
LED PROJECTION CLOCK
MADE IN CHINA
6 941326 980130

EN 55032:2015+A11:2020+A1:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021

TEST REPORT

For

Jinjiang Guanghua Electronic Industrial Trade Co.,Ltd.

Pujin Industrial Area, Longhu,Jinjiang Quanzhou City,Fujian

Tested Model: GH8013
Multiple Model: AN0726, GH8020

Report Type: Original Report	**Product Type:** LED PROJECTION CLOCK
Report Number:	XMTN1231017-60637E-01
Report Date:	2023/11/6
Reviewed By:	Dylan Zhang EMC Engineer Dylan Zhang
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	XMTN1231017-60637E-01	Original Report	2023/11/6

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	LED PROJECTION CLOCK
EUT Model:	GH8013
Multiple Model:	AN0726, GH8020
Model Difference:	Please refer to the DoS
Rated Input Voltage:	DC 5V from Adapter
The Highest Operating Frequency:	32.768kHz
Cable	USB Cable: Unshielded detachable 0.95m
Serial Number:	2CDZ-1
EUT Received Date:	2023/10/18
EUT Received Status:	Good

Objective

This report is prepared on behalf of ***Jinjiang Guanghua Electronic Industrial Trade Co.,Ltd.*** in accordance with EN 55032:2015+A11:2020+A1:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements;
EN 55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements;
EN IEC 61000-3-2:2019+A1:2021 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase);
EN 61000-3-3:2013+A1:2019+A2:2021 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection.

The objective is to determine the compliance of EUT with:
EN 55032:2015+A11:2020+A1:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021.

Test Methodology

All measurements contained in this report were conducted with
EN 55032:2015+A11:2020+A1:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements;
EN 55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment - Immunity requirements;
EN IEC 61000-3-2:2019+A1:2021 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase);
EN 61000-3-3:2013+A1:2019+A2:2021 Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection.

Declarations

The information marked ▲ is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Test Mode:
M1:Operating

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No EUT software is used for testing.

Support Equipment List and Details

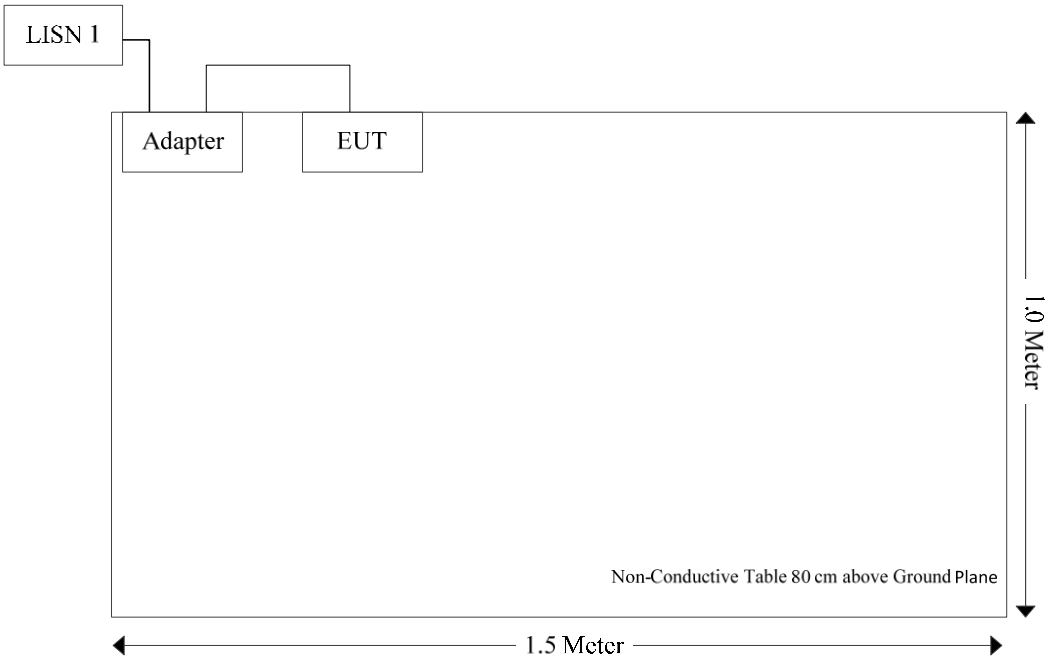
Manufacturer	Description	Model	Serial Number
Huntkey	Adapter	HKA01105021-XE	0D1805002143

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
/	/	/	/	/	/

Block Diagram of Test Setup

M1:



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
R&S	LISN	ENV216	101614	2022/11/18	2023/11/17
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2023/9/7	2024/9/6
R&S	EMI Test Receiver	ESCI	100035	2023/8/18	2024/8/17
R&S	Test Software	EMC32	V9.10.00	N/A	N/A
Radiated emissions below 1GHz					
Sunol Sciences	Hybrid Antenna	JB3	A060611-1	2023/9/6	2024/9/5
Narda	Attenuator	779-6dB	04269	2023/9/6	2024/9/5
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2023/8/1	2024/7/31
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-04	2023/8/1	2024/7/31
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2023/8/1	2024/7/31
Sonoma	Amplifier	310N	185914	2023/8/1	2024/7/31
R&S	EMI Test Receiver	ESCI	100224	2023/8/18	2024/8/17
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
EFT & Surge & Dips					
EM TEST	EMS Comprehensive Tester	Compact NX5	P1850225473	2022/11/16	2023/11/16
EM TEST	AC Autotransformer	MV2616	P1401128614	N/A	N/A
Flicker					
EVERFINE	Harmonic & Flicker Measurement System	HFM3000	P630850CD141 1115	2022/11/16	2023/11/15
EVERFINE	Harmonic & Flicker Testing Power Source	HFS-4000	P624486CD141 1122	2022/11/22	2023/11/21
ESD					
TESEQ	ESD Generator	NSG 438	1019	2022/11/16	2023/11/15
CS					
HP	Signal Generator	8648A	3426A00831	2022/11/22	2023/11/21
AR	Power Amplifier	15A250	12934	N/A	N/A
Werlatone	Dual Directional Coupler	C5091-10	113192	2023/2/9	2024/2/8
NARDA	Attenuator	769-6	02754	N/A	N/A
HP	Power Meter	EPM-441A	GB37481494	2022/11/18	2023/11/17
Agilent	Power sensor	8482A	US37296108	2022/11/18	2023/11/17
COM-POWER	CDN	M325E	521064	2022/11/22	2023/11/21
PFMF					
EM TEST	AC Current Transformer	MC2630	301873	N/A	N/A
EM TEST	Loop Antenna	MS100	303298	N/A	N/A
PAOFN	AC Transformer	AC250	250003	N/A	N/A
FLUKE	Clamp Meter	317	42270435WS	2022/11/18	2023/11/17
RS					
AR	Antenna	ATL80M1G	0351400	N/A	N/A
AR	Antenna	ATT700M12 G	0349410	N/A	N/A
HP	Signal Generator	8665B	3438a00584	2022/11/18	2023/11/17
AR	Power Amplifier	500W1000C	0353561	N/A	N/A
AR	Power Amplifier	60S1G6	0348711	N/A	N/A
PASTERNACK	Dual Directional Coupler	PE2239-30	1711	2023/7/15	2024/7/14
Agilent	Power Meter	E4419B	MY45103907	2022/11/18	2023/11/17
Agilent	E-Series Avg Power Sensor	E9301A	MY41497625	2022/11/22	2023/11/21
Agilent	E-Series Avg Power Sensor	E9301A	MY41497628	2022/11/22	2023/11/21

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Item:	Conducted emission	Radiated emissions below 1GHz	EMS	Flicker
Temperature:	26ºC	25.5ºC	22.6~26.4ºC	26.0ºC
Relative Humidity:	63%	50%	55~61%	55%
ATM Pressure:	101.2kPa	100.8kPa	100.1kPa	100.1kPa
Tester:	Joe Li	Zoo Zou	Lane Sun	Lane Sun
Test Date:	2023/10/24	2023/10/27	2023/10/19	2023/10/19

Note:
*The relative humidity of ESD test environment is 56%.

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 55032 Clause A.3	Conducted emissions	Compliant
2	EN 55032 Clause A.2	Radiated emissions	Compliant
3	EN 55035 Clause 4.2.1	Electrostatic discharges IEC 61000-4-2	Compliant
4	EN 55035 Clause 4.2.2.2	Continuous radiated disturbances IEC 61000-4-3	Compliant
5	EN 55035 Clause 4.2.2.3	Continuous conducted disturbances IEC 61000-4-6	Compliant
6	EN 55035 Clause 4.2.3	Power frequency magnetic fields IEC 61000-4-8	Compliant
7	EN 55035 Clause 4.2.4	Electrical fast transients/burst IEC 61000-4-4	Compliant
8	EN 55035 Clause 4.2.5	Surges IEC 61000-4-5	Compliant
9	EN 55035 Clause 4.2.6	Voltage dips and short interruptions IEC 61000-4-11	Compliant
10	EN IEC 61000-3-2	Harmonic current emissions	Not applicable*
11	EN 61000-3-3	Voltage fluctuations and flicker	Compliant

Note:
Not applicable*: The maximum power of this EUT is less than 75W.

1 - CONDUCTED EMISSIONS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner

: If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
-Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
-Non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
-compliance is deemed to occur if no measured disturbance level, increased by (U_{lab}− U_{cispr}), exceeds the disturbance limit;
-Non - compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} − U_{cispr}), exceeds the disturbance limit.

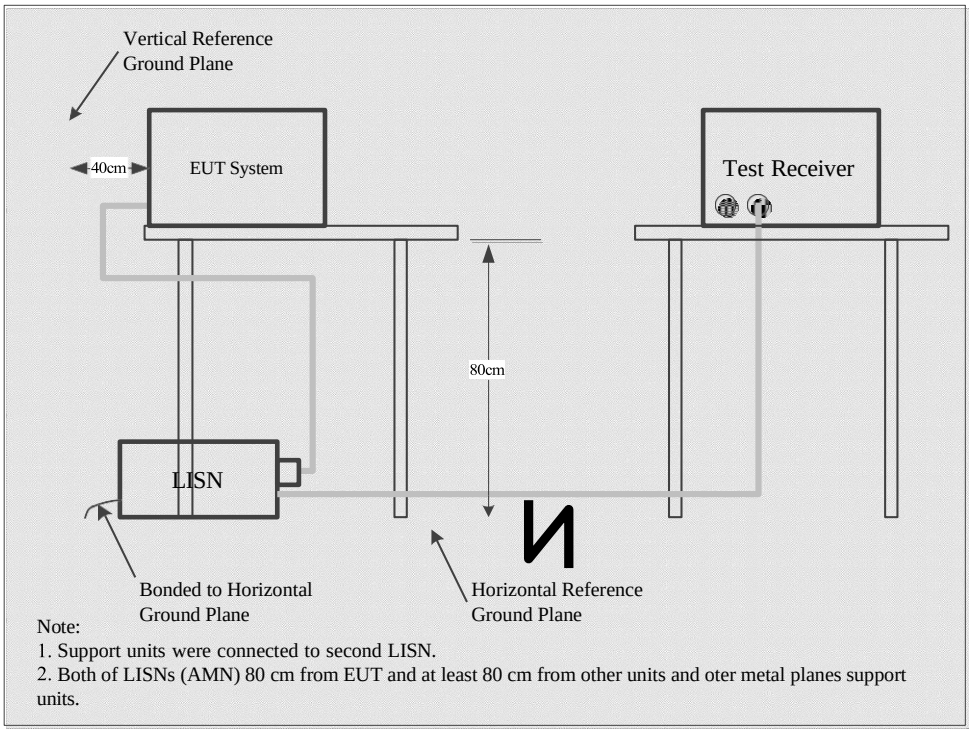
Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz), and conducted disturbance at telecommunication port using AAN is 5.0 dB (150 kHz to 30 MHz).

Table 1 - Values of U_{cispr}

Measurement	U_{cispr}
Conducted disturbance at mains port using AMN (9 kHz to 150 kHz)	3.8 dB
(150 kHz to 30 MHz)	3.4 dB
Conducted disturbance at mains port using voltage probe (9 kHz to 30 MHz)	2.9 dB
Conducted disturbance at telecommunication port using AAN (150 kHz to 30 MHz)	5.0 dB
Conducted disturbance at telecommunication port using CVP (150 kHz to 30 MHz)	3.9 dB
Conducted disturbance at telecommunication port using CP (150 kHz to 30 MHz)	2.9 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



Note:
1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at least 80 cm from other units and oter metal planes support units.

The setup of EUT is according with CISPR 16-1-1:2010+A1:2010+A2 2014, CISPR 16-2-1:2008+A1:2010 +A2 2013 measurement procedure. The specification used was the EN 55032 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to a 230V/50Hz AC line power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz - 30 MHz	9 kHz

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:
Corr. = Cable loss + Factor of coupling device

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit -Result

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.

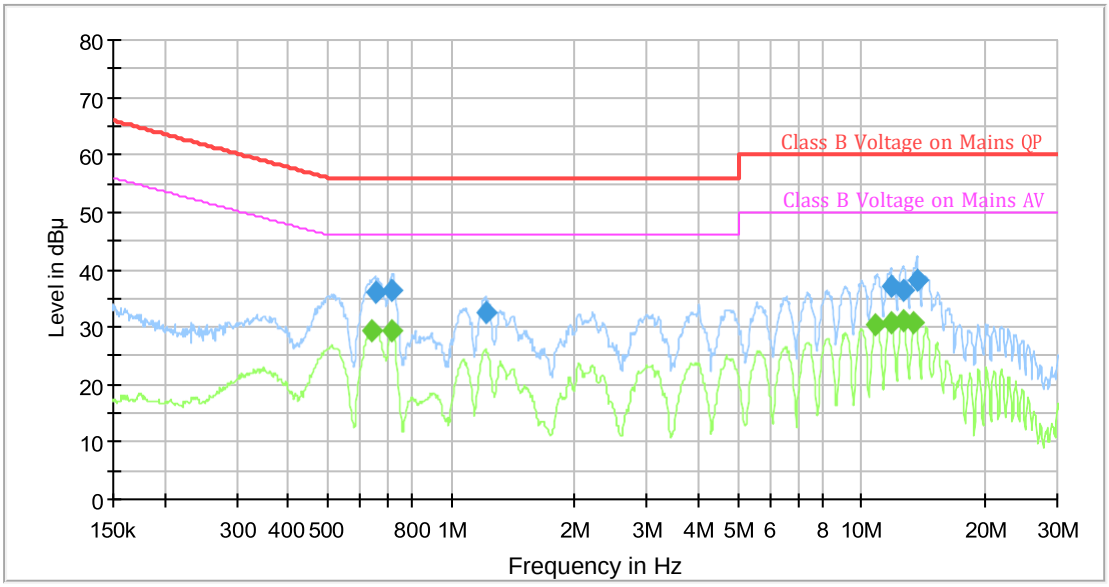
All data was recorded in the Quasi-peak and average detection mode.

