EMC Test Report

For

ShangHai ScanHome Technology Co.,Ltd

Test Standards:	EN 55032 :2015/A1:2020 EN 55035 :2017/A11:2020 EN IEC 61000-3-2:2019/A1:2021 EN 61000-3-3:2013/A2:2021
Product Description:	Barcode scanner
Tested Model:	SH-4120
Adding Models:	SH-400, SH-40, SH-50, SH-70, SH-40N, SH-800, SH-800-GHD, ST-2200, SH-6000, SH-800-HD-G, SH-800-HD-R, SH-7000, SH-210, SH-210-GHD, SH-4620, SH-210-X, SH-410, SH-510, SH-520, SH-210-HD, SH-7200, SH-7300, SH-7400, SH-7500, SH-7600, SH-7700, SH-7600-1M, SH-7600N, SH-2200, SH-2300, SH-2400, SH-2500, SH-4100, SH-4600, SH-4410, SH-4420, SH-5200, SH-5000-1D, SH-5000-2D(G), SH-5000-2D(Y), SH-5000-GHD, SH-5000-HD-G, SH-5000-HD-R, SH-5000-X, SH-210-HD-G, SH-210-HD-R
Report No.:	EBSZ250315495E
Tested Date:	2025-Mar-15 to 2025-Mar-17
Issued Date:	2025-Mar-28
Tested By:	Kiki Chen Kiki Chen
Approved By:	Jerry Liu

Guangdong Eurber Testing Co., Ltd.
Room 401/402, Building A, Tangxi Zhigu, No.21, Xijing Road,
Gushu, Xixiang Subdistrict, Bao'an District, Shenzhen, Guangdong, China

Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Guangdong Eurber Testing Co., Ltd., the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2025.Mar.28	Valid	Original Report

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

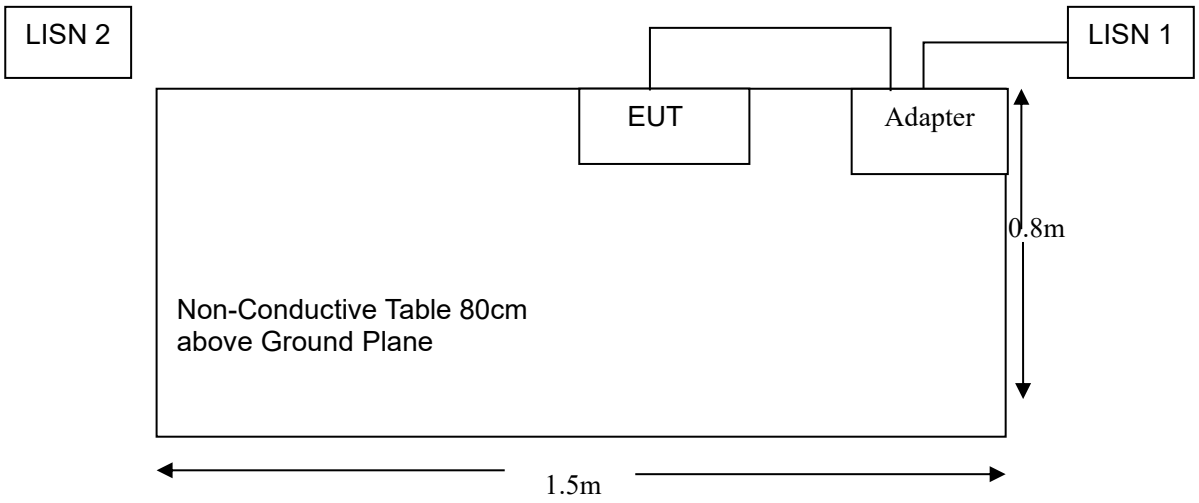
Client Information	
Applicant:	ShangHai ScanHome Technology Co.,Ltd
Address of applicant:	Floor 5,building 5,no.68 zhongchuang road, zhongshan street, songjiang district, Shanghai, China
Manufacturer:	ShangHai ScanHome Technology Co.,Ltd
Address of manufacturer:	Floor 5,building 5,no.68 zhongchuang road, zhongshan street, songjiang district, Shanghai, China

General Description of EUT	
Product Name:	Barcode scanner
Trade Name:	ScanHome
Model No.:	SH-4120
Adding Model(s):	SH-400, SH-40, SH-50, SH-70, SH-40N, SH-800, SH-800-GHD, ST-2200, SH-6000, SH-800-HD-G, SH-800-HD-R, SH-7000, SH-210, SH-210-GHD, SH-4620, SH-210-X, SH-410, SH-510, SH-520, SH-210-HD, SH-7200, SH-7300, SH-7400, SH-7500, SH-7600, SH-7700, SH-7600-1M, SH-7600N, SH-2200, SH-2300, SH-2400, SH-2500, SH-4100, SH-4600, SH-4410, SH-4420, SH-5200, SH-5000-1D, SH-5000-2D(G), SH-5000-2D(Y), SH-5000-GHD, SH-5000-HD-G, SH-5000-HD-R, SH-5000-X, SH-210-HD-G, SH-210-HD-R
Difference description	All models have the same circuit schematics, but the model names and appearance are different. All tests are carried out on SH-4120.
Test Voltage:	DC 5V from Adapter input AC120V/60Hz
Rated Voltage:	DC 5V, 0.5A; Battery: 3.7V, 2000mAh

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1.2 EUT Setup and Operation Mode

Block Configuration Diagram for Conducted Emissions



Test Mode List		
Test Mode	Description	Remark
1	Working	For RE/ESD/RS test
2	Changing	For all test

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
N/A	N/A	N/A	N/A

1.3 Measurement Uncertainty

Measurement uncertainty			
Parameter	Frequency	Polarity	Measurement uncertainty
Conducted Emission	150kHz~30MHz	----	2.42dB
Radiated Emission	30MHz-200MHz	Horizontal	3.70dB
Radiated Emission	30MHz-200MHz	Vertical	3.84dB
Radiated Emission	200MHz-1000MHz	Horizontal	4.05dB
Radiated Emission	200MHz-1000MHz	Vertical	5.28dB
Radiated Emission	1000MHz-6000MHz	----	4.89dB

1.4 Test Facility

Site	Guangdong Eurber Testing Co., Ltd.
Location	Room 401/402, Building A, Tangxi Zhigu, No.21, Xijing Road, Gushu, Xixiang Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Telephone:	0755-23284856
Fax:	0755-23284856

1.5 Test Equipment List and Details

Test Equipment for Conducted Emission					
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Due Date**
LISN	R&S	ENV216	102125	2024/6/22	2025/6/21
LISN	R&S	ENV432	101327	2024/6/22	2025/6/21
EMI Test Receiver	R&S	ESR3	102143	2024/6/22	2025/6/21
EMI Test Software	Audix	E3	N/A	N/A	N/A
Test Equipment for Radiated Emission					
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Due Date**
EMI Test Receiver	R&S	ESR-3	102144	2024/6/22	2025/6/21
Amplifier	Sonoma	310	363917	2024/6/22	2025/6/21
Broadband Antenna	Schwarz beck	VULB9168	9168-757	2023/3/03	2026/3/02
EMI Test Software	Audix	E3	N/A	N/A	N/A
Test Equipment for ESD					
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Due Date**
ESD Generator	Teseq	NSG 437	1121	2024/6/22	2025/6/21
Test Equipment for EFT/SURGE/DIPS					
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Due Date**
Surge Generator	Teseq	NSG 3060-MF	4040	2024/6/22	2025/6/21
CDN	Teseq	CDN 3061-S16	3003	2024/6/22	2025/6/21
EFT/DIPS Generator	Teseq	NSG 3040-MF	6033	2024/6/22	2025/6/21
Transformer	Teseq	INA6501	1002	2024/6/22	2025/6/21
Test Equipment for CS					
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Due Date**
CS Generator	Teseq	NSG 4070B-80	45341	2024/6/22	2025/6/21
6dB Attenuator	Teseq	ATN 6075	32154	2024/6/22	2025/6/21
CDN	Teseq	CDN M016	45065	2024/6/22	2025/6/21
Test Equipment for RS					
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Due Date**
Signal generator	R&S	SMB100A	113825	2024/6/22	2025/6/21
Power Meter	R&S	NRP2	105581	2024/6/22	2025/6/21
Power Sensor	R&S	NRP-Z91	103778	2024/6/22	2025/6/21
Power Sensor	R&S	NRP-Z91	103779	2024/6/22	2025/6/21
Power Amplifier	R&S	BBA150	102377	2024/6/22	2025/6/21
Antenna	R&S	HL046E	100230	N/A	N/A
RS Test Software	Fala	EZ-RS	N/A	N/A	N/A

1.6 Performance Criteria for EMS

According Clause 8 of EN55035,

• General

General performance criteria are defined in the following. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

• Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operation state is allowed below a performance level specified by the manufacturer when the equipment is use as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

• Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

• Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

2. SUMMARY OF TEST RESULTS

EN 55032:2015/A1:2020 Emissions		
Test Standards	**Description of Test Item**	**Result**
EN 55032:2015	Conducted Emissions	Compliance
EN 55032:2015	Radiated Emissions	Compliance

EN 55035:2017/A11:2020 Immunity		
Test Standards	**Description of Test Item**	**Result**
IEC 61000-4-2	Electrostatic Discharge	Compliance
IEC 61000-4-3	Continuous radiated disturbances	Compliance
IEC 61000-4-4	Electrical Fast Transients	Compliance
IEC 61000-4-5	Surges	Compliance
IEC 61000-4-6	Continuous conducted disturbances	Compliance
IEC 61000-4-8	Power Frequency Magnetic Field	N/A
IEC 61000-4-11	Voltage Dips and Interruptions	Compliance

EN IEC 61000-3-2 :2019/A1:2021		
Rule	**Description of Test Item**	**Result**
EN 61000-3-2	Harmonic Current Emissions	Compliance

EN 61000-3-3 :2013/A2:2021		
Rule	**Description of Test Item**	**Result**
EN 61000-3-3	Voltage fluctuations & flicker	Compliance

*Note1: N/A means not applicable.

3. Conducted Emissions

3.1. Conducted Emission Limit

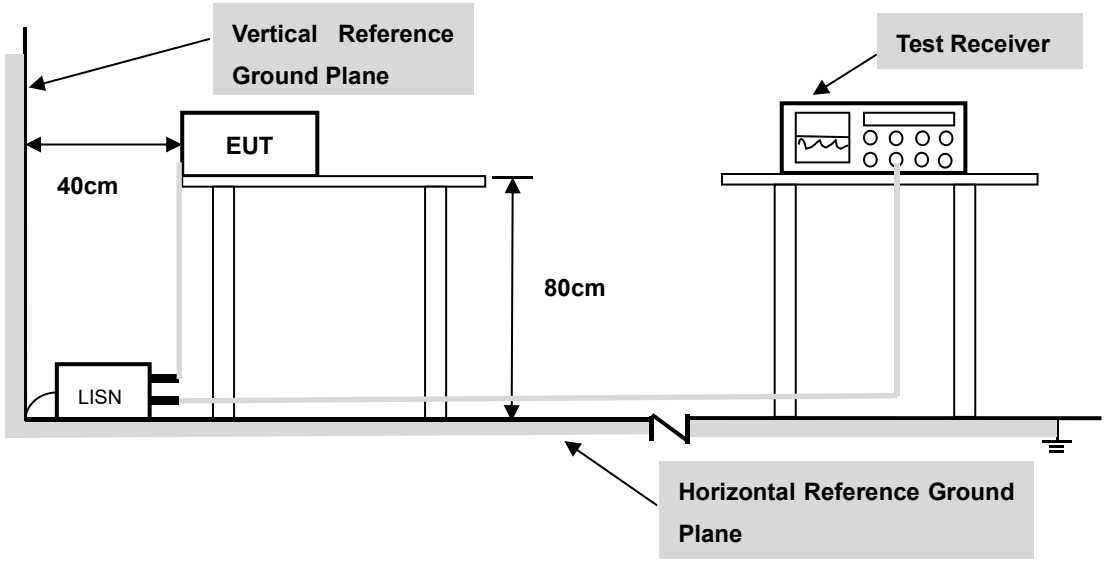
Requirements for conducted emissions from the AC mains power ports of Class B equipment

Frequency Range (MHz)	Coupling device	Detector type/bandwidth	Class B limits dB(μV)
0.15-0.5	AMN	Quasi Peak/9kHz	66~56
0.5-30			60
0.15-0.5	AMN	Average/9kHz	56~46
0.5-30			50
Note The lower limit shall apply at the transition frequencies.			

Requirements for asymmetric mode conducted emissions from Class B equipment

Frequency Range (MHz)	Coupling Device	Detector Type/ bandwidth	Class B voltage limits dB(μV)
0.15~0.5	AAN	Quasi Peak / 9 kHz	84~74
0.5~30			74
0.15~0.5	AAN	Average / 9 kHz	74~64
0.5~30			64
Note1 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. Note2 The lower limit shall apply at the transition frequencies.			

3.2 Block Diagram of Test Setup



3.3.Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the Quasi-peak and average detection mode.

3.4 Result Level & Over Limit Calculation

The Result Level is calculated by Reading Level adding the LISN Factor and the Cable Factor, The basic equation is as follows:

Result Level= Reading Level + LISN Factor + Cable Factor

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a "Over Limit" of -6dB means the emission is 6dB below the maximum limit for Class B device. The equation for "Over Limit" calculation is as follows:

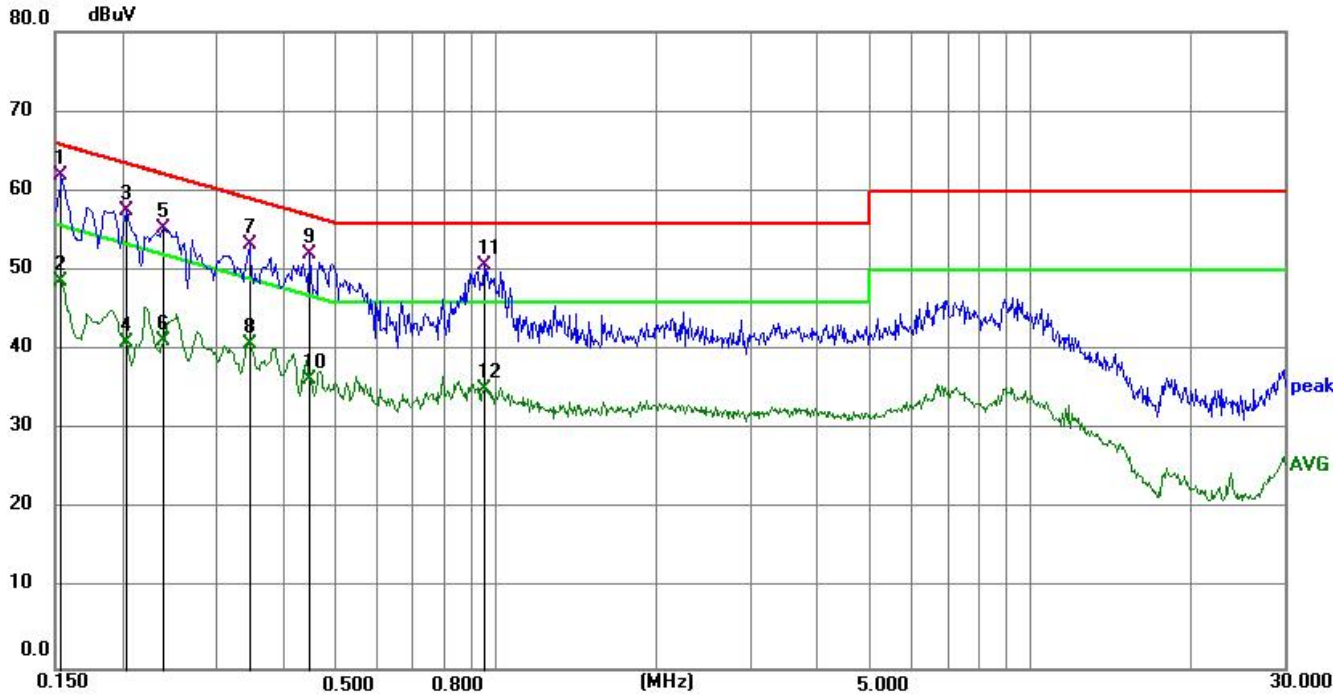
Over Limit = Result Level –Limit

3.5 Environmental Conditions

Temperature:	19.8° C
Relative Humidity:	55.5%RH
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

