TEST REPORT

Report No.....	:	ZHT-240329011E
Product.....	:	Remote Control Battery Disconnect Switch
Trademark.....	:	/
Model(s).....	:	RL-240A-RCM2 RL-240A-RCM3, RL-240A-RCM3-VD, RCR-1, RCR-2, RL-240A-RCM4, RL-240A, RL-240A-RC, RL-240A-RCM5
Model Difference.....	:	RL-240A-RCM2 is the test model, while other models are derivative models. These models are the same on the circuit, only with different model names . Therefore, the test data of RL-240A-RCM2 can represent the remaining models.
Applicant.....	:	YUEQING DAIER ELECTRON CO.,LTD
Address.....	:	No.1636 Liuhuang Road, Xirendang industrial Zone, Liushi Town.Yueqing City, Zhejiang Province, China
Manufacturer.....	:	YUEQING DAIER ELECTRON CO.,LTD
Address.....	:	No.1636 Liuhuang Road, Xirendang industrial Zone, Liushi Town.Yueqing City, Zhejiang Province, China
Prepared by.....	:	Guangdong Zhonghan Testing Technology Co., Ltd.
Address.....	:	Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Date of Receipt.....	:	Mar. 29, 2024
Date of Test(s).....	:	Mar. 29, 2024 - Apr. 03, 2024
Date of Issue.....	:	Apr. 03, 2024
Test Standard(s).....	:	EN IEC 61000-6-3:2021 EN IEC 61000-6-1:2019 EN IEC 61000-3-2:2019 + A1:2021 EN 61000-3-3:2013+A1:2019 + A2:2021

In the configuration tested, the EUT complied with the standards specified above.

Tested by:	Reviewed by:	Approved by:
Kimi Lu/ Engineer	Baret Wu/ Director	Levi Lee/ Manager

Note: The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of ZHT. This document may be altered or revised by ZHT, personnel only, and shall be noted in the revision of the document.

Table of Contents

1. Revision History

Report No.	Issue Date	Description	Approved
ZHT-240329011E	Apr. 03, 2024	Original	Valid

2. Test Summary

Emission			
Requirement - Test	Test Method		Result
Conducted Emission	EN IEC 61000-6-3:2021		N/A
Radiated Emission	EN IEC 61000-6-3:2021		PASS
Immunity			
Requirement - Test	Test Method	Performance criteria	Result
Electrostatic discharges	EN 61000-4-2:2009	B	PASS
Radio-frequency electromagnetic field	EN 61000-4-3:2020	A	PASS
Fast transients	EN 61000-4-4:2012	B	N/A
Surges	EN 61000-4-5:2014	B	N/A
Radio-frequency common mode	EN 61000-4-6:2014	A	N/A
Power frequency magnetic field	EN 61000-4-8:2010	A	N/A
Voltage Dips and Voltage interruptions	EN 61000-4-11:2020	B &B & C & C	N/A

Requirement - Test	Test Method	Limit	Result
Harmonic current emissions	EN IEC 61000-3-2:2019 + A1: 2021	Class A	N/A
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3:2013+A1:2019 + A2: 2021	Clause 5	N/A

Remark: N/A is abbreviation for Not Applicable.

3. General Information

3.1. Description of EUT

EUT 1

Product:	Remote Control Battery Disconnect Switch
Model Name:	RL-240A-RCM2
Rated Power Supply:	Input: DC 12 V
Normal Testing Voltage:	DC 12 V
DC Line	Shorter than 3m
I/O Ports	Refer to User Manual
Highest Frequency Generated	Below 108 MHz

EUT 1

Product:	Remote Control
Model Name:	/
Rated Power Supply:	Input: DC 3 V
Normal Testing Voltage:	DC 3 V
DC Line	/
Highest Frequency Generated	433 MHz

Note:

1) Other Accessory Device List and Details

Description	Manufacturer	Model	Note
Battery	LINQING SHENGHUANG POWER CO., LTD	6-FM-7	AE
/	/	/	/

2) The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

3.2. Block diagram of EUT configuration

Mode 1

3.3. Test Mode

Pretest mode	Mode 1: Working mode		
Worst-case Test mode	Conducted Emission		N/A
	Radiated Emission	Below 1 GHz	Mode 1
		Above 1 GHz	Mode 1
	Harmonic current emissions		N/A
	Voltage changes, voltage fluctuations and flicker		N/A
	Electrostatic discharges		Mode 1
	Radio-frequency electromagnetic fields		Mode 1
	Fast transients		N/A
	Surges		N/A
	Injected currents		N/A
	Power frequency magnetic field		N/A
	Voltage dips and short interruptions		N/A

* Only the Worst-case test mode is shown in the report.

3.4. Test Site Environment

Test Item	Required		Actual
Radiated Emission	Temperature (°C)	15-35	24.6
	Humidity (%RH)	25-75	54.0
	Barometric pressure (mbar)	860-1060	1014
Electrostatic discharges	Temperature (°C)	15-35	24.2
	Humidity (%RH)	25-75	53.2
	Barometric pressure (mbar)	860-1060	1014
Radio-frequency electromagnetic fields	Temperature (°C)	15-35	24.2
	Humidity (%RH)	25-75	53.8
	Barometric pressure (mbar)	860-1060	1014

4. Facilities

4.1. Test Facility

Test site 1: Guangdong Zhonghan Testing Technology Co., Ltd.

Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Test site 2: Shenzhen Haiyun Testing Co., Ltd.

No. 2 Danzi North Road, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

4.2. Test Instruments

Radiated emissions Test (966 chamber)

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Receiver	R&S	ESCI	May 12, 2023	May 11, 2024
Amplifier	Schwarzbeck	BBV 9743 B	May 12, 2023	May 11, 2024
Amplifier	Schwarzbeck	BBV 9718 B	May 17, 2023	May 16, 2024
Bilog Antenna	Schwarzbeck	VULB9162	May 17, 2023	May 16, 2024
Horn Antenna	Schwarzbeck	BBHA9120D	May 12, 2023	May 11, 2024
966 Anechoic Chamber	EMToni	9m6m6m	Nov. 25, 2021	Nov. 24, 2024

Electrostatic discharge immunity Test

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
ESD TEST Generator	HTEC	HESD16	May 12, 2023	May 11, 2024

Radio-frequency electromagnetic fields Test(Site 2)

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Signal Generator	R&S	SMB100A	Oct. 15, 2023	Oct. 14, 2024
Signal Generator	R&S	SMR40	Oct. 15, 2023	Oct. 14, 2024
Power Amplifier	A&R	250W1000A	Oct. 15, 2023	Oct. 14, 2024
Power Amplifier	A&R	1150A100B	Oct. 15, 2023	Oct. 14, 2024
Power Amplifier	A&R	60S1G4	Oct. 15, 2023	Oct. 14, 2024
Communication antenna	Schwarzbeck	FPA3-0.8-6.0R/1329	Oct. 15, 2023	Oct. 14, 2024

4.3. Testing software

Project	Software name	Edition
Radiated Emission	EZ-EMC	FA-03A2 RE+

4.4. Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	2.60
Radiated Emission(30MHz~1GHz)	4.60
Radiated Emission(1GHz~6GHz)	4.30

Decision Rule

☒ Uncertainty is not included

☐ Uncertainty is included

5. Emission

5.1. Conducted Emission

5.1.1. Limit

A.C. Mains Conducted Interference Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

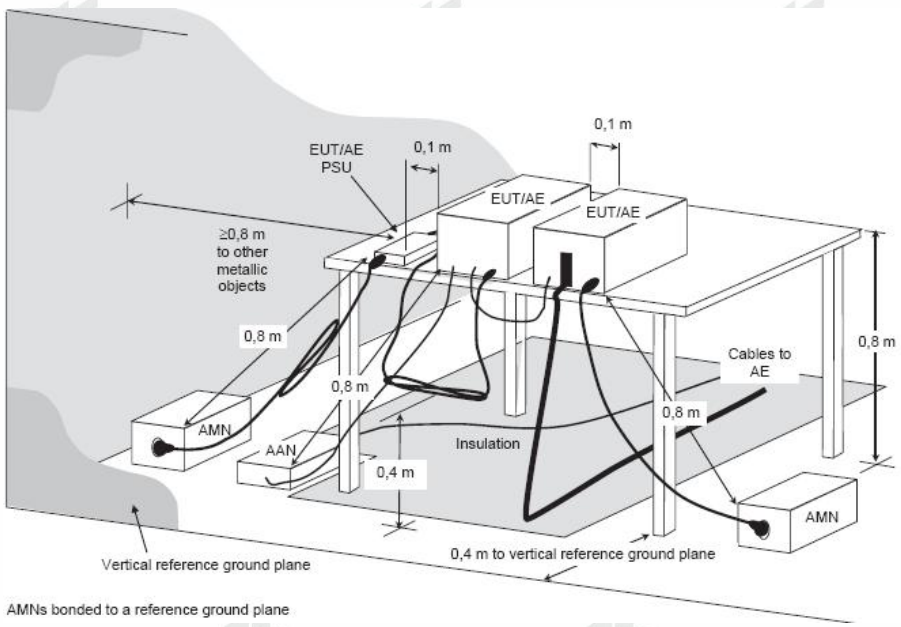
Note:

(1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.1.2. Test setup



5.1.3. Test procedure

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak(mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.
Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

5.1.4. Test results

N/A

This product is powered by Battery and is not applicable to this project.