The report shall list the six emissions with the smallest margin relative to the limit, unless the margin is greater than 20 dB.

Test Data

Please refer to following table and plots:

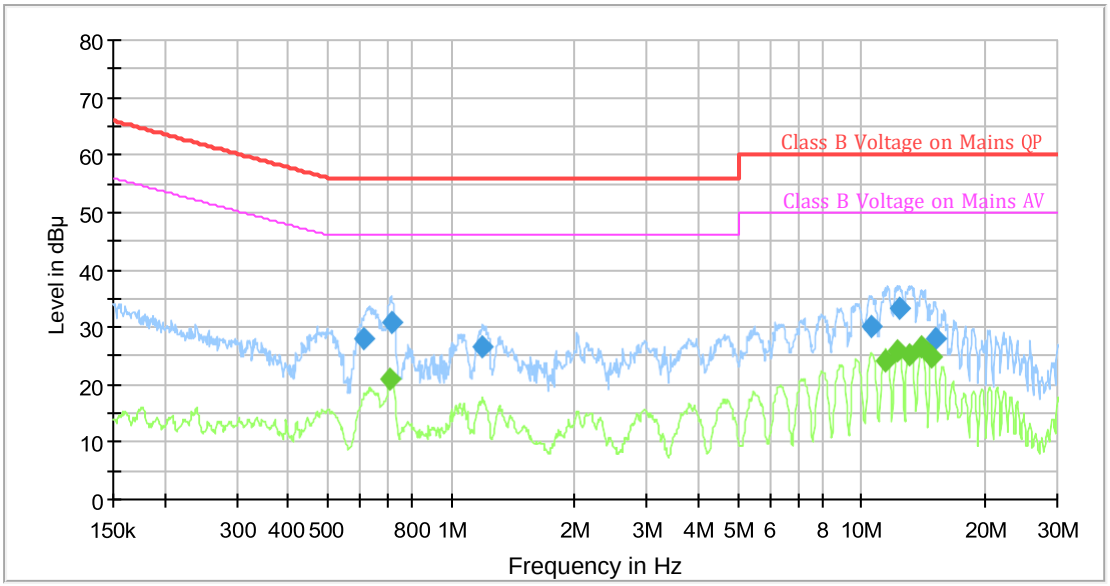
Port:	L
Test Mode:	M1
Power Source:	AC 230V/50Hz
Note:	2CDZ-1



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.643549	---	29.34	46.00	16.66	9.000	L1	10.8
0.653250	36.07	---	56.00	19.93	9.000	L1	10.8
0.714609	---	29.45	46.00	16.55	9.000	L1	10.9
0.718182	36.44	---	56.00	19.56	9.000	L1	10.9
1.212470	32.39	---	56.00	23.61	9.000	L1	10.8
10.828598	---	30.37	50.00	19.63	9.000	L1	10.8
11.728143	---	30.75	50.00	19.25	9.000	L1	10.8
11.786783	36.86	---	60.00	23.14	9.000	L1	10.8
12.576335	36.40	---	60.00	23.60	9.000	L1	10.8
12.576335	---	31.06	50.00	18.94	9.000	L1	10.8
13.418776	---	30.65	50.00	19.35	9.000	L1	10.8
13.621066	38.15	---	60.00	21.85	9.000	L1	10.8

Port:	N
Test Mode:	M1
Power Source:	AC 230V/50Hz
Note:	2CDZ-1



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.615300	27.97	---	56.00	28.03	9.000	N	10.7
0.711054	---	20.81	46.00	25.19	9.000	N	10.8
0.714609	30.64	---	56.00	25.36	9.000	N	10.8
1.194464	26.62	---	56.00	29.38	9.000	N	10.9
10.561897	30.03	---	60.00	29.97	9.000	N	10.9
11.439286	---	24.23	50.00	25.77	9.000	N	10.9
12.266588	---	25.86	50.00	24.14	9.000	N	10.9
12.389561	33.07	---	60.00	26.93	9.000	N	10.9
13.088280	---	25.25	50.00	24.75	9.000	N	10.9
14.034840	---	26.58	50.00	23.42	9.000	N	10.9
14.826346	---	24.92	50.00	25.08	9.000	N	10.9
15.049855	28.05	---	60.00	31.95	9.000	N	10.9

2 - RADIATED EMISSIONS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner

: If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
-Compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
-Non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
-Compliance is deemed to occur if no measured disturbance level, increased by (U_{lab}− U_{cispr}), exceeds the disturbance limit;
-Non - compliance is deemed to occur if any measured disturbance level, increased by (U_{lab} − U_{cispr}), exceeds the disturbance limit.

Based on CISPR 16-4-2:2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB.

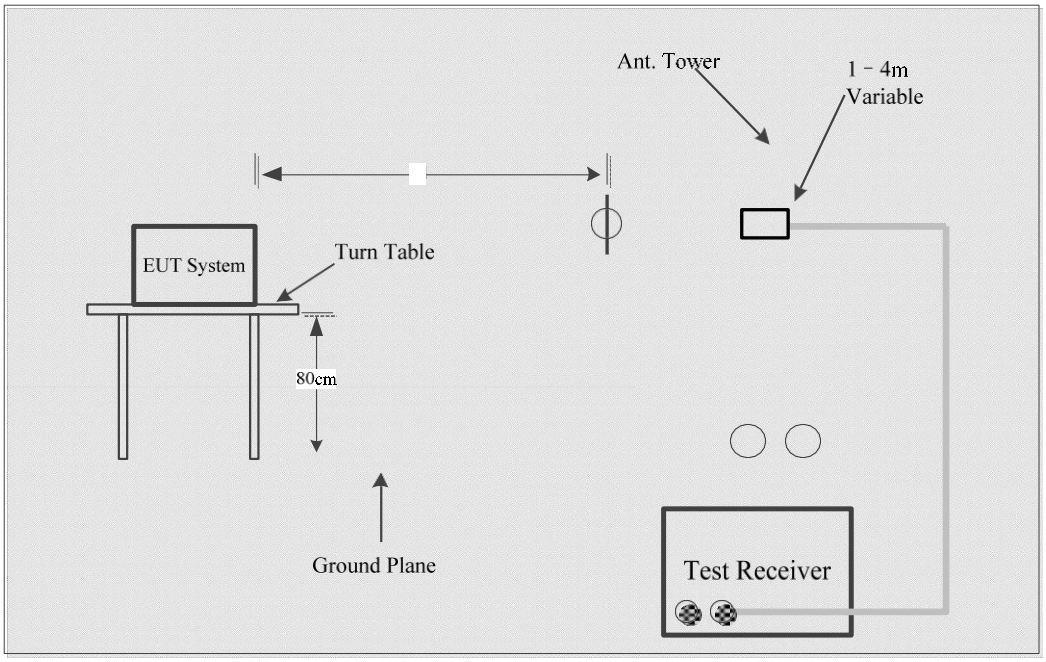
Table 1 - Values of U_{cispr}

Measurement	U_{cispr}
Radiated disturbance(electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup

Below 1GHz:



The radiated emission tests below 1GHz were performed in 3 meters, using the setup accordance with the CISPR 16-1-1:2010+A1:2010+A2:2014, CISPR 16-1-4:2010 + A1:2012, CISPR 16-2-3:2010+A1:2010+A2:2014. The specification used was EN 55032 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

EMI Test Receiver and Spectrum Analyzer Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver (Below 1GHz) was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz - 1000 MHz	120 kHz	300 kHz	120 kHz	QP

Test Procedure

During the radiated emissions, maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the maximized peak measured value complies with under the QP limit more than 6dB, it is unnecessary to perform QP measurement.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading+ Corrected

Note:
Corrected = Antenna Factor + Cable Loss - Amplifier Gain
Or
Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain

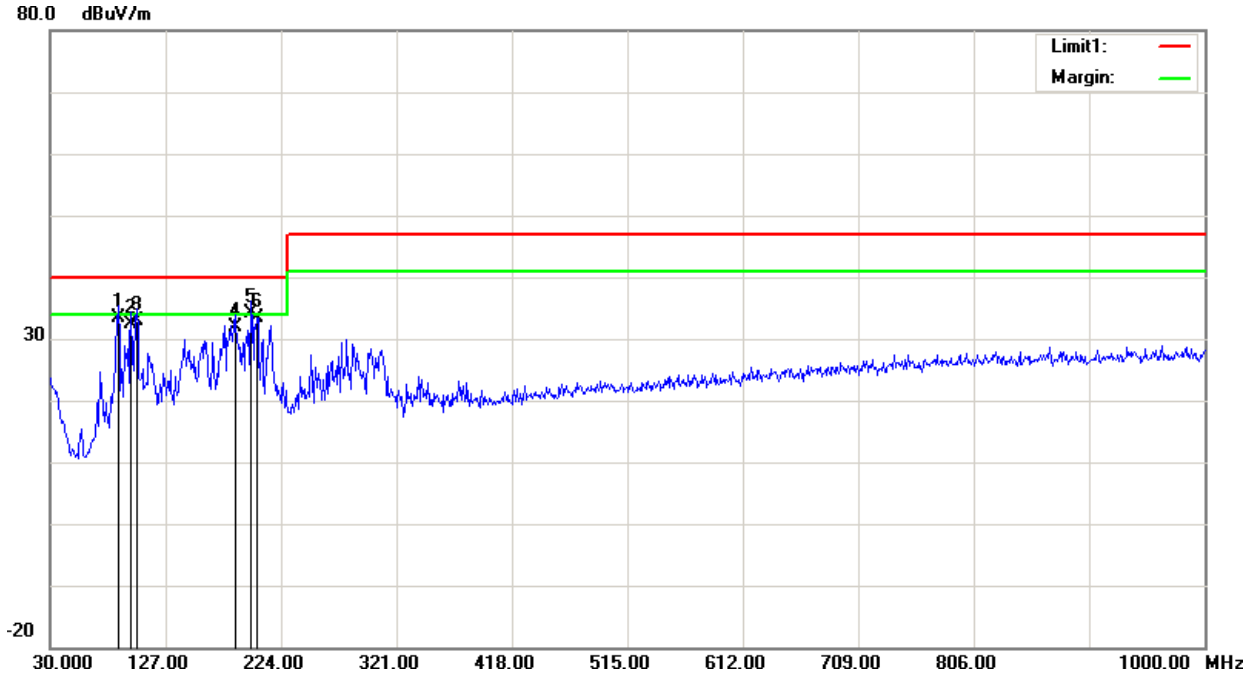
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit for Class B. The equation for margin calculation is as follows:

Margin = Limit -Result

Test Data

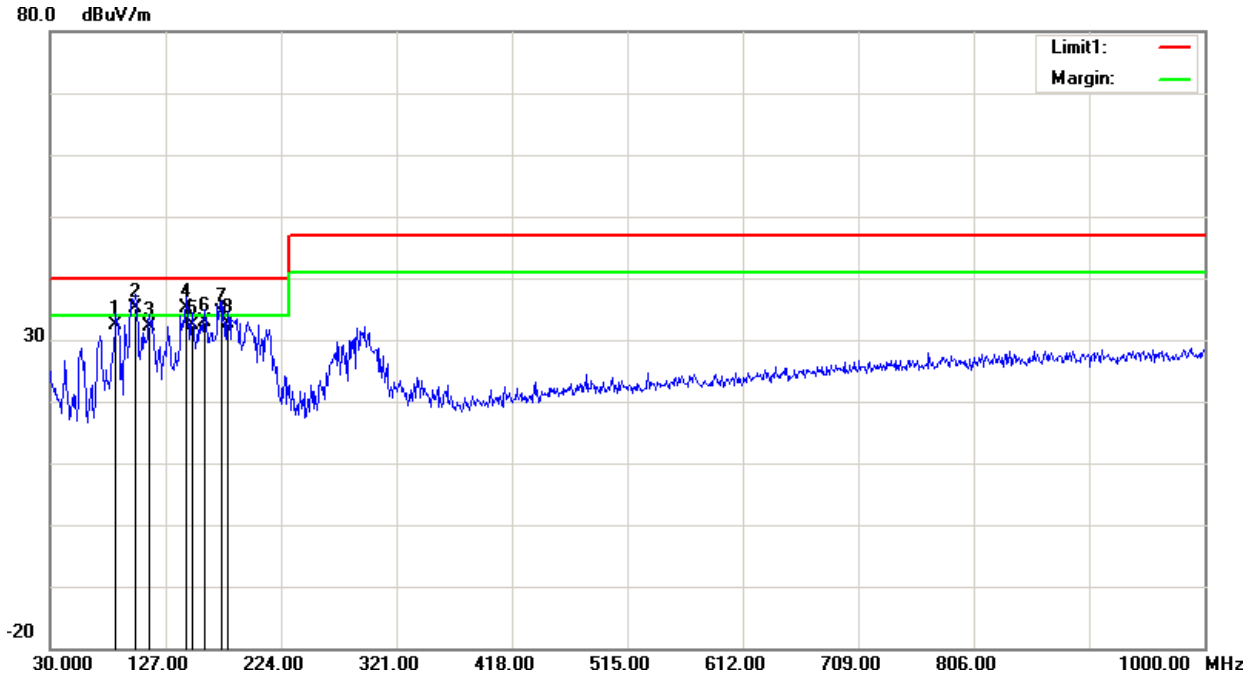
Please refer to following table and plots:

Condition:	EN 55032 Class B	**Polarization:**	Horizontal
Test Mode:	M1	**Distance:**	3m