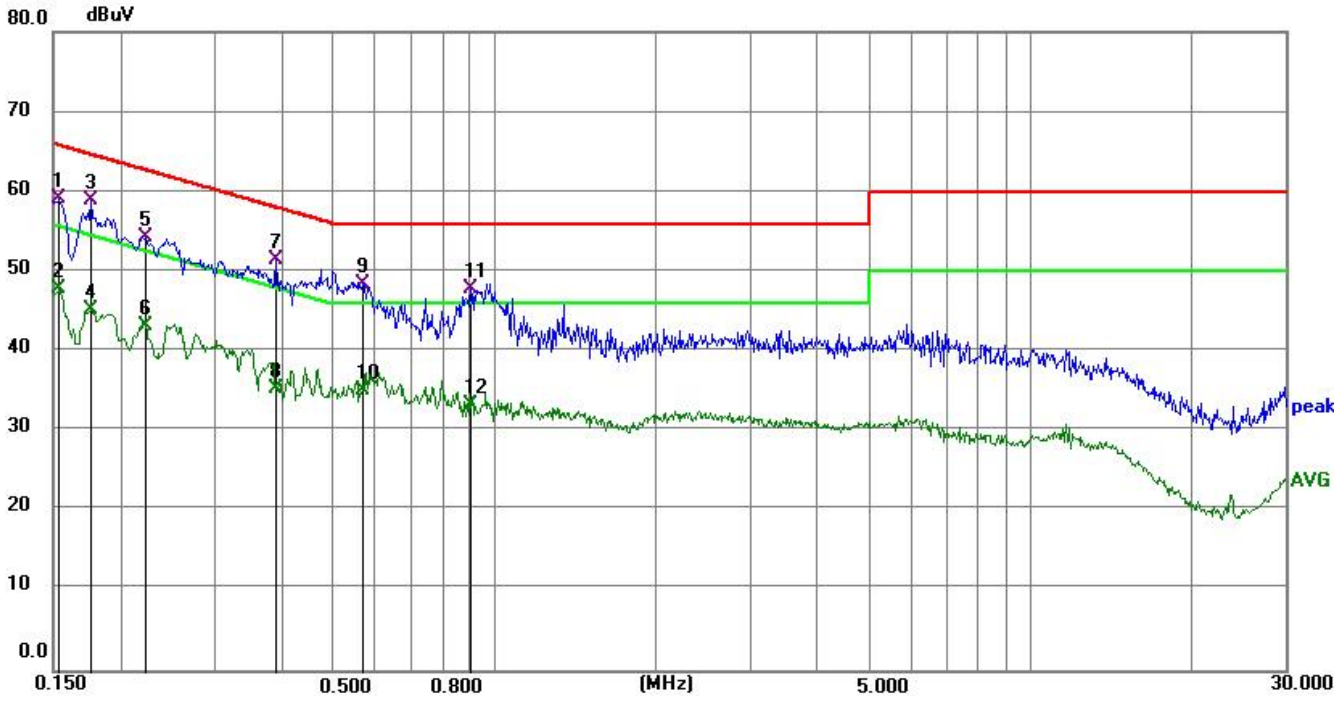
3.6 Test Data and Result

LINE



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1539	51.48	10.42	61.90	65.79	3.89	QP
2	0.1539	38.23	10.42	48.65	55.79	7.14	AVG
3	0.2038	47.14	10.42	57.56	63.45	5.89	QP
4	0.2038	30.51	10.42	40.93	53.45	12.52	AVG
5	0.2391	44.81	10.43	55.24	62.13	6.89	QP
6	0.2391	30.85	10.43	41.28	52.13	10.85	AVG
7	0.3463	42.87	10.43	53.30	59.05	5.75	QP
8	0.3463	30.39	10.43	40.82	49.05	8.23	AVG
9	0.4490	41.60	10.44	52.04	56.89	4.85	QP
10	0.4490	26.00	10.44	36.44	46.89	10.45	AVG
11	0.9530	40.03	10.63	50.66	56.00	5.34	QP
12	0.9530	24.46	10.63	35.09	46.00	10.91	AVG

NEUTRAL



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dB)	
1	0.1544	48.64	10.42	59.06	65.76	6.70	QP
2	0.1544	37.43	10.42	47.85	55.76	7.91	AVG
3	0.1769	48.62	10.42	59.04	64.63	5.59	QP
4	0.1769	34.73	10.42	45.15	54.63	9.48	AVG
5	0.2230	43.89	10.43	54.32	62.71	8.39	QP
6	0.2230	32.77	10.43	43.20	52.71	9.51	AVG
7	0.3929	41.04	10.43	51.47	58.00	6.53	QP
8	0.3929	24.93	10.43	35.36	48.00	12.64	AVG
9	0.5684	37.95	10.47	48.42	56.00	7.58	QP
10	0.5684	24.62	10.47	35.09	46.00	10.91	AVG
11	0.9059	37.19	10.62	47.81	56.00	8.19	QP
12	0.9059	22.64	10.62	33.26	46.00	12.74	AVG

Note: 1. Result Level = Reading Level +LISN/ISN Factor + Cable loss

4. Radiated Emissions

4.1. Radiated Emission Limit

Requirements for radiated emissions at frequencies up to 1GHz for Class B equipment

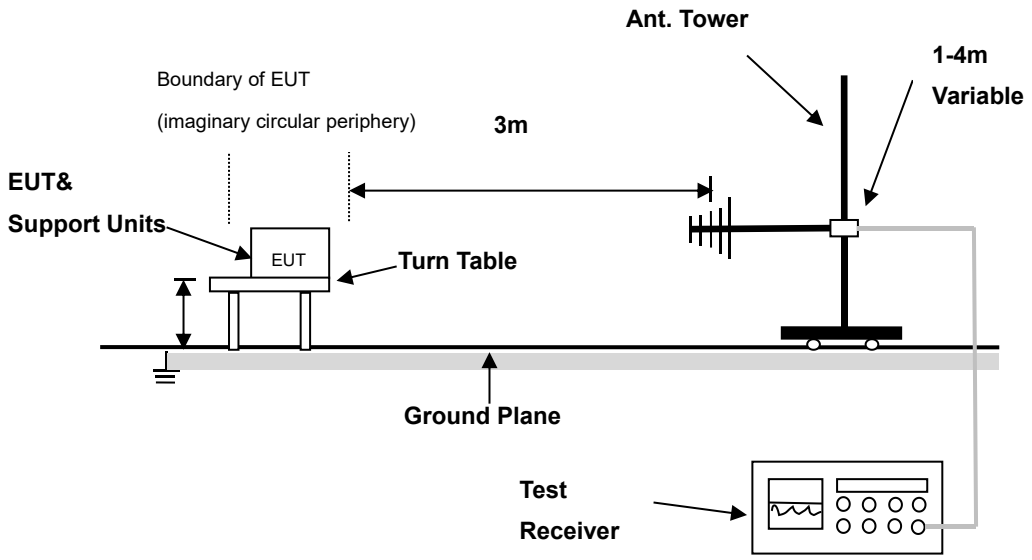
Frequency range (MHz)	Measurement		Class A limits dB(μV/m)
	Distance (m)	Detector type/bandwidth	
30 ~ 230	3	Quasi Peak/120kHz	40
230 ~ 1000			47

Requirements for radiated emissions at frequencies above 1GHz for Class A equipment

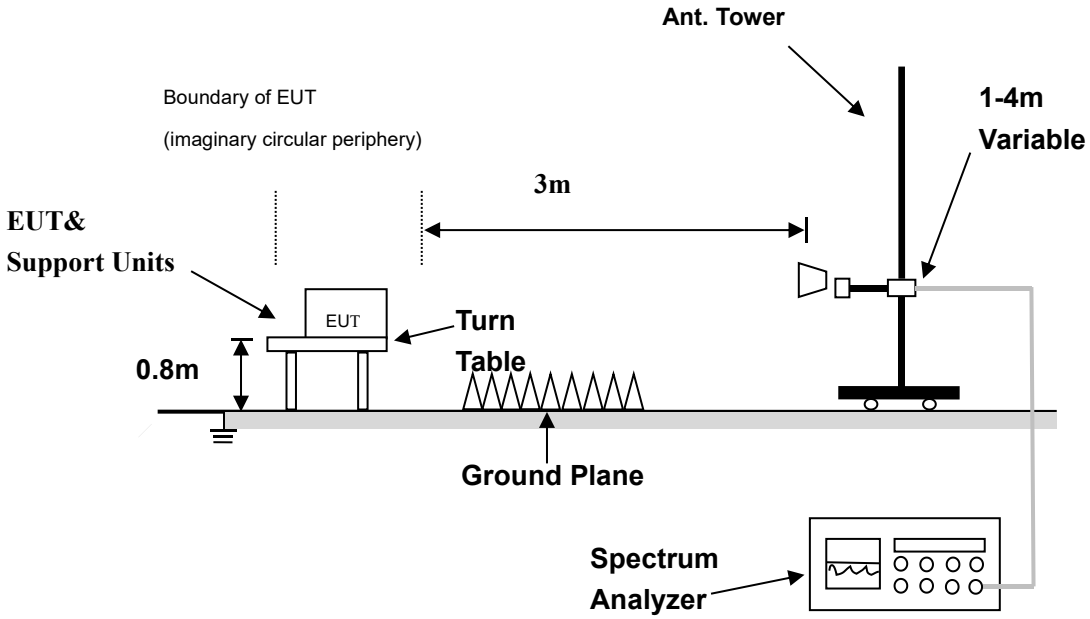
Frequency range (MHz)	Measurement		Class A limits dB(μV/m)
	Distance (m)	Detector type/bandwidth	
1000 ~ 3000	3	Average/1MHz	50
3000 ~ 6000			54
1000 ~ 3000	3	Peak/1MHz	70
3000 ~ 6000			74

4.2.Block Diagram of Test Setup

Radiated Emissions Frequency:30MHz to 1000MHz:



Radiated Emissions Frequency:1000MHz to 6000MHz:



4.3 Test Procedure

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual.