5.2. Radiated emissions

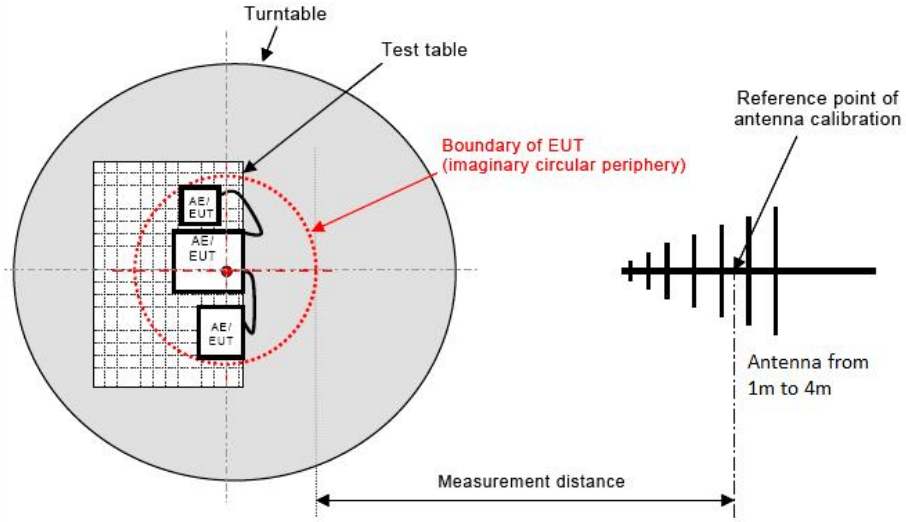
5.2.1. Limit

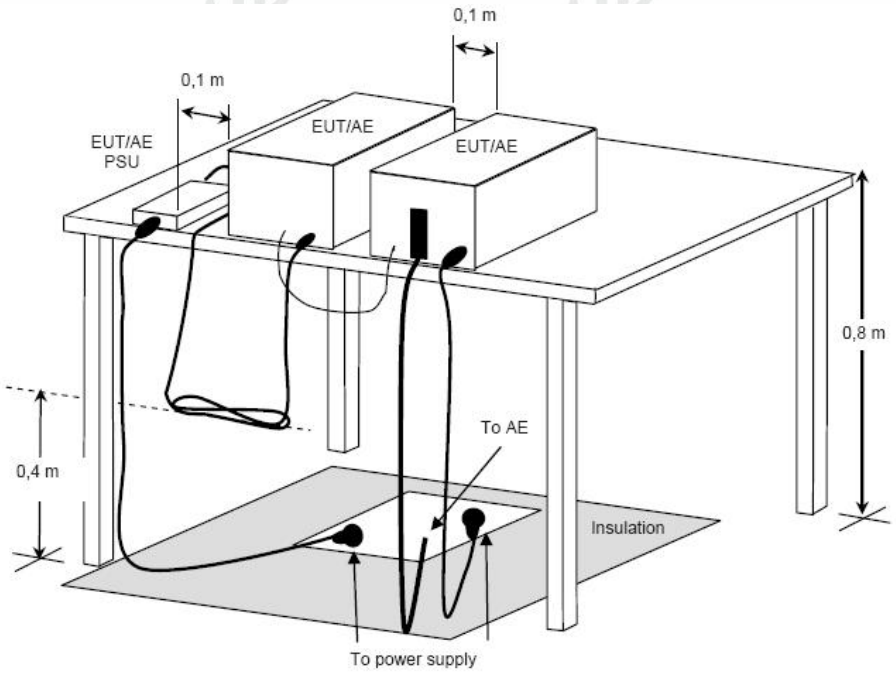
Frequency (MHz)	dBuV/m (Distance 3m)
30 ~ 230	40
230 ~ 1000	47

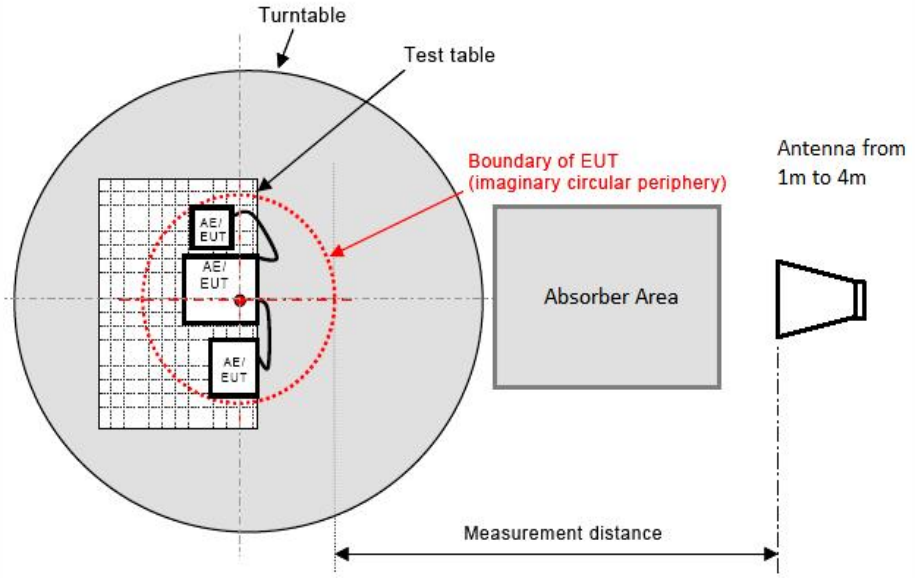
Note: The lower limit shall apply at the transition frequencies.

5.2.2. Block diagram of test setup

Measurement distance







5.2.3. Test procedure

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-an echoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

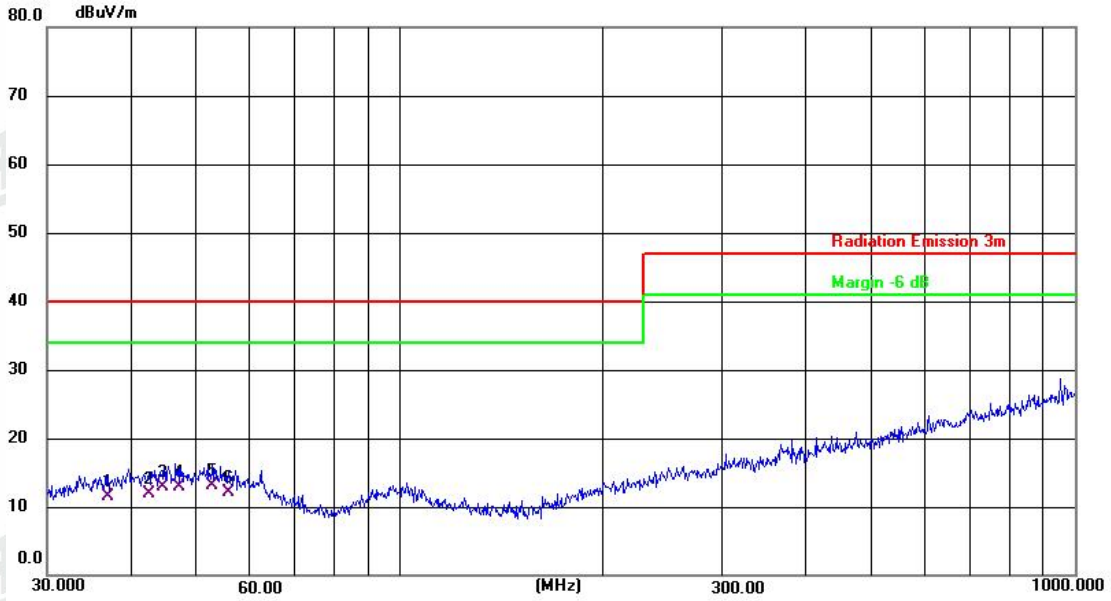
5.2.4. Test results

PASS

Please refer to pages 14 - 17 for data.