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	87.2300	50.16	QP	-16.76	33.40	40.00	6.60
2	97.9000	47.34	QP	-14.94	32.40	40.00	7.60
3	102.7500	46.50	QP	-13.60	32.90	40.00	7.10
4	185.2000	44.19	QP	-12.39	31.80	40.00	8.20
5	198.7800	45.74	QP	-11.54	34.20	40.00	5.80
6	203.6300	45.35	peak	-11.87	33.48	40.00	6.52

Condition:	EN 55032 Class B	**Polarization:**	Vertical
Test Mode:	M1	**Distance:**	3m



No.	Frequency (MHz)	Reading (dBµV)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	85.2900	49.13	QP	-16.73	32.40	40.00	7.60
2	101.7800	49.03	QP	-13.93	35.10	40.00	4.90
3	113.4200	42.97	QP	-10.77	32.20	40.00	7.80
4	144.4600	45.96	QP	-10.76	35.20	40.00	4.80
5	149.3100	43.29	QP	-10.99	32.30	40.00	7.70
6	159.9800	43.95	QP	-11.15	32.80	40.00	7.20
7	173.5600	46.27	QP	-11.77	34.50	40.00	5.50
8	179.3800	45.00	QP	-12.30	32.70	40.00	7.30

3 - ELECTROSTATIC DISCHARGES IEC 61000-4-2

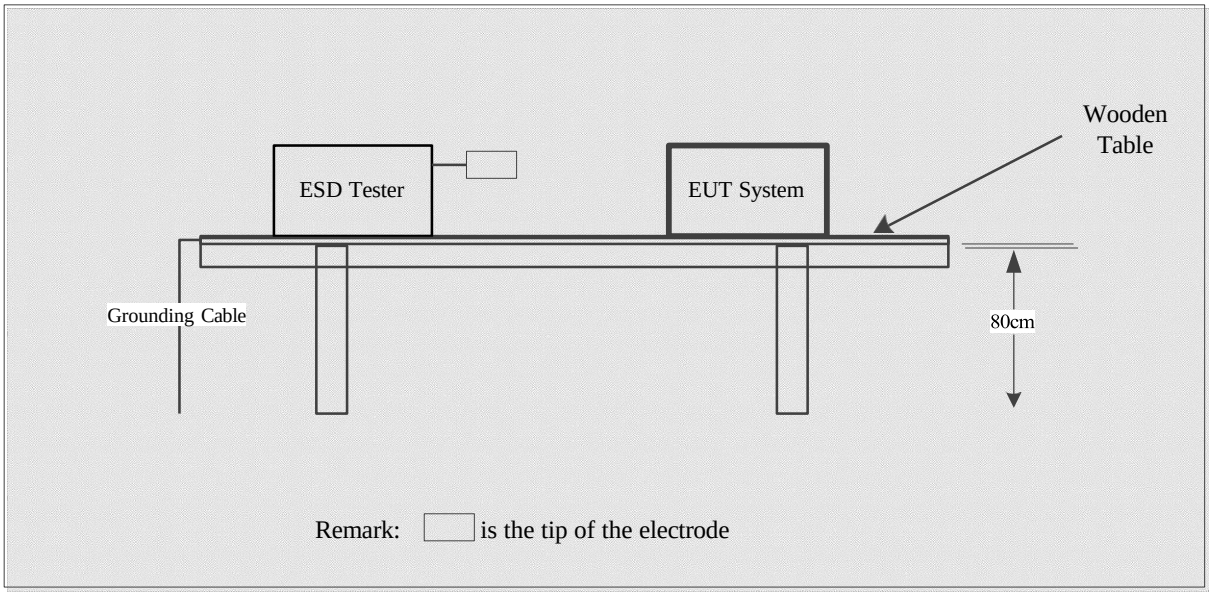
Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-2) please refer to the following:

Parameter	U_{EN}	U_{lab}
Rise time t_r	≤15%	15%
Peak current I_p	≤7%	6.3%
Current at 30 ns	≤7%	6.3%
Current at 60 ns	≤7%	6.3%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



IEC61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by *0.5-millimeter* thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Standard

EN 55035:2017+A11:2020(IEC 61000-4-2:2008)
Test level 3 for Air Discharge at ±8 kV
Test level 2 for Contact Discharge at ±4 kV

Test Level

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 criteria: B

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 times 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 8.3.1of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane:

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane:

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m×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.

Test Data

Please refer to following tables:

Test Mode: M1
Note:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Non-metallic Shell	A	A	A	A	A	A	/	/
DC Port	A	A	A	A	A	A	/	/
Seam	A	A	A	A	A	A	/	/
Button	A	A	A	A	A	A	/	/
Screen	A	A	A	A	A	A	/	/
Required Performance Criteria:B Description of Performance reduction: N/A								

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
/	/	/	/	/	/	/	/	/
Required Performance Criteria:B Description of Performance reduction: N/A								

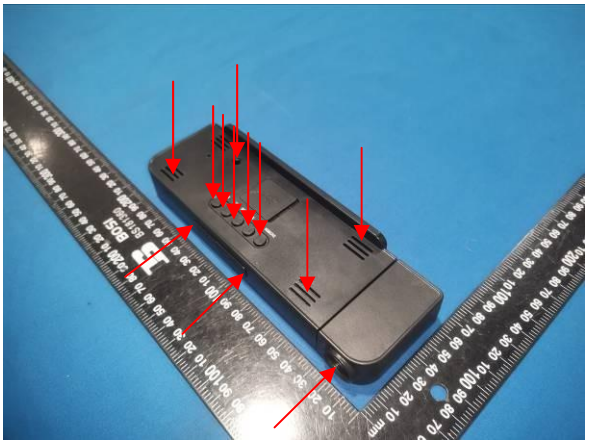
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

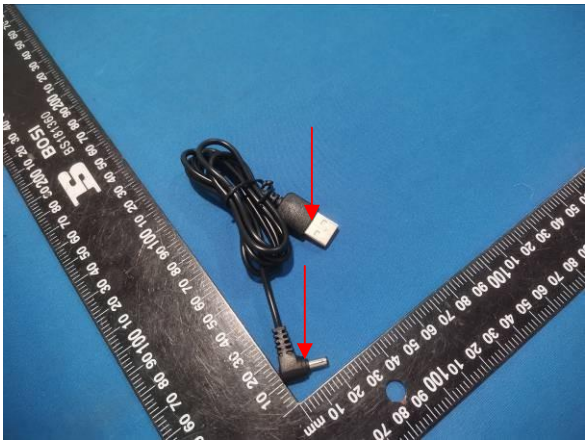
Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/
Top Side	A	A	A	A	/	/	/	/
Bottom Side	A	A	A	A	/	/	/	/
Required Performance Criteria:B Description of Performance reduction: N/A								

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/
Required Performance Criteria:B Description of Performance reduction: N/A								

ESD Location Photo





Air Discharge: ——→ Direct Contact: ——→

4 - CONTINUOUS RADIATED DISTURBANCES IEC 61000-4-3

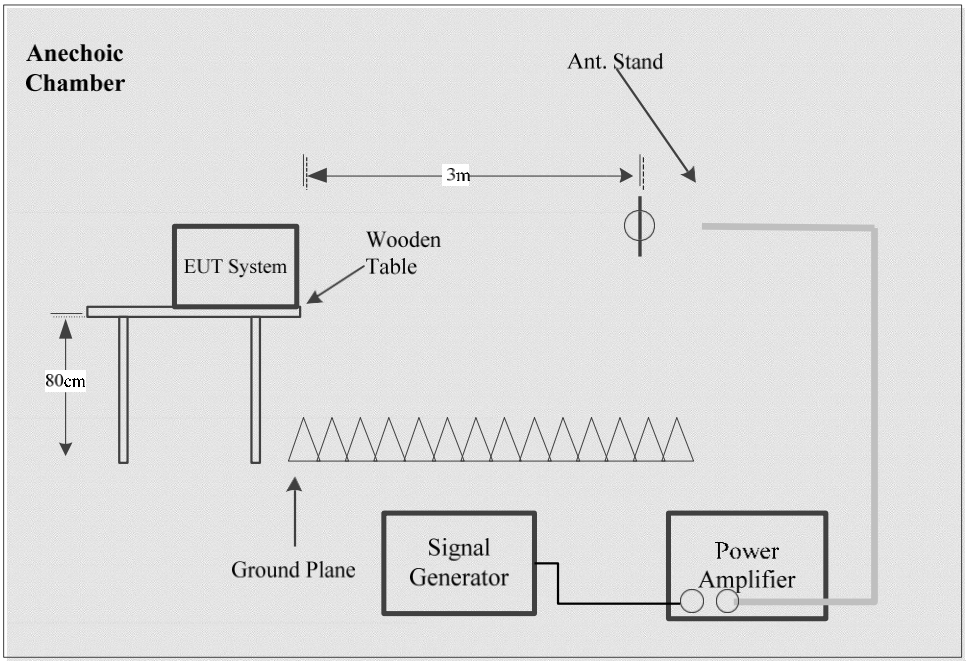
Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-3) please refer to the following:

Parameter	U_{EN}	U_{lab}
Calibration process	1.88 dB	1.88 dB
Level setting	2.19 dB	2.19 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-3:2006+A1:2007+A2:2010)
Test level 2 at 3V/ m (80MHz to 1GHz)
Test level 2 at 3V/ m (1.8GHz, 2.6GHz, 3.5GHz, 5GHz)

Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

Performance criteria: A

A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacture as a permissible loss of performance.
B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.
D. The apparatus is broken, cannot be normal operated.

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.
In order to judge the EUT performance, a CCD camera was used to monitor the EUT.

Test Data

Please refer to following tables:

Test Mode: M1
Note:

Condition of Test	Remarks
Field Strength	3V/m
RF Signal	1 kHz, 80% AM, sine wave
Sweep Frequency Step	1 %, logarithmic
Dwell Time	1 Sec

Table 1: Radiated RF-Electromagnetic Field Immunity, Swept Test

Frequency Range (MHz)	Front Side		Rear Side		Left Side		Right Side		Top Side		Bottom Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A	A	A	A	A
Required Performance Criteria: A Description of Performance reduction: N/A												

Table 2: Radiated RF-Electromagnetic Field Immunity, Spot Test

Spot Test Frequency (MHz)	Front Side		Rear Side		Left Side		Right Side		Top Side		Bottom Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
1800, 2600, 3500, 5000	A	A	A	A	A	A	A	A	A	A	A	A
Required Performance Criteria: A Description of Performance reduction: N/A												

5 - CONTINUOUS CONDUCTED DISTURBANCES IEC 61000-4-6

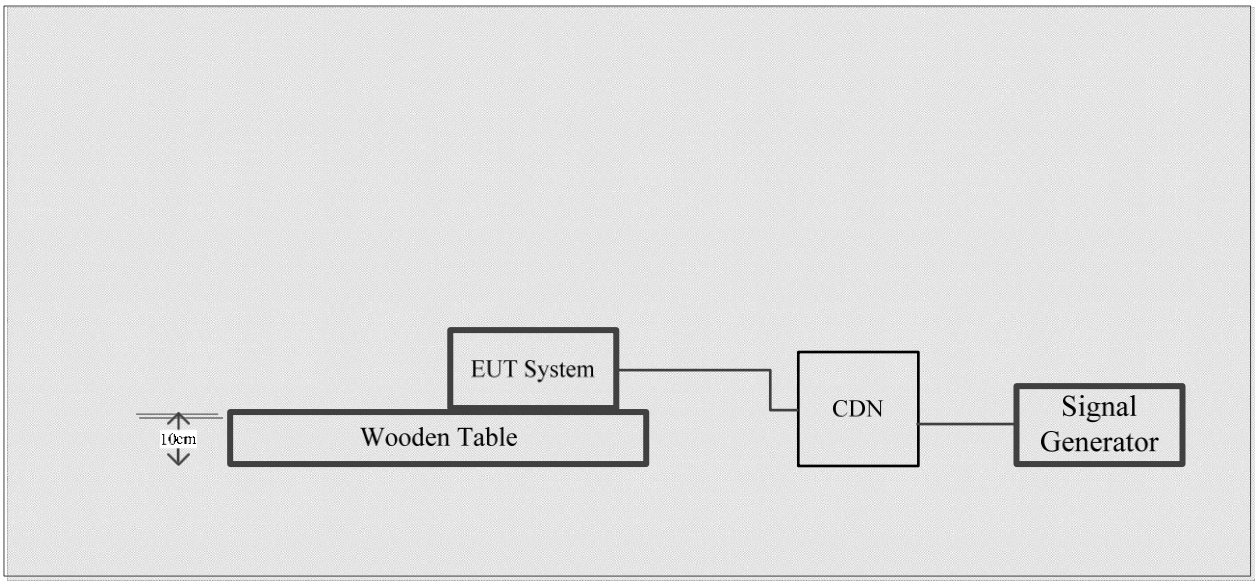
Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-6) please refer to the following:

Parameter	U_{EN}	U_{lab}
CDN calibration process	1.27 dB	1.27 dB
CDN test process	1.36 dB	1.36 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Setup



Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-6:2008)
Test level 2 at 3 V (r.m.s.), 0.15MHz ~ 10MHz,
Test level 3-1 V (r.m.s.), 10MHz ~ 30MHz,
Test level 1 at 1 V (r.m.s.), 30MHz ~ 80MHz,

Test Level

Level	Voltage Level (r.m.s.) (V)
1	1
2	3
3	10
X	Special

Performance criteria: A

Test Procedure

1) Let the EUT work in test mode and test it.
2) 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).
3) The disturbance signal described below is injected to EUT through CDN.
4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
5) The frequency range is swept from 150 kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

Test Data

Please refer to following tables:

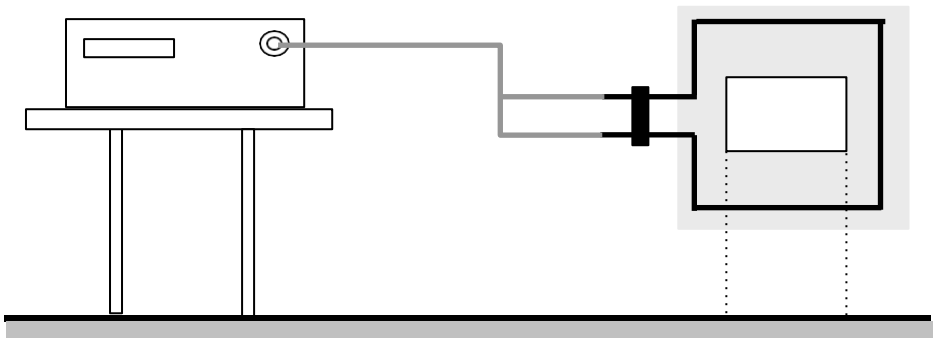
Test Mode: M1
Note:

Table 1: ACmains power input port

Signal Type	Frequency Range (MHz)	Voltage Level (r.m.s.)	Perform Criterion
Modulation: Amplitude 80%, 1kHz sine wave Dwell Time 1 Sec	0.15-10	3V	A
	10-30	3V-1V	A
	30-80	1V	A
Required Performance Criteria: A Description of Performance reduction: N/A			

6 - POWER FREQUENCY MAGNETIC FIELDS IEC 61000-4-8

Test Setup



Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-8:2009)
Test level 1 at 1A/ m

Test Level

Level	Magnetic Field Strength A/m
1	1
2	3
3	10
4	30
5	100
X.	Special

Performance criteria: A

Test Procedure

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m). The induction coil shall then be rotated by 90°in order to expose the EUT to the test field with different orientations.

