EMC Test Report

Product Name:	**Bluetooth Speaker**
Model Number:	**X11**
Applicant:	**Huizhou Jiemeisi Technology Co., Ltd**

KeySense Testing & Certification International Co., Ltd.

1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China

Test Report of EMC				
Product name	Bluetooth Speaker			
Model number	X11			
Series Model	X33, HPG240BT, boAt Stone 580, boAt Stone Beam, SVEN PS-315, Vibe 110, REAL-EL X-707, ACCESS100, MXBS-33-BK-688, NGS ROLLER TEMPO, XTREME500, ROLLER TEMPO MINI, DI1191BL, Mixx XBoost, 974130, PBMSPG3BK, PBMSPG2BK, VK-3202, FS-10, SPBT1053, Cosmos, GW-311, TWS405, TWS404, ORC0002DS, SIREN, ARG-SP-3102, VK-3201, ORC0001DS, BT77 (The just a different model number.)			
Applicant	**Name**	Huizhou Jiemeisi Technology Co., Ltd		
	Address	No.63, Qingtang Dashuling Humei Street, Xiaojinkou street office, Huicheng District, Huizhou City, Guangdong Province, China.		
Manufacturer	**Name**	Huizhou Jiemeisi Technology Co., Ltd		
	Address	No.63, Qingtang Dashuling Humei Street, Xiaojinkou street office, Huicheng District, Huizhou City, Guangdong Province, China.		
Factory	**Name**	Huizhou Jiemeisi Technology Co., Ltd		
	Address	No.63, Qingtang Dashuling Humei Street, Xiaojinkou street office, Huicheng District, Huizhou City, Guangdong Province, China.		
Receipt date	Jan 03, 2023	**Quantity**	1	
Standard	EN 55032:2015+A11:2020 EN 55035:2017+A11:2020 EN IEC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019			
Test site	1F,Lab Building,No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China.			
Test period	Jan 03, 2023- Jan 10, 2023	**Issue Date**	Feb 27, 2023	
Test result	The equipment under test was found to be compliance with the requirements of the standards applied.			
Tested by: Bing. He	**Sign:**	**Date:** 2023.2.27		
Reviewed by: Jack.Li	**Sign:**	**Date:** 2023.2.27	(Stamp)	
Approved by:Tony.Xu (General manager)	**Sign:**	**Date:** 2023.2.27		

KeySense Testing&Certification International Co., Ltd.

Contents

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION(EN 55032:2015+A11:2020)				
Description of Test Item	Standard	Results	Remark	
Conducted disturbance at mains terminals	EN 55032:2015+A11:2020	PASS	Minimum passing margin is -7.69dB at 0.4380MHz	
Radiated Disturbance (30-1000MHz)	EN 55032:2015+A11:2020	PASS	Minimum passing margin is -6.90dB at 304.6099 MHz	
Radiated Disturbance (1-6GHz)	EN 55032:2015+A11:2020	PASS	Minimum passing margin is -27.23dB at 3222.054 MHz	
Harmonic current emission	EN IEC 61000-3-2:2019	PASS	Meet the Class A requirement	
Voltage fluctuations &flicker	EN 61000-3-3:2013+A1:2019	PASS	Meet the Clause 5 requirement	
IMMUNITY(EN 55035:2017+A11:2020)				
Description of Test Item	Basic Standard	Results	Performance Criteria	Observation Criteria
Electrostatic discharge	EN 61000-4-2:2009	PASS	B	A
Radio-frequency Continuous radiated disturbance	EN IEC 61000-4-3:2020	PASS	A	A
Electrical fast transient	EN 61000-4-4:2012	PASS	B	A
Surge	EN 61000-4-5:2014/A1:2017	PASS	B	A
Radio-frequency Continuous conducted disturbance	EN 61000-4-6:2014/A1:2015	PASS	A	A
Voltage dips, >95% reduction	EN IEC 61000-4-11:2020	PASS	B	A
Voltage dips, 30% reduction		PASS	C	A
Voltage interruptions, >95%		PASS	C	B
N/A is an abbreviation for Not Applicable.				
Final Judgment :**Pass**				

2 GENERAL INFORMATION

2.1 Description of Device(EUT)

Description: Bluetooth Speaker

Model Number: X11

Series Model: X33, HPG240BT, boAt Stone 580, boAt Stone Beam, SVEN PS-315, Vibe 110, REAL-EL X-707, ACCESS100, MXBS-33-BK-688, NGS ROLLER TEMPO, XTREME500, ROLLER TEMPO MINI, DI1191BL, Mixx XBoost, 974130, PBMSPG3BK, PBMSPG2BK, VK-3202, FS-10, SPBT1053, Cosmos, GW-311, TWS405, TWS404, ORC0002DS, SIREN, ARG-SP-3102, VK-3201, ORC0001DS, BT77 (The just a different model number.)

Input: DC 5V From Adapter； DC 3.7V From Battery

Note: 1. In Emission test, a pre-test shall be made over a range of DC 5V From Adapter； DC 3.7V From Battery. The report shows only the worst data.

2.2 EUT operating mode(s)

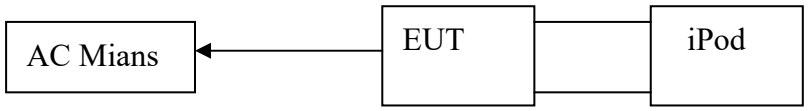
To achieve compliance applied standard specification, the following mode(s) were made during compliance testing:

Operating mode 1	AUX IN
Operating mode 2	BT
Operating mode 3	USB Playing
Operating mode 4	FM
Operating mode 5	SD
The report shows only the worst data.	

2.3 Tested Supporting System Details

No.	Description	KST No.	Manufacturer	Model	Serial Number
1.	Adapter	/	NOKIA	CH-21E	/
2	Adapter	/	HUAWEI	HW-050100U01	/
3	iPod	/	Apple	A1446	/
Note：Customer ship without adapter					

2.4 Block Diagram of connection between EUT and simulators



2.5 Test Facility

Site Description: 1-3F, Lab Building, No.29 District, ZhongKai Hi-Tech Industrial Development Park, Huizhou, Guangdong, China

Name of Firm: KeySense Testing & Certification International Co., Ltd.

EMC Lab: Certificated by CNAS, CHINA

Registration No.:L9678

Date of registration: Feb 07, 2017

2.6 Measurement Uncertainty(95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in shielding room	2.5dB(150kHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	4.14dB(30M~1GHz,Polarize:V)
	4.25dB(30M~1GHz,Polarize:H)

2.7 Test Equipments

2.7.1 For Conducted Emission at the Mains Terminals Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal .Interval
Receiver	R&S	ESR3	102054	2022.11.07	1 year
LISN	AFJ	LS16	16011618383	2022.08.17	1 year

2.7.2 For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Receiver	R&S	ESR3	102055	2022.11.07	1 year
Trilog-boardband antenna	SCHWARZBECK	VULB 9163D	9163961	2021.12.28	3 years
Receiver	R&S	ESR7	101661	2022.11.07	1 year
Horn antenna	Schwarzbeck	BBHA 9120D	9120D-1590	2021.12.28	3 years

2.7.3 For Harmonics Current Emission Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Harmonic & Flicker analyzer	California Instruments	100-CTS-230	1626A00278	2022.08.17	1 year
Programmable power supply	California Instruments	5001iX-CTS-400	1629A02598	2022.08.17	1 year

2.7.4 For Voltage Fluctuations & Flicker Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Harmonic & Flicker analyzer	California Instruments	100-CTS-230	1626A00278	2022.08.17	1 year
Programmable power supply	California Instruments	5001iX-CTS-400	1629A02598	2022.08.17	1 year

2.7.5 For Electrostatic discharge Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Electrostatic discharge generator	Noiseken	ESS-L1611	ESS1643151	2022.08.17	1 year

2.7.6 For Radio-frequency Continuous radiated disturbance Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal generator	R&S	SMC100A	105651	2022.11.07	1 year
Power amplifier	PRANA	MT400	1507-1746	2022.11.07	1 year
Trilog-boardband antenna	SCHWARZBECK	STLP 9128E	9128ES-136	2022.11.07	3years
Power amplifier	PRANA	SV70	1602-1820	2022.11.07	1 year
Horn antenna	Schwarzbeck	BBHA 9120E	BBHA9120E698	2020.10.25	3 years

2.7.7 For Electrical fast transient Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EFT generator	Noiseken	FNS-AX3-A16C	FNS1621762	2022.08.19	1 year

2.7.8 For Surge Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Surge generator	Noiseken	LSS-6230A	LSS1634248	2022.08.17	1 year