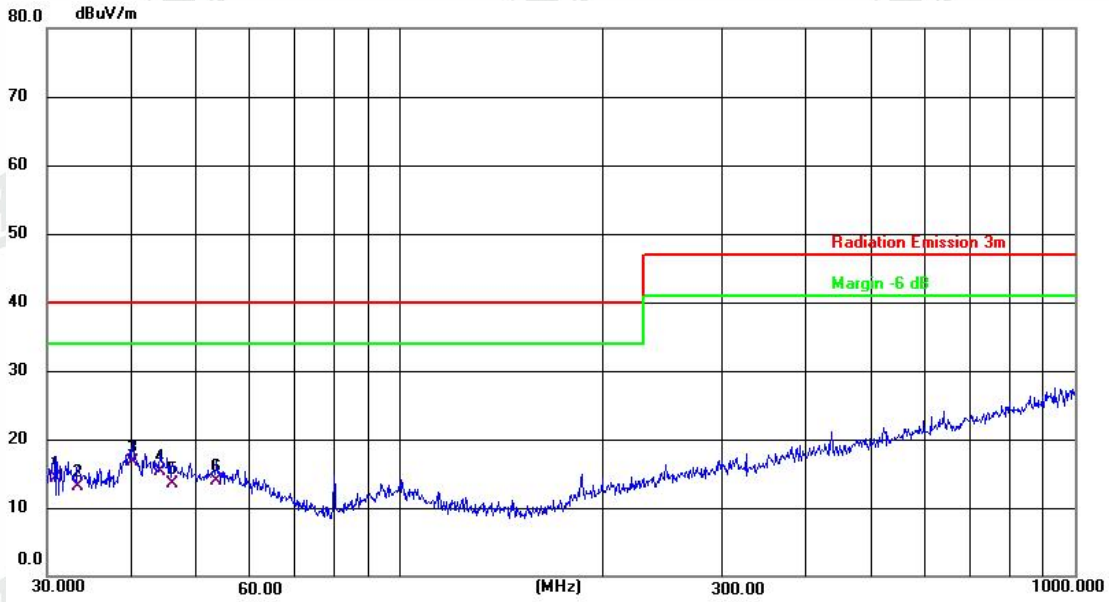
30-1000MHz

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	36.8953	21.84	-10.24	11.60	40.00	-28.40	QP			P	
2	42.4508	21.39	-9.45	11.94	40.00	-28.06	QP			P	
3	44.7433	22.18	-9.24	12.94	40.00	-27.06	QP			P	
4	46.9947	21.88	-9.02	12.86	40.00	-27.14	QP			P	
5 *	52.7600	22.10	-9.04	13.06	40.00	-26.94	QP			P	
6	55.6093	21.49	-9.36	12.13	40.00	-27.87	QP			P	

Polarization: Vertical



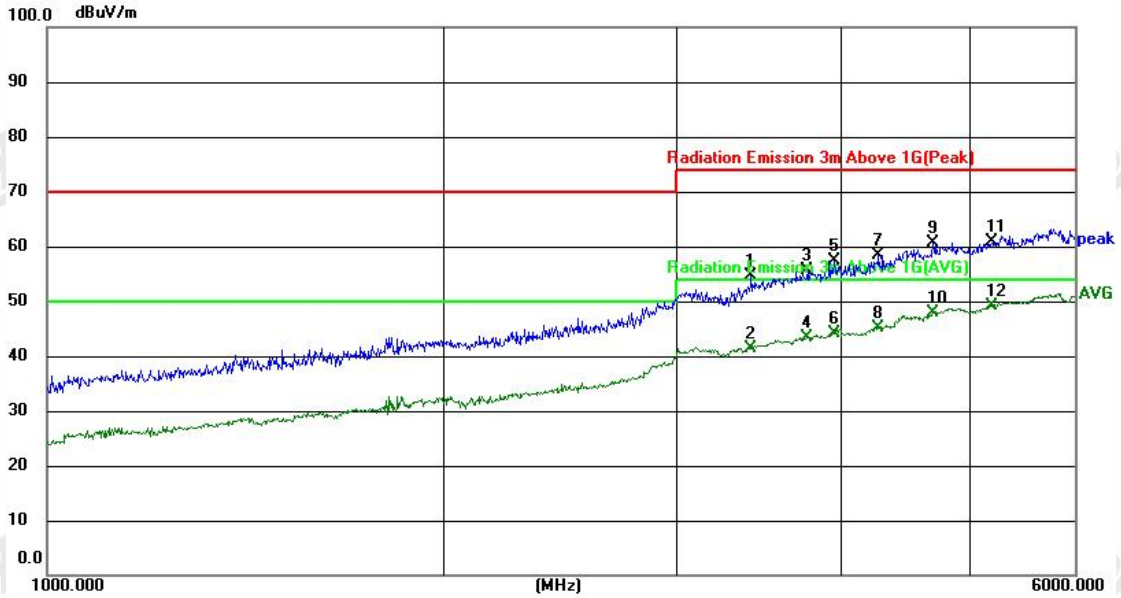
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	30.9619	25.60	-11.28	14.32	40.00	-25.68	QP			P	
2	33.3279	23.99	-10.86	13.13	40.00	-26.87	QP			P	
3 *	40.1347	26.37	-9.68	16.69	40.00	-23.31	QP			P	
4	44.1202	24.55	-9.30	15.25	40.00	-24.75	QP			P	
5	46.0164	22.61	-9.12	13.49	40.00	-26.51	QP			P	
6	53.5052	23.05	-9.13	13.92	40.00	-26.08	QP			P	

Note: Level=Reading + Factor

Margin=Level – Limit

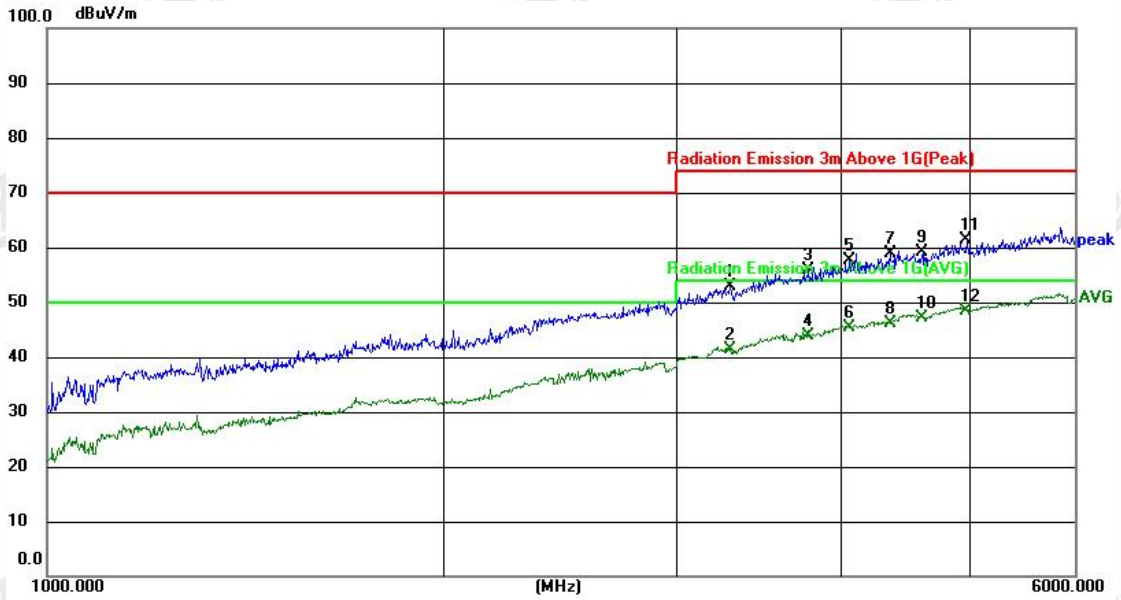
1000-6000MHz

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	3412.193	37.23	17.29	54.52	74.00	-19.48	peak			P	
2	3412.193	24.17	17.29	41.46	54.00	-12.54	AVG			P	
3	3765.580	36.95	18.67	55.62	74.00	-18.38	peak			P	
4	3765.580	24.65	18.67	43.32	54.00	-10.68	AVG			P	
5	3945.153	37.93	19.33	57.26	74.00	-16.74	peak			P	
6	3945.153	24.89	19.33	44.22	54.00	-9.78	AVG			P	
7	4261.126	37.73	20.59	58.32	74.00	-15.68	peak			P	
8	4261.126	24.55	20.59	45.14	54.00	-8.86	AVG			P	
9	4685.613	38.57	21.99	60.56	74.00	-13.44	peak			P	
10	4685.613	25.84	21.99	47.83	54.00	-6.17	AVG			P	
11	5198.752	37.51	23.43	60.94	74.00	-13.06	peak			P	
12 *	5198.752	25.62	23.43	49.05	54.00	-4.95	AVG			P	

Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	3292.081	36.15	16.71	52.86	74.00	-21.14	peak			P	
2	3292.081	24.75	16.71	41.46	54.00	-12.54	AVG			P	
3	3772.333	37.23	18.70	55.93	74.00	-18.07	peak			P	
4	3772.333	25.30	18.70	44.00	54.00	-10.00	AVG			P	
5	4052.622	37.85	19.74	57.59	74.00	-16.41	peak			P	
6	4052.622	25.72	19.74	45.46	54.00	-8.54	AVG			P	
7	4345.943	37.92	20.94	58.86	74.00	-15.14	peak			P	
8	4345.943	25.27	20.94	46.21	54.00	-7.79	AVG			P	
9	4602.405	37.25	21.79	59.04	74.00	-14.96	peak			P	
10	4602.405	25.24	21.79	47.03	54.00	-6.97	AVG			P	
11	4971.018	38.74	22.63	61.37	74.00	-12.63	peak			P	
12 *	4971.018	25.86	22.63	48.49	54.00	-5.51	AVG			P	

Note: Level=Reading + Factor
Margin=Level – Limit

5.3. Harmonic current emissions

5.3.1. Limit

Class A Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current (A)	Harmonics Order n	Maximum Permissible harmonic current (A)
Odd harmonics		Even harmonics	
3	2.30	2	1.08
5	1.14	4	0.43
7	0.77	6	0.30
9	0.40	8 ≤ n ≤ 40	0.23 * 8/n
11	0.33		
13	0.21		
15 ≤ n ≤ 39	0.15 * 15/n		

Class B Harmonics Currents

For Class B equipment, the harmonic of the input current shall not exceed the maximum permissible values given in table which is the limit of Class A multiplied by a factor of 1.5.