Test Data

Please refer to following tables:

Test Mode: M1
Note:

Test Data:

Level	Magnetic Field Strength (A/m)	X (Horizontal)	Y (Vertical)	Z (Special)
1	1	A	A	A
2	3	/	/	/
3	10	/	/	/
4	30	/	/	/
5	100	/	/	/
X	Special	/	/	/
Required Performance Criteria: A Description of Performance reduction: N/A				

7 - ELECTRICAL FAST TRANSIENTS/BURST IEC 61000-4-4

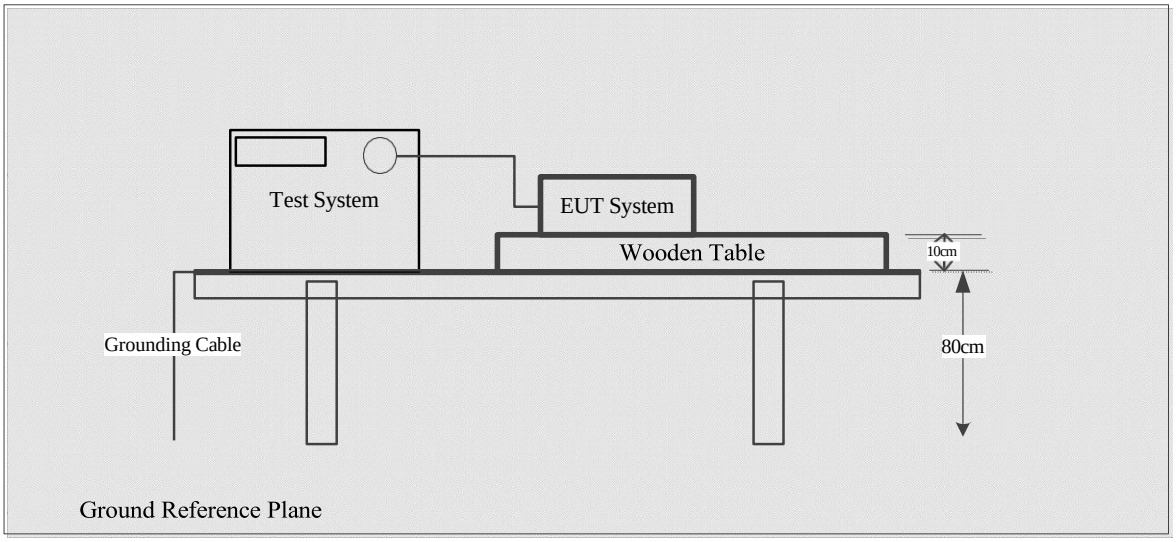
Measurement Uncertainty

U_{lab} (measurement uncertainty of lab) and U_{EN} (measurement uncertainty of EN 61000-4-4) please refer to the following:

Parameter	U_{EN}	U_{lab}
Rise time t_r	6.20%	6.20%
Peak voltage value V_p	8.60%	8.60%
Voltage pulse width t_w	5.90%	5.90%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test System Setup



Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-4:2012)
AC mains: Test level 2 at 1 kV
Signal port: Test level 2 at 0.5 kV

Test Level

Open Circuit Output Test Voltage ±10%		
Level	**On Power Supply Lines**	**On I/O (Input/Output) Signal data and control lines**
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

Performance criteria: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

Test Data

Please refer to following tables:

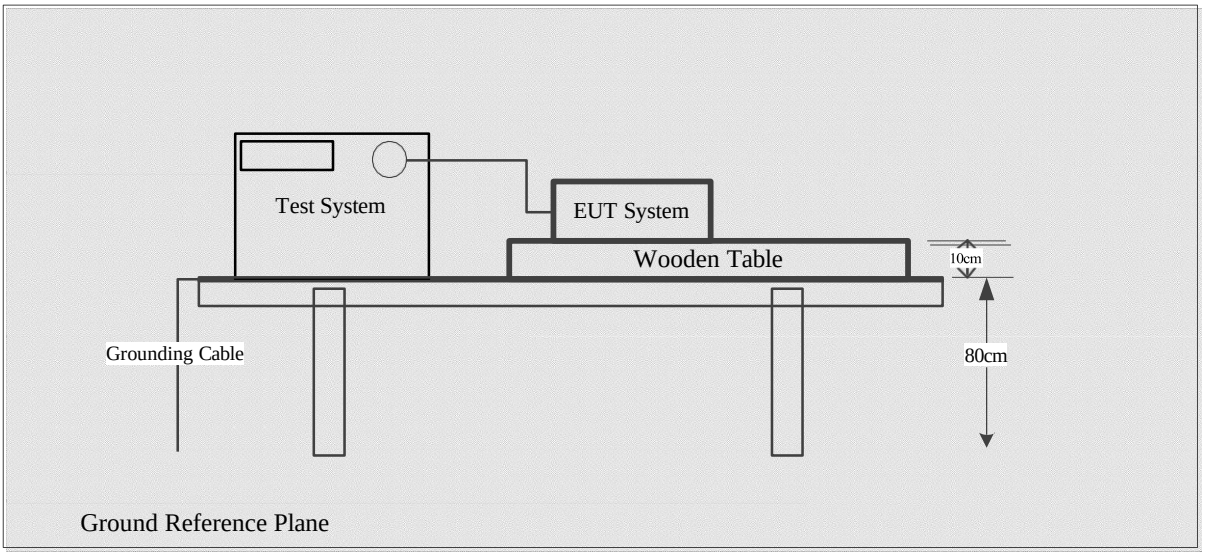
Test Mode: M1
Note:

AC Mains Power Input Ports

Test Line	Test Level (kV)							
	+0.5	**-0.5**	**+1.0**	**-1.0**	**+2.0**	**-2.0**	**+4.0**	**-4.0**
L	A	A	A	A	/	/	/	/
N	A	A	A	A	/	/	/	/
Earth	/	/	/	/	/	/	/	/
L+N	A	A	A	A	/	/	/	/
L + Earth	/	/	/	/	/	/	/	/
N + Earth	/	/	/	/	/	/	/	/
L+N+Earth	/	/	/	/	/	/	/	/
Required Performance Criteria: B Description of Performance reduction: N/A								

8 - SURGES IEC 61000-4-5

Test System Setup



Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-5:2005)
AC Mains: Line-to-line: Test level 3 at 1 kV;
Line-to-ground: Test level 3 at 2 kV
Signal port: Test level 2 at 1 kV

Test Level

Level	Open-circuit test voltage ±10% kV	
	Line-to-line	Line-to-ground
1	N/A	0.5
2	0.5	1
3	1	2
4	2	4
X	Special	Special

Performance criteria: B

Test Procedure

1) Provide disturbance signal described below is injected to EUT.
2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
3) Different phase angles are done individually.
4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data

Please refer to following tables:

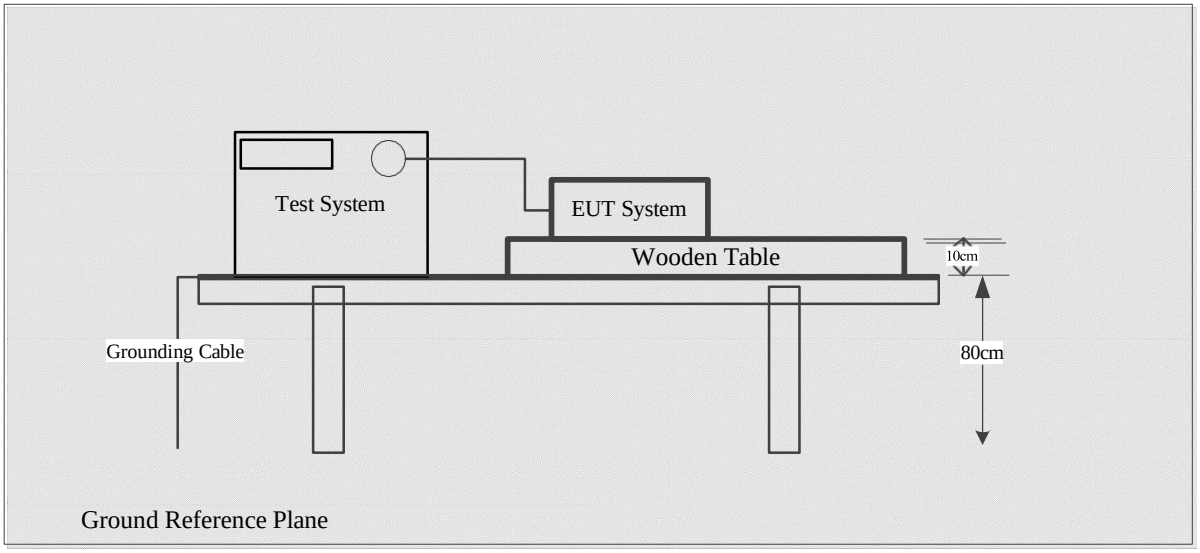
Test Mode: M1
Note:

Table 1: AC mains power input port

Level	Voltage	Poll	Path	Phase Angle	Perform Criterion
1	0.5kV	+	L- N	90	A
1	0.5kV	-	L- N	270	A
2	1kV	+	L- N	90	A
2	1kV	-	L- N	270	A
Required Performance Criteria: B Description of Performance reduction: N/A					

9 -VOLTAGE DIPS AND SHORT INTERRUPTIONS IEC 61000-4-11

Test Setup



Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-11:2004)
Test levels and Performance Criterion

Test Level

Test Level	Residual Voltage (%)	Duration (Periods)	Performance Criteria
1	<5	0.5	B
2	70	25	C
3	<5	250	C

Test Procedure

1) The interruption is introduced at selected phase angles with specified duration.
2) Record any degradation of performance.

Test Data

Please refer to following tables:

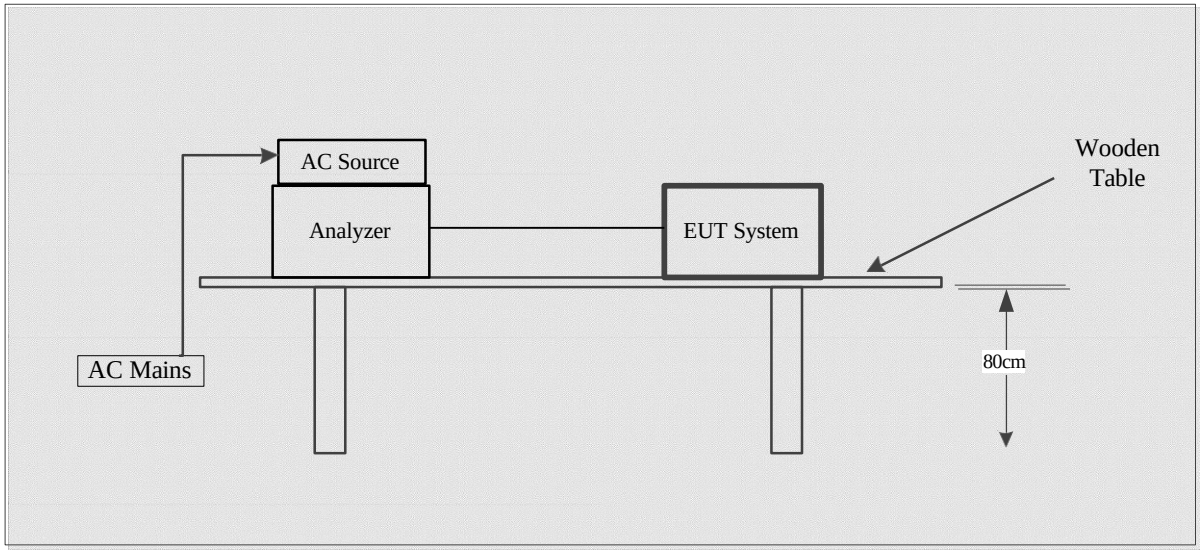
Test Mode: M1
Note:

Table 1: Voltage Dips/Interruptions Test

Residual Voltage (%)	Td (Number of cycles)	Phase Angle (°)	N	Result	Required Performance Criteria
<5	0.5	0/90/180/270	3	A	B
70	25	0/90/180/270	3	A	C
<5	250	0/90/180/270	3	B	C
Description of Performance reduction: B indicates that the power supply of the EUT was interrupted during the test, and the EUT was restarted. After the test, it can automatically return to normal use.					

11 -VOLTAGE FLUCTUATIONS AND FLICKER

Test System Setup



Test Standard

EN 61000-3-3:2013+A1:2019+A2:2021

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.
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;
- the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the 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.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

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.