(2) Support equipment, if needed, was placed as per EN 55032.All I/O cables were positioned to simulate typical actual usage as per EN 55032

(3) The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

(4) Recorded at least the six highest emissions.

4.4 Result Level & Over Limit Calculation

The Result Level is calculated by Reading Level adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Result Level = Reading Level + Antenna Factor + Cable Factor - Amplifier Gain

The "**Over Limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB means the emission is 6dB below the maximum limit for Class B device. The equation for margin calculation is as follows:

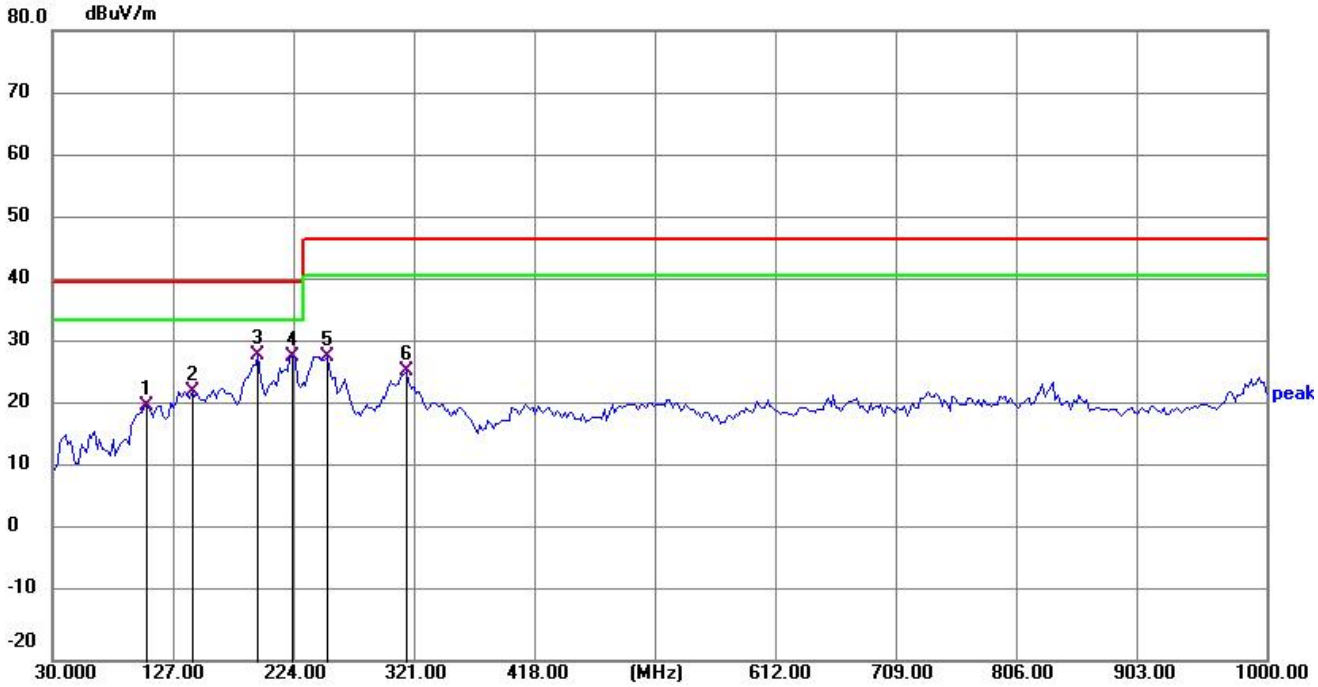
Over Limit = Result Level –Limit

4.5 Environmental Conditions

Temperature:	26° C
Relative Humidity:	54%RH
Atmospheric Pressure:	102.5kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

4.6 Test Data and Result

Mode1: Horizontal:



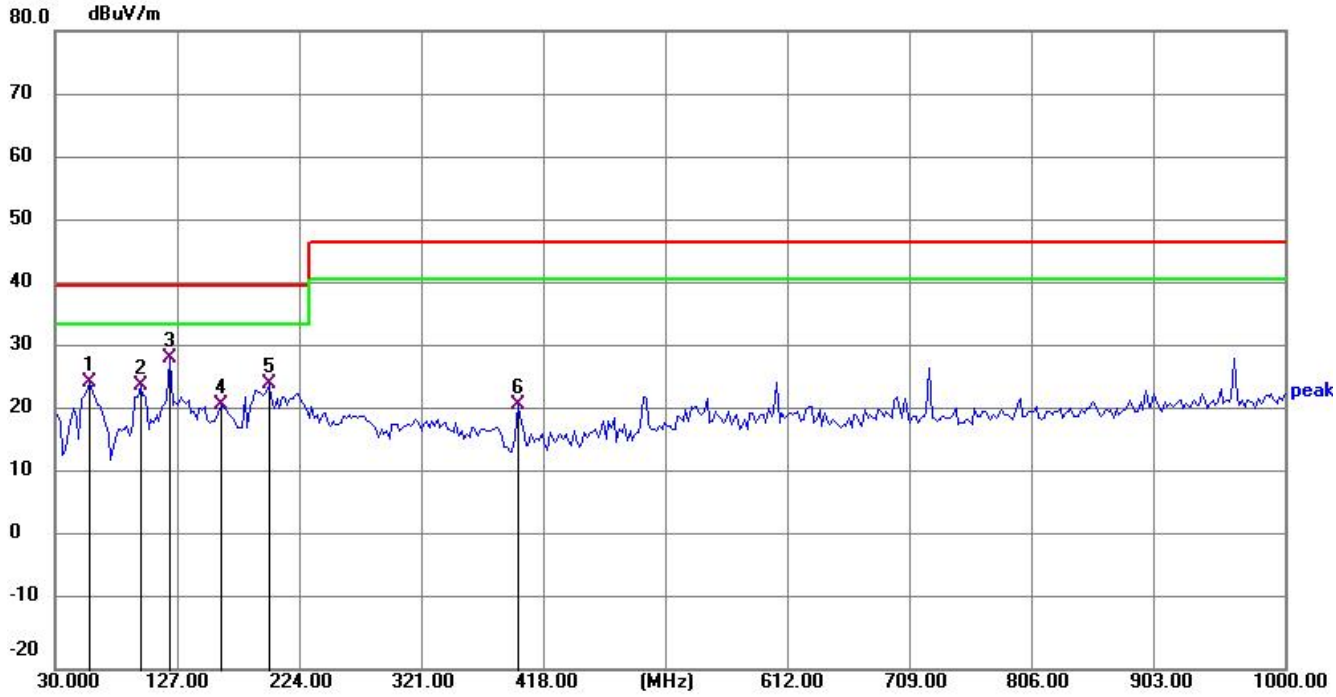
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	105.9129	41.65	-21.11	20.54	40.00	19.46	QP
2	141.7607	41.36	-18.62	22.74	40.00	17.26	QP
3	194.4781	49.05	-20.59	28.46	40.00	11.54	QP
4	221.8913	47.91	-19.65	28.26	40.00	11.74	QP
5	249.3043	47.58	-19.33	28.25	47.00	18.75	QP
6	312.5652	43.43	-17.37	26.06	47.00	20.94	QP

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	48.9782	39.09	-14.11	24.98	40.00	15.02	QP
2	95.3695	51.67	-24.75	26.92	40.00	13.08	QP
3	135.4347	48.72	-18.48	30.24	40.00	9.76	QP
4	198.6956	47.46	-18.12	29.34	40.00	10.66	QP
5	242.9782	45.72	-15.65	30.07	47.00	16.93	QP
6	352.6304	43.30	-16.13	27.17	47.00	19.83	QP

Mode 2: Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	57.4129	45.37	-20.35	25.02	40.00	14.98	QP
2	97.4782	47.69	-23.15	24.54	40.00	15.46	QP
3	120.6739	49.67	-20.86	28.81	40.00	11.19	QP
4	160.7391	40.63	-19.16	21.47	40.00	18.53	QP
5	198.6956	47.87	-23.15	24.72	40.00	15.28	QP
6	394.8043	39.56	-18.18	21.38	47.00	25.62	QP

Vertical:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	59.5217	45.35	-20.50	24.85	40.00	15.15	QP
2	95.3695	46.87	-23.30	23.57	40.00	16.43	QP
3	120.6739	48.28	-20.86	27.42	40.00	12.58	QP
4	160.7391	36.76	-19.16	17.60	40.00	22.40	QP
5	196.5869	46.13	-23.04	23.09	40.00	16.91	QP
6	599.3478	42.40	-14.71	27.69	47.00	19.31	QP