Class C Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current Expressed as a percentage of the input current at the fundamental frequency (%)
2	2
3	30．λ*
5	10
7	7
9	5
11 ≤ n ≤ 39 (odd harmonics only)	3
* λ is the circuit power factor	

Class D Harmonics Currents

Harmonics Order n	Maximum Permissible harmonic current per watt (mA/W)	Maximum Permissible harmonic current (A)
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
11 ≤ n ≤ 39 (odd harmonics only)	3.85/n	See limit of Class A

5.3.2. Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and the EUT is supplied in series with power analyzer from a power source having the same normal voltage and frequency as the rated supply voltage and the equipment under test. And the rated voltage at the supply voltage of EUT of 0.94 times and 1.06 times shall be performed.

A definition of the normal load or of the conditions for adequate heat discharge can usually be found in the EN publication corresponding to the equipment under test.

Equipment may have several separately controlled circuits. Each circuit is considered as a single piece of equipment if it can be operated independently and separately from the other circuits.

5.3.3. Test Result

N/A

This product is powered by Battery and is not applicable to this project.

5.4. Voltage changes, voltage fluctuations and flicker

5.4.1. Test Procedure

The EUT was put on the top of a wooden table 0.8m above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

5.4.2. Limit

Test Item	Limit
Pst (Short-term flicker indicator.)	1.0
Plt (Long-term flicker indicator.)	0.65
Td(t)(ms) (Maximum time that d(t) exceeds 3.3%)	500
dmax(%) (Maximum relative voltage change.)	4
dc(%) (Relative steady-state voltage change)	3.3

5.4.3. Test Result

N/A

This product is powered by Battery and is not applicable to this project.

6. Immunity

Performance criteria

Performance criterion **A**

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss 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 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**

The equipment shall continue to operate as intended after the test. No degradation of performance or loss function is allowed below a performance level specified by the manufacturer, when the equipment is used as intended. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from equipment if used as intended.

Performance criterion **C**

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by operation of the controls.

6.1. Electrostatic discharges

6.1.1. Test Specification

Test Port	:	Enclosure port
Discharge Impedance	:	330 ohm / 150 pF
Discharge Mode	:	Single Discharge
Discharge Period	:	one second between each discharge

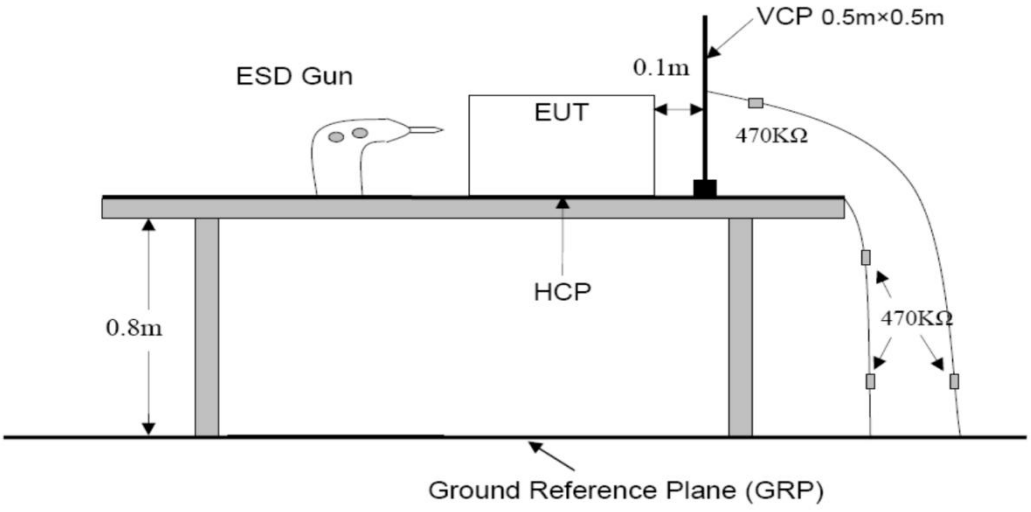
6.1.2. Test Levels and Performance Criterion

Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-2:2009)

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	±2	±2
2.	±4	±4
3.	±6	±8
4.	±8	±15
X	Special	Special

Performance criterion: **B**

6.1.3. Test setup



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6.1.4. Test Procedure

Air Discharge:

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

Contact Discharge:

All the procedure shall be same as Section Air Discharge except that the tip of the discharge electrode shall touch the EUT.

Indirect discharge for horizontal coupling plane:

At least 10 single discharges(in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit(if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

Indirect discharge for vertical coupling plane:

At least 10 single discharge (in the most sensitive polarity) 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.

6.1.5. Test Result

PASS

Test Point	Contact (C) Air (A)	Voltage (kV)	Performance Criterion	Result (Performance Criterion)
Indirect Discharge (HCP)	C	± 4	☐A ☒B	A
Indirect Discharge (VCP)	C	± 4	☐A ☒B	A
Conductive Surfaces	C	± 4	☐A ☒B	A
Slots, Apertures, and Insulating Surfaces	A	± 8	☐A ☒B	A

6.2. Radio-frequency electromagnetic field

6.2.1. Test Specification

Test Port	:	Enclosure port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second
Polarization	:	Horizontal & Vertical

6.2.2. Test Levels and Performance Criterion

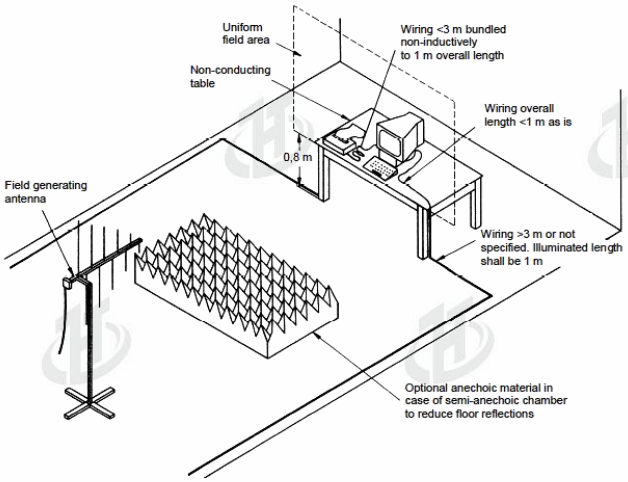
Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-3:2020)

Characteristics	Test levels
Frequency range	80 MHz to 1 000 MHz, 1 400 Mhz to 6 000 Mhz
Test level	3 V/m (unmodulated)
Modulation	1 kHz, 80 % AM, sine wave

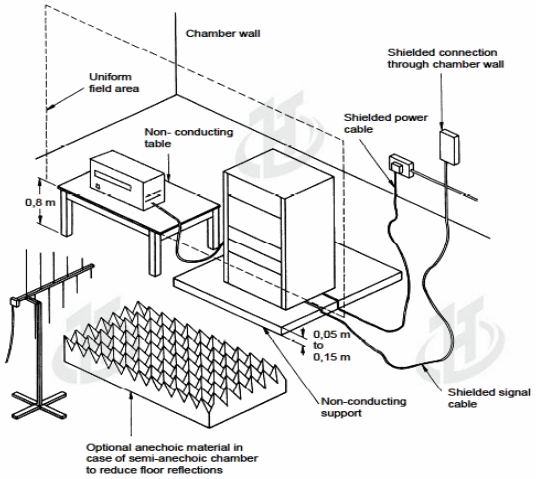
Performance criterion: **A**

6.2.3. Test setup

For table-top equipment



For floor standing equipment



6.2.4. Test Procedure

Measurement was performed in full-an echoic chamber.
Measurement procedure was applied according to EN 61000-4-3 clause 8.
The test method and equipment was specified by EN 61000-4-3.