2.7.9 For Radio-frequency Continuous conducted disturbance Test

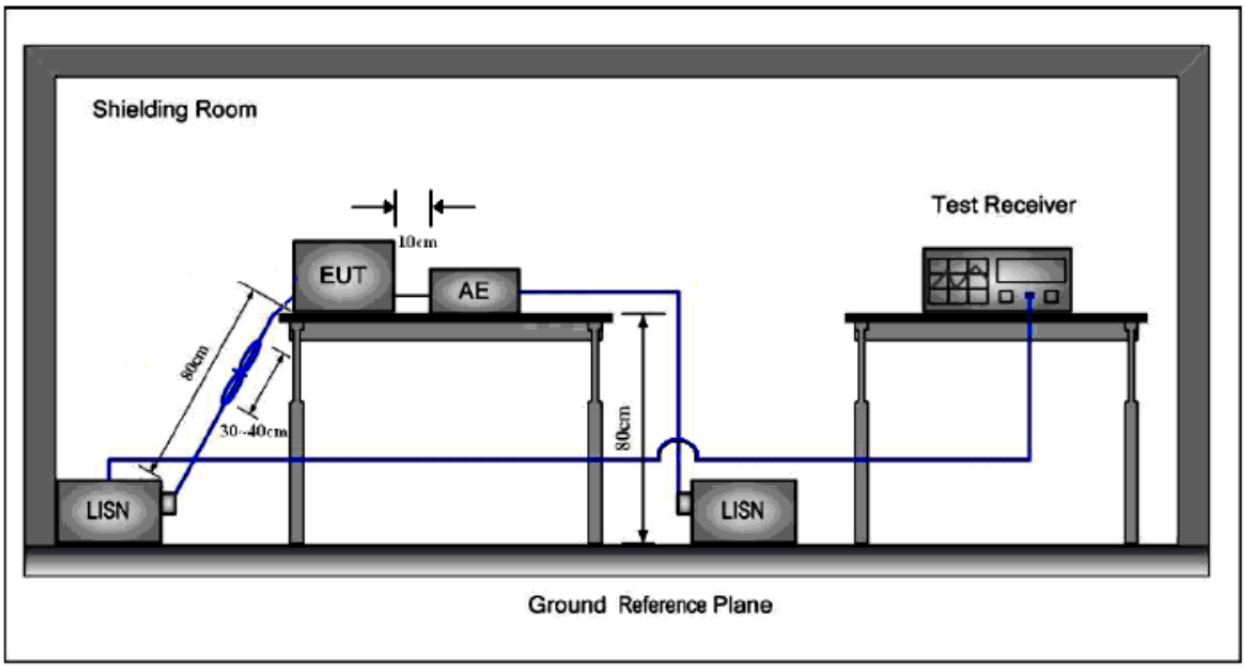
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Signal generator	R&S	SMC100A	105651	2022.11.07	1 year
Power amplifier	PRANA	DR220	1602-1819	2022.11.07	1 year
CND	TESEQ	M016	43434	2022.08.17	1 year

2.7.10 For Voltage dips and interruptions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Dips simulator	Noiseken	VDS-2002	VDS1510396	2022.08.17	1 year

3 CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

3.1 Block Diagram of Test Setup



3.2 Test Standard

EN 55032: 2015+A11 2020, Class B

3.3 Limits of mains terminal disturbance voltage

Frequency range [MHz]	Limits [dBμV]	
	Quasi-peak	Average
0,15 to 0,50	66 - 56 *	56 - 46 *
0,50 to 5	56.00	46.00
5 to 30	60.00	50.00
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50MHz.		

3.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Jan 09, 2023	20°C	59%	101.0kPa

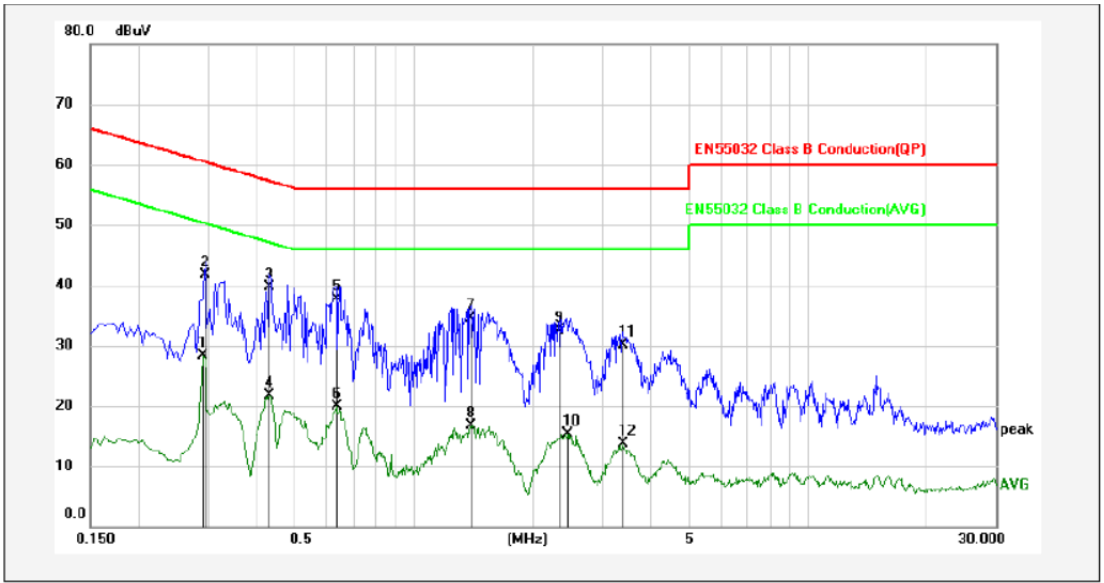
3.5 Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2).This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The side of power line was checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55032 Class A on conducted Disturbance test.

The bandwidth of the test receiver (R&S Test Receiver ESR) is set at 9kHz.
The frequency range from 150kHz to 30MHz is checked.

3.6 Test Data

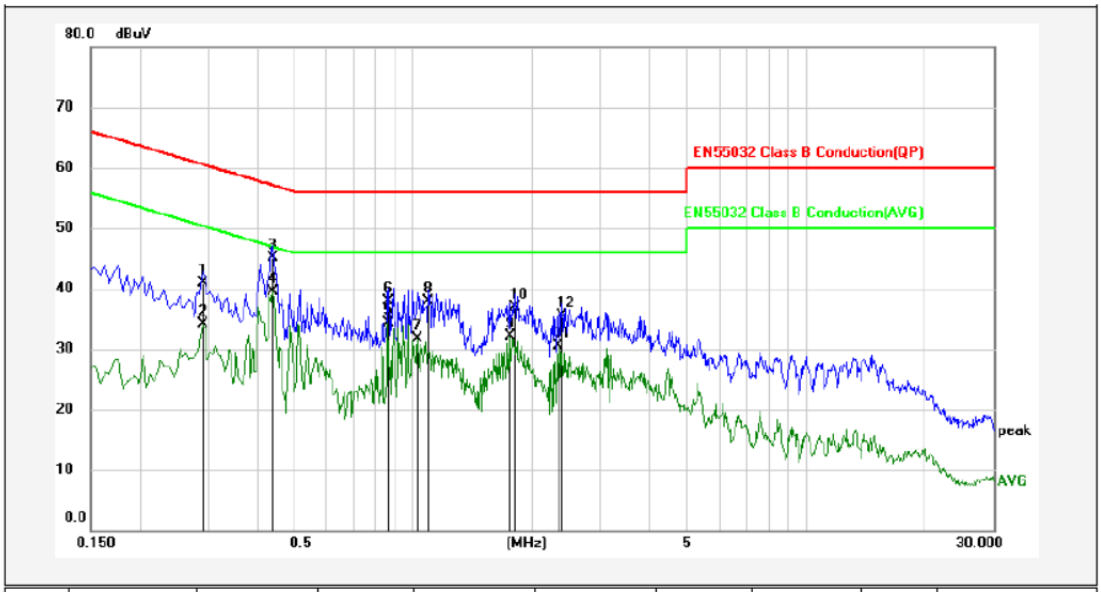
EUT:	Bluetooth Speaker	Model Name:	X11
Test Mode:	BT	Test Date:	2023.01.09
Phase:	Live	Test Voltage:	DC 5V From Adapter
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2895	17.66	10.48	0.24	28.38	50.54	-22.16	AVG	
2	0.2940	31.08	10.48	0.24	41.80	60.41	-18.61	QP	
3	0.4290	28.98	10.48	0.24	39.70	57.27	-17.57	QP	
4	0.4290	11.02	10.48	0.24	21.74	47.27	-25.53	AVG	
5	0.6360	27.07	10.49	0.24	37.80	56.00	-18.20	QP	
6	0.6360	9.09	10.49	0.24	19.82	46.00	-26.18	AVG	
7	1.3920	23.88	10.5	0.22	34.60	56.00	-21.40	QP	
8	1.3920	5.92	10.5	0.22	16.64	46.00	-29.36	AVG	
9	2.3460	21.79	10.51	0.2	32.50	56.00	-23.50	QP	
10	2.4495	4.67	10.51	0.2	15.38	46.00	-30.62	AVG	
11	3.3945	19.48	10.52	0.2	30.20	56.00	-25.80	QP	
12	3.4035	2.93	10.52	0.2	13.65	46.00	-32.35	AVG	

Remarks: 1. Result=Reading+Lisn+Cab_L
2. If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detctor is unnecessary.

