TEST REPORT
IEC 60945
Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results

Report No.....:	T200922D02-RL
Date of Issue..... .:	Oct. 06, 2020
Total number of pages.....:	41
Testing laboratory .....:	Compliance Certification Services Inc.
Location.....:	No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)
Test Place.....:	6 F,No.605, Zhongshan Rd.,Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)
Applicant.....:	AXIOMTEK CO., LTD.
Address:.....:	8F., No.55, Nanxing Rd., Xizhi Dist, New Taipei city 221, Taiwan
Manufacturer.....:	AXIOMTEK CO., LTD.
Address:.....:	8F., No.55, Nanxing Rd., Xizhi Dist, New Taipei city 221, Taiwan
Standards.....:	IEC 60945 : 2002+Corr.1:2008, clause 5.2.2, 5.2.3, 7.1, 7.2, 8.1, 8.2, 8.3, 8.4, 8.7, 11.1, 11.2 and 12.1.2 IACS E10 NO.9 and 10 IEC 60068-2-1 : 2007 IEC 60068-2-2 : 2007 IEC 60068-2-6 : 2007 IEC 60068-2-30 : 2005
Test procedure.....:	Standard
Non-standard test method.....:	N/A
Type of test equipment .....:	eBOX
Trade mark.....:	AXIOMTEK
Model/Type designation.....:	eBOX100-51R-FL-DC, eBOX100-51R-FL-DCxxxxxx(x can be 0-9, A-Z, a-z, "-", "_", "/" or blank; for marketing purpose)
Rating.....:	I/P : 100-240Vac, 50/60Hz, 1.8A

Declaration:
CCS represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of R.O.C., or National Institute of Standards and Technology (NIST) of U.S.A.
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Tested by:	Reviewed by:
Toy Wang	**Kasim Fan**

Test item particulars:	
Protection against ingress of water……	IPX0
Mass of equipment.(Kg)……..	Approx. 0.7Kg
Testing :	
Date of receipt of test item	Oct. 06, 2020
Date(s) of performance of tests	Reference to report no. T200708D07-RL
Possible test case verdicts:	
-Test case does not apply to the test object.	N(.A.)
-Test object does meet the requirement.	P(ass)
-Test object does not meet the requirement.	F(ail)

General Remarks:

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

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"(see Enclosure #) refers to additional information appended to the report.

“(see appended table)” refers to a table appended to the report.

1	Test data sheet	Page 1 – 41
2	Attachment – A. Acoustic noise and signals test report (report no. YC70002/2020)	Total 1 copy
3	Attachment – B. Compass safe distance test report (report no. 200710002T)	Total 1 copy

Comments:

Sample Number: D20070807-00101

General product information :

1. The equipment consist of one Industrial Computer and one power supply, all testing is combined with SPS : FSP060-DHAN3.
2. Unless otherwise specified the tests were performed on model : eBOX100-51R-FL-DC

Revision History

Rev.	Issue Date	Report Number	Revisions	Effect Page	Revised By
00	Oct. 06, 2020	T200922D02-RL	Original report	N/A	Kasim Fan

TABLE OF CONTENTS

Table of Testing Summary Results

Item	Description	Test Standard	Verdict
1.1	VISUAL INSPECTION	IEC 60945, clause 8.1	Passed
1.2	EXTREME POWER SUPPLY	IEC 60945, clause 5.2.2, 7.1	Passed
1.3	EXCESSIVE CONDITIONS	IEC 60945, clause 5.2.3, 7.2	Passed
1.4	PROTECTION AGAINST ACCIDENTAL ACCESS TO DANGEROUS VOLTAGES	IEC 60945, clause 12.1.2	Passed
2.1	DRY HEAT TEST	IEC 60945, clause 8.2 IEC 60068-2-2	Passed
2.2	DAMP HEAT TEST	IEC 60945, clause 8.3 IEC 60068-2-30	Passed
2.3	LOW TEMPERATURE TEST	IEC 60945, clause 8.4 IEC 60068-2-1	Passed
2.4	VIBRATION TEST	IEC 60945, clause 8.7 IEC 60068-2-6	Passed
2.5	INSULATION RESISTANCE TEST	IACS E10 NO.9	Passed
2.6	HIGH VOLTAGE TEST	IACS E10 NO.10	Passed
2.7	Acoustic noise and signals	IEC 60945, clause 11.1	Passed
2.8	Compass safe distance	IEC 60945, clause 11.2	Passed

1 CHARACTERISTIC TEST

1.1. VISUAL INSPECTION

Product	eBOX
Model/Type designation	eBOX100-51R-FL-DC
CCS sample number:	D20070807-00101

1.1.1. INSPECTION REQUIREMENT

The visual inspection shall be carrier out to ensure that the equipment is of sound construction and, so far as can be ascertained, meets its specified requirements.

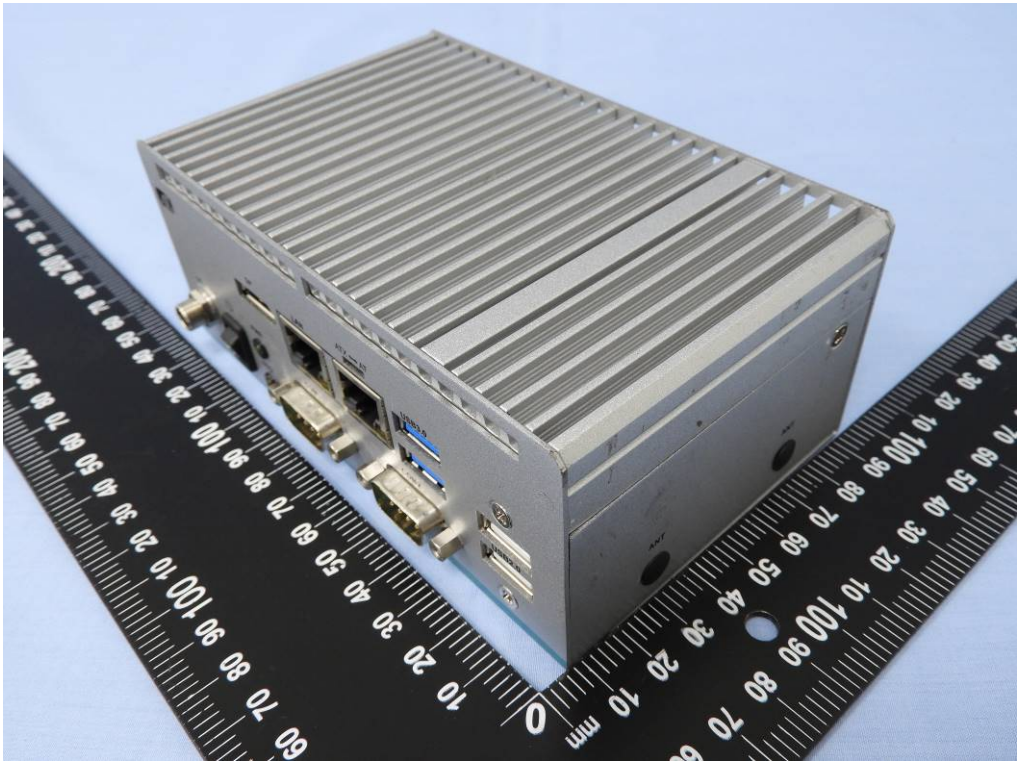
1.1.2. INSPECTION REQUIREMENT

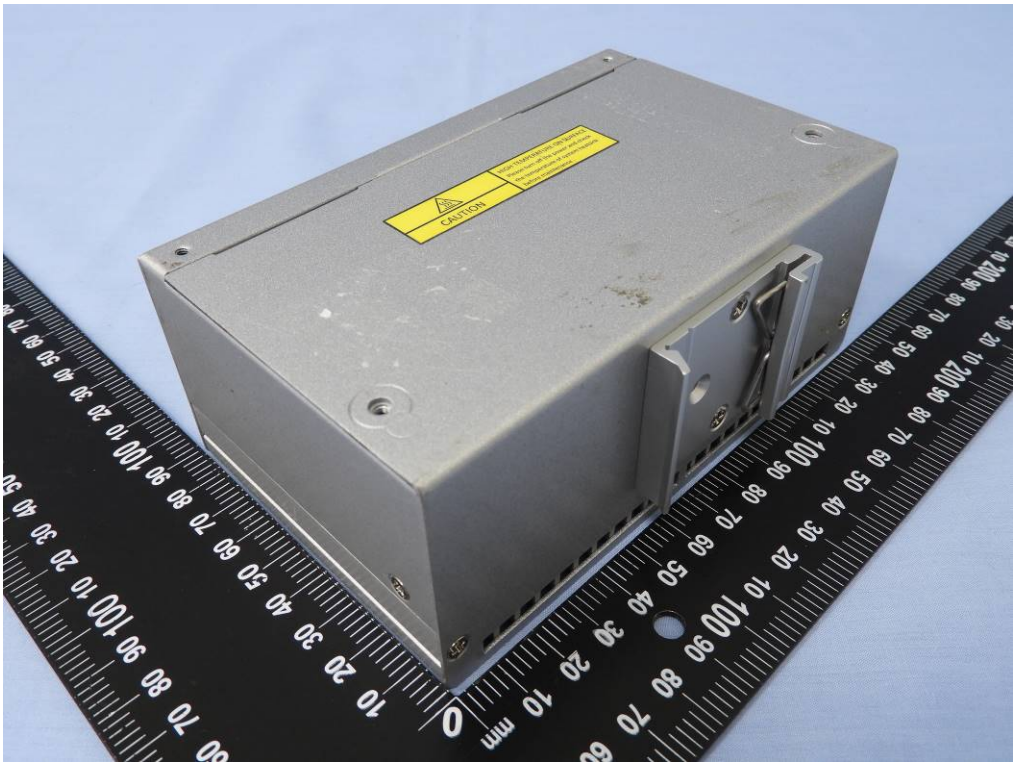
The inspection procedure was in accordance with IEC 60945 clause 8.1.

1.1.3. INSPECTION RESULT

PASSED

1.1.4. EUT PHOTO





1.2.Extreme power supply

1.2.1. TEST REQUIREMENT

Rated voltage= 100-240Vac= Un

Exposures, each with a duration of 15 minutes, are performed at the following supply voltages:

Table 1 – Extreme power supply variation

Power supply	Voltage variation %	Frequency variation %
a.c.	±10	±5
d.c.	+30 −10	Not applicable

The test specimens are observed during the exposures, and a functional test is performed at the end of each exposure.
An additional power supply variations test is performed as part of the functional test during the low temperature and the dry heat test profiles.

1.2.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Digital Power Meter	YOKOGAWA	WT210	27E244101	04.11.2021
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021

1.2.3. TEST PROCEDURE

The test procedure was in accordance with IEC 60945 clause 4.3.1, 5.2.2 and 7.1

1.2.4. TEST RESULTS

Temperature	23.5°C	**Humidity**	56.8% RH
Pressure	1012.4mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

NO.	Input Voltage (Un)	Test Voltage		Test time	Result /Observation
1	100Vac/50Hz	-10%Un	90Vac	-5%Fn	47.5Hz
2	100Vac/60Hz	-10%Un	90Vac	+5%Fn	63.0Hz
3	100Vac/50Hz	Un	100Vac	-5%Fn	47.5Hz
4	100Vac/60Hz	Un	100Vac	+5%Fn	63.0Hz
5	240Vac/50Hz	Un	240Vac	-5%Fn	47.5Hz
6	240Vac/60Hz	Un	240Vac	+5%Fn	63.0Hz
7	240Vac/50Hz	+10%Un	264Vac	-5%Fn	47.5Hz
8	240Vac/60Hz	+10%Un	264Vac	+5%Fn	63.0Hz

1.2.5. TEST PHOTO

Supply variations Test(Test Voltage: 90Vac/47.5Hz)

Supply variations Test(Test Voltage: 264Vac/63.0Hz)

1.3.Excessive conditions

1.3.1. TEST REQUIREMENT

a) Power Supply Misconnection Test

- The test specimens are subjected to an input from a power supply of reversed polarity for a period of 5 minutes.
- After completion of the test and reset of the protection of the test specimens, if required, the power supply shall be connected normally and a performance check shall be carried.

b) Excessive Current Test

- Short circuit the Positive and Negative input after the fuse in the EUT.

c) Excessive Voltage Test

- Excessive voltage is greater than that specified in 5.2.2. Protection shall be provided against such excesses at an appropriate level chosen by the manufacturer.