In the case of equipment having several separately controlled circuits in accordance with 6.6,limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data

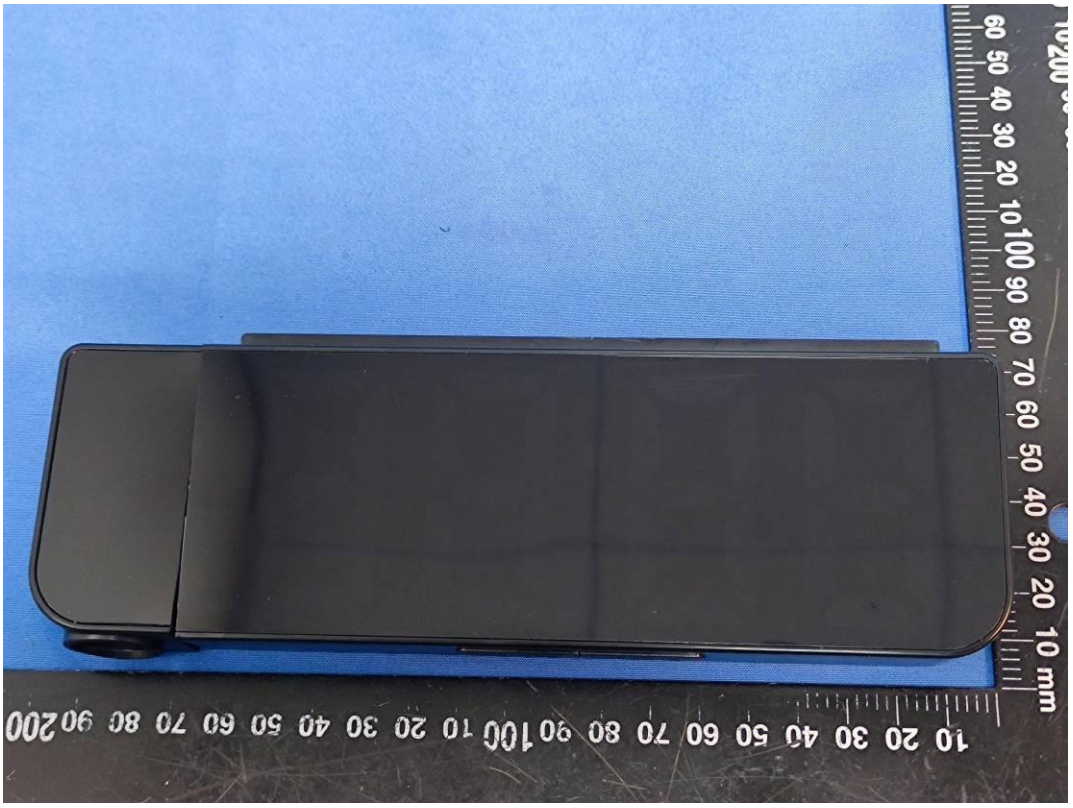
Please refer to following tables:

Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurement)
Test Mode:	M1
Power Source:	AC 230V/50Hz
Test Result	PASS

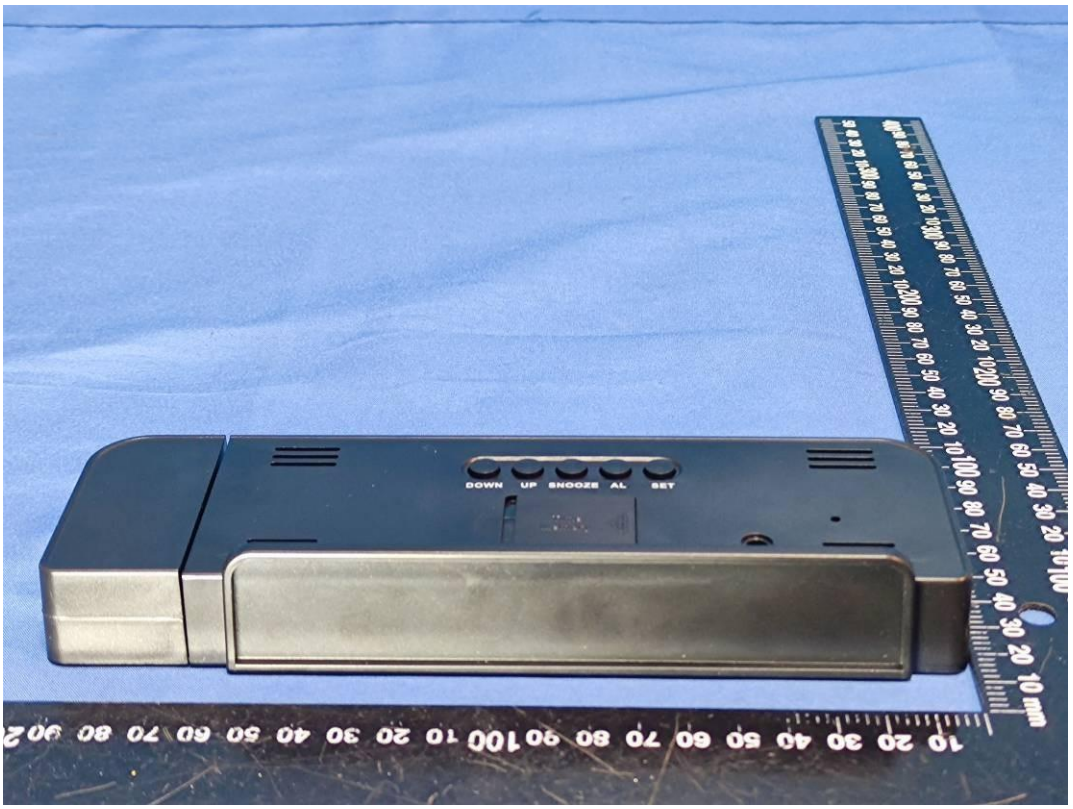
Maximum Flicker results

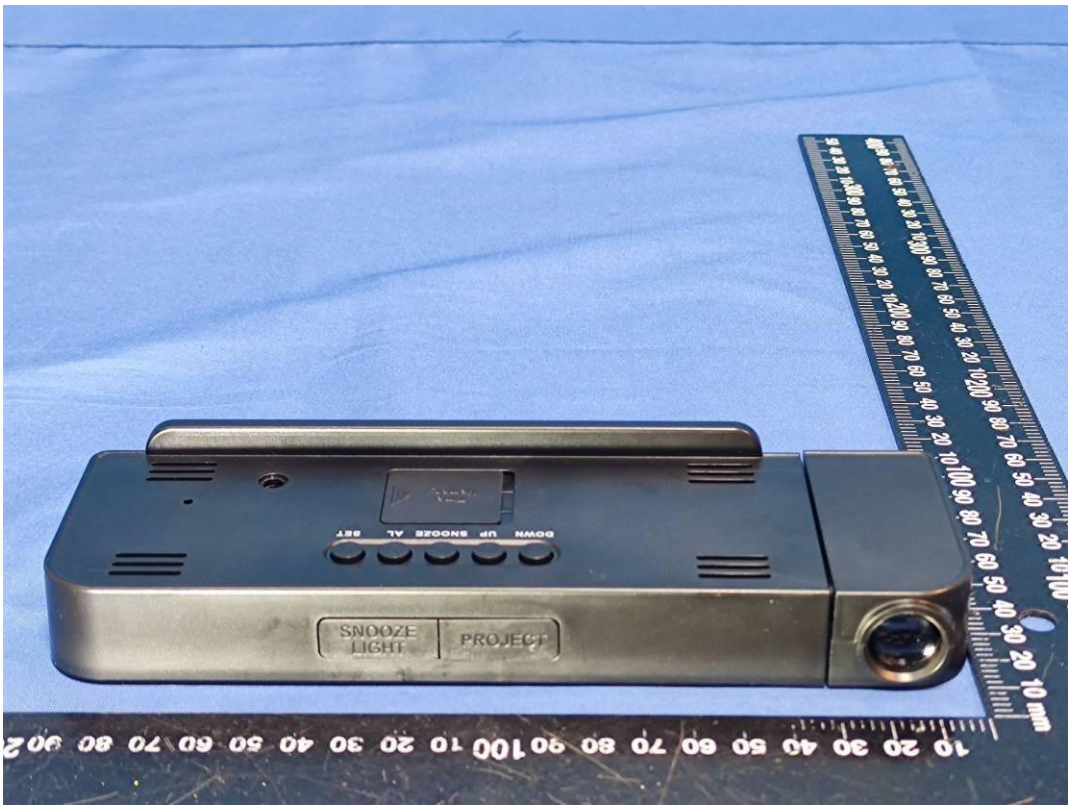
	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.009	3.30	PASS
dmax [%]	0.224	4.00	PASS
dt [s]	0.000	0.50	PASS