EUT:	Bluetooth Speaker	Model Name:	X11
Test Mode:	BT	Test Date:	2023.01.09
Phase:	Neutral	Test Voltage:	DC 5V From Adapter
Operator:	Bing	Note:	

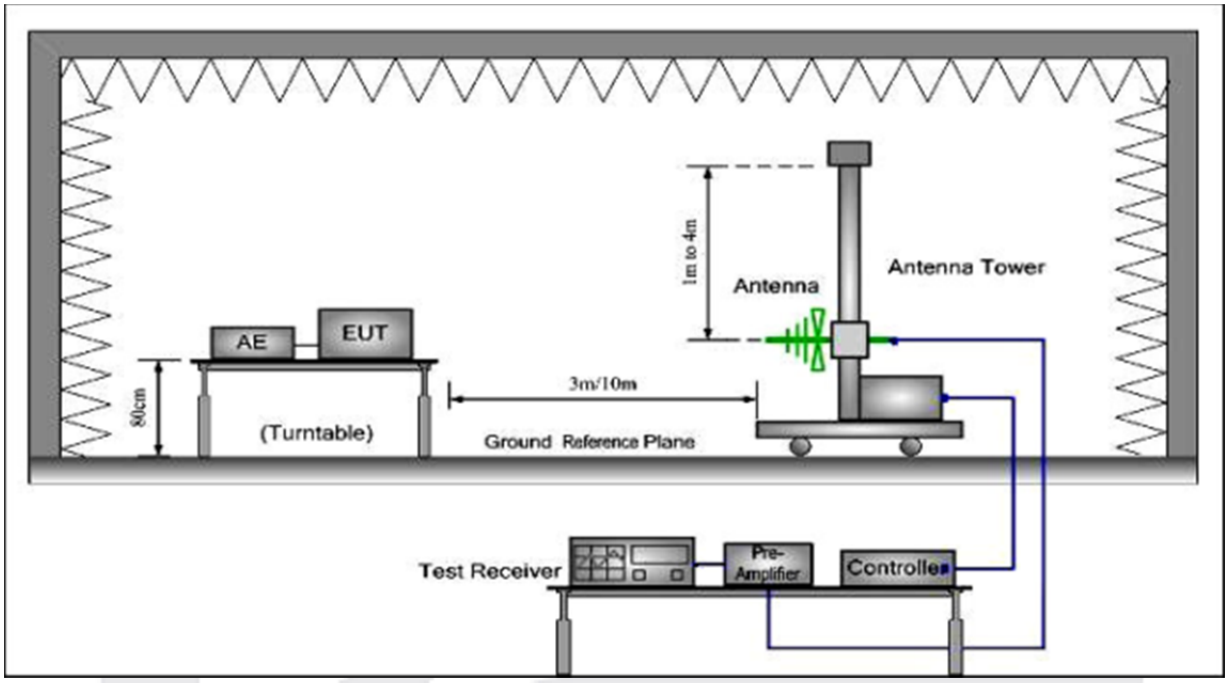


No.	Frequency (MHz)	Reading (dBuV)	Lisn/Isn (dB)	Cab_L (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2895	30.18	10.48	0.24	40.90	60.54	-19.64	QP	
2	0.2895	23.36	10.48	0.24	34.08	50.54	-16.46	AVG	
3	0.4380	34.38	10.48	0.24	45.10	57.10	-12.00	QP	
4	0.4380	28.69	10.48	0.24	39.41	47.10	-7.69	AVG	
5	0.8610	23.52	10.5	0.23	34.25	46.00	-11.75	AVG	
6	0.8655	27.27	10.5	0.23	38.00	56.00	-18.00	QP	
7	1.0230	20.99	10.5	0.23	31.72	46.00	-14.28	AVG	
8	1.0905	27.17	10.5	0.23	37.90	56.00	-18.10	QP	
9	1.7565	21.43	10.51	0.21	32.15	46.00	-13.85	AVG	
10	1.8105	26.28	10.51	0.21	37.00	56.00	-19.00	QP	
11	2.3460	19.74	10.51	0.2	30.45	46.00	-15.55	AVG	
12	2.3955	24.79	10.51	0.2	35.50	56.00	-20.50	QP	

Remarks: 1. Result=Reading+Lisn+Cab_L
2. If the average limit is met when using a quasi-peak detector.
the EUT shall be deemed to meet both limits and measurement
with average detctor is unnecessary.

4 RADIATED EMISSION TEST

4.1 Block Diagram of Test Setup



4.2 Test Standard

EN 55032: 2015+A11 2020, Class B

4.3 Limits for radiated disturbance

Frequency MHz	Distance	Limits dB(μV)/m Class B
30 ~ 230	3m	40(Quasi Peak)
230 ~ 1000	3m	47(Quasi Peak)
1000 ~ 3000	3m	70 (Peak) 50 (Average)
3000 ~ 6000	3m	74 (Peak) 54 (Average)

4.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Jan 06, 2022	20°C	60%	101.0kPa

4.5 Test Procedure

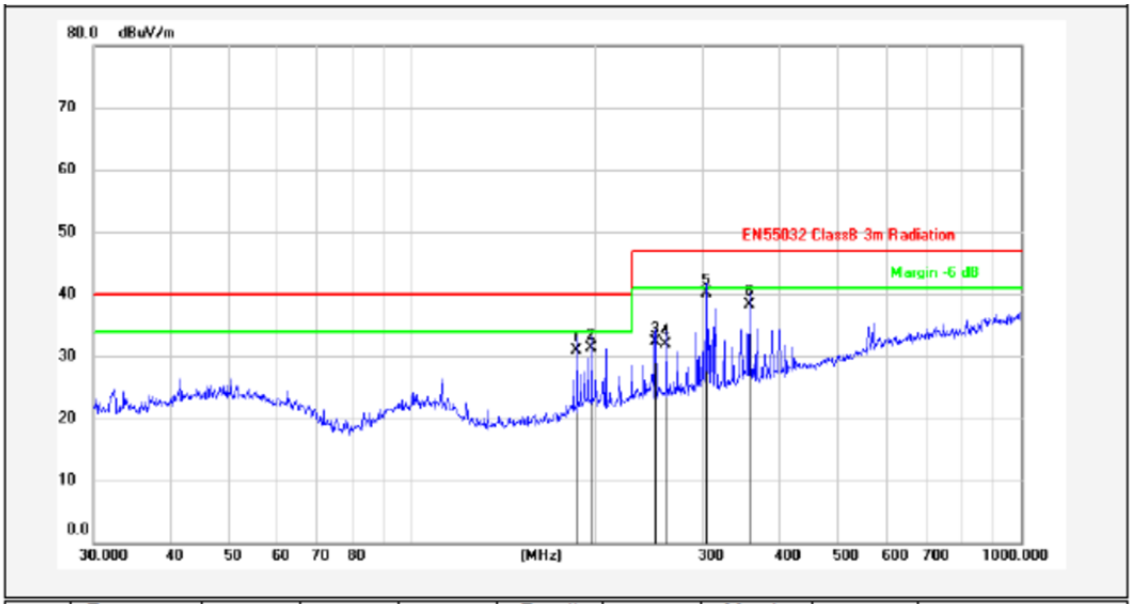
The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth setting on the test receiver was 120 kHz.

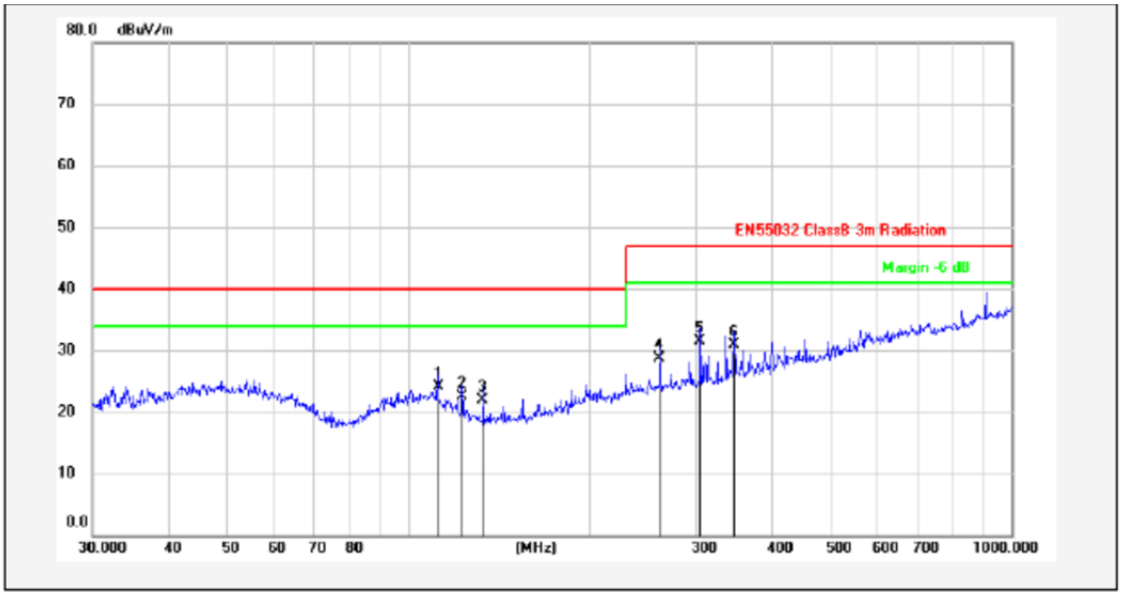
4.6 Test Data(30MHz-1000MHz)

EUT:	Bluetooth Speaker	Model Name:	X11
Test Mode:	BT	Test Date:	2023.01.06
Polarization:	Horizontal	Test Voltage:	DC 5V From Adapter
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna. (dB/m)	Cable. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	186.4408	18.74	10.18	2.08	31.00	40.00	-9.00	QP	
2	197.2000	17.98	11.22	2.1	31.30	40.00	-8.70	QP	
3	251.1803	17.72	12.31	2.27	32.30	47.00	-14.70	QP	
4	261.0582	17.21	12.48	2.31	32.00	47.00	-15.00	QP	
5	304.6099	24.59	13.11	2.4	40.10	47.00	-6.90	QP	
6	357.9286	21.45	14.39	2.56	38.40	47.00	-8.60	QP	