1.3.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Digital Power Meter	YOKOGAWA	WT210	27E244101	04.11.2021
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021

1.3.3. TEST PROCEDURE

The test procedure was in accordance with IEC 60945 clause 4.3.2, 5.2.3 and 7.2

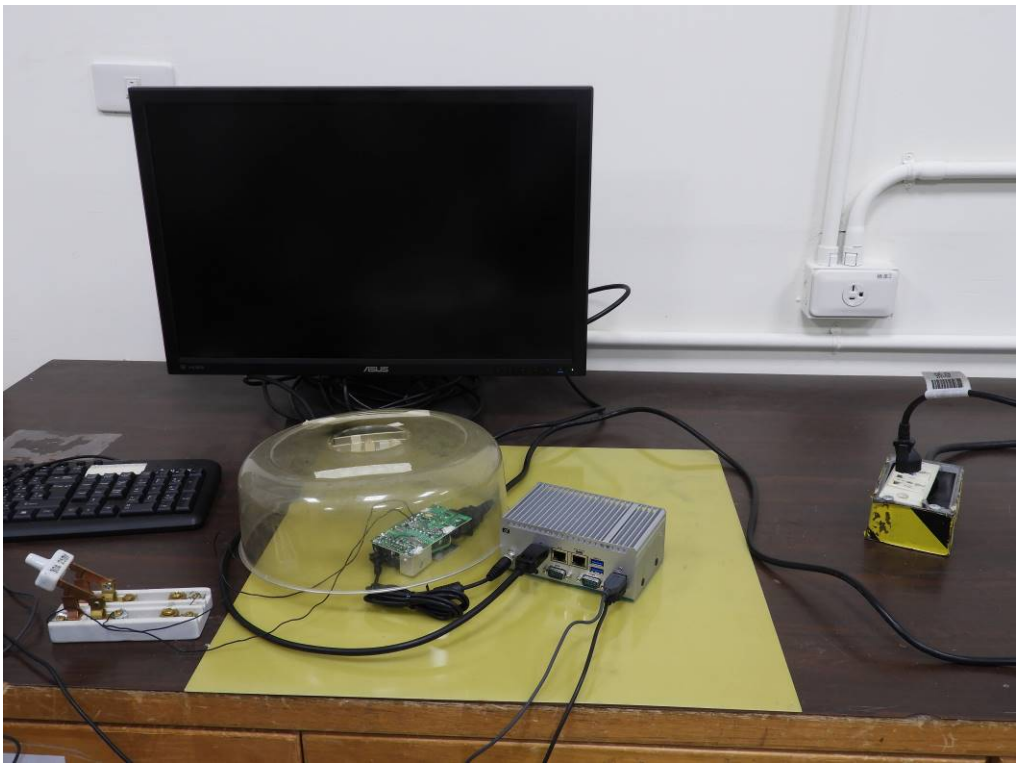
1.3.4. TEST RESULTS

Temperature	20.6℃	Humidity	54.2% RH
Pressure	1007.2mbar	Tested By	Toy Wang
TEST RESULTS		PASSED	

NO.	Test Voltage (Un)	Test time	Result /Observation
Power Supply Misconnection Test :			
a	264Vac	5 min.	- The unit normal operation.
Excessive Current Test :			
b	264Vac	5 min.	- Fuse opened immediately, the unit shut down. (The unit normal operation after replacing a new fuse of the same rating.)
Excessive Voltage Test :			
c	264Vac → 400Vac	10 min.	- The unit shut down and adapter damage when input voltage is supplied at 400Vac. (The unit normal operated after replacing a new adapter and supplied 264Vac.)

No malfunction of the test specimens occurs during exposure.
During and after completion of the test, the function of the test specimens was OK.

1.3.5. TEST PHOTO



Excessive Current Test

Excessive Voltage Test

1.4.DANGEROUS VOLTAGES TEST

1.4.1. TEST REQUIREMENT

For low-voltage equipment (rated voltages not exceeding 1000 V a.c. and 1500 V d.c.) the test finger shall be connected to a low-voltage supply (of not less than 40 V and not more than 50 V) in series with a suitable lamp connected between the access probe and the hazardous parts inside the enclosure.

1.4.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Digital Multimeter	FLUKE	15B	18060325	10.15.2020
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021
Test Finger	TESTING	--	TP12	09.18.2020

1.4.3. TEST PROCEDURE

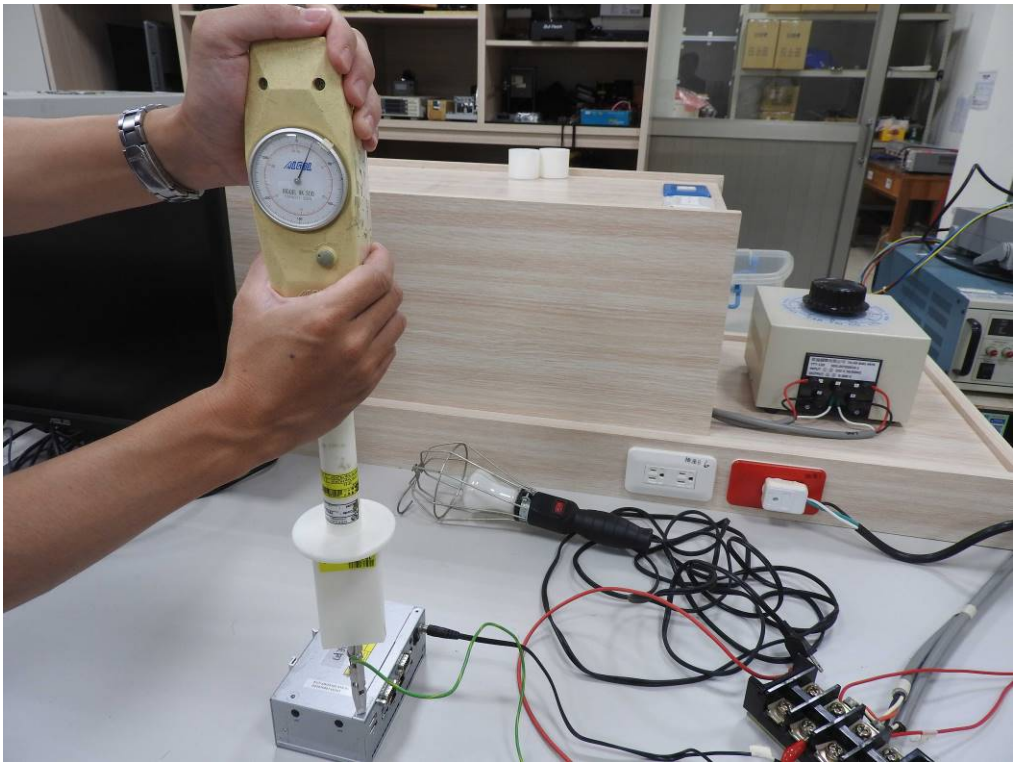
The test procedure was in accordance with IEC 60945- clause 12.1.2.

1.4.4. TEST RESULTS

Temperature	20.6°C	**Humidity**	54.2% RH
Pressure	1007.2mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

For the low voltage test, the lamp shall not light.

1.4.5. TEST PHOTO



Dangerous voltages test

2 ENVIRONMENTAL TEST

2.1. DRY HEAT TEST

2.1.1. TEST REQUIREMENT

The EUT is placed in a chamber at normal room temperature and relative humidity. The EUT and if appropriate, any climatic control devices with which it is provided shall then be switched on. The temperature shall then be raised to and maintained at the maximum operating temperature specified with a maximum deviation of ± 3 °C. At the end of a soak period of 10 h to 16 hours, the EUT shall be subjected to a performance test and check. The temperature of the chamber shall be maintained at the maximum operating temperature ± 3 °C during the whole performance test period. At the end of the test, the EUT shall be returned to normal environmental conditions.

2.1.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021
Temperature & Humidity Chamber	CTF	LY-4S-TH	2013012302	05.05.2021

2.1.3. TEST PROCEDURE

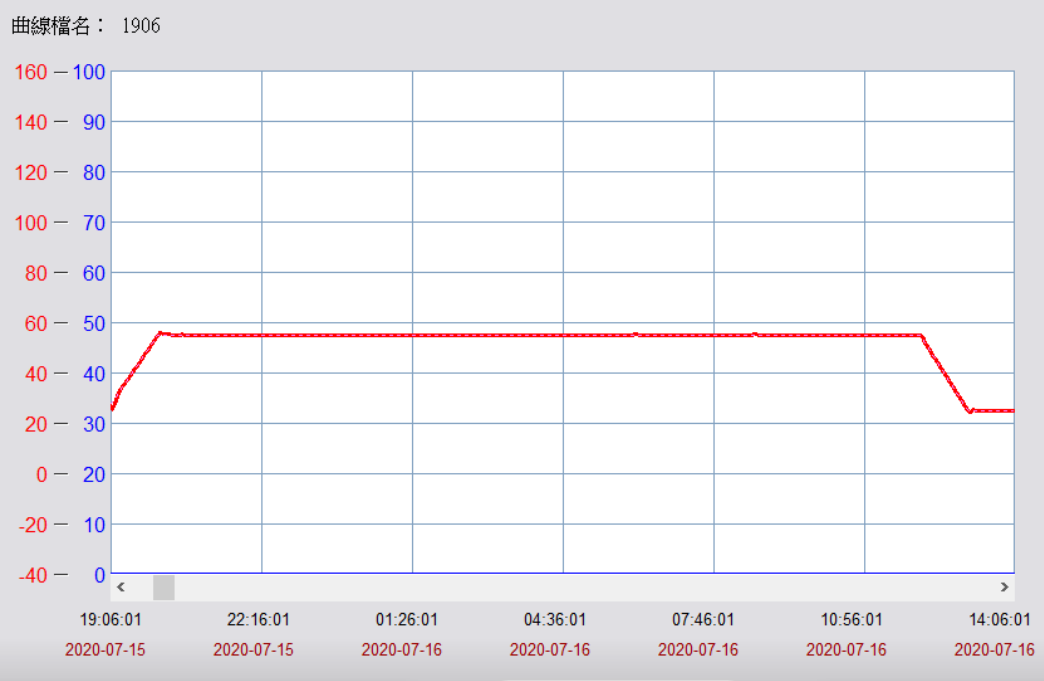
The test procedure was in accordance with IEC60068-2-2.

2.1.4. TEST RESULTS

Temperature	24.4ºC	**Humidity**	53.2% RH
Pressure	1011.5 mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

Condition	Temperature ℃	Duration	Observation
Operating	55 ℃	16 Hours	No Deviation

2.1.5. TEST PHOTO



2.2.DAMP HEAT TEST

2.2.1. TEST REQUIREMENT

The EUT shall be placed in a chamber at normal room tem
perature and relative humidity. The temperature shall then be raised to +40 °C ± 2 °C, and the relative humidity raised to 93 % ± 3 % over a period of 3 h ± 0,5 h. These conditions shall be maintained for a period of 10 h to 16 h.
Any climatic control devices provided in the EUT may be switched on at the conclusion of this period. The EUT shall be switched on 30 min later, or after such period as agreed by the manufacturer, and shall be kept operational for at least 2 h during which period the EUT shall be subjected to a performance check as specified in the relevant equipment standard. The temperature and relative humidity of the chamber shall be maintained as specified the whole test period. At the end of the test period and with the EUT still in the chamber, the chamber shall brought to room temperature in not less than 1 h. At the end of the test the EUT shall be returned to normal environmental conditions.