EXHIBITA - EUT PHOTOGRAPHS



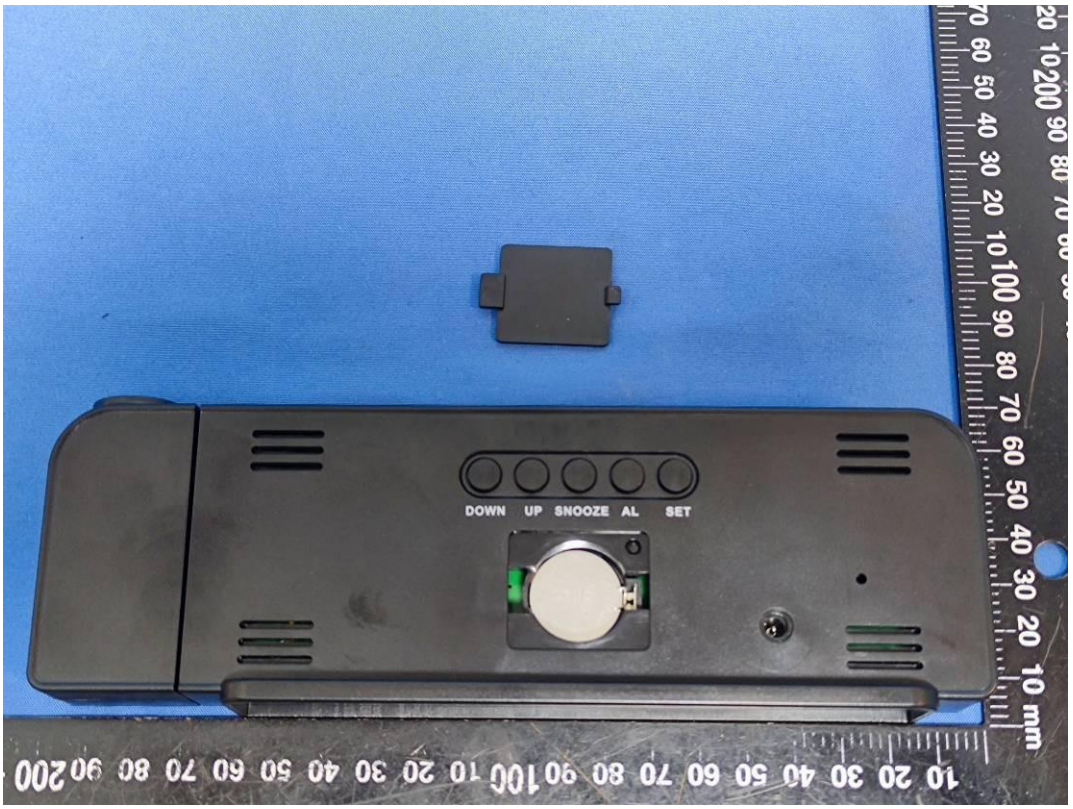

DOWN UP SNOOZE AL SET

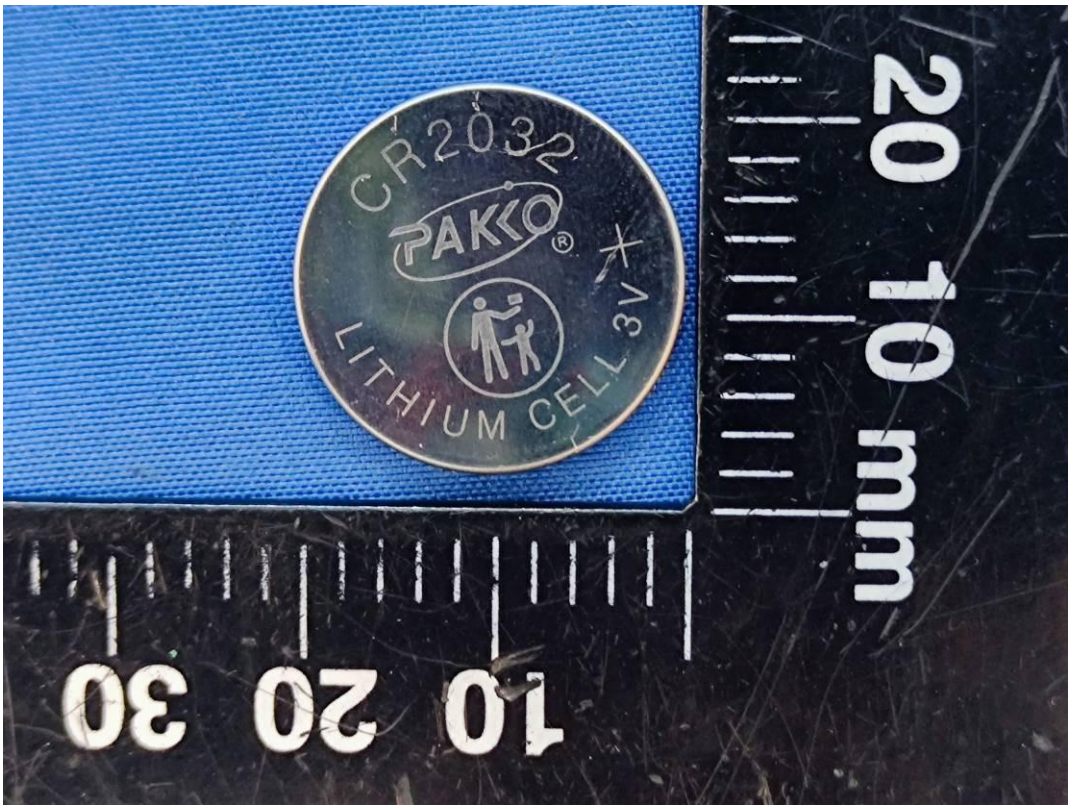

DOWN UP SNOOZE AL SET

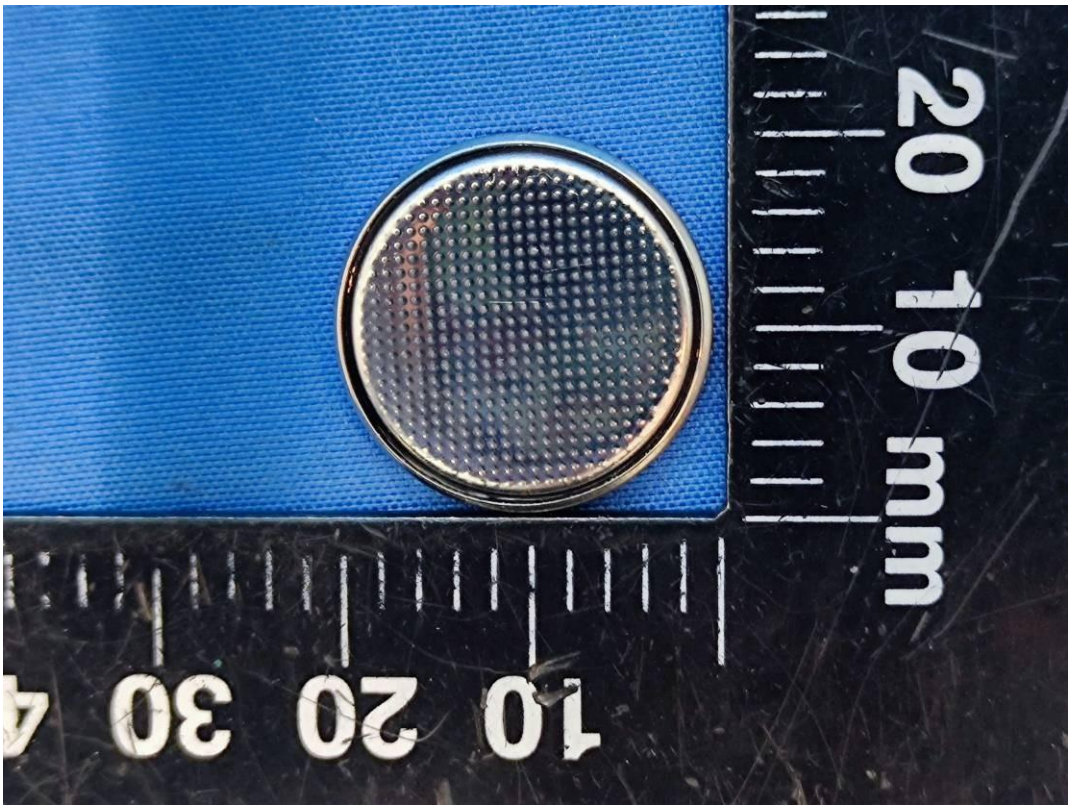

SNOOZE
LIGHT
PROJECT

Port

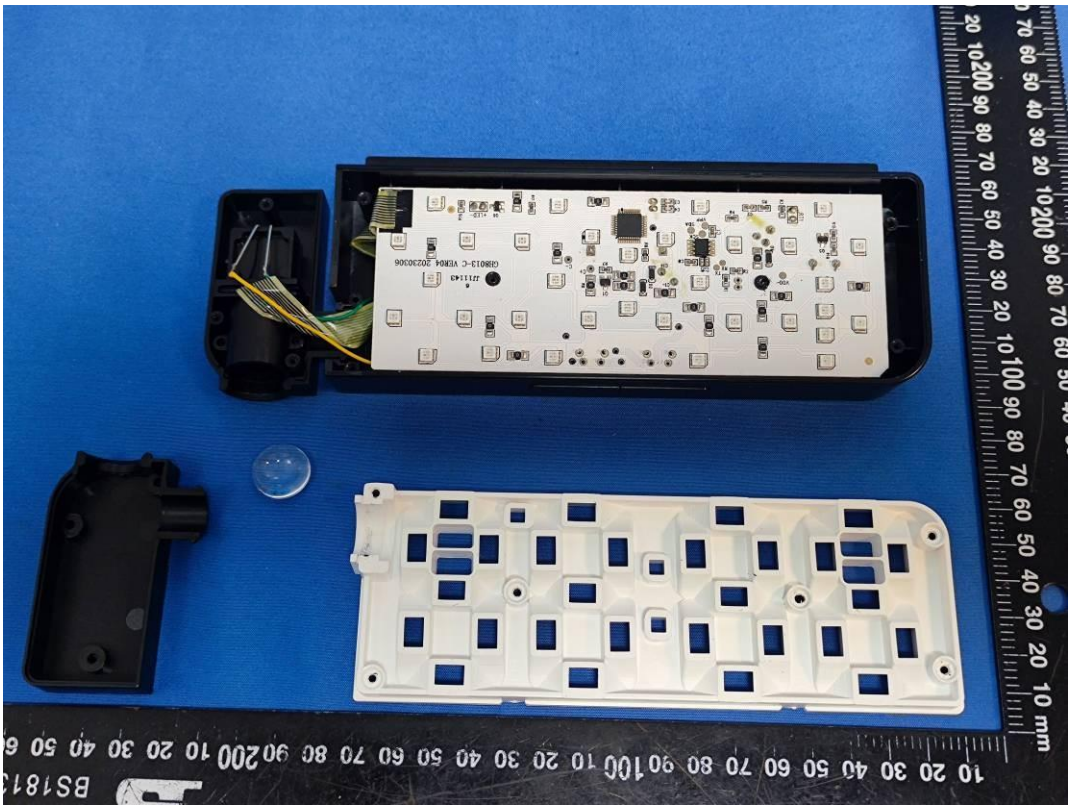
Uncover

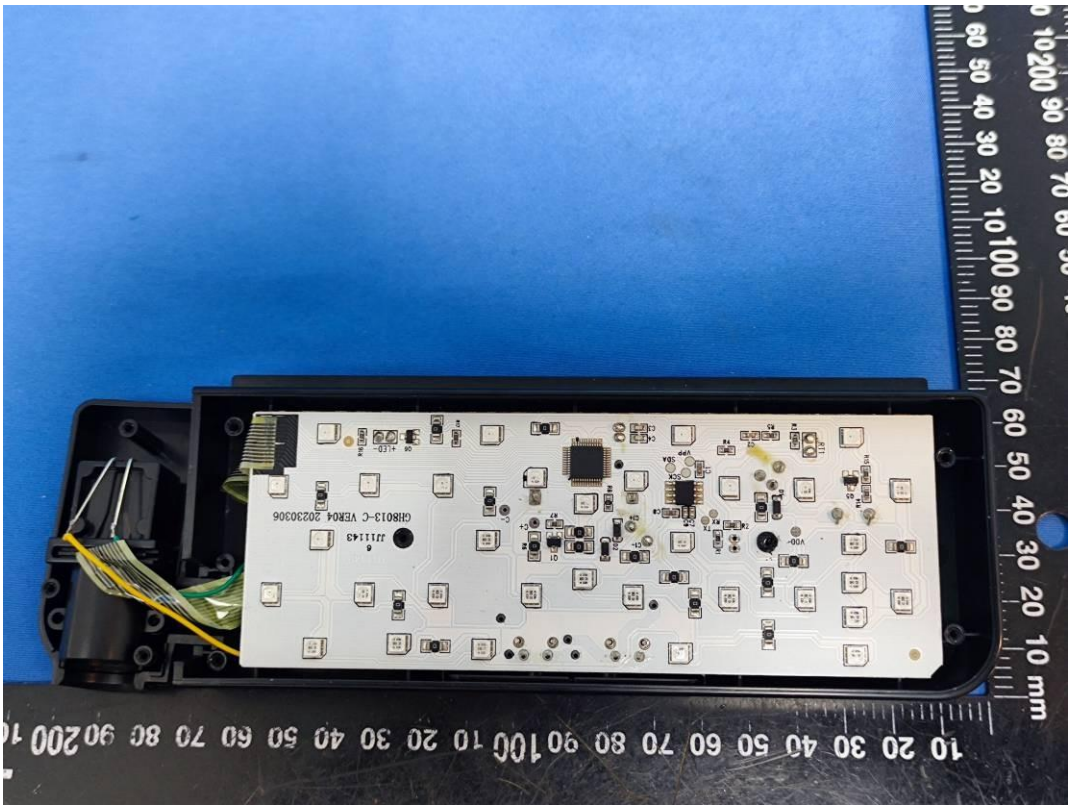


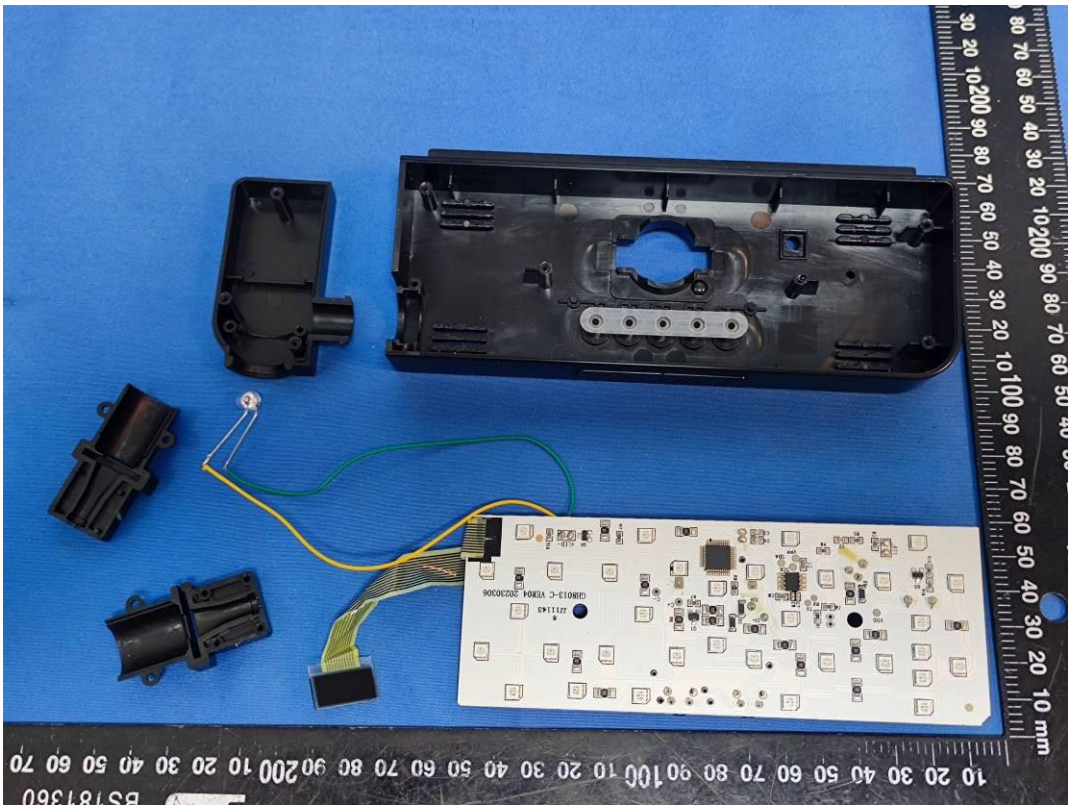