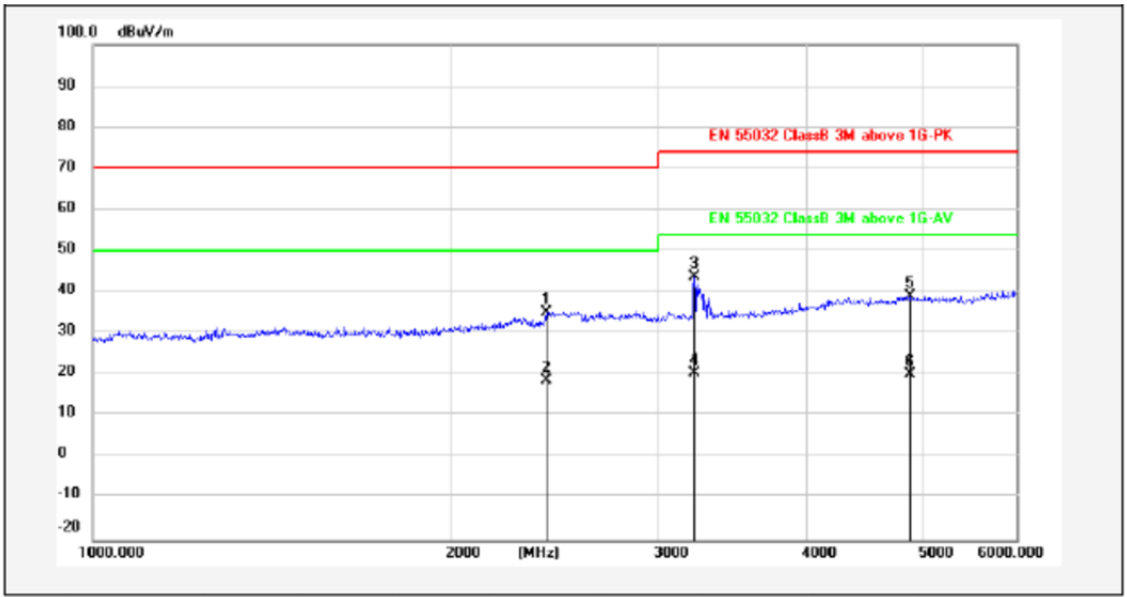
EUT:	Bluetooth Speaker	Model Name:	X11
Test Mode:	BT	Test Date:	2023.01.06
Polarization:	Vertical	Test Voltage:	DC 5V From Adapter
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna. (dB/m)	Cable. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	112.1305	10.75	11.8	1.65	24.20	40.00	-15.80	QP	
2	122.8340	11.01	9.8	1.69	22.50	40.00	-17.50	QP	
3	133.1511	11.54	8.7	1.76	22.00	40.00	-18.00	QP	
4	261.0583	13.91	12.48	2.31	28.70	47.00	-18.30	QP	
5	304.6099	16.09	13.11	2.4	31.60	47.00	-15.40	QP	
6	346.8092	14.07	14.41	2.52	31.00	47.00	-16.00	QP	

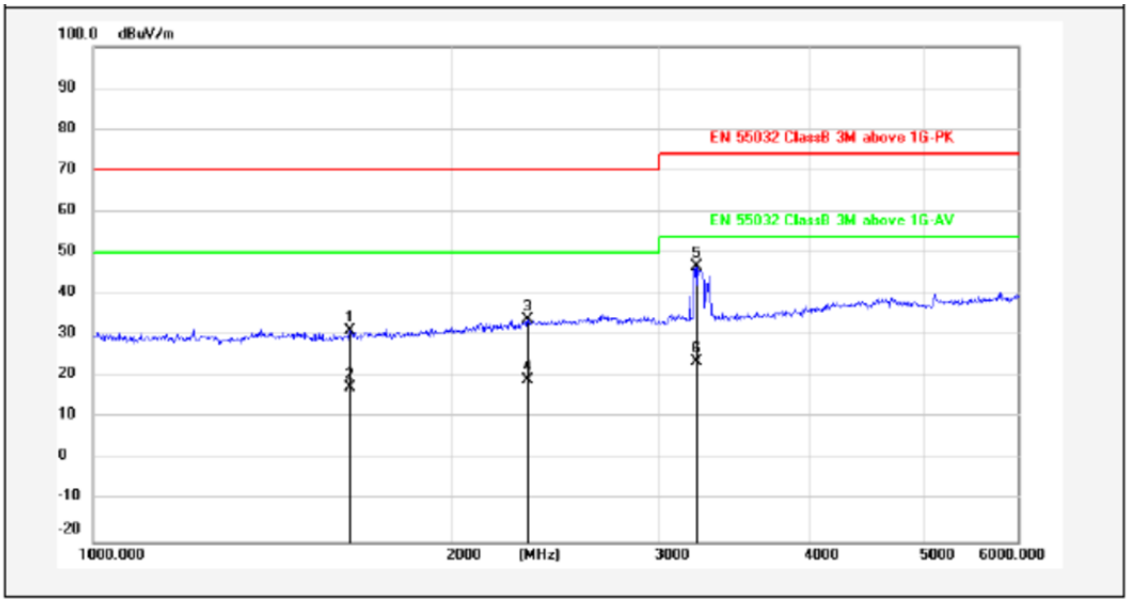
Test data(1GHz-6GHz)

EUT:	Bluetooth Speaker	Model Name:	X11
Test Mode:	BT	Test Date:	2023.01.06
Polarization:	Horizontal	Test Voltage:	DC 5V From Adapter
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna. (dB/m)	Cable. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2410.307	41.92	27.3	-34.08	35.14	70.00	-34.86	peak	
2	2410.307	25.48	27.3	-34.08	18.70	50.00	-31.30	AVG	
3	3210.528	49.22	28.33	-33.75	43.80	74.00	-30.20	peak	
4	3210.528	25.82	28.33	-33.75	20.40	54.00	-33.60	AVG	
5	4882.743	39.26	31.37	-31.63	39.00	74.00	-35.00	peak	
6	4882.743	20.46	31.37	-31.63	20.20	54.00	-33.80	AVG	

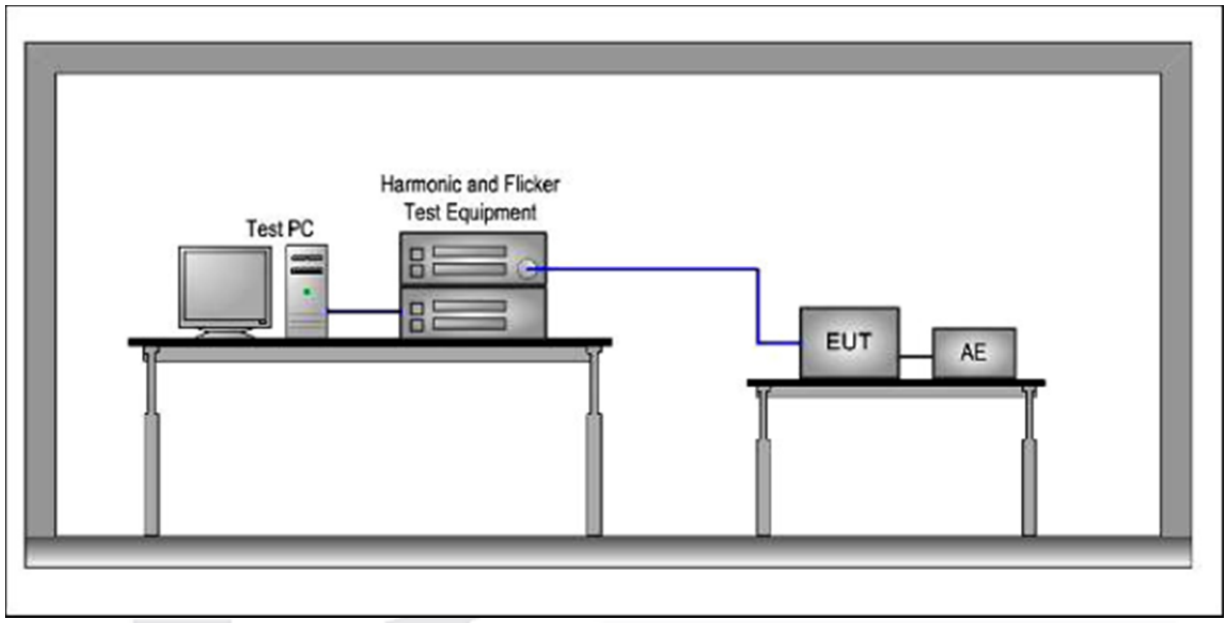
EUT:	Bluetooth Speaker	Model Name:	X11
Test Mode:	BT	Test Date:	2023.01.06
Polarization:	Vertical	Test Voltage:	DC 5V From Adapter
Operator:	Bing	Note:	



No.	Frequency (MHz)	Reading (dBuV/m)	Antenna. (dB/m)	Cable. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	1645.607	41.66	24.92	-35.39	31.19	70.00	-38.81	peak	
2	1645.607	27.87	24.92	-35.39	17.40	50.00	-32.60	AVG	
3	2321.299	40.79	26.99	-34.07	33.71	70.00	-36.29	peak	
4	2321.299	26.18	26.99	-34.07	19.10	50.00	-30.90	AVG	
5	3222.054	52.18	28.33	-33.74	46.77	74.00	-27.23	peak	
6	3222.054	29.21	28.33	-33.74	23.80	54.00	-30.20	AVG	

5 HARMONIC CURRENT EMISSION TEST

5.1 Block Diagram of Test Setup



5.2 Test Standard

EN IEC 61000-3-2:2019, Class A

5.3 Limits of Harmonic Current

Limits for Class A equipment	
Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15≤n≤39	0.15 15/n
Even harmonics	
2	1.08
4	0.43
6	0.30
8≤n≤40	0.23 8/n

Remark: If the EUT power level is below 75 Watts and therefore has no defined limits.