6.2.5. Test Result

PASS

Frequency (MHz)	Polarization	Test level (V/m)	Modulation	Exposed location	Result (Performance Criterion)
80 - 1 000 1 400 - 6 000	H & V	3	1 kHz, 80% AM, 1 % increment	All sides	A

6.3. Fast transients

6.3.1. Test Specification

Test Port	:	input a.c. power port
Impulse Frequency	:	5 kHz
Impulse Wave-shape	:	5/50 ns
Burst Duration	:	15 ms
Burst Period	:	300 ms
Test Duration	:	2 minutes per polarity

6.3.2. Test Levels and Performance Criterion

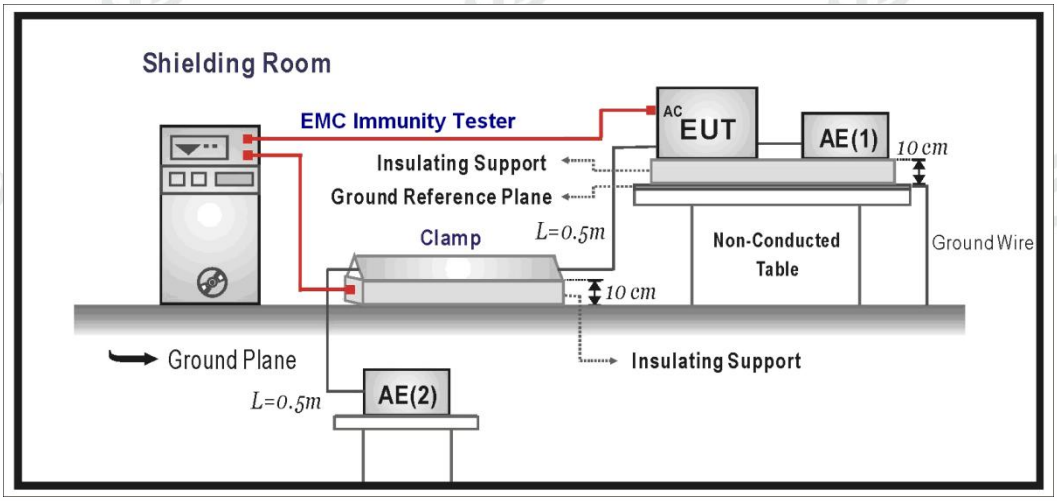
Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-4:2012)

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (Input/Output) Signal data and control ports	
	Voltage peak KV	Repetition rate KHz	Voltage peak KV	Repetition rate KHz
1.	0.5	5 or 100	0.25	5 or 100
2.	1.0	5 or 100	0.5	5 or 100
3.	2.0	5 or 100	1.0	5 or 100
4.	4.0	5 or 100	2.0	5 or 100
X	Special	Special	Special	Special

Note 1 Use of 5 KHz repetition rates is traditional; however, 100 KHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types.
Note 2 With some products, there may be no clear distinction, between power ports and I/O ports, in which case it is up to product committees to make this determination for test purposes.
Note 3 "X" is an open level. The level has to be specified in the dedicated equipment specification.

Performance criterion: **B**

6.3.3. Test setup



6.3.4. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 minus.

For Signal/Control ports:

Applicable only to ports which, according to the manufacturer's specification, support cable lengths greater than 3 m

For DC network power ports:

Not applicable to input ports intended for connection to a battery or a rechargeable battery which shall be removed or disconnected from the equipment for recharging

Test the device with a DC power input port on the AC power input specified by the AC-DC power adapter, which is intended to be used with a dedicated AC-DC power adapter. If the adapter is used, this test is only applicable to the intended permanent connection to a length exceeding 3 M

6.3.5. Test Result

N/A

This product is powered by Battery and is not applicable to this project.

6.4. Surges

6.4.1. Test Specification

Test Port	:	input a.c. power port
Wave-Shape	:	Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	:	1 pulse / min.
Phase Angle	:	0° / 90° / 180° / 270°
Test Events	:	5 pulses (positive & negative) for each polarity

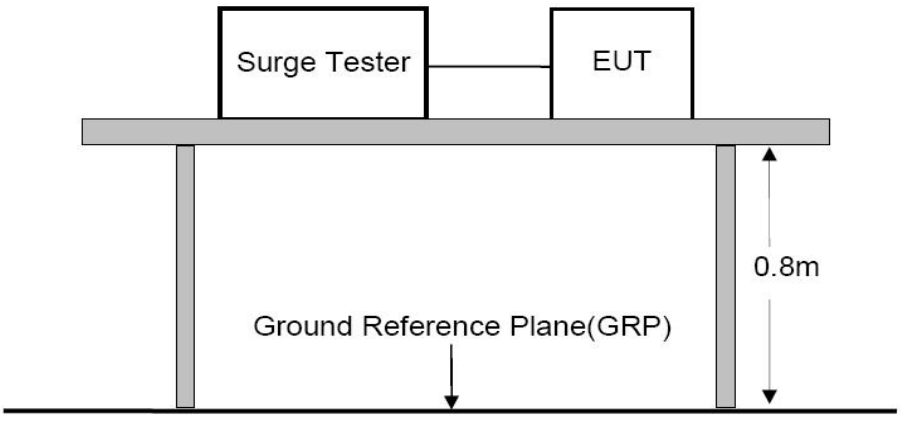
6.4.2. Test Levels and Performance Criterion

Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-5:2014)

Severity Level	Open-Circuit Test Voltage KV
1	0.5
2	1.0
3	2.0
4	4.0
*	Special

Performance criterion: **B**

6.4.3. Test setup



6.4.4. Test Procedure

1. Set up the EUT and test generator as shown on Section 12.1.
2. For line to line coupling mode, provide a 1.0KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
3. Five positive pulses Line-to-neutral at 90°phase,Five negative pulses Line-to-neutral at 270°phase. with a maximum 1/min repetition rate are conducted during test.
4. Different phase angles are done individually.
5. Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

6.4.5. Test Result

N/A

This product is powered by Battery and is not applicable to this project.

6.5. Radio-frequency common mode

6.5.1. Test Specification

Test Port	:	input a.c. power port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second

6.5.2. Test Levels and Performance Criterion

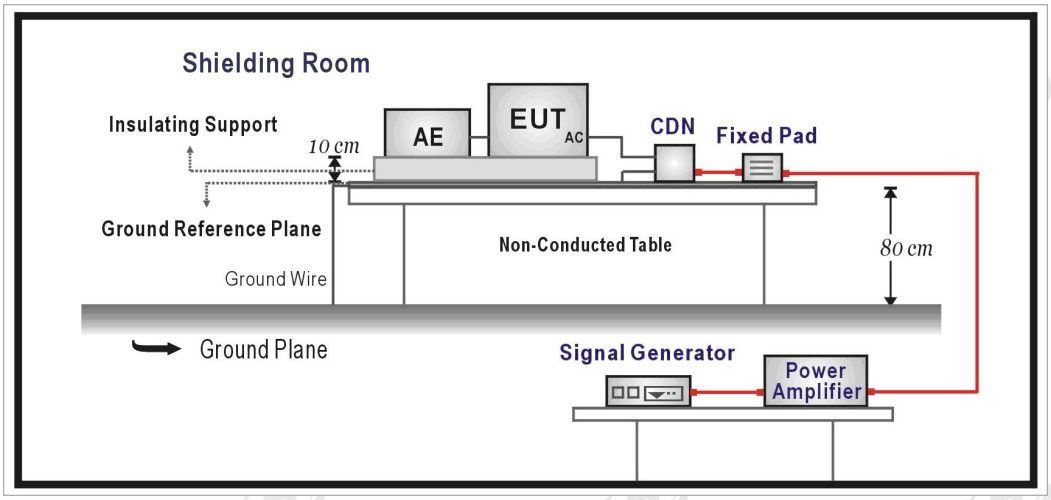
Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-6:2014)

Frequency ranges MHz	Test level V	Modulation	Performance criterion
0,15 to 80	3	80% AM (1kHz)	A

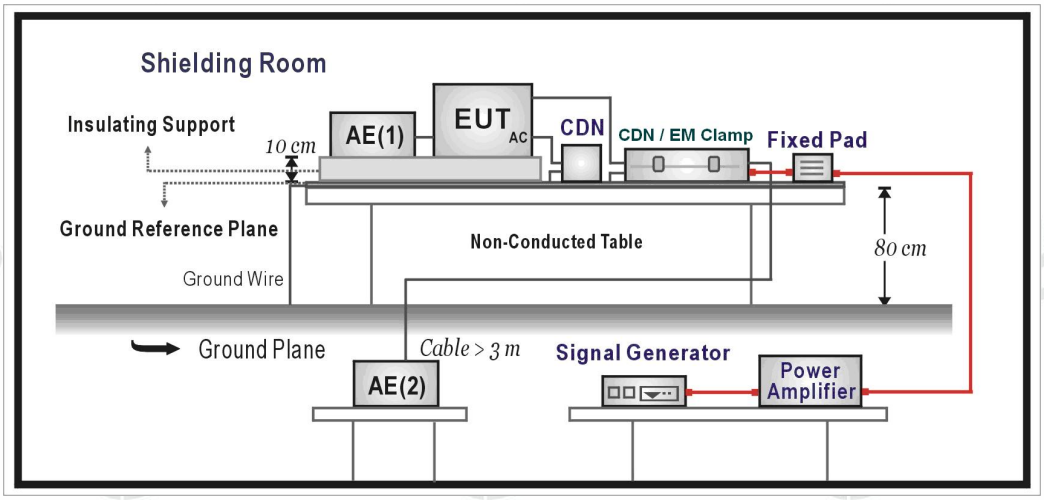
Performance criterion: **A**

6.5.3. Test setup

CDN Method



EM Clamp Method



6.5.4. Test Procedure

1. Set up the EUT, CDN and test generators as shown on Section 5.6.1.
2. Let the EUT work in test mode and measure it.
3. The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m 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).
4. The disturbance signal described below is injected to EUT through CDN.
5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.
6. 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 1KHz sine wave.
7. The rate of sweep shall not exceed 1.5*10-3decades/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.
8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

6.5.5. Test Result

N/A

This product is powered by Battery and is not applicable to this project.