2.2.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021
Temperature & Humidity Chamber	CTF	LY-4S-TH	2013012302	05.05.2021

2.2.3. TEST PROCEDURE

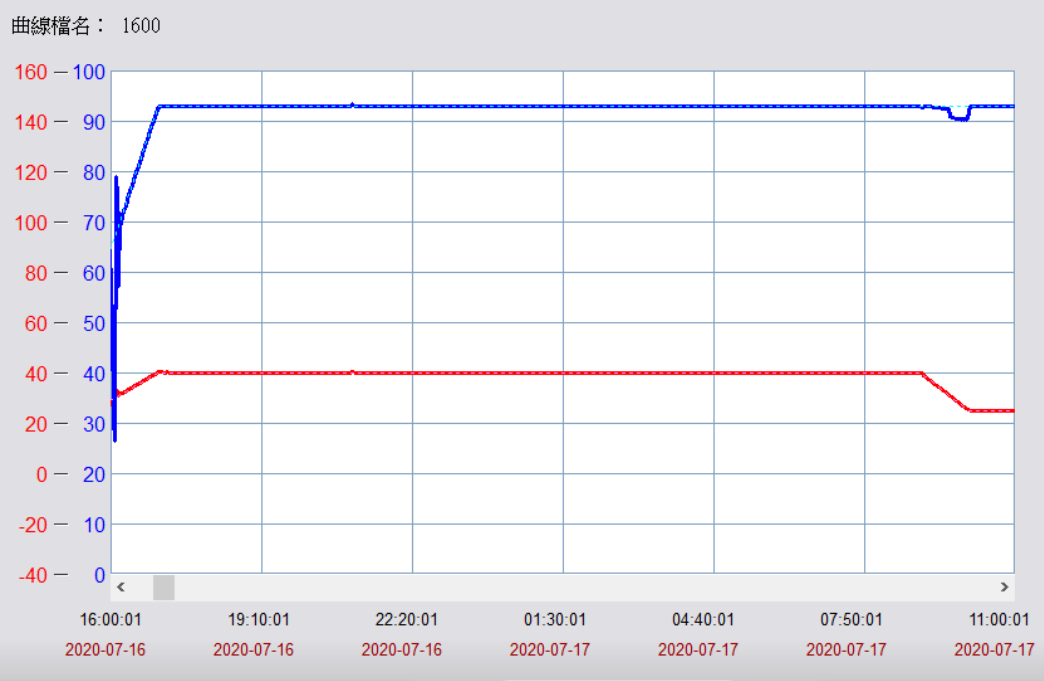
The test procedure was in accordance with IEC 60068-2-30.

2.2.4. TEST RESULTS

Temperature	24.2ºC	**Humidity**	52.4% RH
Pressure	1018.8 mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

Temperature	Humidity	Duration	Observation
40˚C	93%	16 Hours	No Deviation

2.2.5. TEST PHOTO



2.3.LOW TEMPERATURE TEST

2.3.1. TEST REQUIREMENT

The EUT shall be placed in a chamber at normal room temperature and relative humidity. The temperature shall then be reduced to, and maintained at –15°C ± 3°C, for a period of 10 h to 16h. Any climatic control devices provided in the EUT may be switched on at the conclusion of this period. The EUT shall be switched on 30 min later, or after such period as agreed by the manufacturer, and shall be kept operational for at least 2 h during which period the EUT shall be subjected to a performance check test and check as specified in the relevant equipment standard. The requirements of the performance test and check shall be met.

2.3.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021
Temperature & Humidity Chamber	CTF	LY-4S-TH	2013012302	05.05.2021

2.3.3. TEST PROCEDURE

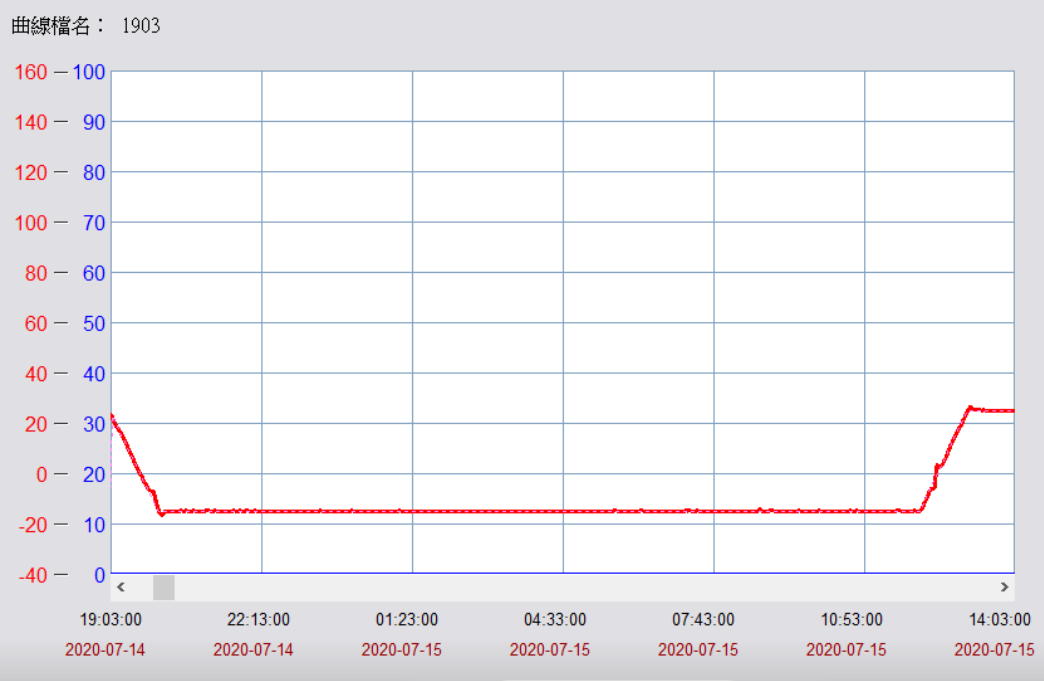
The test procedure was in accordance with IEC60068-2-1.

2.3.4. TEST RESULTS

Temperature	27.0ºC	**Humidity**	41.3% RH
Pressure	1015.2 mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

Condition	Temperature	Duration	Observation
Non-operating	-15°C	16 Hours	No Deviation

2.3.5. TEST PHOTO



2.4. VIBRATION TEST (Sinusoidal)

2.4.1. TEST REQUIREMENT

The EUT, complete with any shock and vibration absorbers with which it is provided, shall be fastened to the vibration table by its normal means of support and in its normal attitude. The EUT may be resiliently suspended to compensate for weight not capable of being withstood by the vibration table. Provision may be made to reduce or nullify any adverse effect on EUT performance which might be caused by the presence of an electromagnetic field due to the vibration unit. The EUT shall be subjected to sinusoidal vertical vibration at all frequencies between: – 2 Hz to 5 Hz and up to 13,2 Hz with an excursion of ±1 mm ± 10 % (7 m/s2 maximum acceleration at 13,2 Hz); – above 13,2 Hz and up to 100 Hz with a constant maximum acceleration of 7 m/s2.

The frequency sweep rate shall be 0.5 octaves/min in order to allow the detection of resonances in any part of the EUT as mounted. A resonance search shall be carried out throughout the test. During the resonance search the EUT shall be externally observed, by unaided visual and aural means, for obvious signs of any resonances of components or sub-assemblies that may affect the integrity of the EUT. Such observations shall be recorded in the test report. If any resonance, as measured by a sensor fixed to the outside of the EUT at the location where obvious signs of resonance have been observed, has a magnitude ratio ≧5 measured relative to the surface where the EUT is fastened, the EUT shall be subjected to a vibration endurance test at each resonant frequency at the vibration level specified in the test with a duration of 2 h. When resonant frequencies with magnitude ratios ≧5 are harmonically related, only the fundamental frequency shall be tested. If no resonance with a magnitude ratio ≧5 occurs, the endurance test shall be carried out at one single observed frequency. If no resonance occurred, the endurance test shall be carried out at a frequency of 30 Hz. Performance check(s) shall be carried out at least once during each endurance test period, and once before the end of each endurance test period. The procedure shall be repeated with vibration in each of two mutually perpendicular directions in the horizontal plane.The requirements of the performance check shall be met.

2.4.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Vibration Generator	Vibration Source	VS-600V-51	E01105	04.21.2021
Thermo Recorder	T&D	TR-73U	F8061F8F	02.26.2021

2.4.3. TEST PROCEDURE

The test procedure was in accordance with IEC 60068-2-6:2007

2.4.4. TEST RESULTS

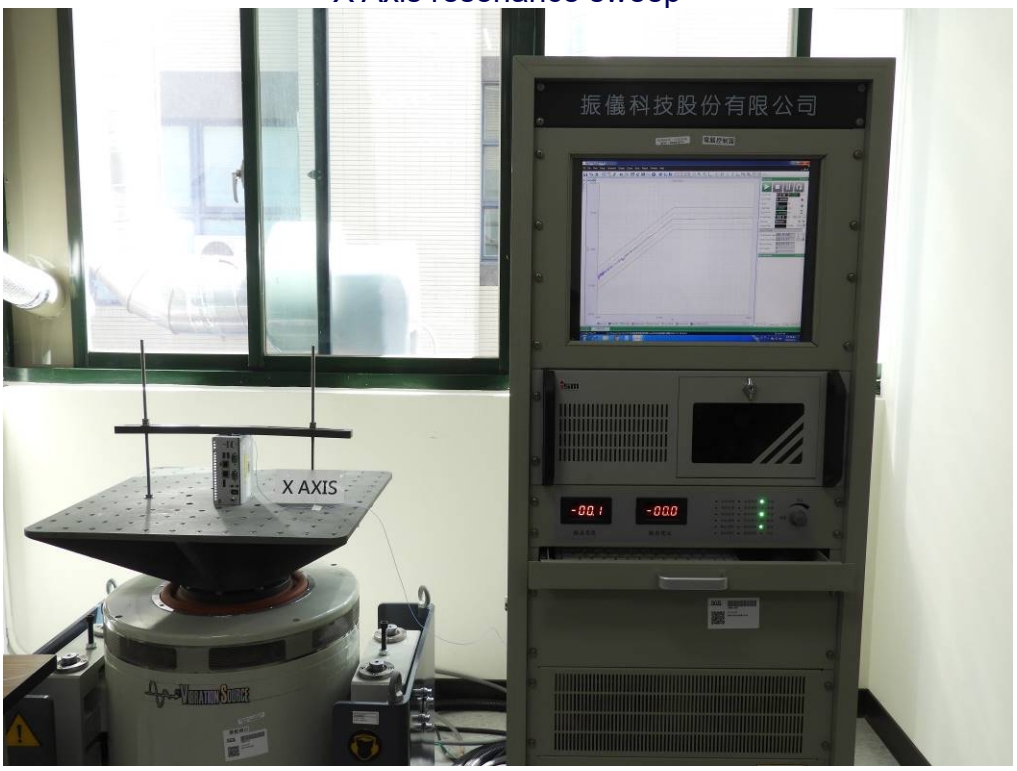
Temperature	24.6°C	**Humidity**	54.1% RH
Pressure	1012.4 mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

- After recovery, this performance check at normal room temperature.