5.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Jan 08, 2023	20°C	54%	101.0kPa

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN

5.5 Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

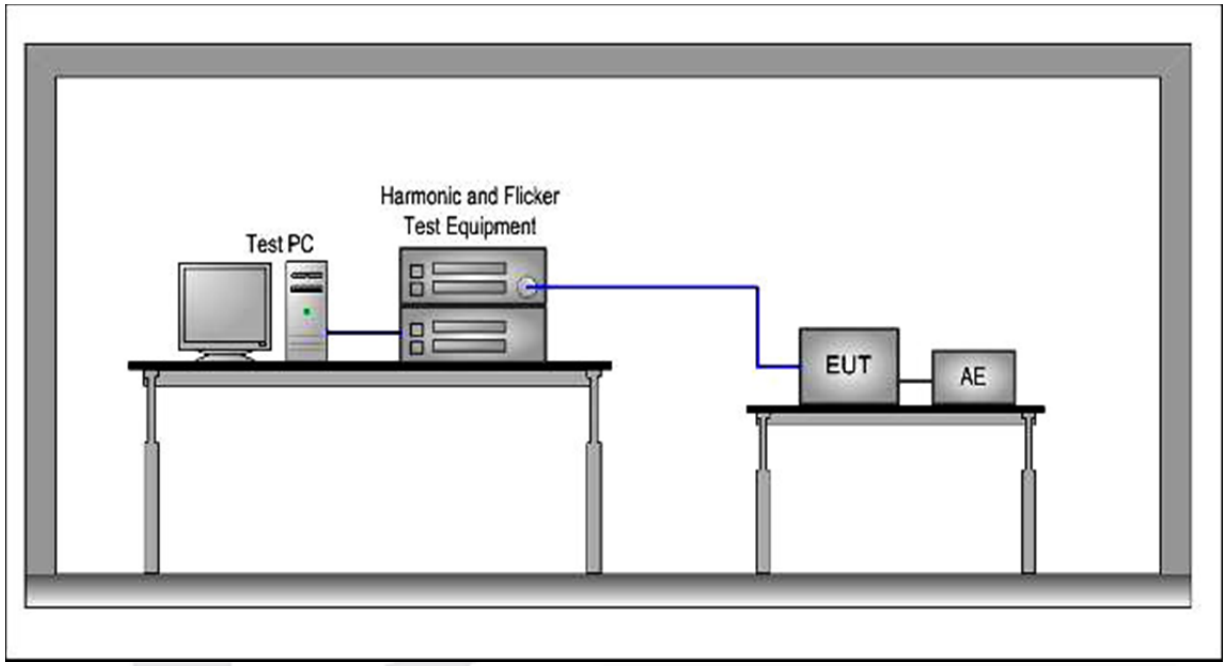
5.6 Test Data

Remark:

This product has a power consumption 75W or less under normal operating conditions. It is therefore not likely to produce harmonics above the limits of the standard.The product is deemed to comply whit the standard whitout any measurements.

6 VOLTAGE FLUCTUATIONS & FLICKER TEST

6.1 Block Diagram of Test Setup



6.2 Test Standard

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

6.3 Limits of Voltage Fluctuation and Flick

Test Item	Limit	Note
Pst	1.0	Pst means Short-term flicker indicator
Plt	0.65	Plt means long-term flicker indicator
Tmax	500ms	Tmax means maximum time that d(t) exceeds 3.3%
dmax(%)	4%	dmax means maximum relative voltage change.
dc(%)	3.3%	dc means relative steady-state voltage change.

6.4 Operating Condition of EUT

Test date	Ambient temperature	Relative humidity	Atmospheric pressure
Jan 08, 2023	20°C	54%	101.0kPa

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN

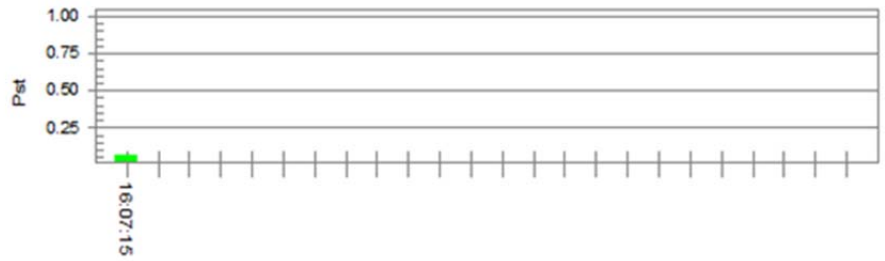
6.5 Test Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions During the flick measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

6.6 Test Data

Test Result: Pass **Status: Test Completed**

Pst and limit line **European Limits**



Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.12			
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

7 IMMUNITY TEST RESULT

Description of Performance Criteria:

Performance criteria A

During and 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 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 criteria B

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

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

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 except from the equipment if used as intended.

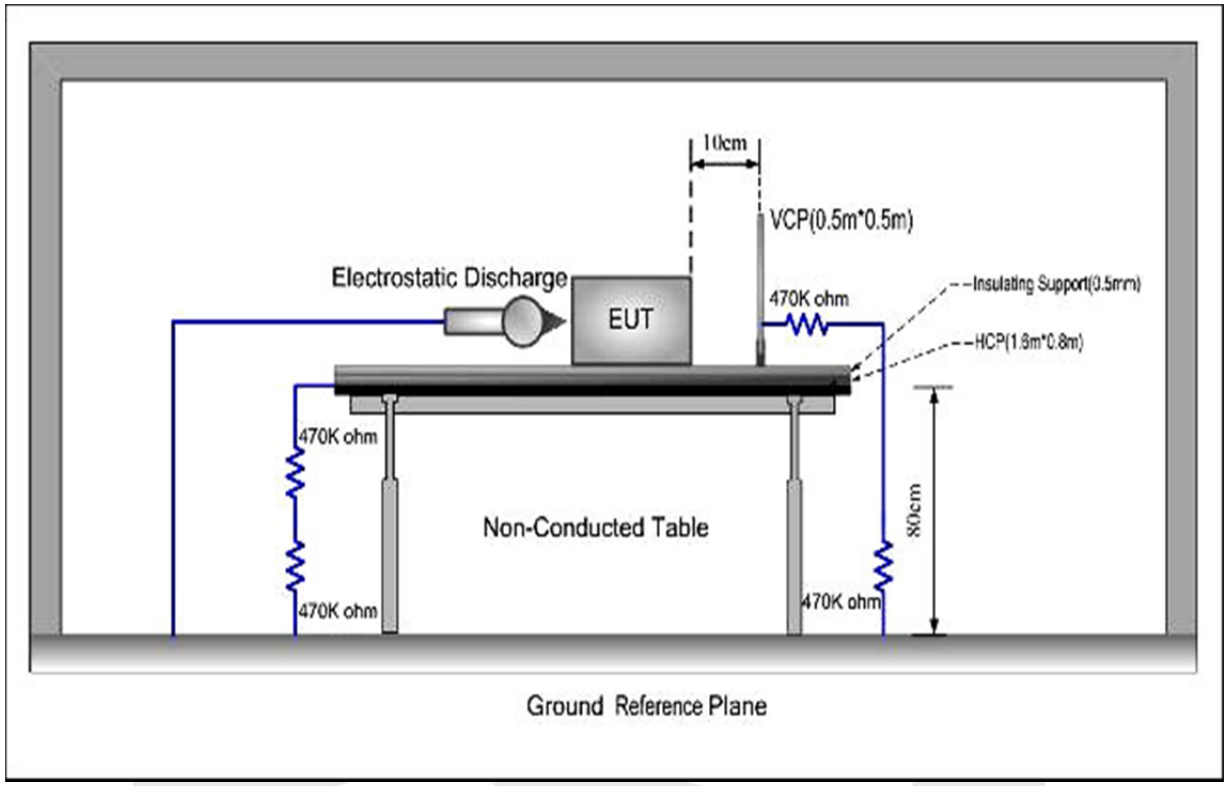
Performance criteria C

During and after testing, a temporary 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.

Functions, and/or information stored in non-volatile memory, or protected by a backup, shall not be lost.

8 ELECTROSTATIC DISCHARGE TEST

8.1 Block Diagram of Test Setup



8.2 Test Standard

EN 55035: 2017/A1 2020 (EN 61000-4-2)
(Severity Level 1&2&3 for Air Discharge at 2kV 4kV 8kV;
Severity Level 1&2 for Contact Discharge at 2kV 4kV)

8.3 Severity Levels and Performance Criterion

Severity Levels	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)	Performance criterion
1.	2	2	B
2.	4	4	
3.	6	8	
4.	8	15	
x	Special	Special	

8.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN
2	BT
3	USB Playing
4	FM
5	SD

8.5 Test Procedure

8.5.1 Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed.