6.6. Power frequency magnetic fields

6.6.1. Test Levels and Performance Criterion

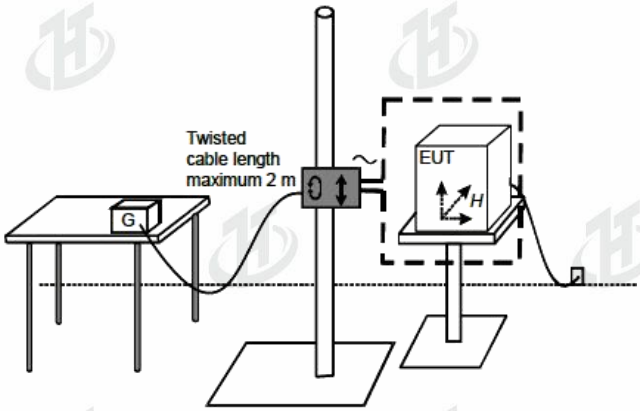
Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-8:2010)

Characteristics	Test levels
Field frequency	50 / 60 Hz
Test level	3 A/m

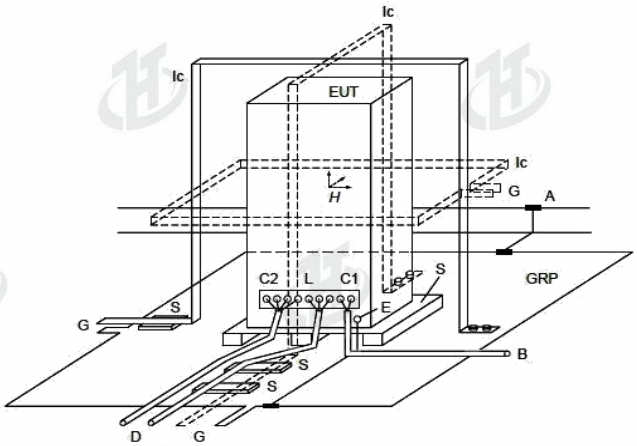
Performance criterion: **A**

6.6.2. Test setup

For table-top equipment



For floor standing equipment



6.6.3. Test Procedure

Measurement was performed in shielded room.
Measurement procedure was applied according to EN 61000-4-8 clause 8.
The test method and equipment was specified by EN 61000-4-8.

6.6.4. Test Result

N/A

The product is not a magnetically sensitive device.

6.7. Voltage Dips and Voltage interruptions

6.7.1. Test Specification

Test Port	:	input a.c. power port
Phase Angle	:	0°, 180°
Test cycle	:	3 times

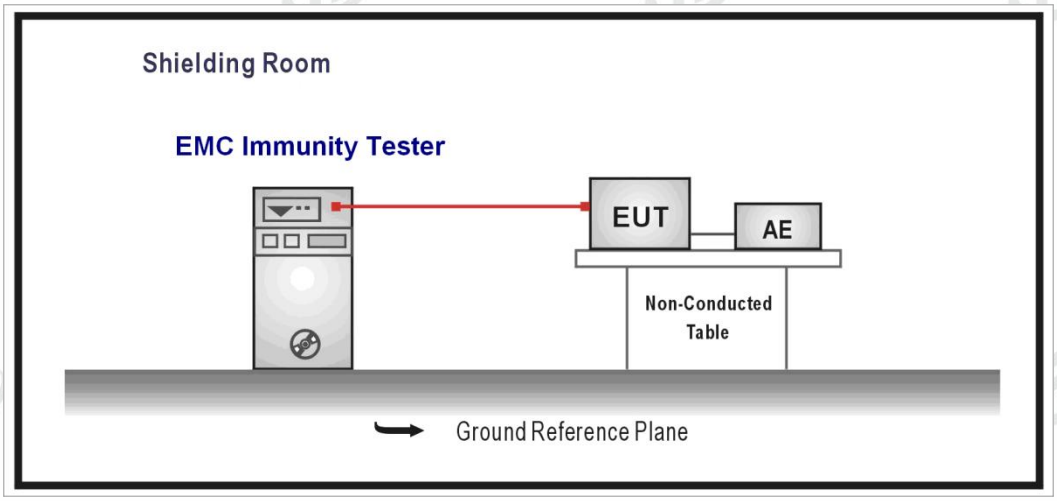
6.7.2. Test Levels and Performance Criterion

Test Standard
EN IEC 61000-6-1:2019
(EN 61000-4-11: 2020)

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)	
		50Hz	60Hz
0	100	0.5	0.5
0	100	1	1
70	30	25	30
0	100	250	300

Performance criterion: **B, B**, **C, C,**

6.7.3. Test setup



6.7.4. Test Procedure

1. Set up the E.U.T. and test generator as shown on Section 5.7.1.
2. The interruptions is introduced at selected phase angles with specified duration.Record any degradation of performance.

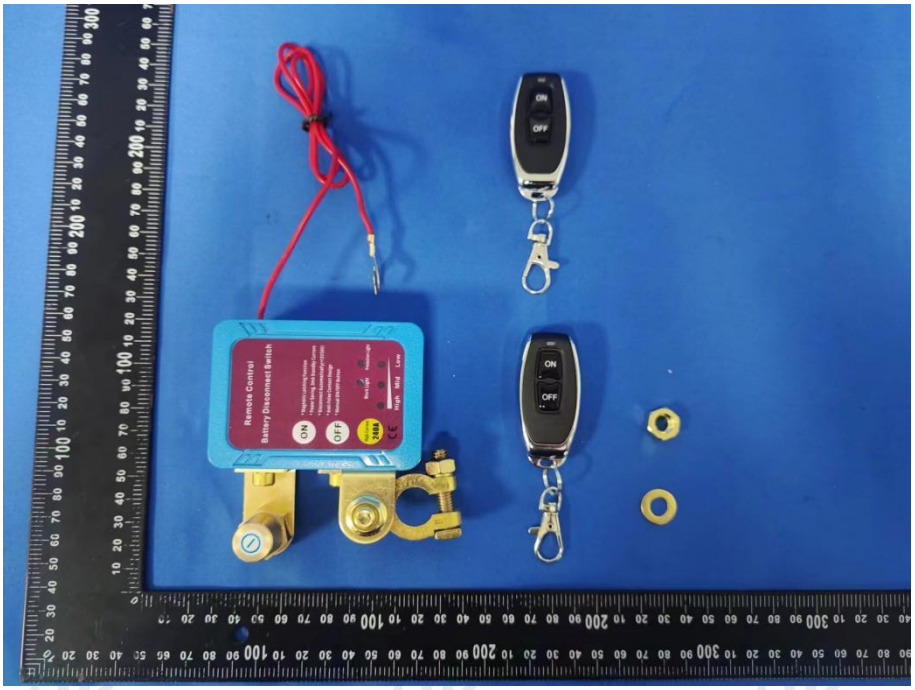
6.7.5. Test Result

N/A

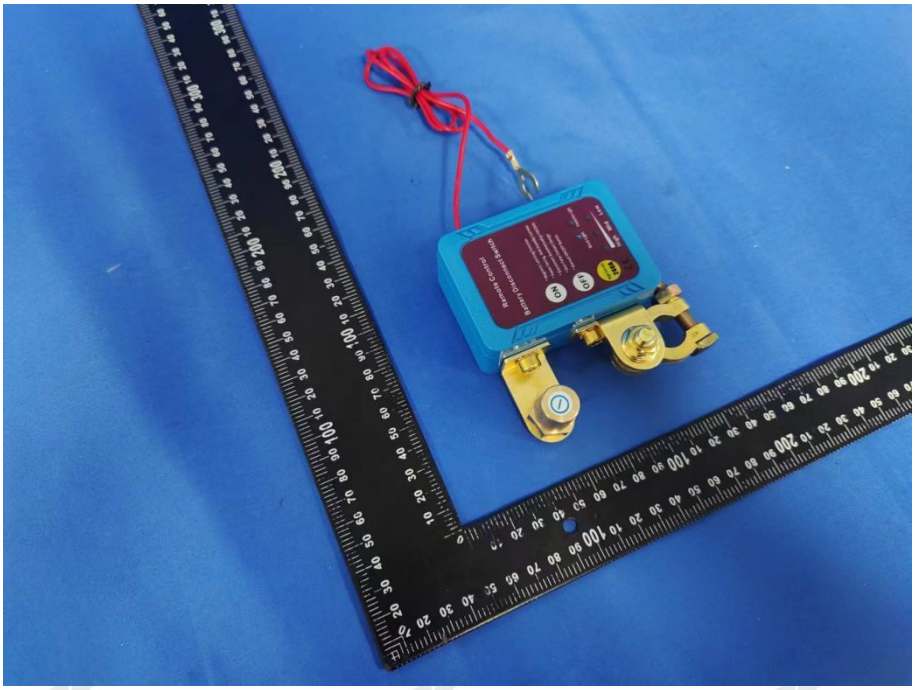
This product is powered by Battery and is not applicable to this project.