Axial	Accelerate	Frequency Range	Resonances Frequency
longitudinal	7 m/s2 RMS	2 ~ 100 Hz	--
transverse	7 m/s2 RMS	2 ~ 100 Hz	--
vertical	7 m/s2 RMS	2 ~ 100 Hz	--

2.4.5. TEST PHOTO

X Axis resonance sweep



Control Peak	6.996m/s2
Frequency	100.0 Hz
Sweep Rate	0.5 Oct/Min
Sweep Type	Log
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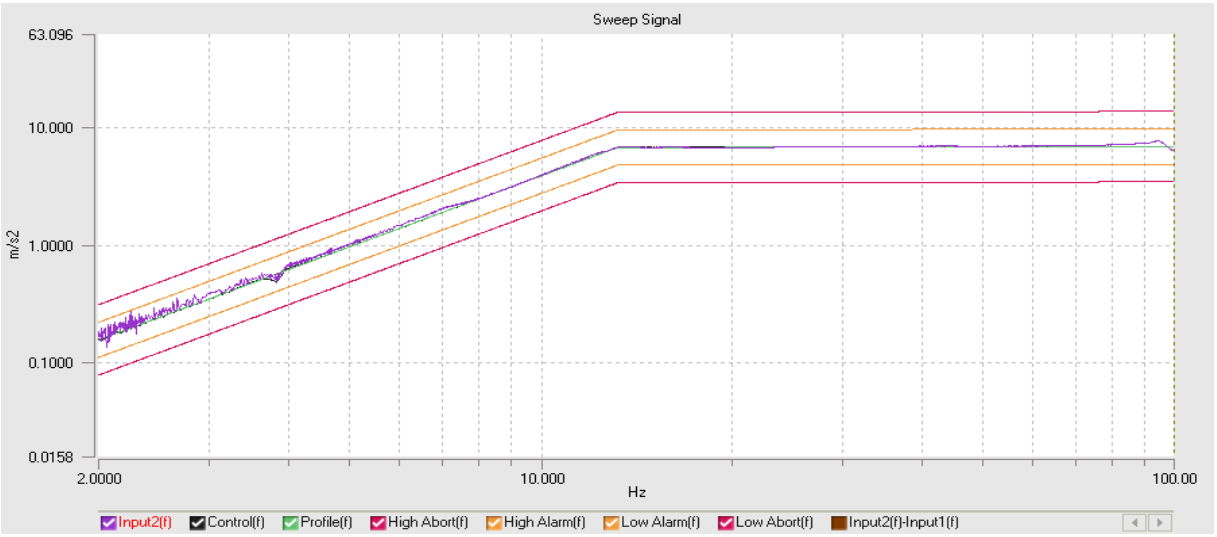
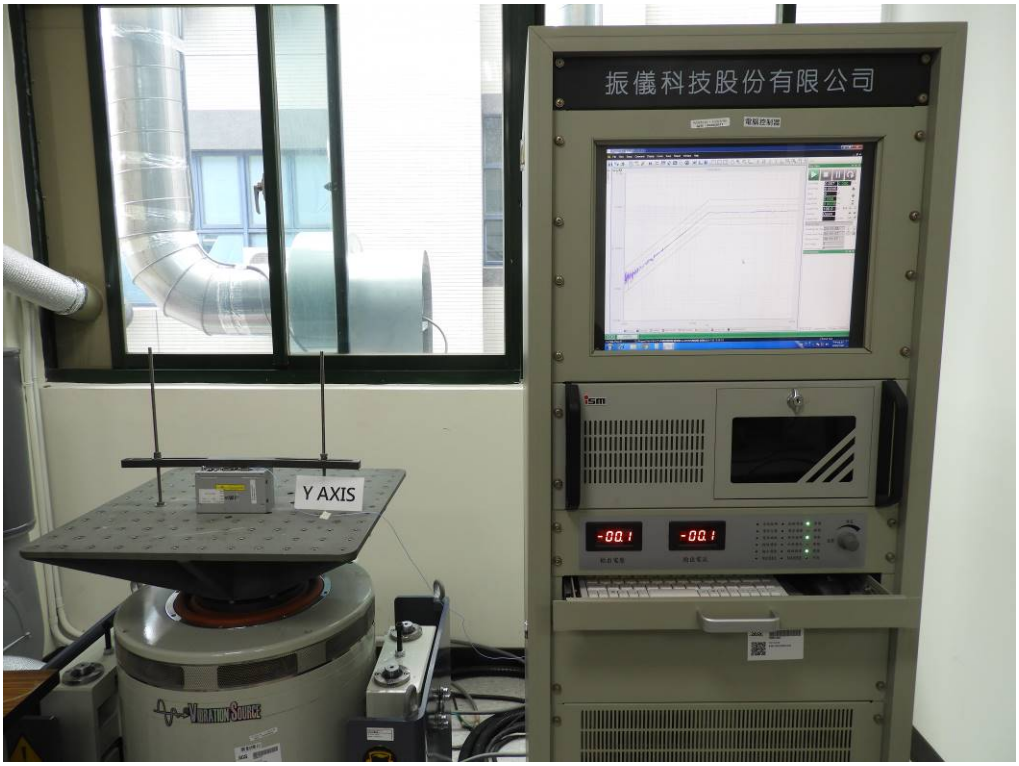


Y Axis resonance sweep



Control Peak	6.997m/s2
Frequency	100.0 Hz
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Sweep Type	Log
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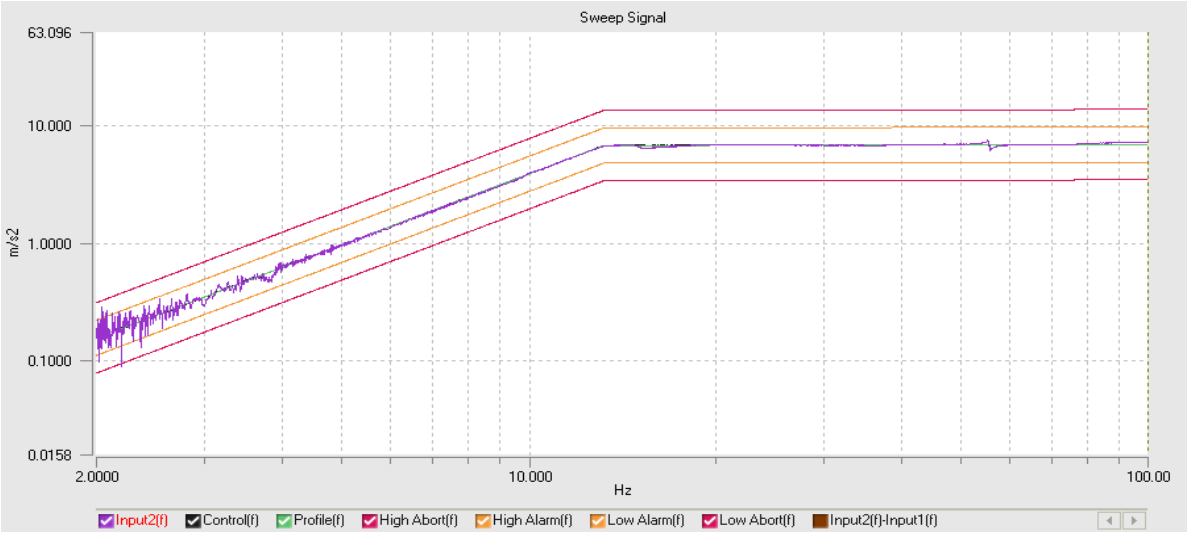
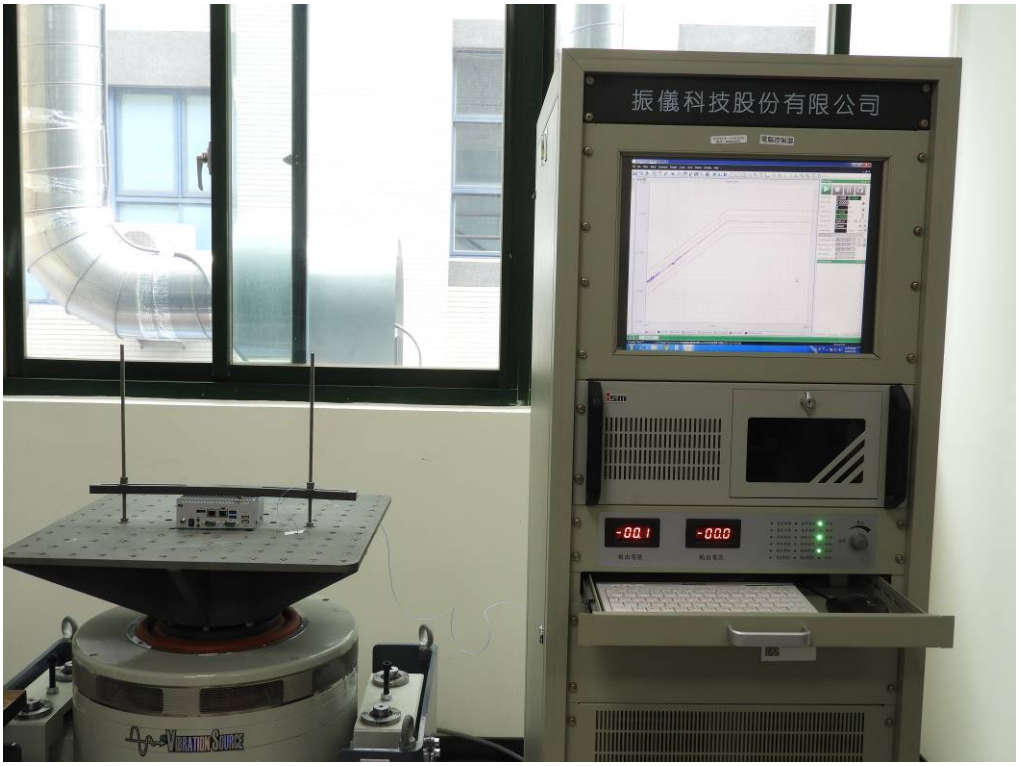


Z Axis resonance sweep



Control Peak	7.001m/s2
Frequency	100.0 Hz
Sweep Rate	0.5 Oct/Min
Sweep Type	Log
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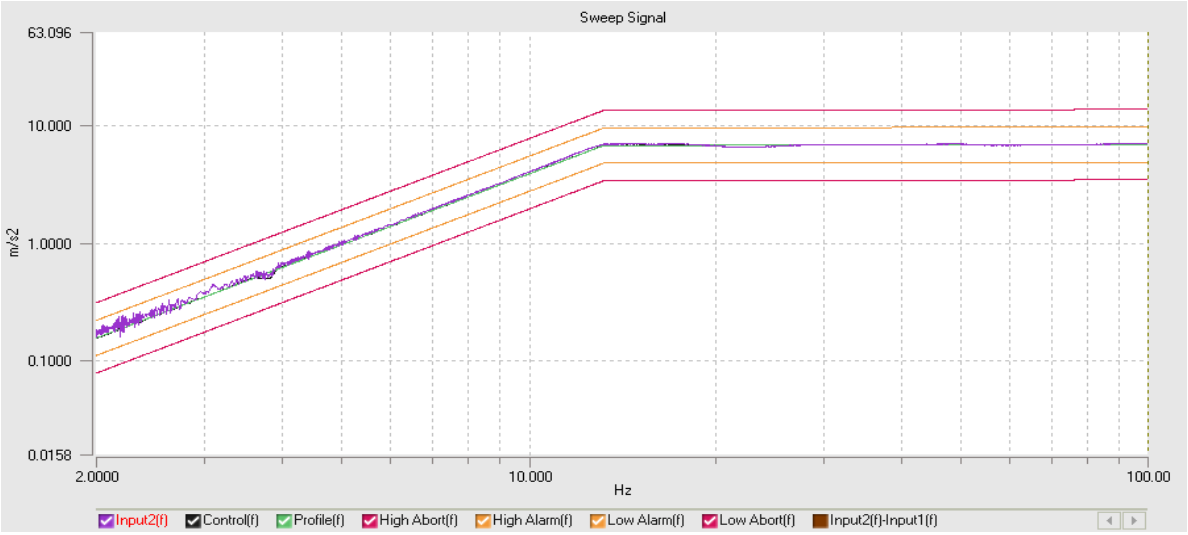