CR2032
PAKKO
LITHIUM CELL 3V
20 10 mm
10 20 30

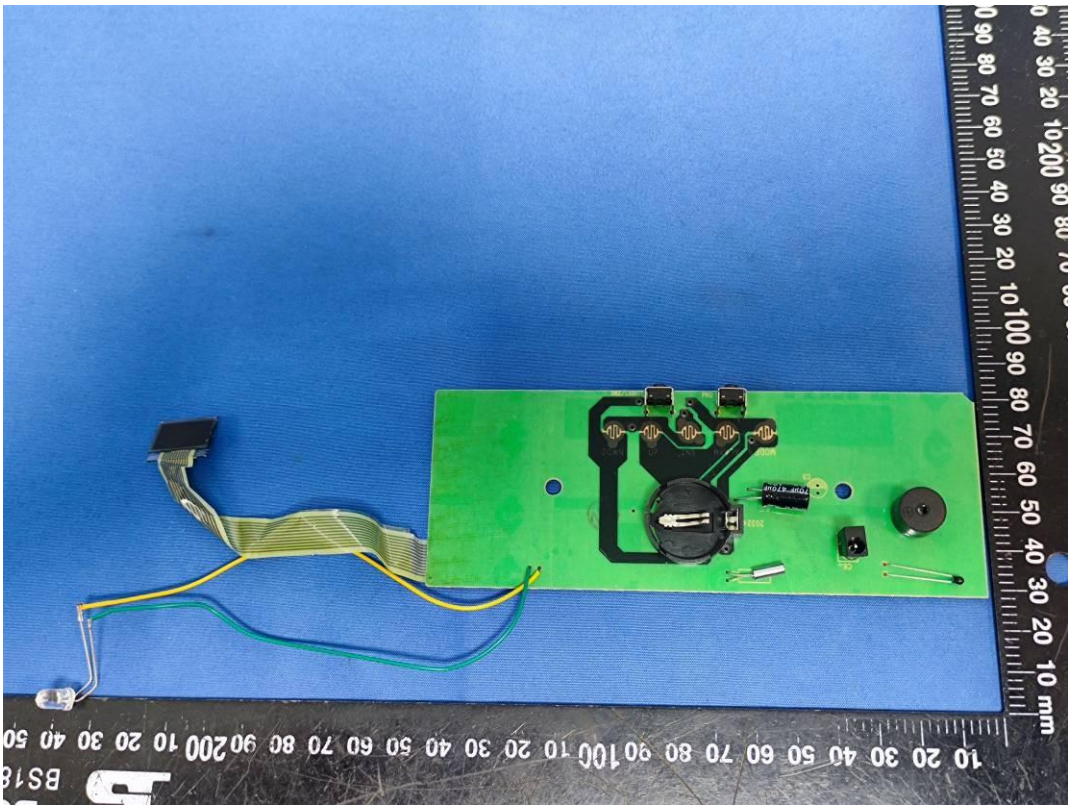

20 10 mm
10 20 30

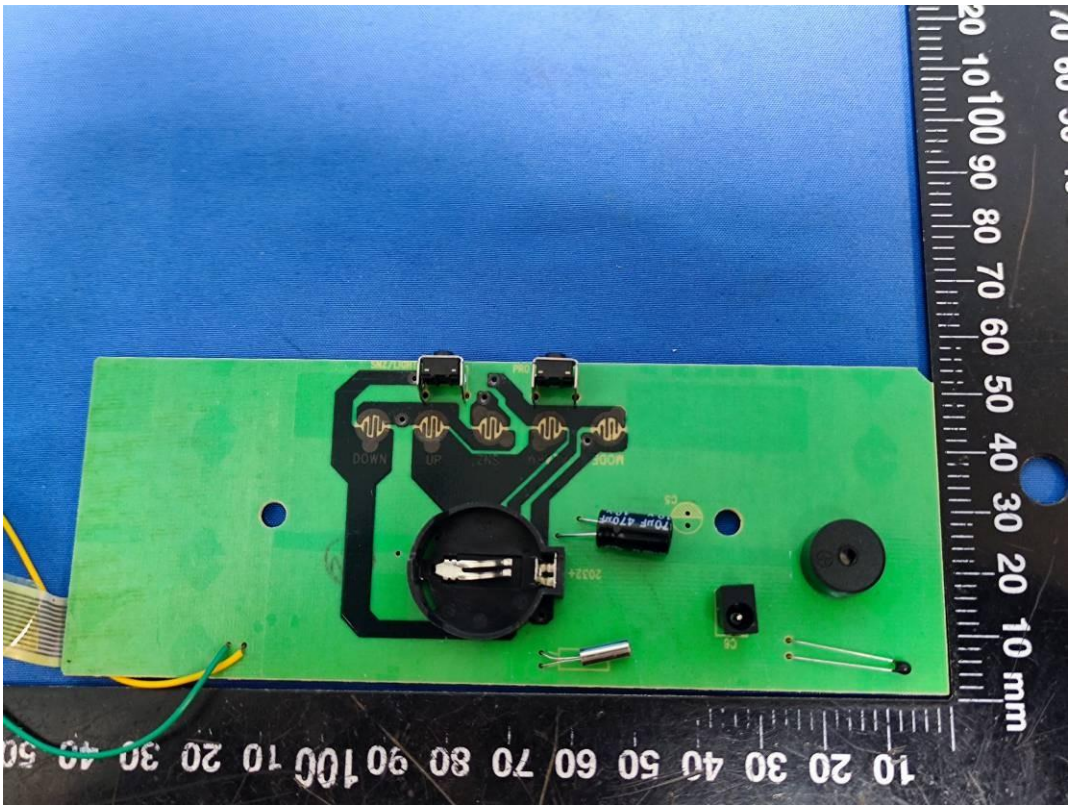

88:88

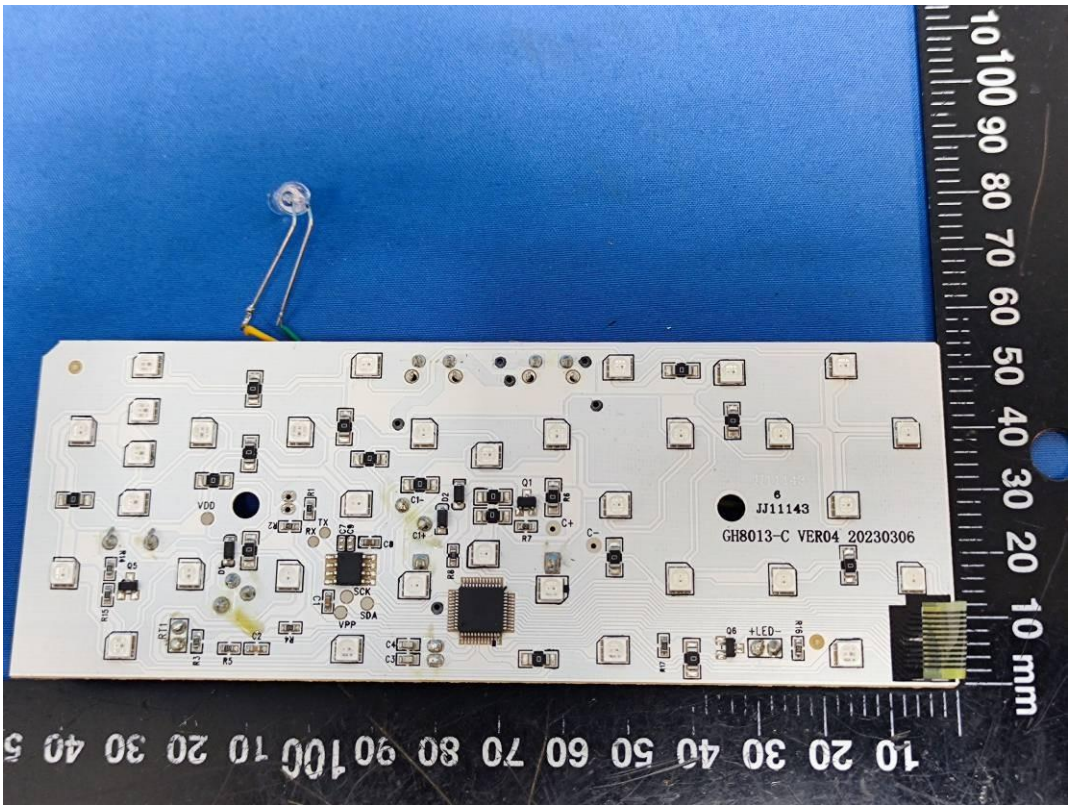


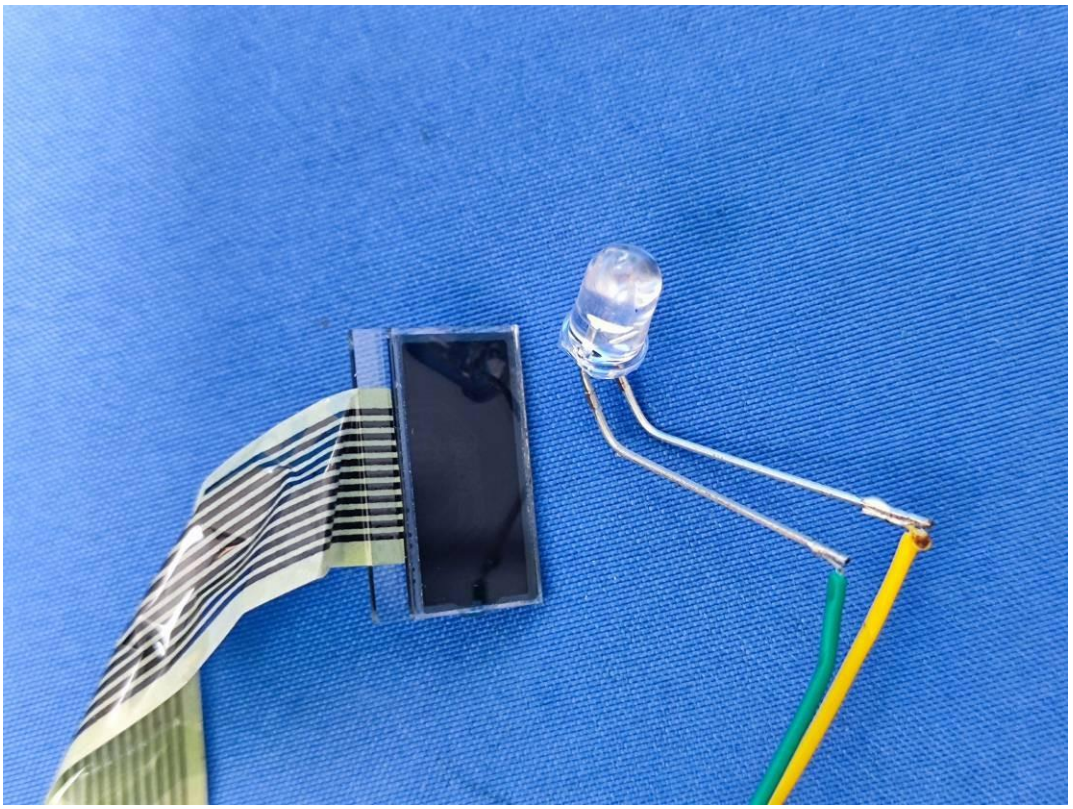









JJ11143
GH8013-C VER04 20230306
10 20 30 40 50 60 70 80 90 100
10 100 90 80 70 60 50 40 30 20 10 mm