7. Photographs of EUT

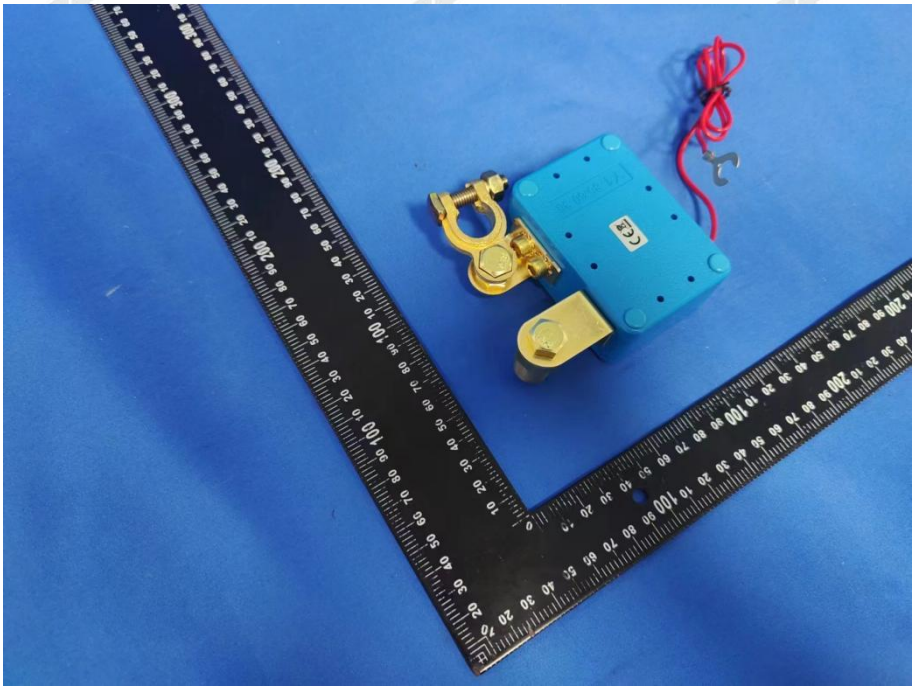
EUT Photo 1



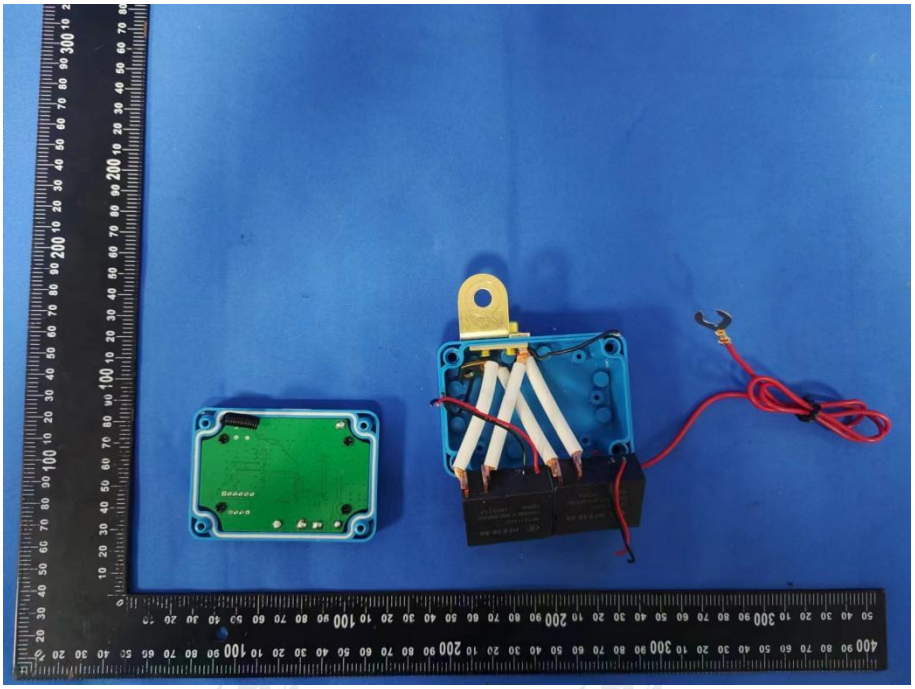
EUT Photo 2



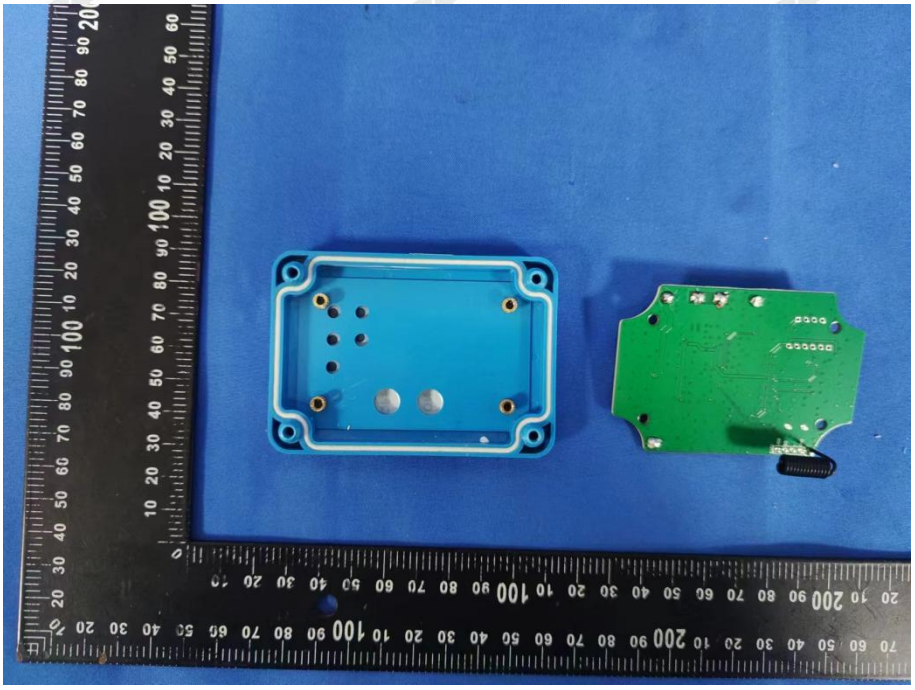
EUT Photo 3



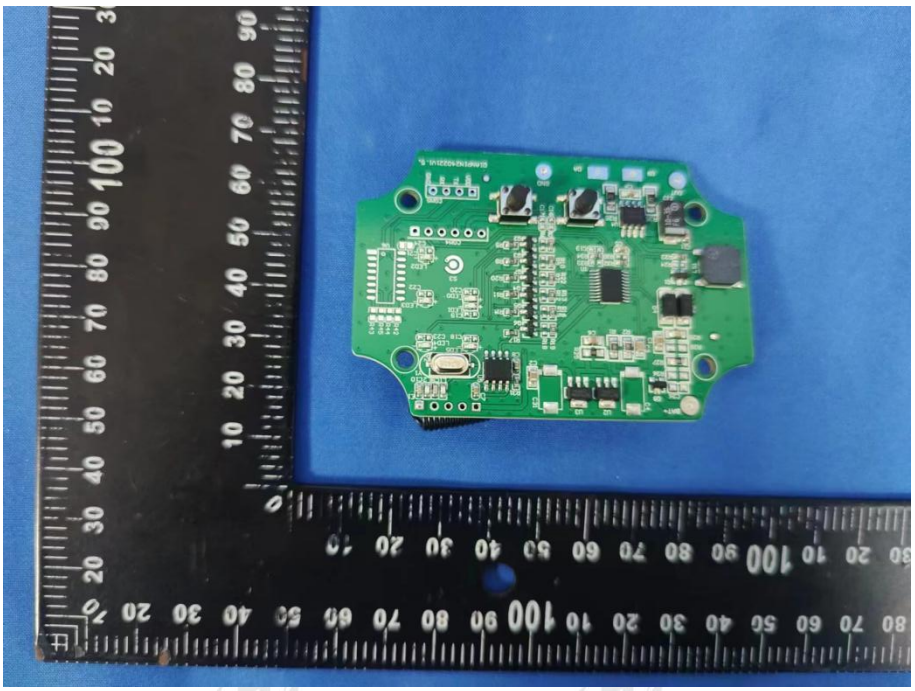
EUT Photo 4



EUT Photo 5



EUT Photo 6



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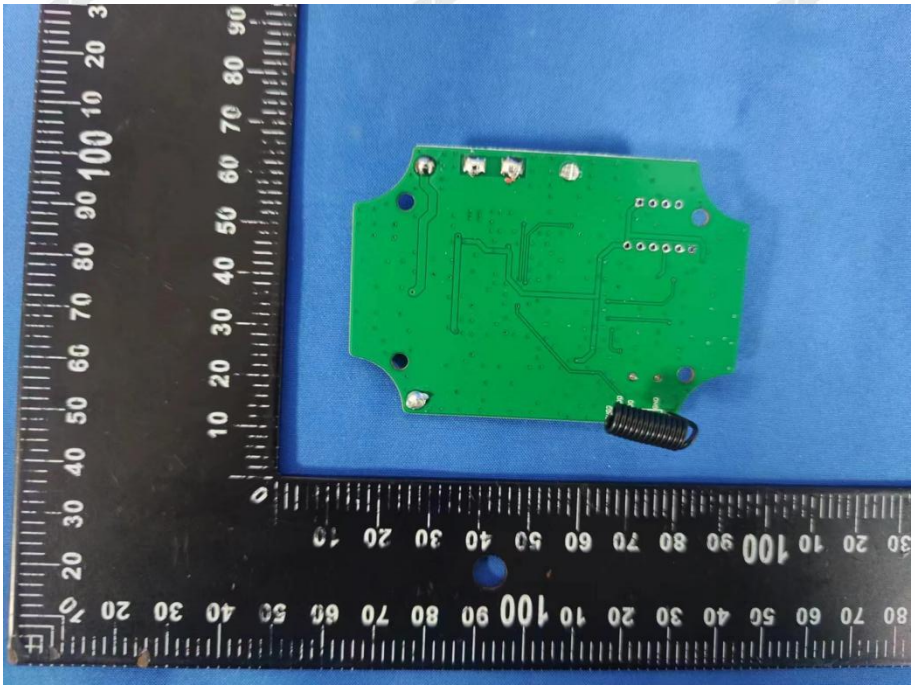