X Axis endurance test

Control Peak	6.999m/s2
Frequency	30.0 Hz
Sweep Rate	1 Oct/Min
Sweep Type	Log
Total Elapsed Time	02:00:07
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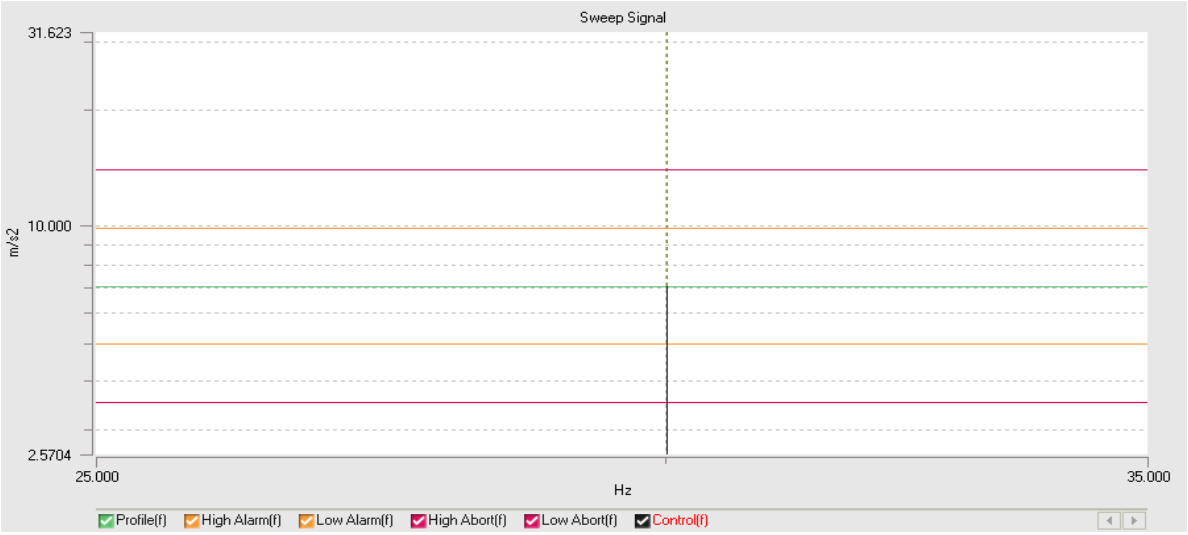
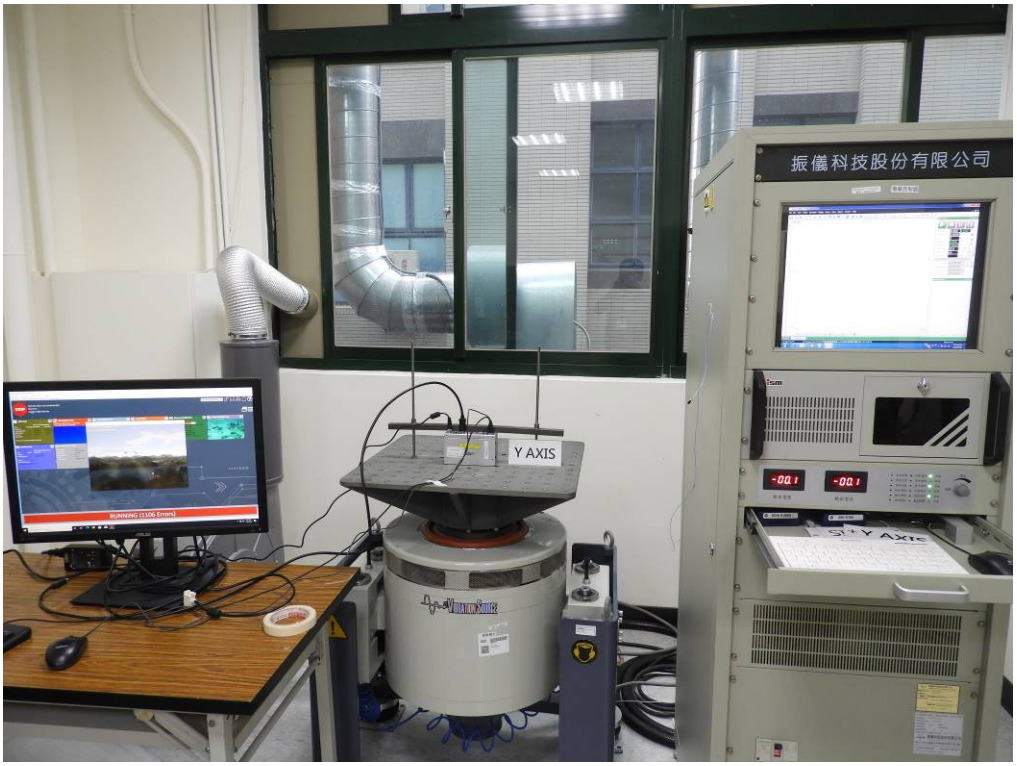


Y Axis endurance test



Control Peak	7.000m/s2
Frequency	30.0 Hz
Sweep Rate	1 Oct/Min
Sweep Type	Log
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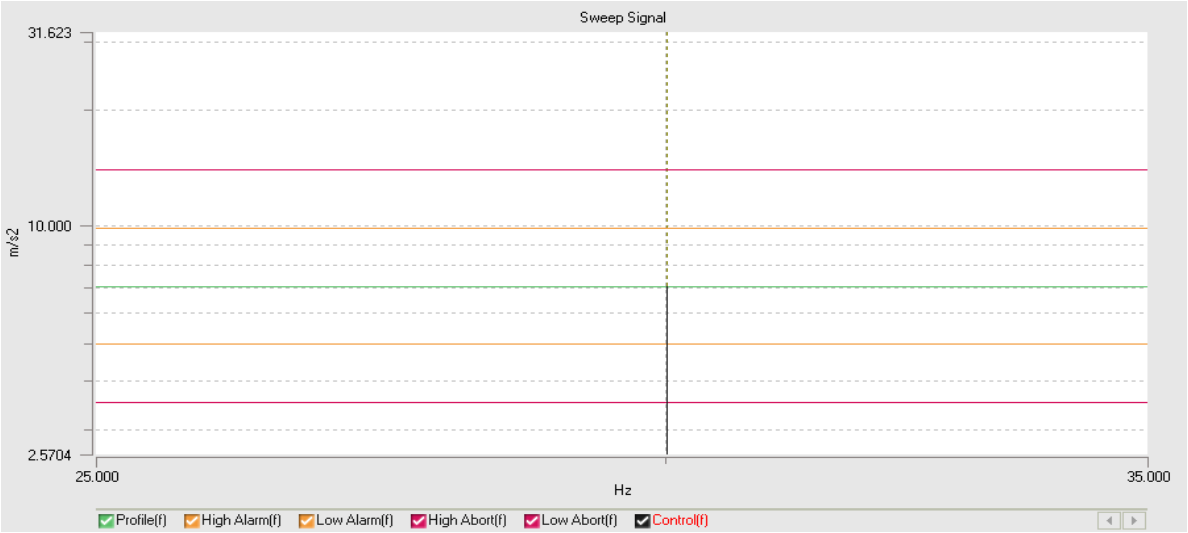

Z Axis endurance test

Control Peak	7.001m/s2
Frequency	30.0 Hz
Sweep Rate	1 Oct/Min
Sweep Type	Log
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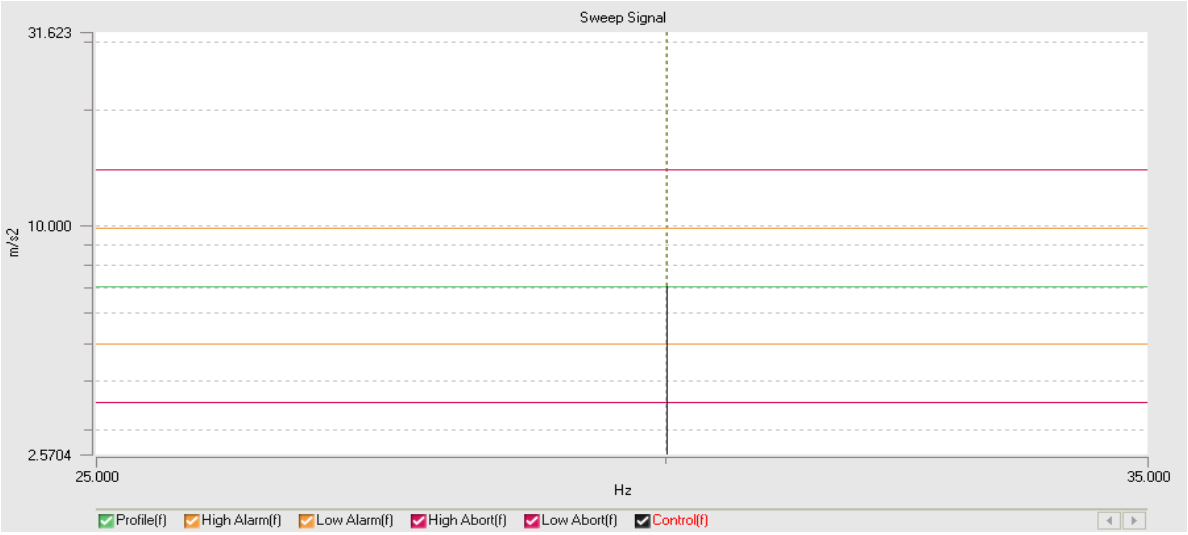


2.5. Insulation Resistance

2.5.1. TEST REQUIREMENT

- For high voltage equipment, reference is made to UR E11.
- Insulation resistance test is to be carried out before and after: damp heat test, cold test, salt mist test and high voltage test;
- between all phases and earth; and where appropriate, between the phases.

Note: Certain components e.g. for EMC protection may be required to be disconnected for this test.

Rated supply voltage Un (V)	Test voltage Un (V)	Min. insulation resistance	
		before test M ohms	after test M ohms
Un ≦ 65	**2 x Un min. 24V**	**10**	**1,0**
Un > 65	500	100	10

2.5.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Electrical Safety Compliance Analyzer	EXTECH	7451	1990884	10.13.2020

2.5.3. TEST PROCEDURE

The test procedure was in accordance with IACS 10 NO. 9.