10 20 30 40 50 60 70 80 90 100
10 20 30 40 50 60 70 80 90 100
mm

EXHIBITB - TEST SETUP PHOTOGRAPHS

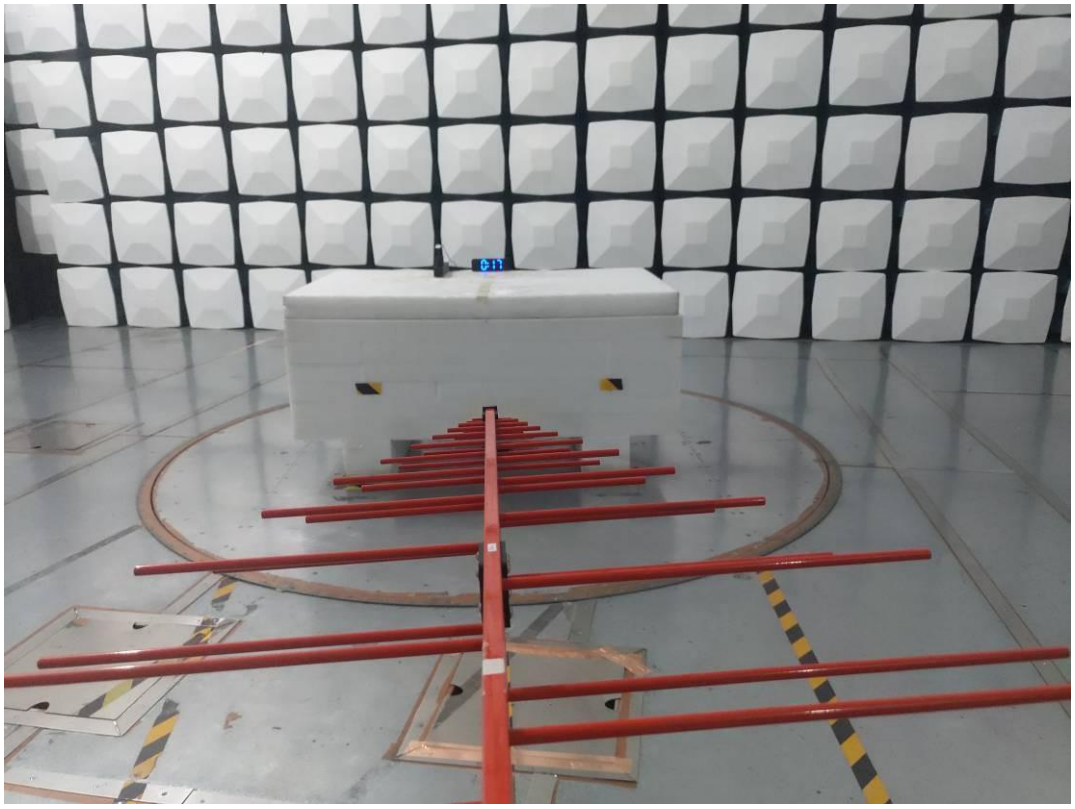
Conducted emissions

Conducted emissions front View

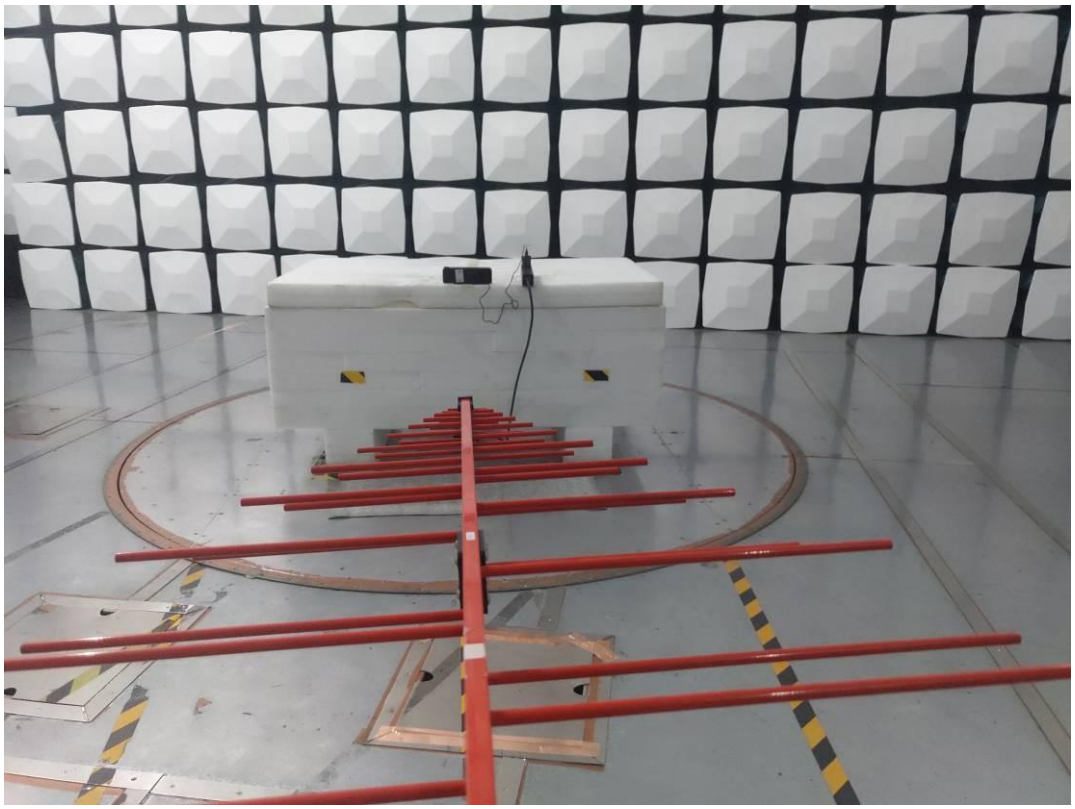
Conducted emissions side View

Radiated Emissions

Radiated Emissions Below 1GHz front View



Radiated Emissions Below 1GHz rear View

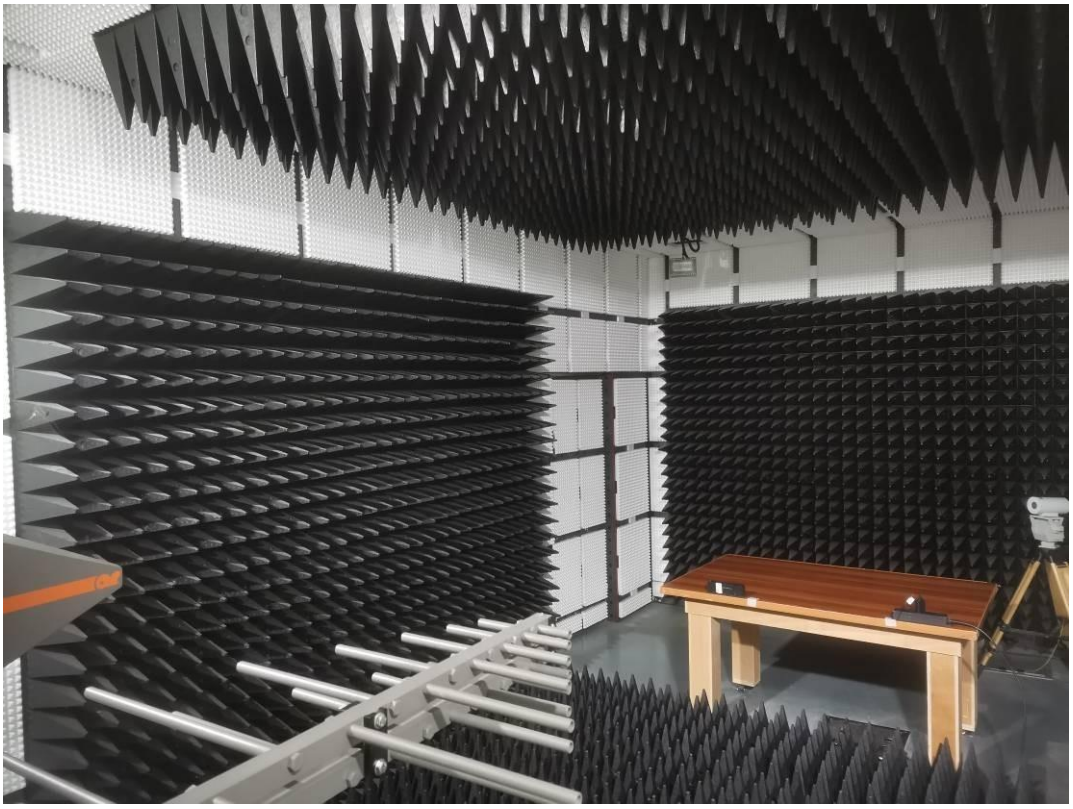


ESD

Test Setup Photo View

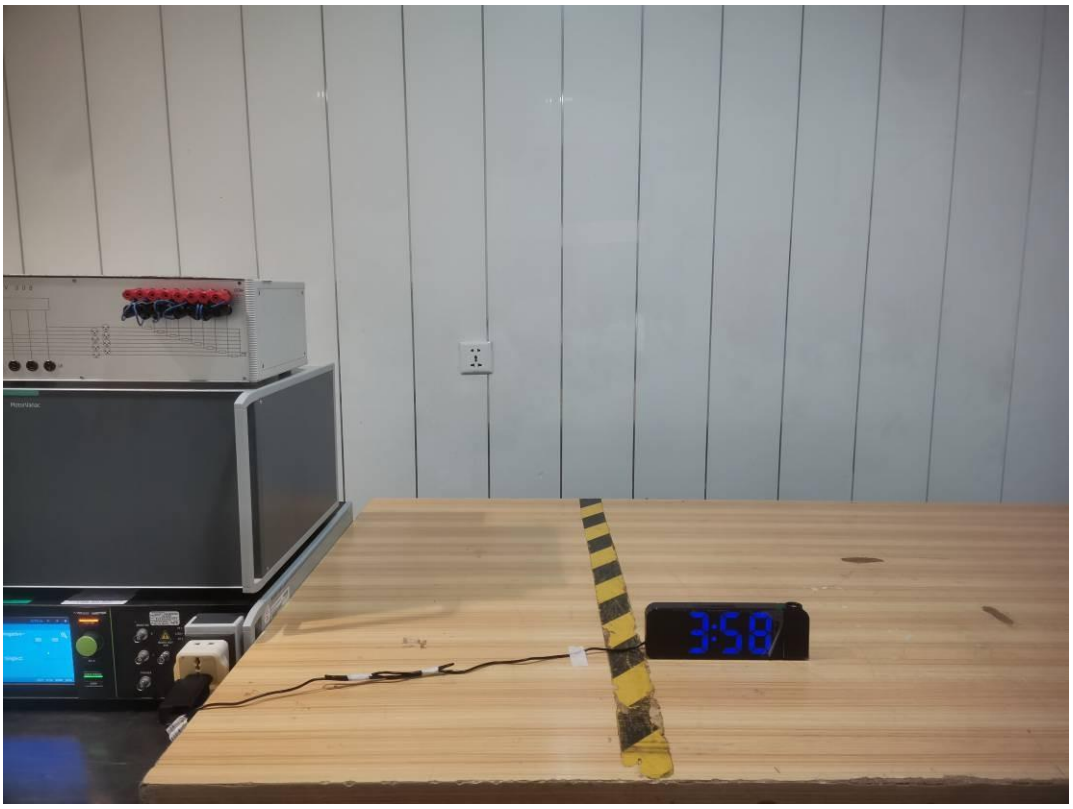
RS

Test Setup Photo View



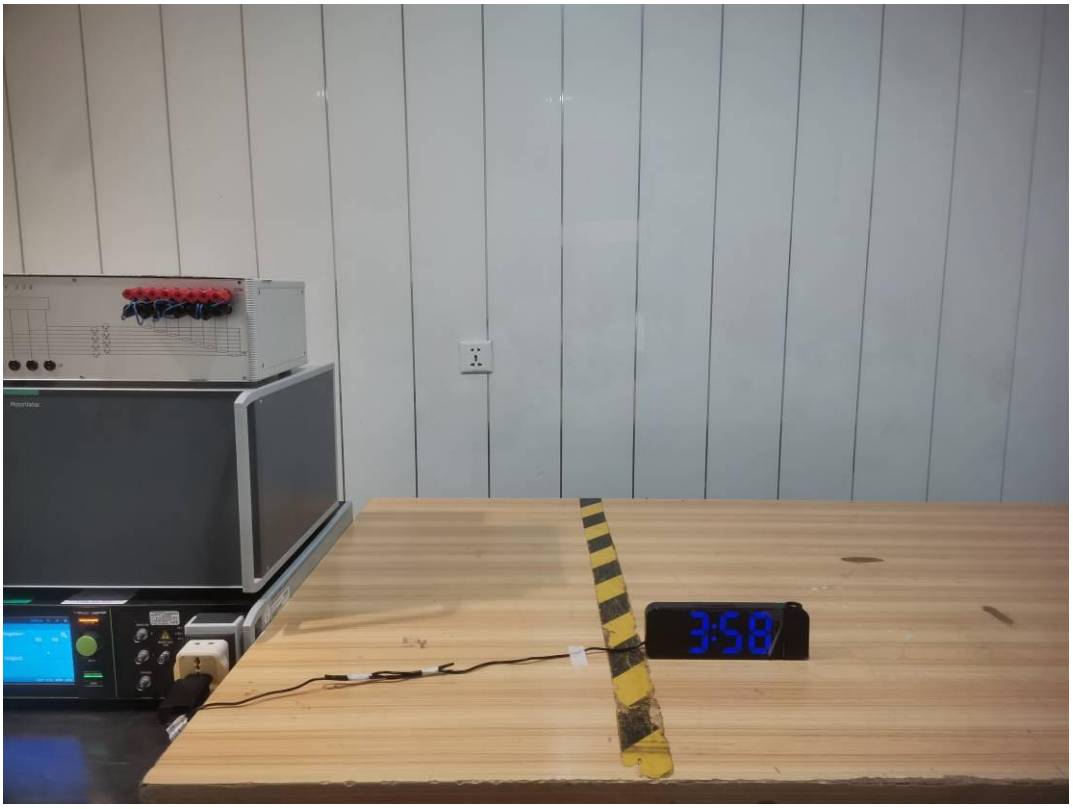
EFT

Test Setup Photo View



Dips

Test Setup Photo View



CS

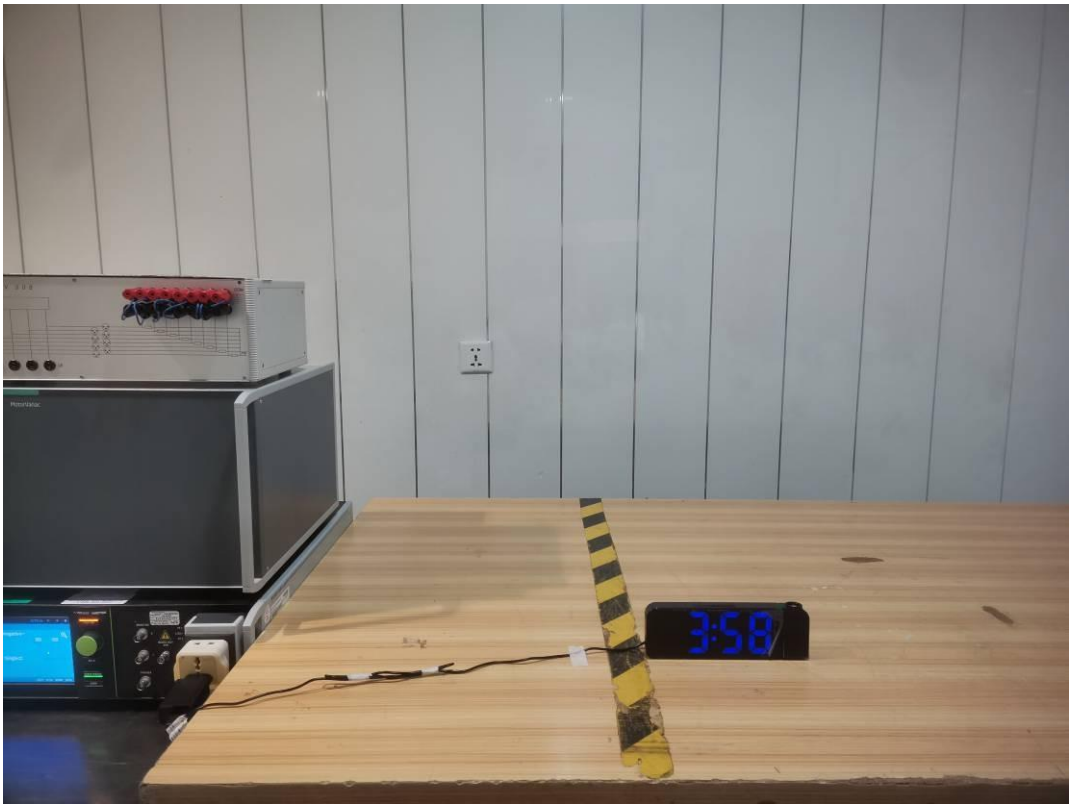
Test Setup Photo View

Flicker

Test Setup Photo View

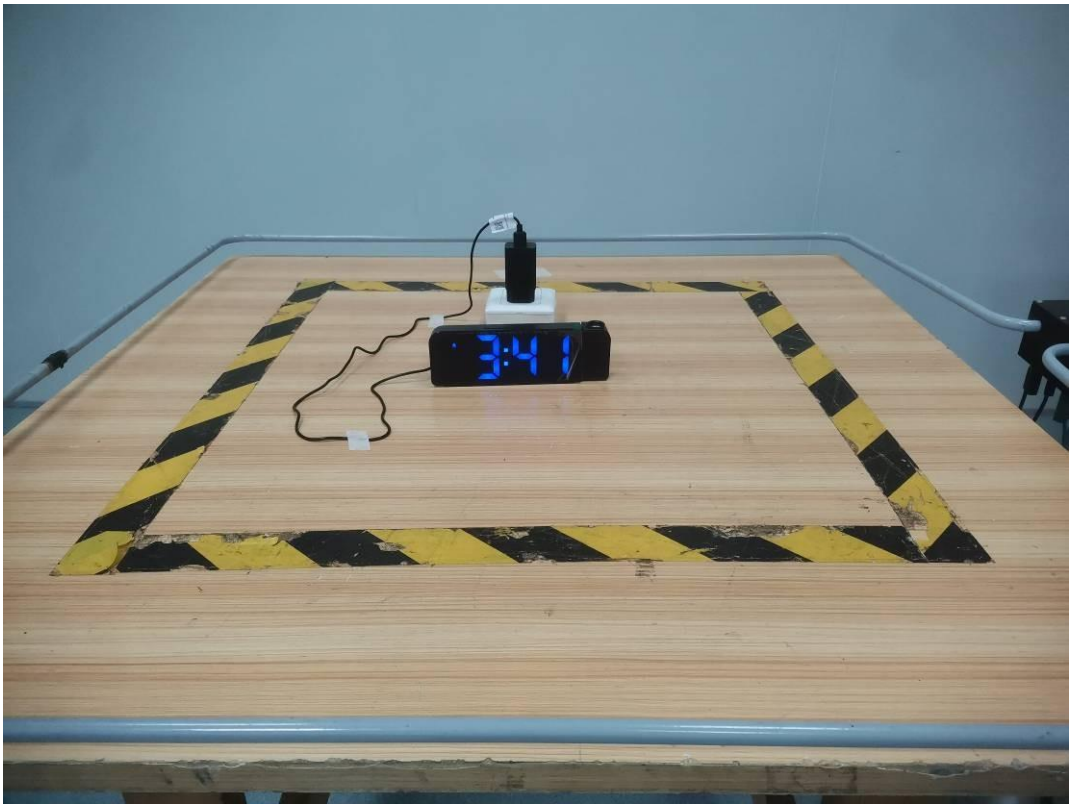
Surge

Test Setup Photo View



PFMF

Test Setup Photo View



DECLARATION OF SIMILARITY LETTER

Jinjiang Guanghua Electronic Industrial Trade Co.,Ltd.
Add: Pujin Industrial Area, Longhu,Jinjiang Quanzhou City,Fujian
Tel: 15260868888 Fax: N/A
Email: 27117@qq.com

DECLARATION OF SIMILARITY

Date: 2023-11-01

To whom it may concern

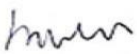
Dear Sir or Madam:

We, Jinjiang Guanghua Electronic Industrial Trade Co.,Ltd., hereby declare that the product: LED PROJECTION CLOCK, model: AN0726,GH8020 are electrically identical with the model: GH8013 which was tested by BACL(Dongguan)with the same electromagnetic emissions and electromagnetic compatibility characteristics.

A description of the differences between these models and that are declared similar are as follows:
They are the same product, and just the different model name. the rest are the same.
The detail information, please check the reports.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature: 

Printed Name: Anita
Title: Manager

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