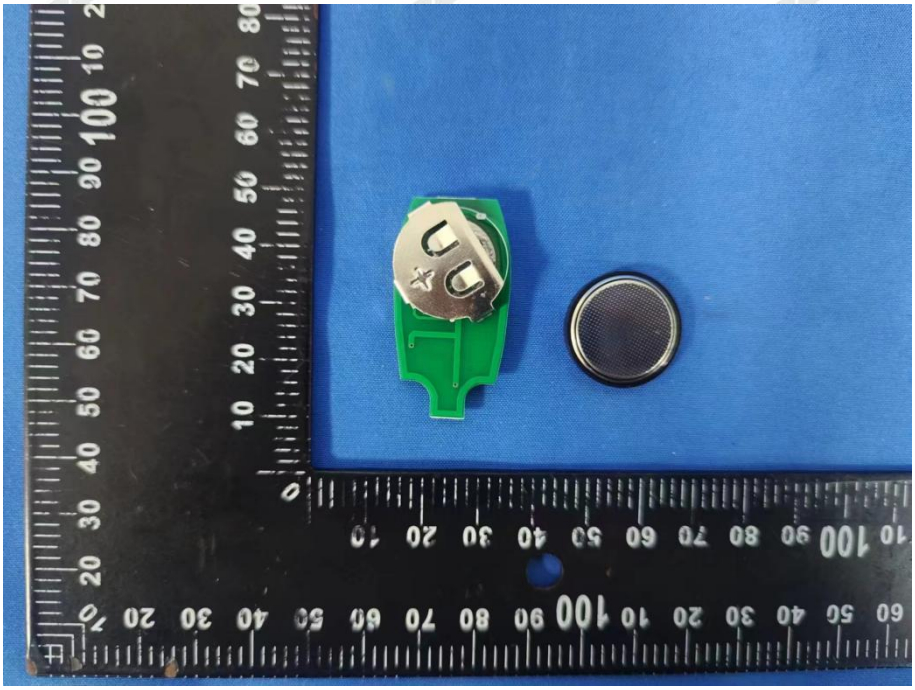


EUT Photo 8

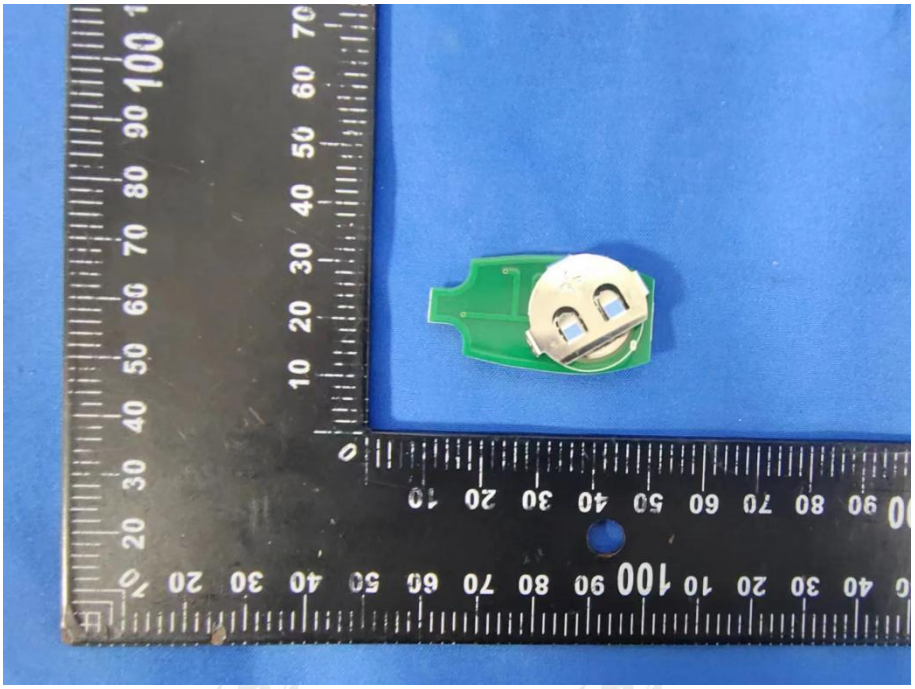
EUT Photo 9

EUT Photo 10

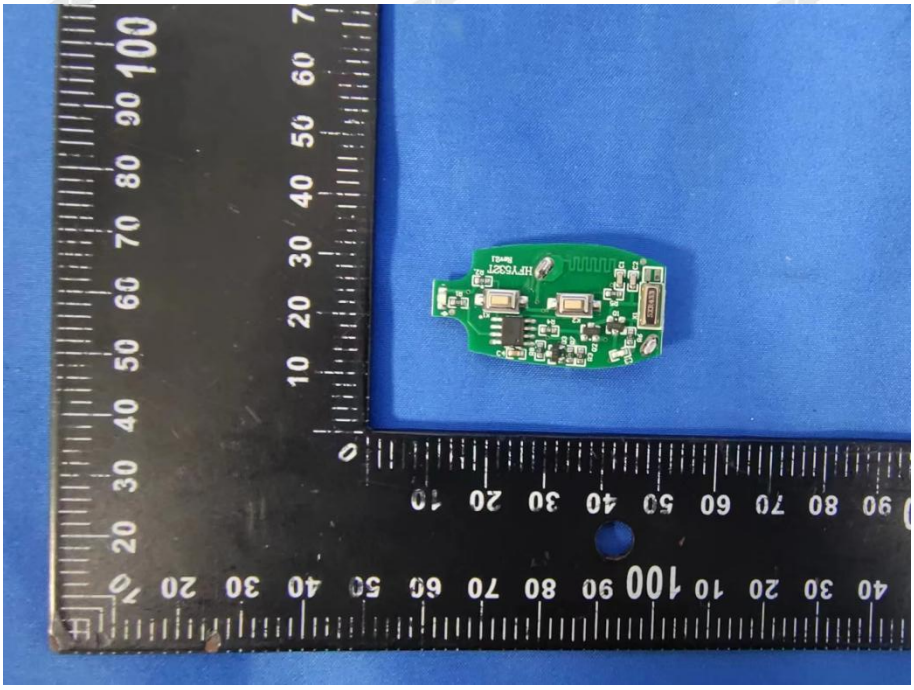
EUT Photo 11



EUT Photo 12

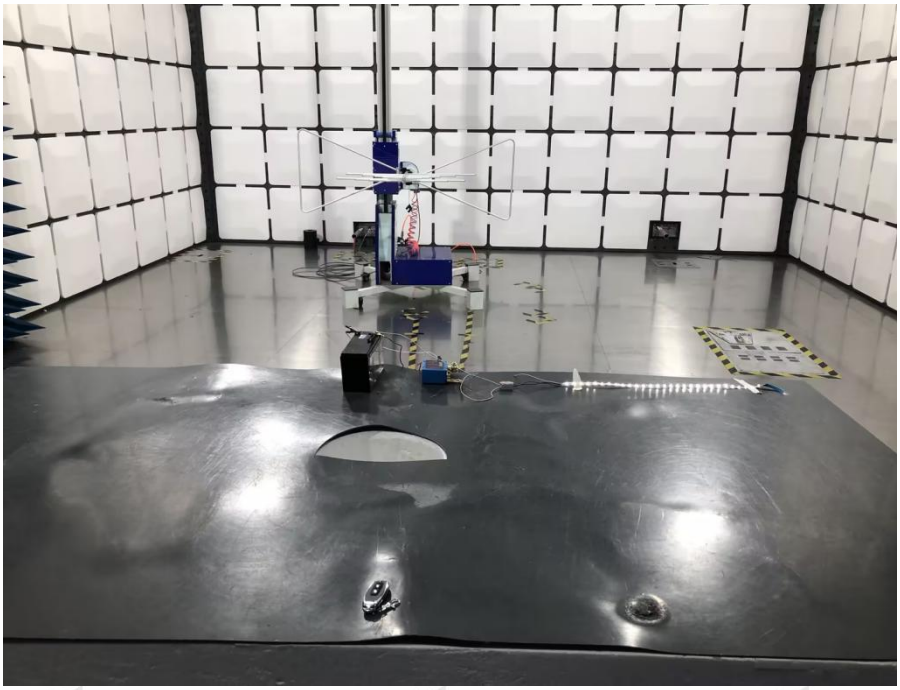


EUT Photo 13



8. Test Setup Photographs

Radiated Emission



End of report