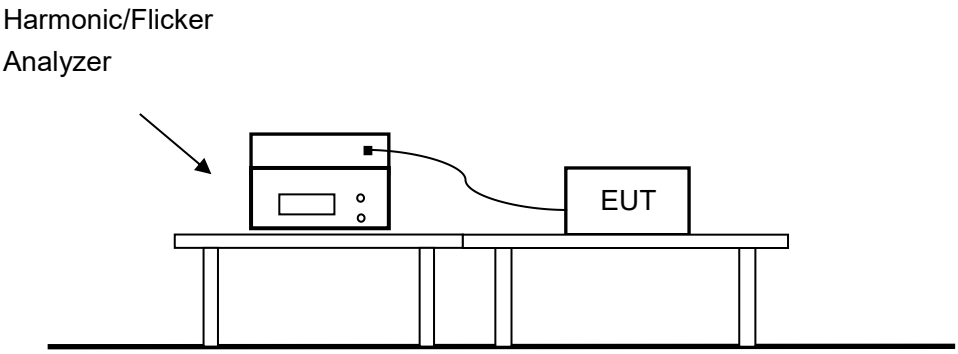
Note: 1. Level = Reading Level +Antenna Factor + Cable loss – Preamp factor1

5. Voltage fluctuations and flicker

5.1 Limits

The following limits apply:
-the value of Pst shall not be greater than 1,0;
-the value of Plt shall not be greater than 0,65;
-Tmax, the accumulated time value of d(t) with a deviation exceeding 3,3% during a single voltage change at the EUT terminals, shall not exceed 500ms;
-the maximum relative steady-state voltage change, dc, shall not exceed 3,3%;
-the maximum relative voltage change dmax, shall not exceed:
a) 4% without additional conditions;
b) 6% for equipment which is:
- switched manually, or
- switched automatically more frequently than twice per day, and also has either a delayed restart(the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
c) 7% for equipment which is:
-attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
-switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart(the delay being not less than a few tens of seconds) or manual restart after a power supply interruption.

6.2.Block Diagram of Test Setup



5.3 Environmental Conditions

Temperature:	23℃
Relative Humidity:	55%RH
Atmospheric Pressure:	100.6kPa
Test Date:	2025.Mar.17

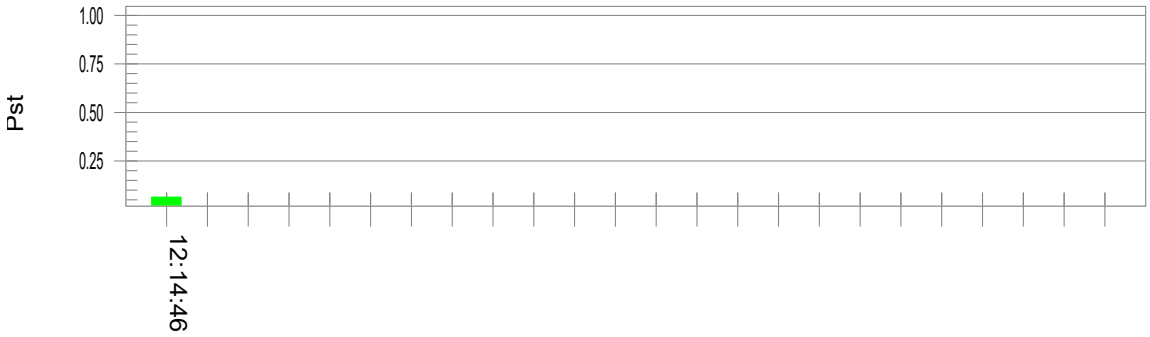
Tested By:	Kiki Chen

5.4 Test Data and Result

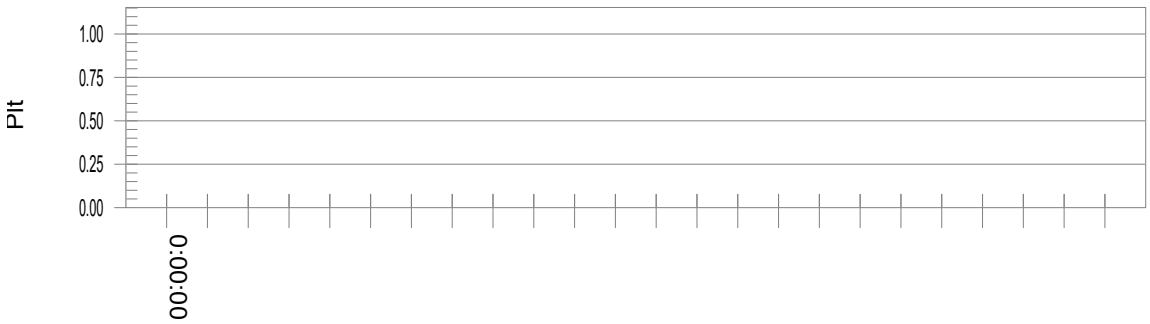
Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

Test Result: Pass Status: Test Completed

Pst_i and limit line European Limits



Plt and limit line



Parameter values recorded during the test:

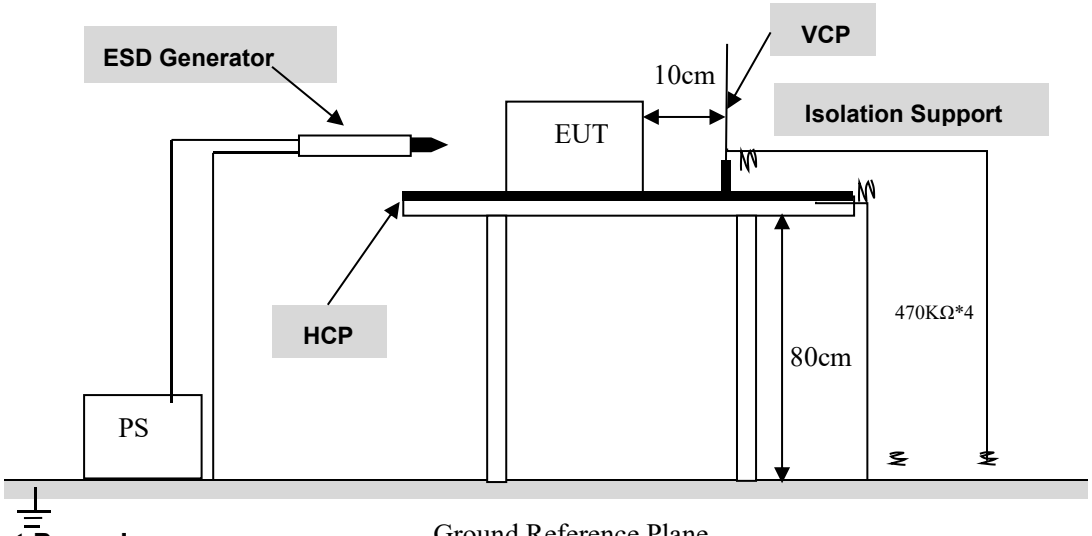
Vrms at the end of test (Volt):	230.09			
Highest dt (%):	0.00	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

6. Electrostatic Discharge

6.1 ESD Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Electrostatic discharge	Enclosure port	4kV(Contact Discharge)	IEC 61000-4-2	B
		8kV(Air Discharge)	IEC 61000-4-2	B

6.2 Block Diagram of Test Setup



6.3 Test Procedure

Air Discharges:

This test is done on a non-conductive surface. The round Discharges tip of the Discharges electrode shall be approached as fast as possible to touch the EUT. After each Discharge, the Discharges electrode shall be removed from the EUT. The generator is then re-triggered for a new single Discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air Discharges completed.

Contact Discharges:

All the procedure shall be same as Section 8.3.2 of IEC 61000-4-2, except that the tip of the Discharges electrode shall touch the EUT before the Discharges switch is operated.

Indirect Discharges for HCP

At least 20 single Discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The Discharges electrode positions vertically at a distance of 0.1 m from the EUT and with the Discharges electrode touching the coupling plane.