8.5.2 Contact Discharge:

All the procedure was same as Section 8.5.1. except that the generator was re-triggered for a new single discharge and repearted 50 times for each pre-selected test point. The tip of the discharge electrode was touch the EUT before the discharge switch was operated.

8.5.3 Indirect discharge for horizontal coupling plane

At least 20 single discharges were 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.

8.5.4 Indirect discharge for vertical coupling plane

At least 20 single discharge were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

8.6 Test Data

Electrostatic Discharge Test Results

EUT	:	Bluetooth Speaker	Temperature	:	21℃
M/N	:	X11	Humidity	:	50%
Test Voltage	:	DC 3.7V From Battery	Test Date	:	2023.01.09
Test Engineer	:	Bing	Pressure	:	101.3kPa
Required Performance	:	B	Actual Performance	:	A

Air Discharge: ±2kV ±4kV ±8kV	# For Air Discharge each Point Positive ＞25 times and negative ＞25 times discharge
Contact Discharge: ±2kV ±4kV	# For Contact Discharge each point positive ＞25 times and negative ＞25 times discharge

For the time interval between successive single discharges an initial value of one second.
After discharge to the ungrounded part of EUT, it needs the bleeder resistor to remove the charge prior to next ESD pulse

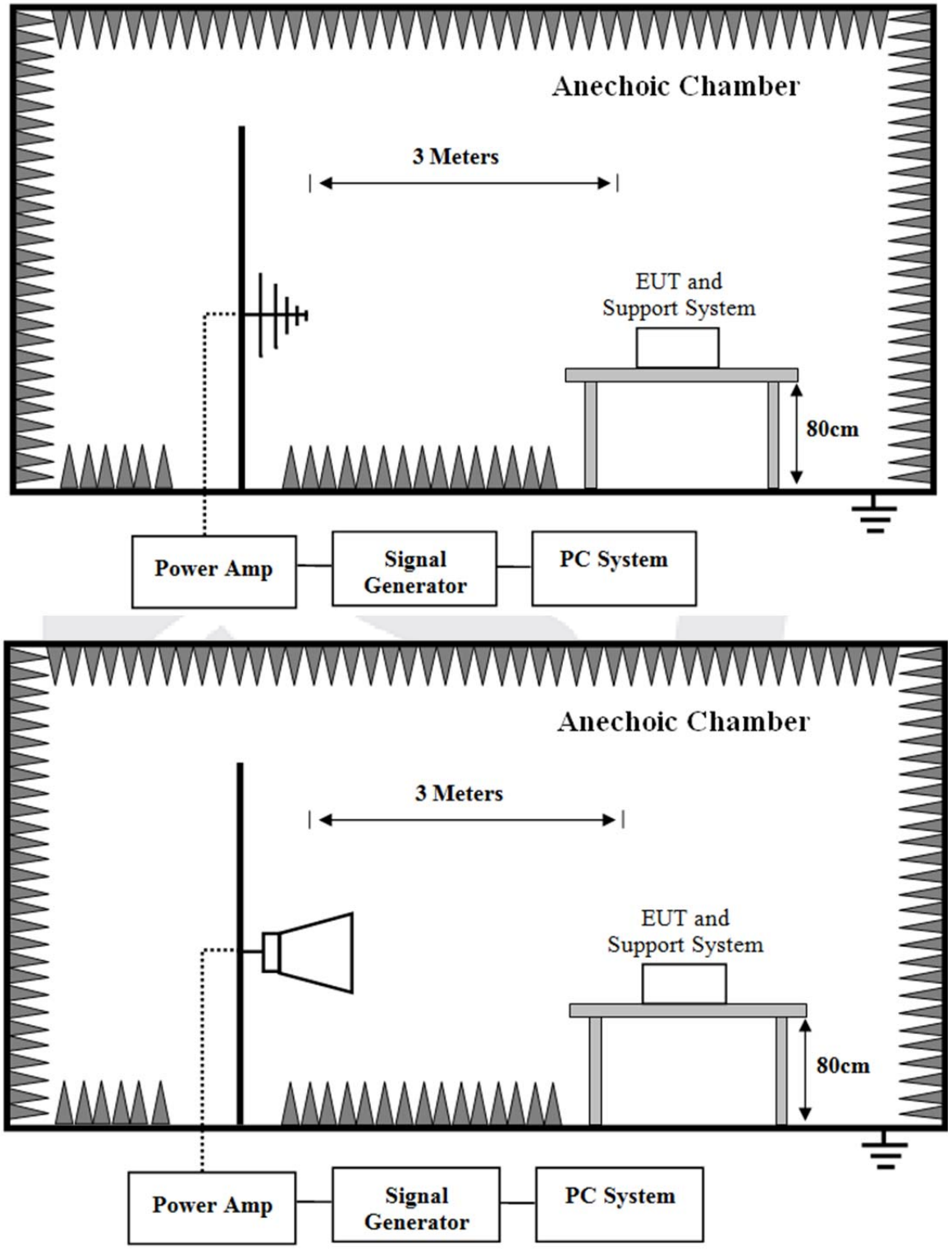
Discharge Voltage (kV)	Type of discharge	Dischargeable Points	Performance		Result (Pass/Fail)
			Required	Observation	
±2	Contact	Center of VCP	B	A	**Pass**
±4	Contact	Center of HCP	B	A	**Pass**
±2	Contact	1,2	B	B	**Pass**
±4	Contact	1,2	B	B	**Pass**
±4	Air	3,4,5	B	A	**Pass**
±6	Air	3,4,5	B	A	**Pass**
±8	Air	3,4,5	B	A	**Pass**

1	USB Port	8	/
2	AUX IN Port	9	/
3	Slot	10	/
4	Button	11	/
5	SD Port	12	/
6	/	13	/
7	/	14	/

Performance:
The Voice appeared noise during the test, but self-recoverable after the test.

9 Radio Frequency Electromagnetic Field Immunity Test

9.1 Block Diagram of Test Setup



9.2 Test Standard

EN 55035:2017/A11 2020 (EN 61000-4-3),

Frequency Range：80-1000MHz,1800MHz, 2600MHz, 3500MHz, 5000MHz

Severity Level 2 at 3V/m

Radio Frequency Electromagnetic Field Immunity Test levels

Level	Test field strength V/m
1	1
2	3
3	10
4	30
X	Special
Note: X is an opoen test level and the associated field strength may be any value. This level may be given in the product standard.	

9.3 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN

9.4 Test Procedure

The field sensor is placed on the EUT table (0.8 meter above the ground) which is 3 meters away from the transmitting antenna. Through the signal generator, power amplifier and transmitting antenna to produce a uniformity field strength (3V/m measured by field sensor) around the EUT table from frequency range specified and records the signal generator‘s output level at the same time for whole measured frequency range. Then, put EUT and its simulators on the EUT turn table and keep them 3 meters away from the transmitting antenna which is mounted on an antenna tower and fixes at 1 meter height above the ground. Using the recorded signal generator’s output level to measure the EUT from frequency range specified and both horizontal & vertical polarization of antenna must be set and measured. Each of the four sides of EUT must be faced this transmitting antenna and measures individually.

All the scanning conditions are as follows：

Test Level	
Frequency	80-1000MHz,1800MHz, 2600MHz, 3500MHz, 5000MHz
Test level	3V/m (Severity Level 2)
Antenna polarization	Horizontal & Vertical
Modulation	80%, 1kHz Amplitude Modulation
Steps increment	1%

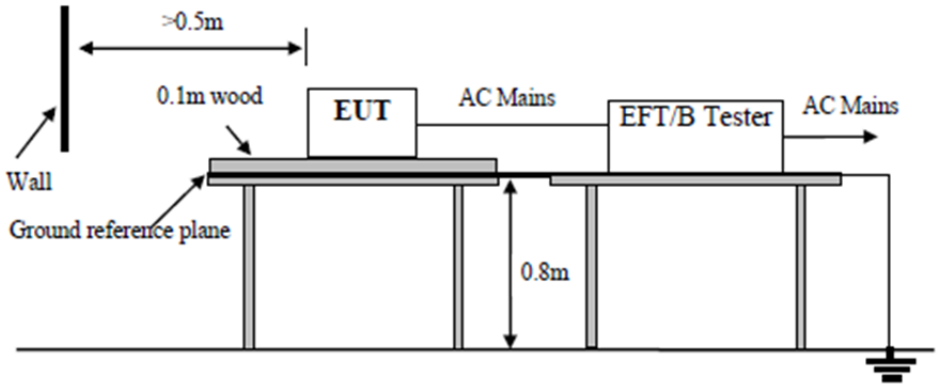
9.5 Test Data

Radio-frequency Continuous radiated disturbance Test Results

Field Strength (V/m)	Test Frequency (MHz)	Test mode (worst case)	Polarization of antenna	Reference Level	Audio output	Limit	Interference Ratio (worst case)
3	80-1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz	AUX IN	H	75dBSPL	Headset	⩽ -20	-22
			V	75dBSPL	Headset		-24

10 ELECTRICAL FAST TRANSIENT/BURST TEST

10.1 . Block Diagram of Test Setup



10.2 Test Standard

EN 55035: 2017/A11 2020 (EN 61000-4-4)

10.3 Severity Levels and Performance Criterion

Open Circuit Output Test Voltage ±10%			
Severity Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines	Performance criterion
1.	0.5KV	0.25KV	B
2.	1KV	0.5KV	
3.	2KV	1KV	
4.	4KV	2KV	
X	Special	Special	
The use of 5 kHz repetition frequency is traditional, however, 100 kHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. With some products, there may be no clear distinction between power ports and signal ports, in which case it is up to product committees to make this determination for test purposes.			
a "X" can be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification.			