2.5.4. TEST RESULTS

Temperature	24.2ºC	**Humidity**	52.4% RH
Pressure	1010.8 mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

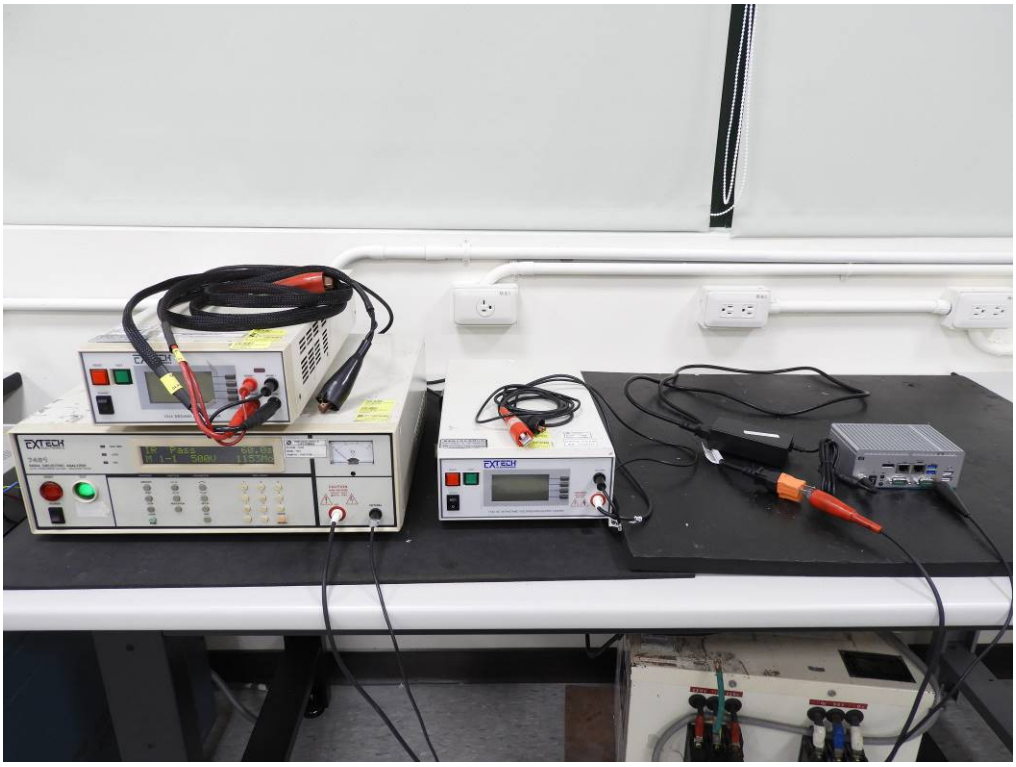
1. Insulation measurement Test (before high voltage test) :

Model	eBox100-51R-FL-DC		
Insulation applied between / Test item:	**Test voltage (V DC)**	**Test time (sec)**	**Resistance (Ω)**
Power – Metal enclosure	500	60	1153MΩ

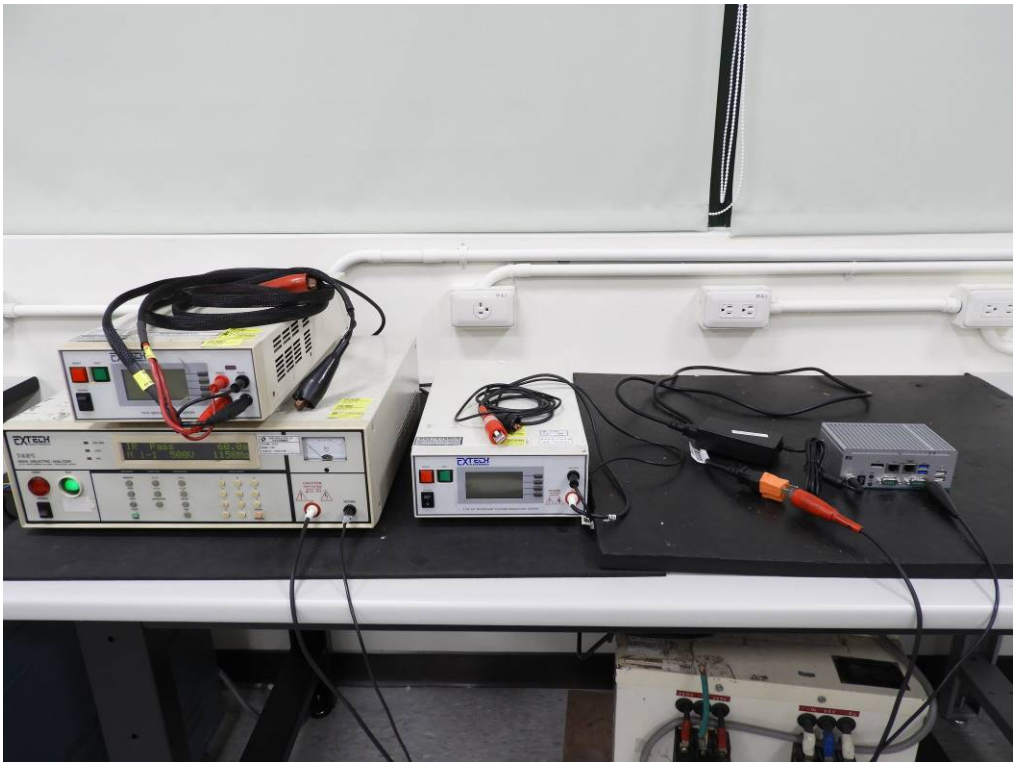
2. Insulation measurement Test (after high voltage test) :

Model	eBox100-51R-FL-DC		
Insulation applied between / Test item:	**Test voltage (V DC)**	**Test time (sec)**	**Resistance (Ω)**
Power – Metal enclosure	500	60	1158MΩ

2.5.5. TEST PHOTO



Insulation measurement Test (before high voltage test)



Insulation measurement Test (after high voltage test)

2.6. High voltage

2.6.1. TEST REQUIREMENT

- For high voltage equipment, reference is made to UR E11.
- separate circuits are to be tested against each each other and all circuits connected with each other tested against earth;
- printed circuits with electronic components may be removed during the test;
- period of application of the test voltage: 1 minute

Rated voltage Un (V)	Test voltage (A.C. voltage 50 or 60Hz) (V)
Up to 65	**2 x Un + 500**
66 to 250	1500
251 to 500	2000
501 to 690	2500

2.6.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Electrical Safety Compliance Analyzer	EXTECH	7451	1990884	10.13.2020

2.6.3. TEST PROCEDURE

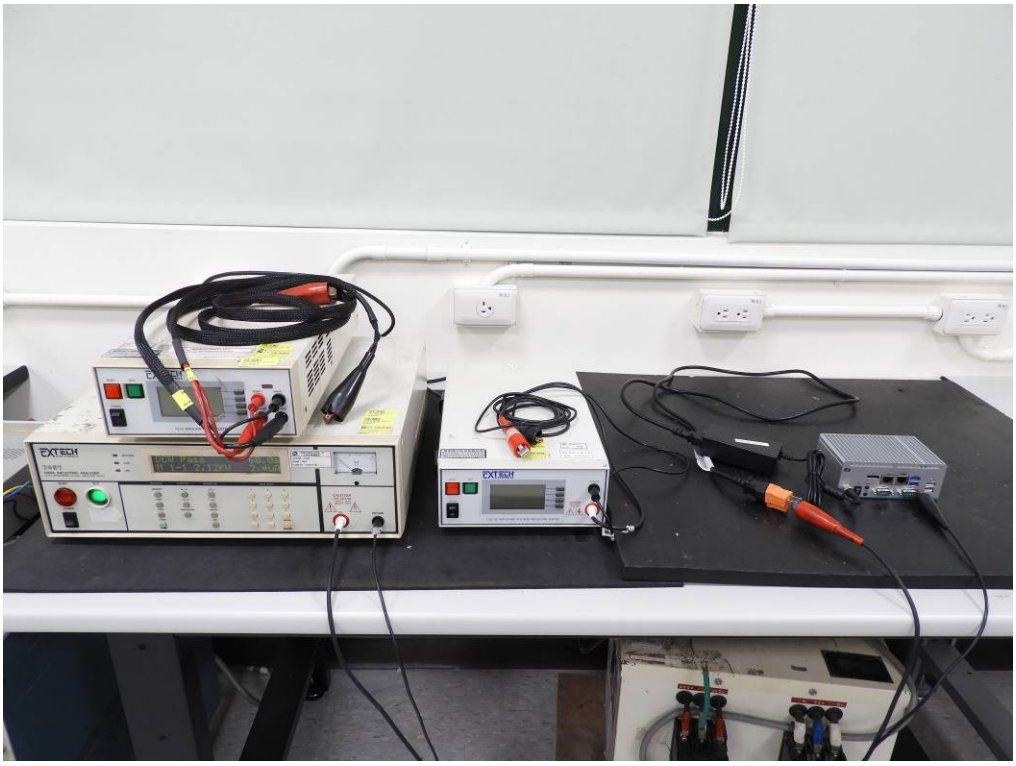
The test procedure was in accordance with IACS 10 NO. 10.

2.6.4. TEST RESULTS

Temperature	24.2°C	**Humidity**	52.4% RH
Pressure	1010.8 mbar	**Tested By**	Toy Wang
TEST RESULTS		**PASSED**	

Model	eBox100-51R-FL-DC			
Teat voltage applied between / Test item: :	**Test voltage (V DC)**	**Test time (sec)**	**Test current (mA)**	**Breakdown Yes / No**
Power – Metal enclosure	2121	60	2.4	No
Note : Test voltage : 1500Vac x 1.414 = 2121 Vdc				

2.6.5. TEST PHOTO



Voltage withstand test

2.7.Acoustic noise and signals

2.7.1. TEST REQUIREMENT

The acoustic pressure detected shall not exceed a level of 60 dB(A) at a distance of 1 m from any part of the EUT.
With audible alarms switched on, the acoustic noise pressure of an alarm shall be at least 75 dB(A) but not greater than 85 dB(A) at a distance of 1 m from any part of the EUT which is accessible for its operation.

2.7.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Free-Field 1/2" Microphone Unit	B&K	4190-C-001	2387089	2021/9/11
			2387093	
			2387094	
			2387095	
Multichannel Portable PLUSE Data Acquisition System	B&K	3560D	2394936	2021/7/31

2.7.3. TEST PROCEDURE

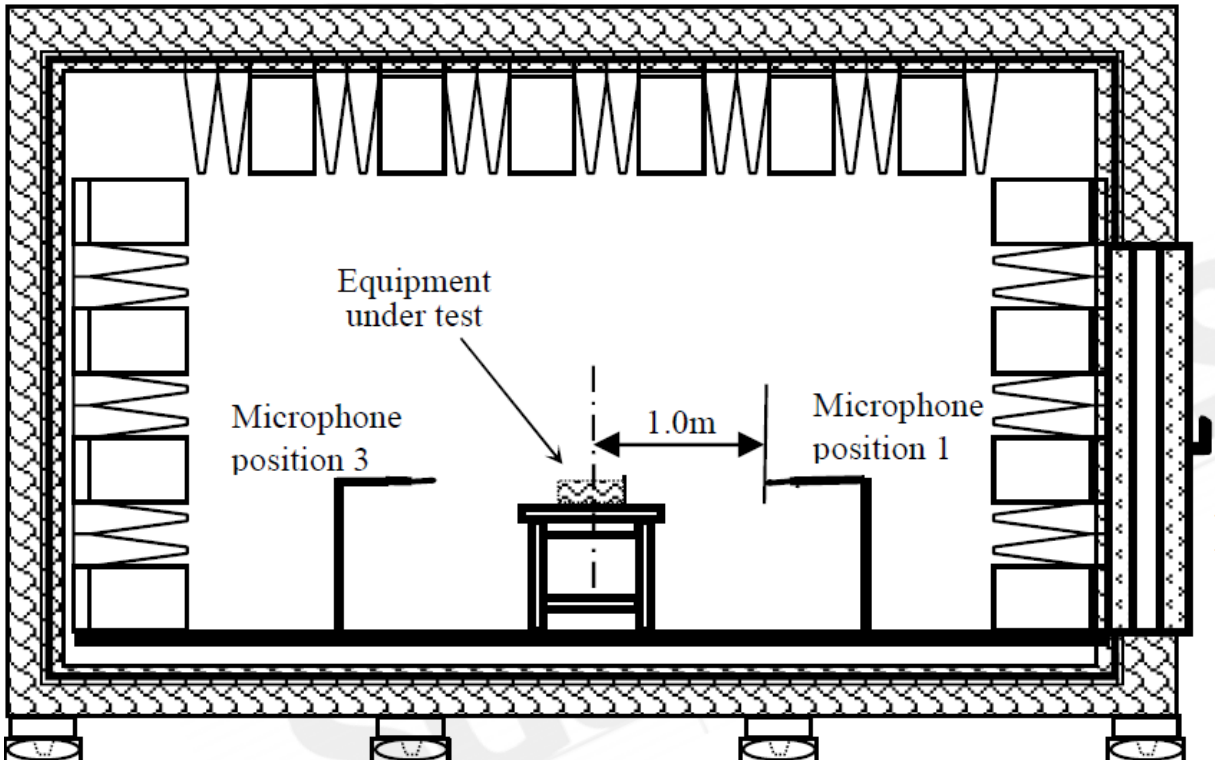
The test procedure was in accordance with IEC 60945 clause 11.1.