Indirect Discharges for VCP

At least 20 single Discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of

0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated

6.4 Environmental Conditions

Temperature:	20° C
Relative Humidity:	52%
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

6.5 Test Data and Result

EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-8	+8	-15	+15
Air Discharge								
Slot	A	A	A	A	A	A	/	/
Screen	A	A	A	A	A	A	/	/
Surface	A	A	A	A	A	A	/	/

EN 61000-4-2 Test Points	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Contact Discharge								
Port	A	A	A	A	/	/	/	/

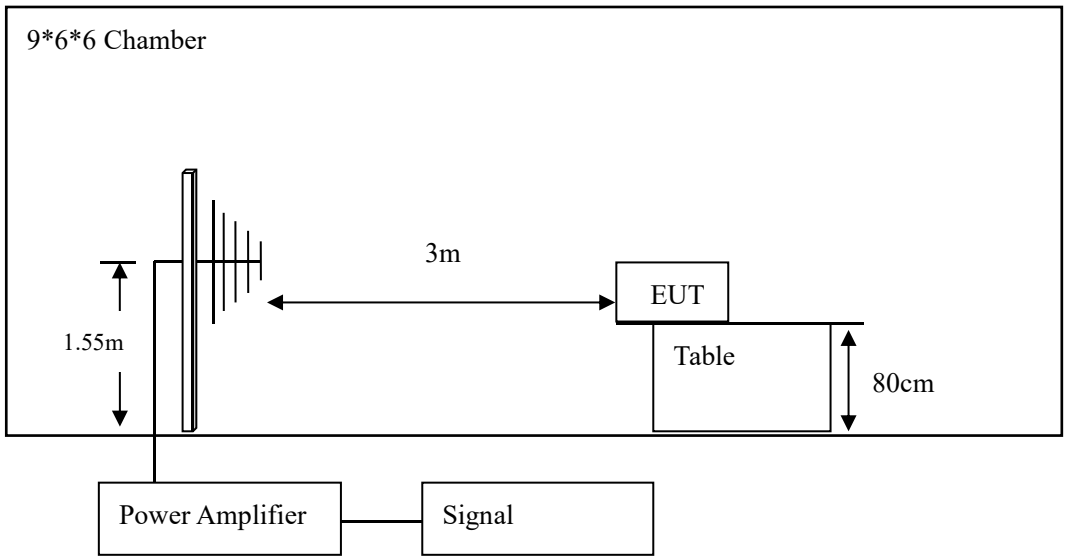
EN 61000-4-2 Test Points	Test Levels (kV)							
	Indirect Contact Discharge (HCP)				Indirect Contact Discharge (VCP)			
	-2	+2	-4	+4	-2	+2	-4	+4
Front Side	A	A	A	A	A	A	A	A
Back Side	A	A	A	A	A	A	A	A
Left Side	A	A	A	A	A	A	A	A
Right Side	A	A	A	A	A	A	A	A

7. Radio Frequency Electromagnetic Field

7.1 RS Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performanc e criterion
Radio-frequency electromagnetic field Amplitude modulated	Enclosure port	80-1000MHz,1800MHz, 2600MHz,3500MHz,5000MHz 3V/m(unmodulated, r.m.s) 80% AM(1kHz)	IEC 61000-4-3	A

7.2 Block Diagram of Test Setup



7.3 Test Procedure

Test is conducting under the description of IEC61000-4-3.

(1)The EUT was switched on and allowed to warm up to its normal operating condition.

(2)The EUT was exercised and monitored in the manner specified by the customer.

(3)All test instruments were PC controlled, via their IEEE 488.2 bus interfaces, and the test conducted in the following manner:

The testing frequencies were swept over the required frequency range, with a step frequency equal to 1% of fundamental. The sweep rate was 1.0 x 10^{-3} decades/s.For each frequency tested, the signal generator output level was adjusted automatically until the unmodulated field strength registered by the field monitor reached the desired level. This level was held constant for the specified dwell time.

(4)The EUT was continuously monitored during the test in accordance with the Pass / Fail criteria declared by the customer.

(5)The test was done in both horizontal and vertical antenna polarizations, and for all necessary sides of the EUT.

7.4 Environmental Conditions

Temperature:	20° C
Relative Humidity:	52%RH
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

7.5 Test Data and Result

Field Strength: 3V/m
Frequency step: 1% of fundamental
Dwell time: 1 second
Modulation: AM by 1kHz sine wave with 80% modulation depth

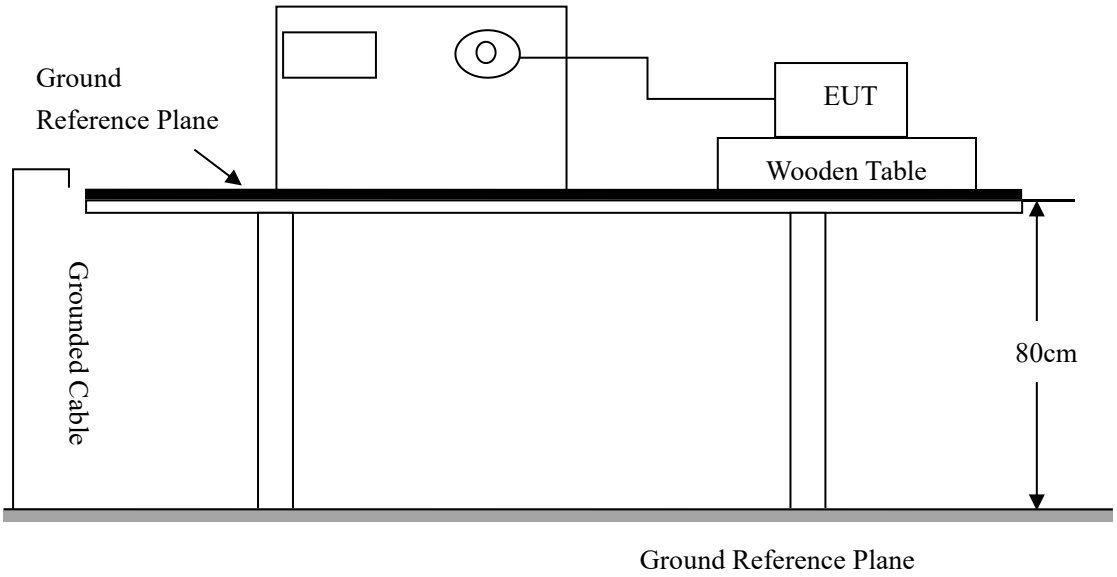
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1800,2600, 3500,5000	3	A	A	A	A	A	A	A	A

8. Electrical fast transients

8.1 EFT Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Electrical fast transients	Input a.c. power. ports	1kV(peak) Tr/Th:5/50ns Repetition frequency:5kHz	IEC 61000-4-4	B
	Analogue/digital data ports	0.5kV(peak) Tr/Th:5/50ns Repetition frequency:5kHz		B

8.2 Block Diagram of Test Setup



8.3 Test Procedure

(1)The EUT was switched on and allowed to warm up to its normal operating condition.

(2)D.C./A.C. Power Line Test

The EFT/B test system has a built-in coupling/decoupling network which couples the generated EFT bursts into the EUT power supply lines connected to it. The EFT bursts were coupled to the selected lines (one at a time) of the EUT.

(3)I/O Signal & Control Line Test

The interference impulses were capacitively coupled to the EUT's signal cables.

(4)The EUT was monitored during the test in accordance with the Pass /Fail criteria declared by the customer.

(5)The test was performed with EFT bursts in the positive and negative polarities and repeated on all necessary lines.

8.4 Environmental Conditions

Temperature:	22° C
Relative Humidity:	62%RH
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

8.5 Test Data and Result

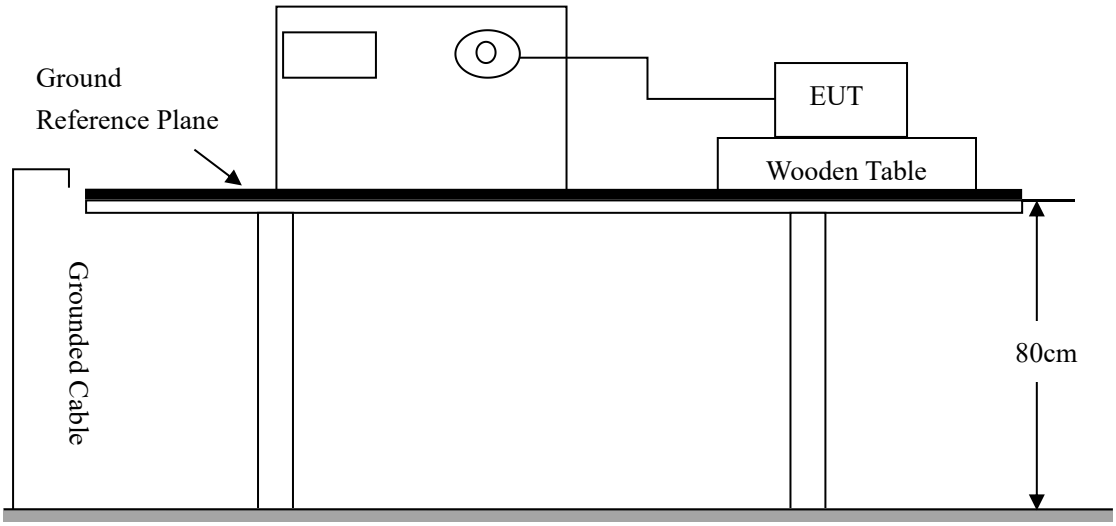
IEC61000-4-4 Test Points		Test Levels(kV)					
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0
AC mains power input port	L	A	A	A	A	/	/
	N	A	A	A	A	/	/
	L+N	A	A	A	A	/	/
	PE	/	/	/	/	/	/
	L+PE	/	/	/	/	/	/
	N+PE	/	/	/	/	/	/
	L+N+PE	/	/	/	/	/	/
Single Port	RJ45	/	/	/	/	/	/

9. Surges

9.1 Surges Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Surges	Input a.c. power ports	Tr/Th:1,2/50μs 1kV (line to line) 2kV(line to earth)	IEC 61000-4-5	B
	Analogue/digital data ports	Tr/Th:10/700μs 1kV (line to ground)	IEC 61000-4-5	C

9.2 Block Diagram of Test Setup



Ground Reference Plane

9.3 Test Procedure

(1)The power supply to EUT was switched on and allowed to warm up to its normal operating condition.

