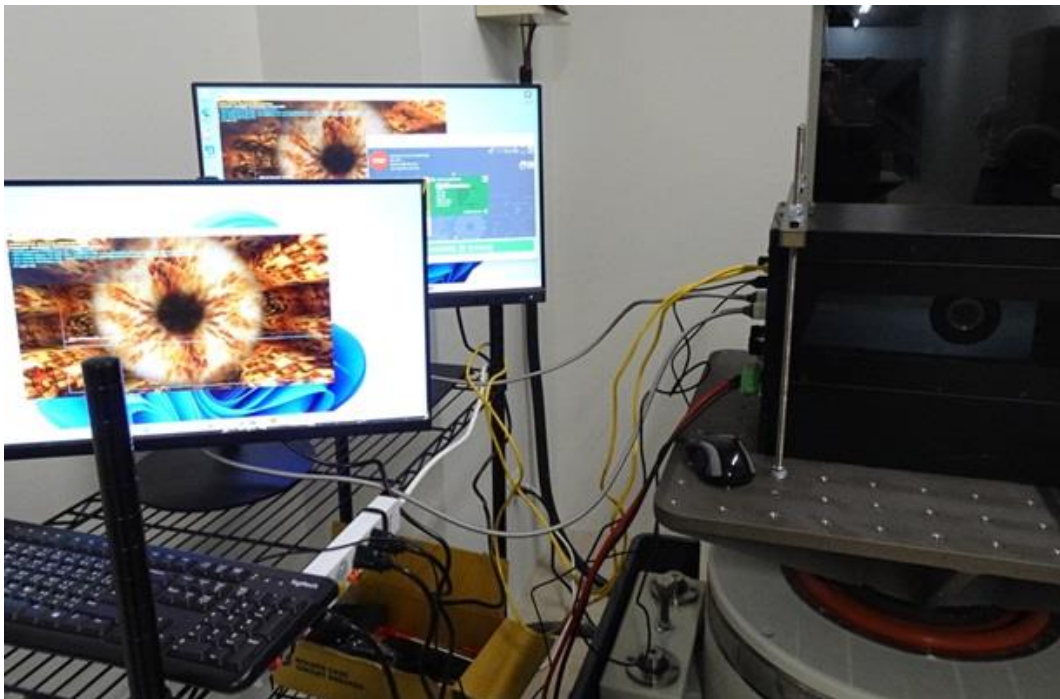
During temperture test



During Vibration/ Shock Test: X axis



During Vibration/ Shock Test: Y axis



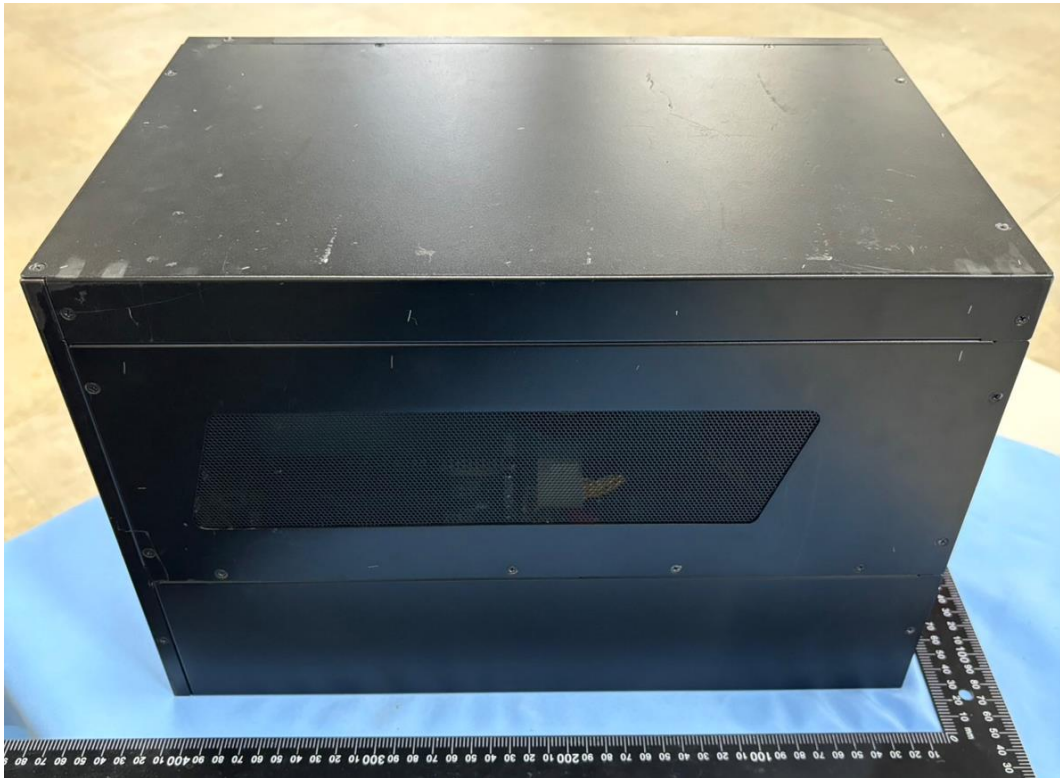
During Vibration/ Shock Test: Z axis



EUT Photographs (Including LAN card OOB-100 and PE-2001H for Temperature test)



EUT Photographs (Including GPU for Vibration/ Shock Test)



EUT Photographs