2.7.4. TEST RESULTS

Temperature	28.9°C	**Humidity**	37.0% RH
Pressure	9980 mbar	**Tested By**	Reliability Laboratory Allen Wang
TEST RESULTS		**PASSED**	

	SPL (dBA)	SPL (dBA)	SPL (dBA)	SPL (dBA)
Test location	Front	Right	Rear	Left
Background Noise	17.0	17.0	18.0	17.1
Idle Mode	17.0	16.9	18.0	17.1

2.7.5. Layout description :



2.7.6. Test Photo

2.8.Compass safe distance

2.8.1. TEST REQUIREMENT

Each unit of the EUT shall be tested in the position and attitude relative to the compass or magnetometer at which the error produced at the compass would be a maximum, provided the item can be fitted in this way.
The compass-safe distance of any unit of the EUT is defined as the distance between the nearest point of the unit and the centre of the compass or magnetometer at which it will not produce a deviation in the standard compass of more than 5,4°/H where H is the horizontal component of the magnetic flux density in μT (microtesla) at the place of testing.
For the steering compass, the standby steering compass and the emergency compass, the permitted deviation is 18°/H, H being defined as above.
Each unit of the EUT shall be tested:
a) in the magnetic condition in which it is received with the EUT unpowered;
b) after normalizing with the EUT unpowered;
c) in the powered condition, if the unit is capable of being energized electrically.
Normalizing means a procedure to maximize the homogeneity of the magnetic flux in the EUT by placing it in Helmholtz coils or by other adequate means.
In each of the above tests, the unit shall be rotated to determine the direction in which it produces the maximum deviation.
Further information is given in ISO 694 and IEC 61000-4-8.

2.8.2. TEST INSTRUMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Electromagnetic Field Radiation Tester	Lutron	Lutron EMF-827	I.216876	2020/10/23
Gauss meter	Lutron	GU-3001	Q596599	2021/07/24
Magnetization Coil	CAL	HC-1	N/A	N.C.R

2.8.3. TEST PROCEDURE

The test procedure was in accordance with IEC 60945 clause 11.2.

2.8.4. TEST RESULTS

Temperature	25.0ºC	**Humidity**	65.0% RH
Pressure	1001 mbar	**Tested By**	CAL-TECH Technology Co., Ltd. Lucas Shin
TEST RESULTS		**PASSED**	

Only EUT：

Condition	Standard Compass	Steering Compass
Non-energized	35cm	20cm
Non-energized after magnetisation	40cm	25cm
Energized and operation	70cm	45cm

Full Load：

Condition	Standard Compass	Steering Compass
Non-energized	30cm	20cm
Non-energized after magnetisation	30cm	20cm
Energized and operation	70cm	45cm

2.8.5. Test Photo

Reliability Laboratory

TEST REPORT

Report No.: YC70002/2020
Page: 1 of 6
Date: August 3, 2020

AXIOMTEK CO., LTD.
8F., NO. 55, NANXING ROAD, XIZHI DISTRICT,
NEW TAIPEI CITY, TAIWAN

The following merchandise was submitted and identified by the vendor as:

Product Description:	IPC
Style／ Item No.:	Ebox100-51R-FL/ No.1
Quantity:	Total 1 set
Testing Period:	Jul. 31, 2020

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. Emission Sound Pressure Level Measurement Test

Test Results： -PLEASE SEE ATTACHED SHEETS-

* Measured values in this report are for use in planning or in determining declared values. They are not the declared values.

Signed for and on behalf of SGS TAIWAN Ltd.

Allen Wang
Asst. Supervisor

1. Emission Sound Pressure Level Measurement Test:

Test Equipment:

Name	Brand	Model	Serial No.
Multichannel Portable PULSE Data Acquisition System	Brüel & Kjær	3560D	2394936
Free-Field 1/2” Microphone Unit	Brüel & Kjær	4190-C-001	2387089
Free-Field 1/2” Microphone Unit	Brüel & Kjær	4190-C-001	2387093
Free-Field 1/2” Microphone Unit	Brüel & Kjær	4190-C-001	2387094
Free-Field 1/2” Microphone Unit	Brüel & Kjær	4190-C-001	2387095

Acoustical Environment Description:

Acoustical Environment: An essential free field over a reflecting plane (Semi-Anechoic Room)
Ambient Temperature: ~ 28.9 ℃
Ambient Pressure: ~ 99.8 kPa
Ambient Humidity: ~ 37 % RH

Test Location: No.134, Wu Kung Road, New Taipei Industrial Park, WuKu District, New Taipei City, Taiwan

Test Method/ Specification:

Test Method: Refer to IEC60945 Edition 4.0: 2002 and client’s request

1. Measurement Setup:

Filter Bandwidth: 1/3 Octave
Acoustic Weighting: A-Weighting
Lower centre frequency: 100 Hz
Upper centre frequency: 10 kHz
Measurement Time Interval: 30 seconds

Test Method/ Specification--Continued:

2. Installation of Equipment Under Test:

Installation and Mounting Condition: Be placed in the center on the top plane of the standard test table

Location in the Test Room: Be located in the center inside the test room.

3. Equipment Operation During Measurement:

Operating Mode Identification	Description/ Comment
Operating Mode	The specimen being tested is power on status under operating system.

4. Measurement Positions:

Microphone positions: At the microphone positions specified by customer --
Four microphone positions be located 1.0 m away from the projection in the center of the reference box on the horizontal plane and are centered at the front, rear, right and left sides of the equipment.

Microphone Orientation: 0° below horizontal

Specimen:

Style/ Item No.: Ebox100-51R-FL / No.1
Main Dimension: L: 14.0 cm W: 9.0 cm H: 6.0 cm
Rated Power Line frequency: 110 Vac/ 60 Hz
Quantity: 1 set

Test Result:

A-Weighted Sound Pressure Level
Unit: dB(A) reference 20μPa

Style/ Item No.:	Operating Condition	Microphone Position	Measured A-weighted sound pressure level (L'_{pA})	A-weighted background noise level (L''_{pA})	Background noise correction K_{1A}	A-weighted emission sound pressure level (L_{pA})
Ebox100-51R-FL/ No.1	Operating Mode	At bystander position 1	17.0	17.0	1.3	15.7
		At bystander position 2	16.9	17.0	1.3	15.6
		At bystander position 3	18.0	18.0	1.3	16.7
		At bystander position 4	17.1	17.1	1.3	15.8

Appendix I:

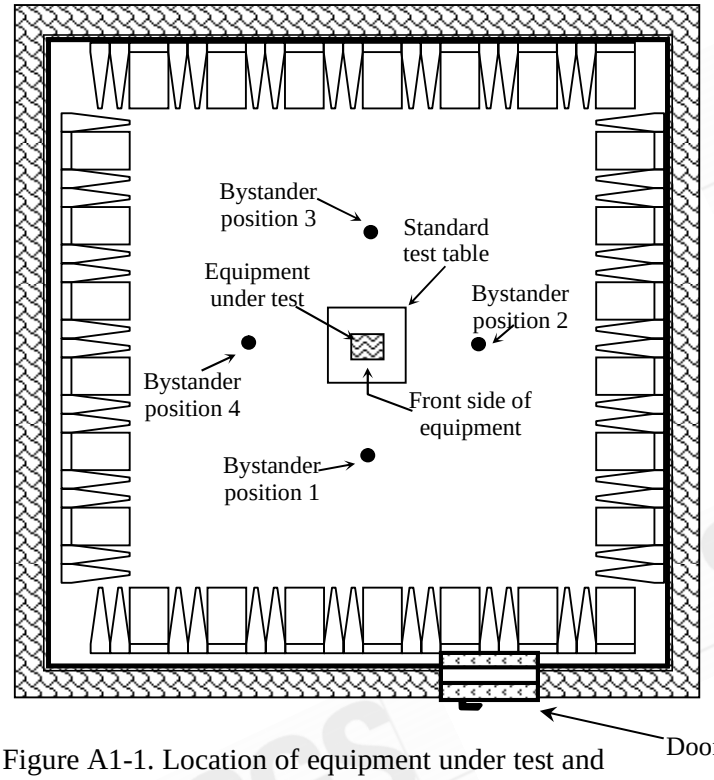


Figure A1-1. Location of equipment under test and microphone position (Top View)

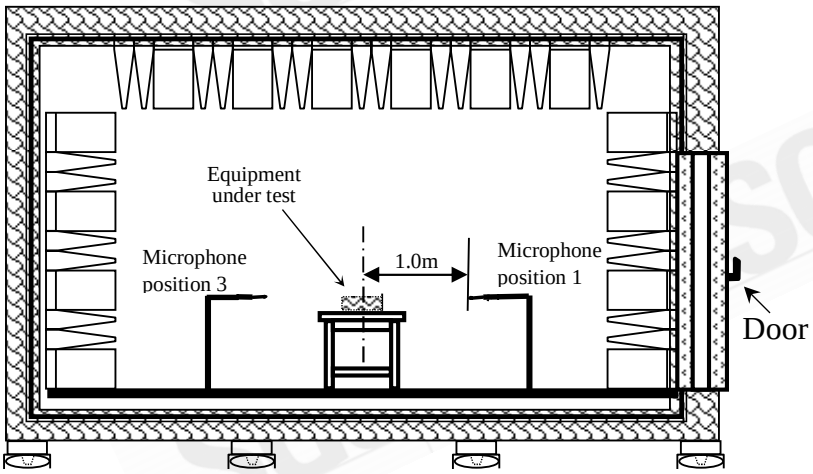
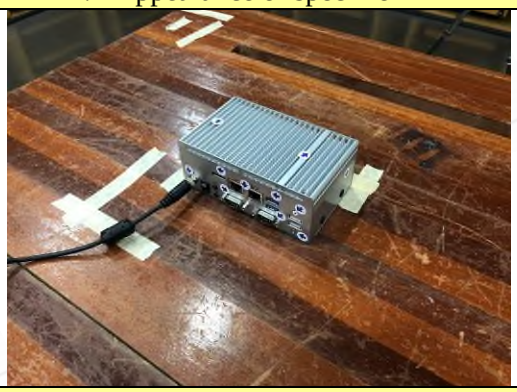


Figure A1-2. Location of equipment under test and microphone position (Side View)

Test Photos:

	
1. Appearance of specimen	2. Appearance of specimen
	
3. Emission Sound Pressure Level Measurement Test	4. Emission Sound Pressure Level Measurement Test

— — — **The End of Test Report** — — —

Test Report

Product Name . : IPC
Brand Name . : NA
Model No . : eBOX100-51R-FL
Series No . : NA

Prepared for

Applicant's company . : AXIOMTEK CO., LTD.
Applicant Address . : 8F., No.55, Nanxing Road, Xizhi District, New Taipei City 221, Taiwan
Telephone . : NA
FAX . : NA

Test Laboratory

Name . : Cal-Tech Technology Corp. -Consolidated laboratory
Address . : 3F., No.331, Tanmei St., Neihu Dist.,Taipei City 114, Taiwan (R.O.C.)
Telephone . : +886-2-27965371
FAX . : +886-2-27943091

Table of Contents

1. TEST OF COMPLIANCE

Test report no .	:	200710002T
Applicant's company .		AXIOMTEK CO., LTD.
Manufacturer's company .	:	AXIOMTEK CO., LTD.
Product Name .	:	IPC
Brand Name .	:	NA
Model No .	:	eBOX100-51R-FL
Serial No .	:	NA
Tested Power Supply .	:	100-240Vac , 50/60Hz
Date of Product Receiving .	:	2020.07.24
Duration of test .	:	2020.07.24~2020.07.28
Issued Date .	:	2020.07.29
Test Standards .	:	IEC 60945:2002

Test programs as specified by IEC 60945 were performed on Model eBOX100-51R-FL.