(2)The surge generator phase shifter was set to different angle.

(3)The correct open-circuit test level was set with the surge generator disconnected from the coupling network.

(4)The output of the generator was then reconnected back to the coupling network.

(5)Five discharges, generated by the voltage surge generator, were made on each relevant line, for each polarity, at each test level, with the relevant discharge interval.

(6)The EUT was observed during, and checked after the test to determine the result.

9.4 Environmental Conditions

Temperature:	21° C
Relative Humidity:	55%RH
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

9.5 Test Data and Result

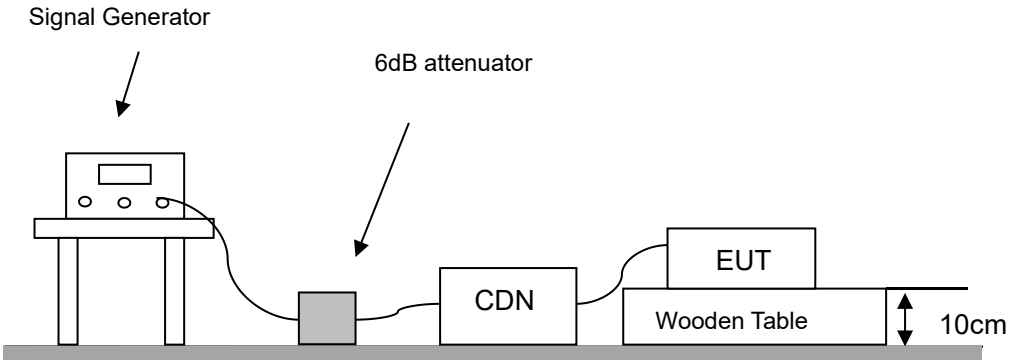
IEC61000-4-5 Test Points		Test Levels(kV)					
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0
AC mains power input port	L-N	A	A	A	A	/	/
	L-PE	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/
Signal port	RJ45	/	/	/	/	/	/

10. Radio-Frequency Continuous Conducted

10.1 CS Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Radio-frequency continuous conducted	Input a.c. power ports	0,15~10MHz,3V 10~30MHz,3~1V 30~80MHz,1V	IEC 61000-4-6	A
	Analogue/digital data ports	0,15~10MHz,3V 10~30MHz,3~1V 30~80MHz,1V	IEC 61000-4-6	A

10.2 Block Diagram of Test Setup



10.3 Test Procedure

(1)The EUT was switched on and allowed to warm up to its normal operating condition.

(2)The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN(coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

(3)The frequency range is swept from 150 kHz to 80 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.

(4)The rate of sweep shall not exceed $1.5*10^{-3}$decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

(5)The EUT was continuously monitored during the test in accordance with the PASS/FAIL criteria declared by the customer.

10.4 Environmental Conditions

Temperature:	22° C
Relative Humidity:	55%RH
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

10.5 Test Data and Result

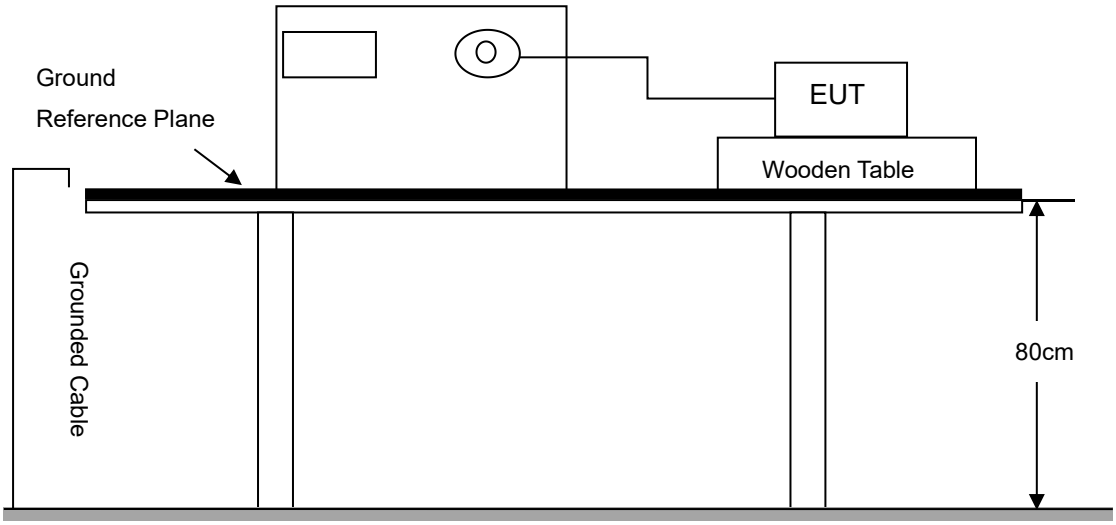
IEC 61000-4-6 Test Point	Frequency Range (MHz)	Strength (Vrms)	Modulation	Result
Power Line	0.15~10	3	AM	A
	10~30	3~1		A
	30~80	1		A
RJ45 Port	0.15~10	3	AM	N/A
	10~30	3~1		N/A
	30~80	1		N/A

11. Voltage Dips and Interruptions Test Result

11.1 DIPS Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Voltage Dips	Input a.c. power port	>95% reduction 0,5 period	IEC 61000-4-11	B
		30% reduction 25 period		C
Voltage interruptions		>95% reduction 250 period		C

11.2 Block Diagram of Test Setup



11.3 Test Procedure

(1)The interruption is introduced at selected phase angles with specified duration.

(2)Record any degradation of performance.

11.4 Environmental Conditions

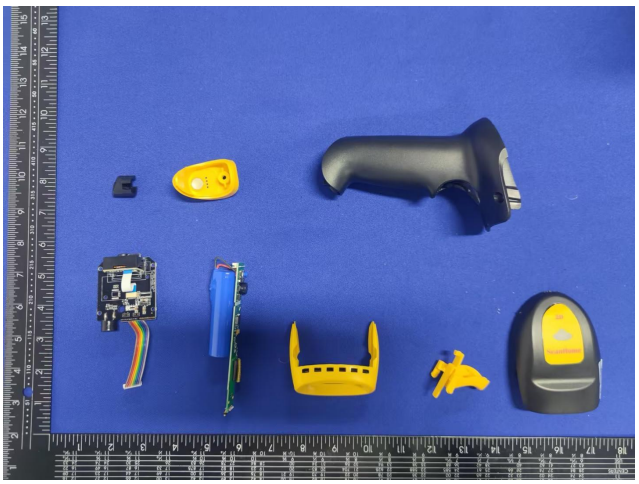
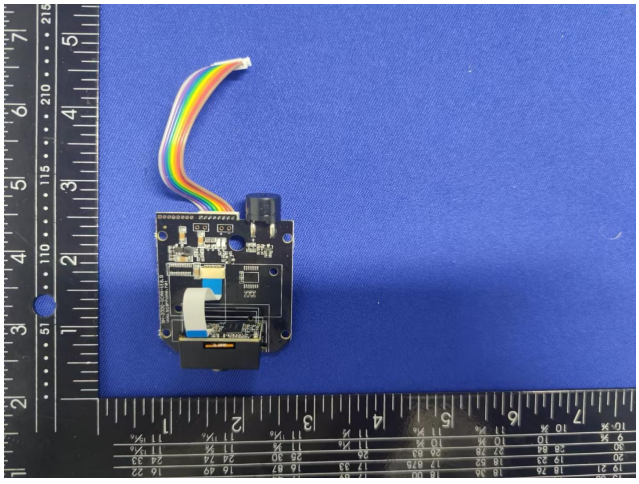
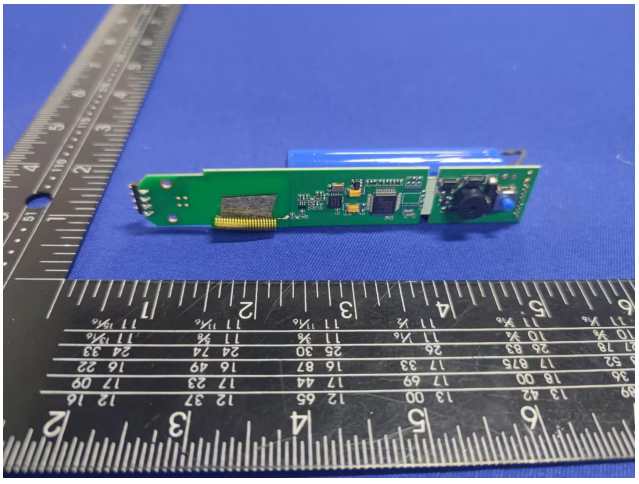
Temperature:	20° C
Relative Humidity:	52%RH
Atmospheric Pressure:	101.8kPa
Test Date:	2025.Mar.17
Tested By:	Kiki Chen