10.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN

10.5 Test Procedure

The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was 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 was more than 0.5m. The length of signal and power cable between EUT and EFT generator was 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

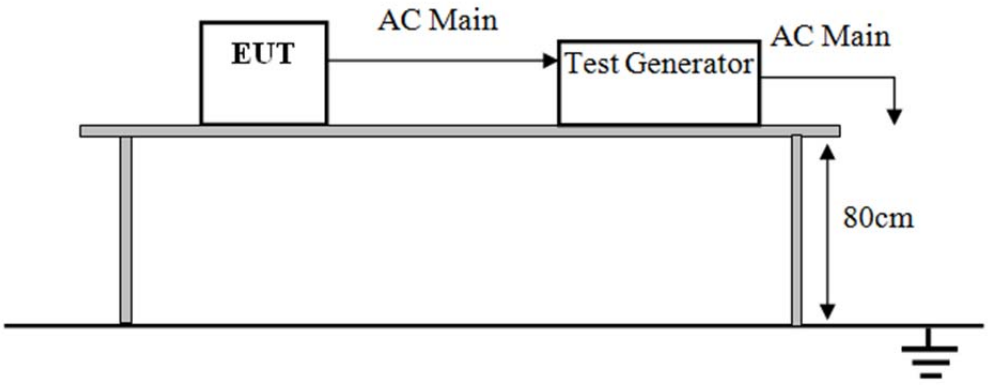
10.6 Test Data

Electrical fast transient Test Results

Coupling Ports		Coupling Voltage	Inject Method	Result
AC Power Ports	L-N	±1 kV	Direct	Pass
	L-N-PE	±1 kV	/	/
Remark: There was no change compared with initial operation during the test.				

11 SURGE TEST

11.1 Block Diagram of Test Setup



11.2 Test Standard

EN 55035: 2017A11 2020 (EN 61000-4-5)

11.3 Severity Levels and Performance Criterion

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

11.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN

11.5 Test Procedure

2Ω effective output impedance of the generator was used for L-N test.12Ω effective output impedance of the generator was used for L-PE,N-PE test.

5 positive and 5 negative (polarity) tests were applied successively synchronized to the voltage phase, 90°, 270°to L-N respectively. The repetition rate was 1 per minute during test.

(1). For input and AC power ports:
The EUT was connected to the power mains by using a coupling device which coupled the surge interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration was 1 minute.
(2). For signal lines and control lines ports:
None.
(3). For DC input and DC output power ports:
None.

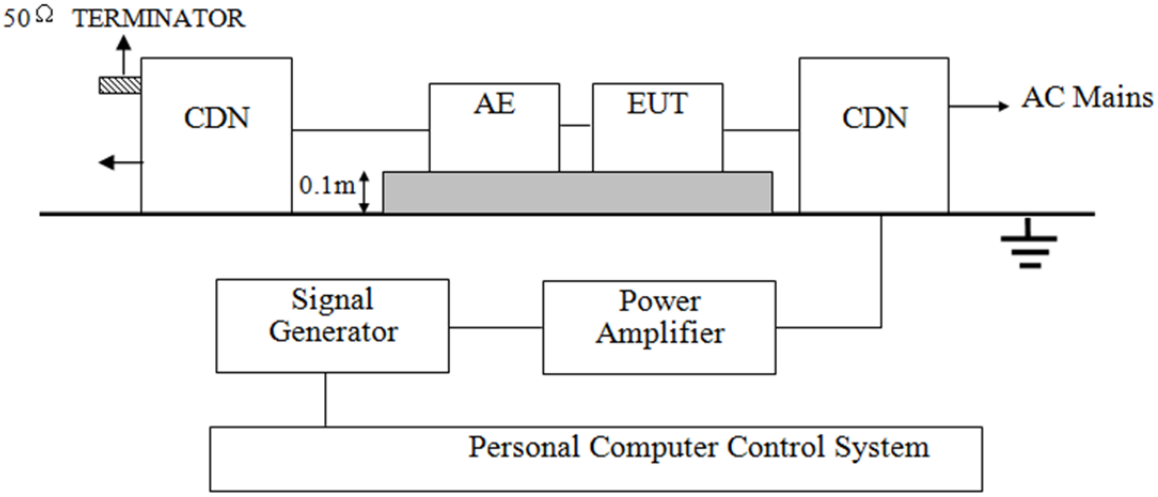
11.6 Test Data

Surge Immunity Test Results

Coupling Ports		Coupling Voltage	Coupling Phase / Result			
			0°	90°	180°	270°
AC power ports	L-N	+/-1kV Direct	/	Pass	/	Pass
	L-PE	+/-2kV Direct	/	/	/	/
	N-PE	+/-2kV Direct	/	/	/	/
Remark: There was no change compared with initial operation during the test.						

12 RADIO-FREQUENCY CONTINUOUS CONDUCTED DISTURBANCE TEST

12.1 Block Diagram of Test Setup



12.2 Test Standard

EN 55035: 2017/A11 2020(EN 61000-4-6)

12.3 Severity Levels and Performance Criterion

Level	Voltage Level (e.m.f.) V
1.	1
2.	3
3.	10
X	Special

12.4 Operating Condition of EUT

The details of test modes are as follows：

No.	Test Mode
1.	AUX IN

12.5 Test Procedure

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

The frequency range was swept from 0.15 MHz - 10 MHz, 10 MHz – 30 MHz and 30 MHz – 80MHz using 3V, 3 V - 1V, 1V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

The rate of sweep shall not exceed 1.5*10-3decades/s.Where the frequency was swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value

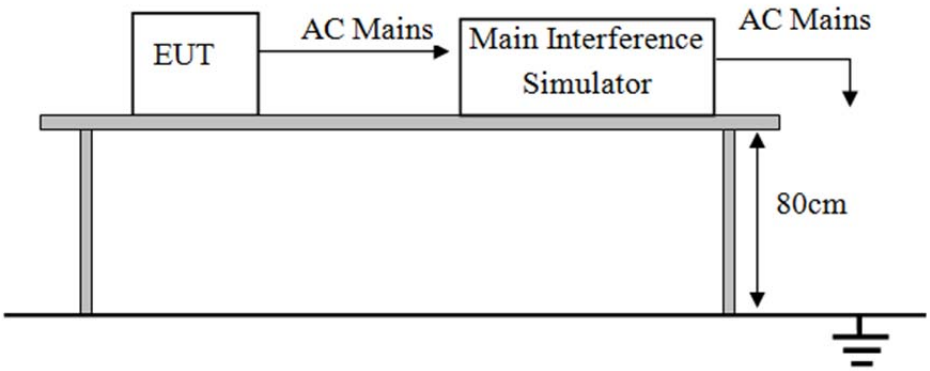
12.6 Test Data

Radio-frequency Continuous conducted disturbance Test Results

Voltage (V)	Test Frequency (MHz)	Test mode (worst case)	Injection Method	Required	Observation	Result
3	0.15 –10 MHz	AUX IN	CDN-M2	A	A	PASS
3 -1	10 –30MHz					PASS
1	30 –80 MHz					PASS

13 VOLTAGE DIPS AND INTERRUPTIONS TEST

13.1 Block Diagram of Test Setup



13.2 Test Standard

EN 55035: 2017/A11 2020 (EN 61000-4-11)

13.3 Severity Levels and Performance Criterion

Test category	reduction	Periods	Performance criterion
Voltage dips	＞95%	0.5P	B
Voltage dips	30%	25P/30P	C
Voltage interruptions	＞95%	250P/300P	C

13.4 Operating Condition of EUT

The details of test modes are as follows:

No.	Test Mode
1.	AUX IN

13.5 Test Procedure

1) The EUT and test generator were setup as shown on Section 13.1.
2) The interruptions are introduced at selected phase angles with specified duration.
3) Record any degradation of performance.