The product was found to fully comply with the specified

Statement

The test report consists of 12 pages in total. It shall not be reproduced except in full, without the written approval of Cal-Tech Technology Corp.. This document may be altered or revised by Cal-Tech Technology Corp only, and shall be noted in the revision section of the document. The test results in the report only to the tested sample.

Test Engineer: Lucas Shih _____ Lucas Shih

Authorized by: _____ James Cheng

Report Issued: 2020/07/29 YYYY/MM/DD

2. SUMMARY OF THE TEST RESULT

2.1. Test program according to IEC 60945

Item	TEST	IEC 60945	Result
1	Compass Safe Distance Test	Section 11.2	See Section 4.1

3. GENERAL INFORMATION

3.1. Test laboratory

Name	: Cal-Tech Technology Corp. -Consolidated laboratory
Address	: 3F., No.331, Tanmei St., Neihu Dist.,Taipei City 114,
Telephone	: +886-2-27965371
FAX	: +886-2-27943091

3.2. Test Conditions

Normal Voltage	: 100-240Vac , 50/60Hz
Normal Temperature	: 25± 3 °C
Relative Humidity	: 65%± 5 %

3.3. Standard for Methods of Measurement

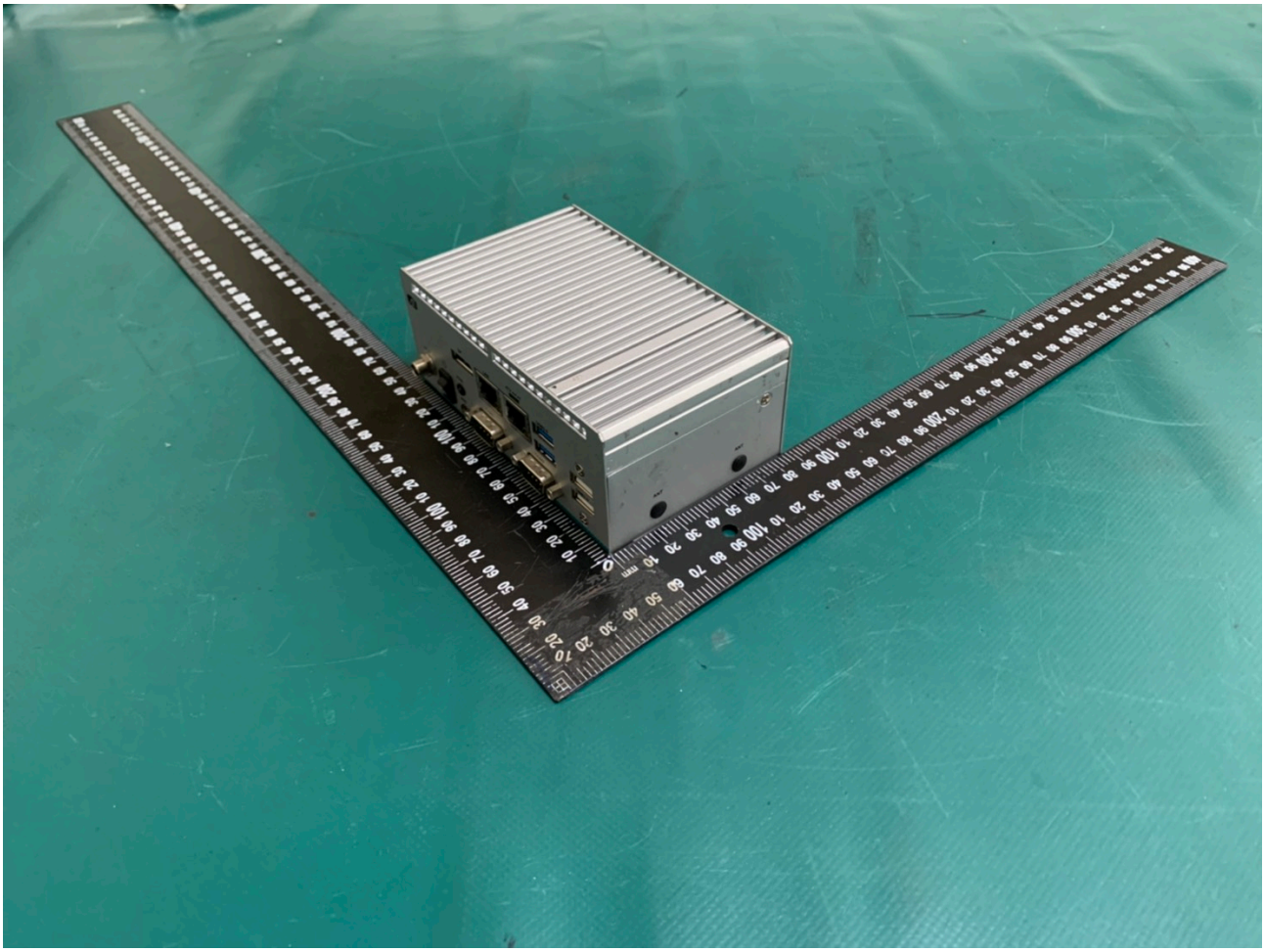
The test program for eBOX100-51R-FL is in according with the following standards:

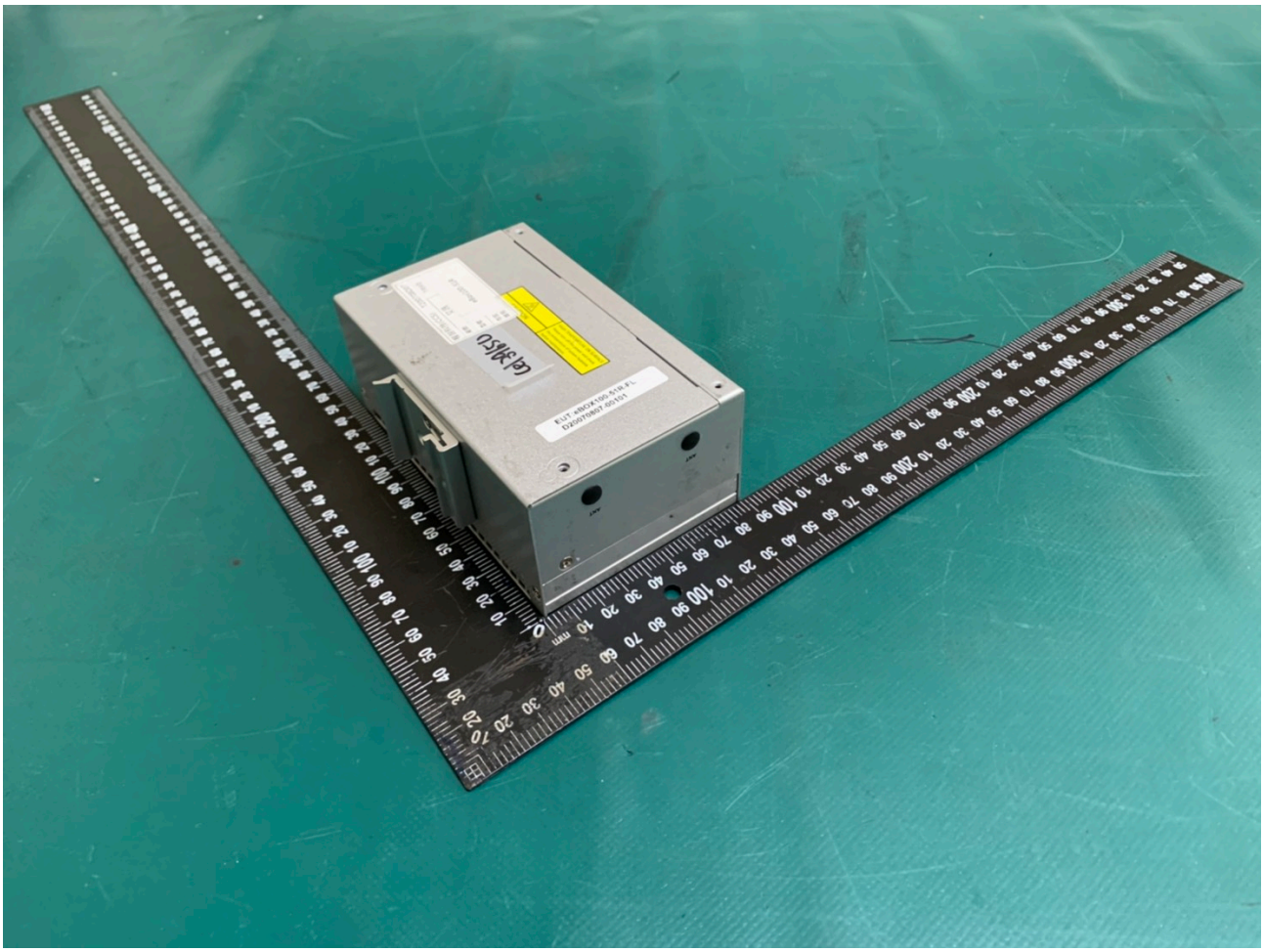
Here is the list of the standards followed in this test report.

Within the scope of the test program the following test categories are offered:

- Special purpose tests program includes accroding to IEC 60945.

3.4. EUT Photograph





3.5. Product Category

Items	Description
Product Type	IPC
Power Type	Built-in

Power	Model	Rating
Power Requirements	eBOX100-51R-FL	100-240Vac , 50/60Hz

Note:

For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

4. SPECIAL PURPOSE TESTS

4.1. Compass Safe Distance Test

Test Requirements

According to IEC 60945-11.2

Equipment for installation within a distance of 5 m from a standard or a steering magnetic compass shall betested for compass safe distance in accordance with IEC 60945.

Test Procedures

According to IEC 60945 Sec.11.2.2

Compass safe distance is defined as the distance between the nearest point of the EUT and a subject compass where an unacceptable compass deviation occurs.

For a standard compass, the horizontal magnetic flux shall be less than 0.942 mGauss (compass deviation of 5.4°/H).

For a steering/standby/emergency compass, the horizontal magnetic flux shall be less than 3.142 mGauss (compass deviation of 18°/H).

The compass safe distance is measured with a DC milligauss meter. The EUT is first rotated to determine the worst case direction. The EUT is then moved towards or away from the measurement probe until the required field is measured. The distance between the EUT and DC milligauss meter is then measured.

Measurements are made at 3 EuT conditions:

1) Non-energized (in the magnetic condition received from the customer)

2) Non-energized after magnetisation in a 1 Gauss (80A/m) DC field, with a superimposed stabilising 50Hz AC field of 18 Gauss (1430A/m) *

3) Energized and in normal operating condition

Test Results

EUT only

Condition	Standard Compass	Steering Compass
Non-energized	35 cm	20 cm
Energized and operating	40 cm	25 cm
Non-energized after magnetisation	70 cm	45 cm

Full Load

Condition	Standard Compass	Steering Compass
Non-energized	30 cm	20 cm
Energized and operating	30 cm	20 cm
Non-energized after magnetisation	70 cm	45 cm

5. PHOTOGRAPHS OF TEST CONFIGURATION

5.1. Compass Safe Distance Test

EUT only

Full Load

6. TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

Item No.	NAME	MODEL NO.	SERIAL NO.	MANUFACTURER	Cal. Date
1	Electromagnetic Field Radiation Tester	EMF-827	I.216876	Lutron	2019/10/24
2	Gauss meter	GU-3001	Q596599	Lutron	2020/7/24
3	Magnetization Coil	HC-1	NA	CAL	NCR