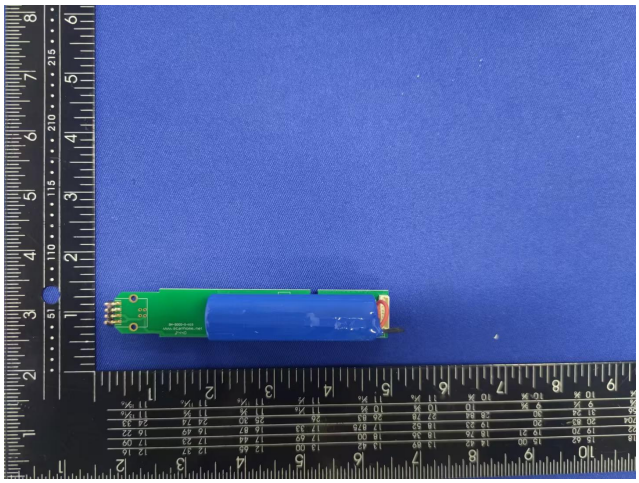
11.5 Test Data and Result

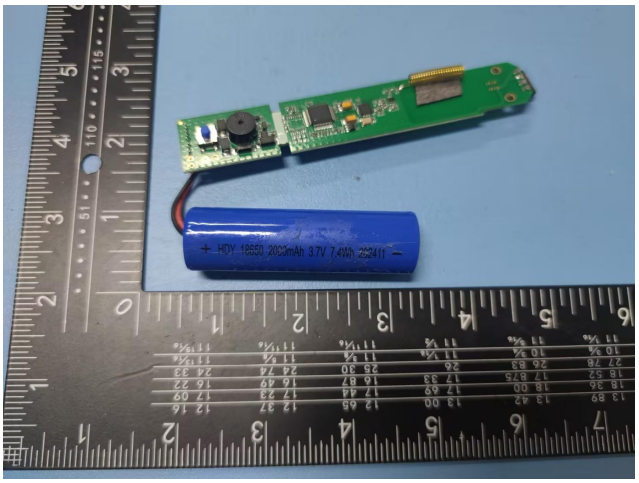
Environmental Phenomenon	Test Level $\%U_T$	Reduction (%)	Duration (periods)	Result
Voltage Dips	<5	>95	0.5	A
	70	30	25	A
Voltage interruptions	<5	>95	250	B

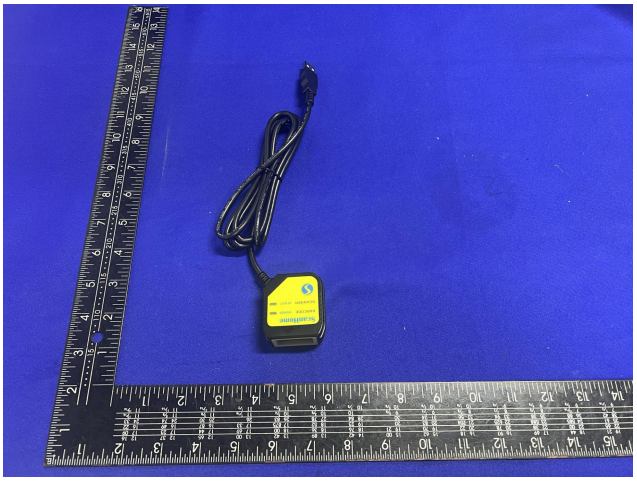
EXHIBIT B – PHOTOGRAPHS OF EUT

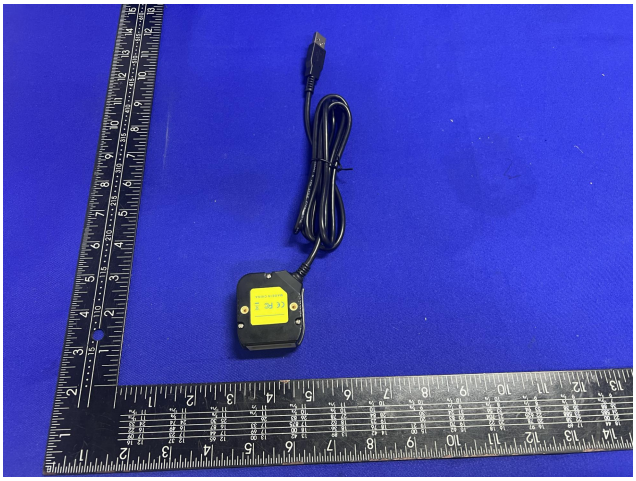


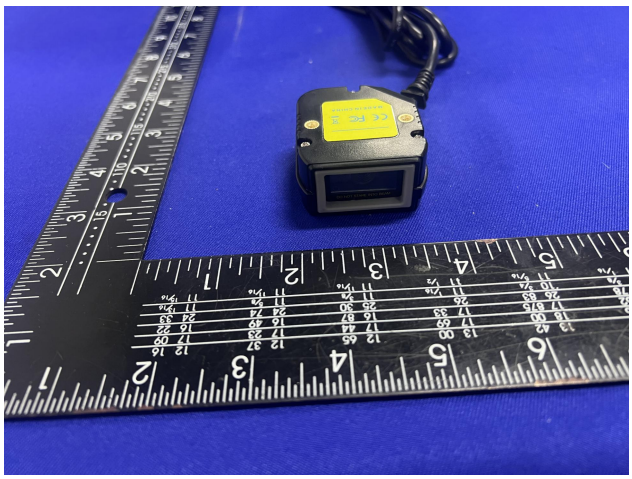





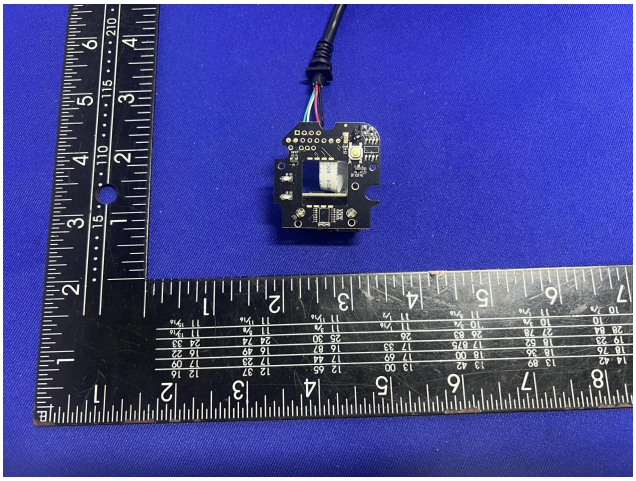


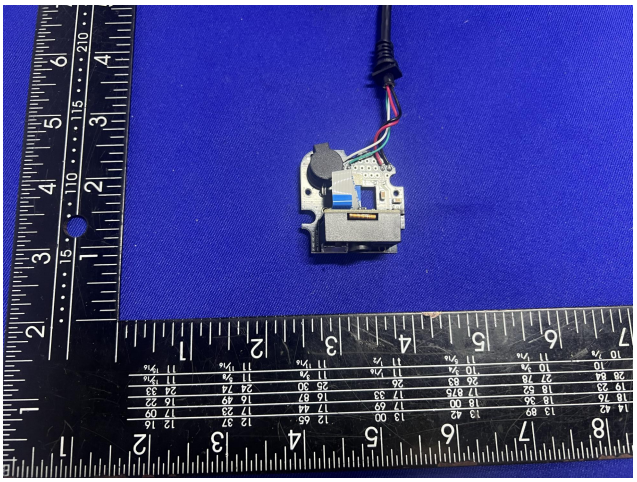












None

******* END OF REPORT *******