13.6 Test Data

Voltage Dips and Short Interruptions Immunity Test Result AC 230V/50Hz

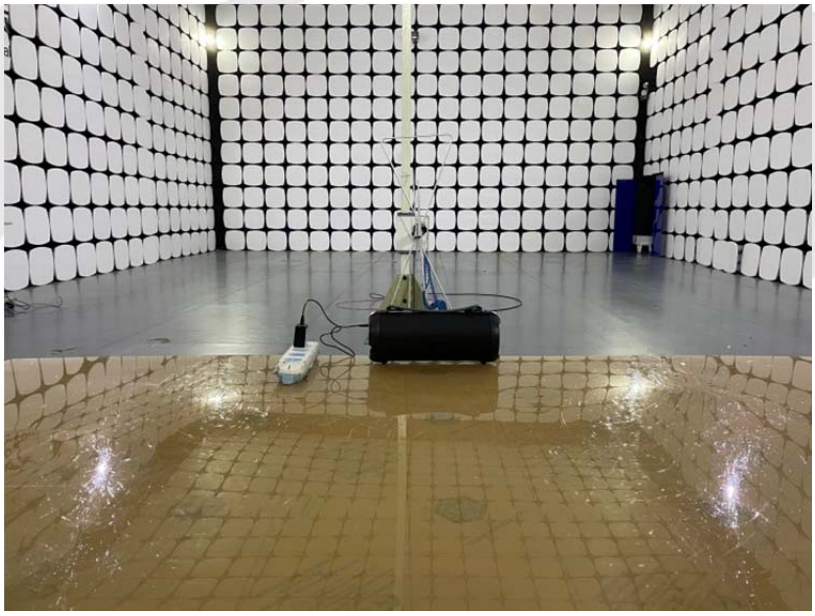
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in period)	Criterion	Result
0	100	0.5P	B	PASS
70	30	25P	C	PASS
0	100	250P	C	PASS

Remark: The EUT was Stopped during the test, but self-recoverable after the test

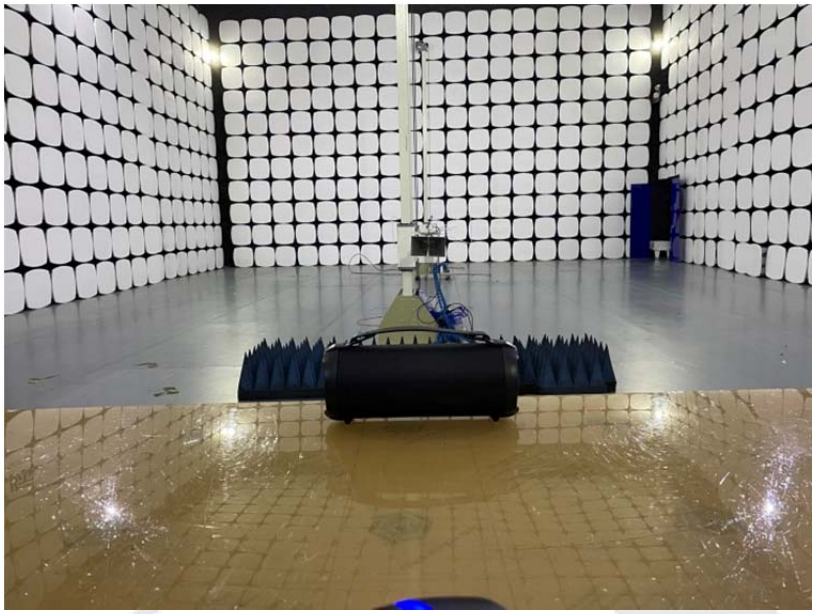
14 Test setup photo

Conducted disturbance at mains terminals Test

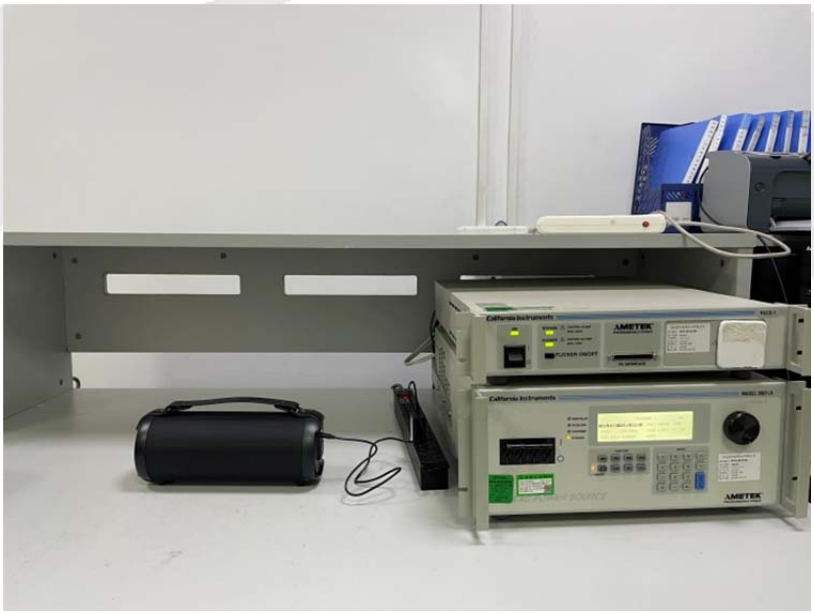
Radiated Disturbance Test (30-1000MHz)



Radiated Disturbance Test (above 1GHz)

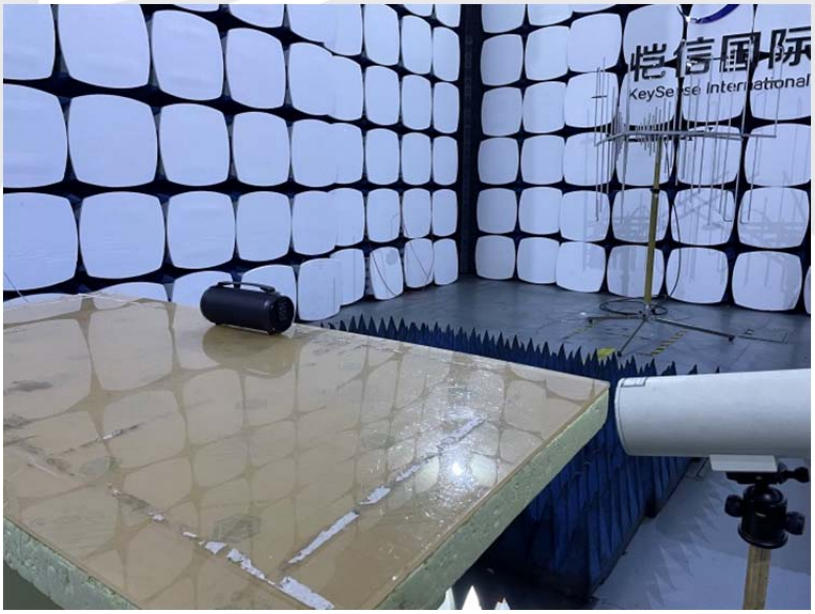


Harmonic current emission & Voltage fluctuations &flicker Test

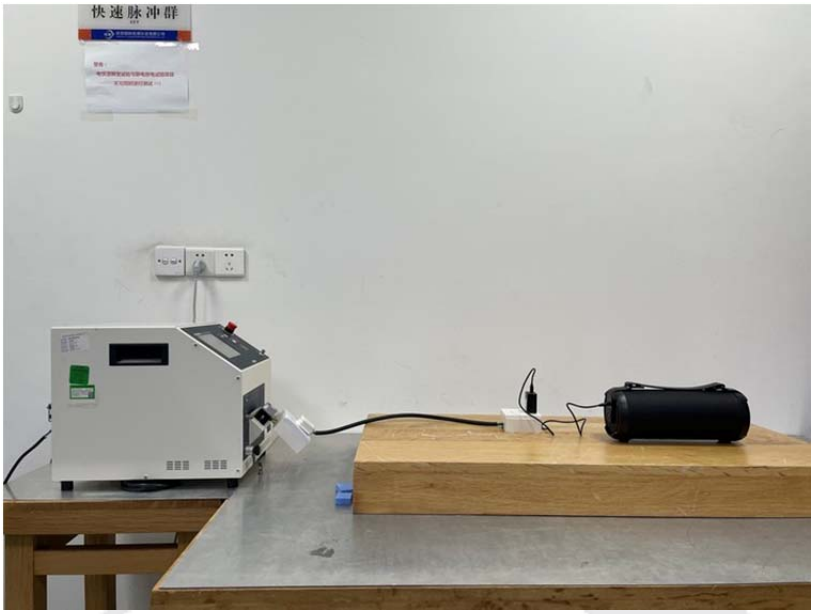


Electrostatic discharge Test

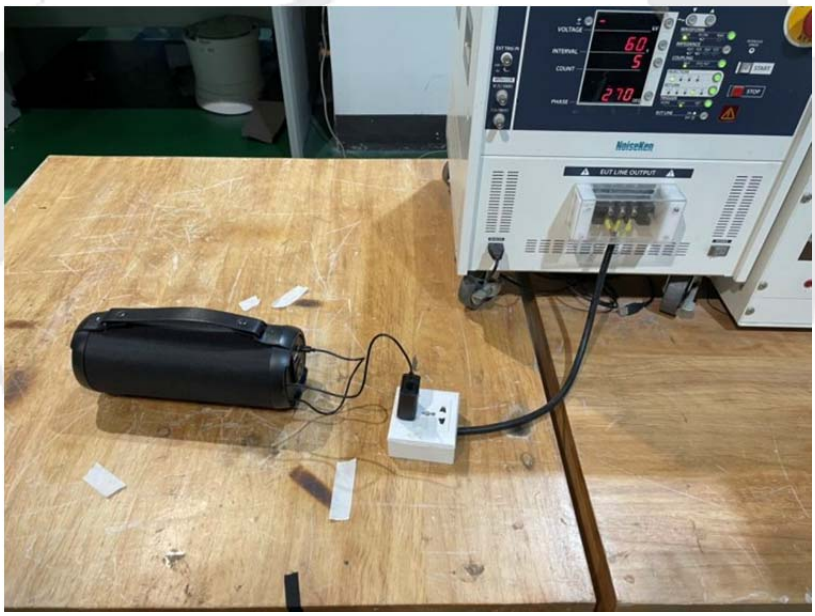
Radio-frequency Continuous radiated disturbance Test



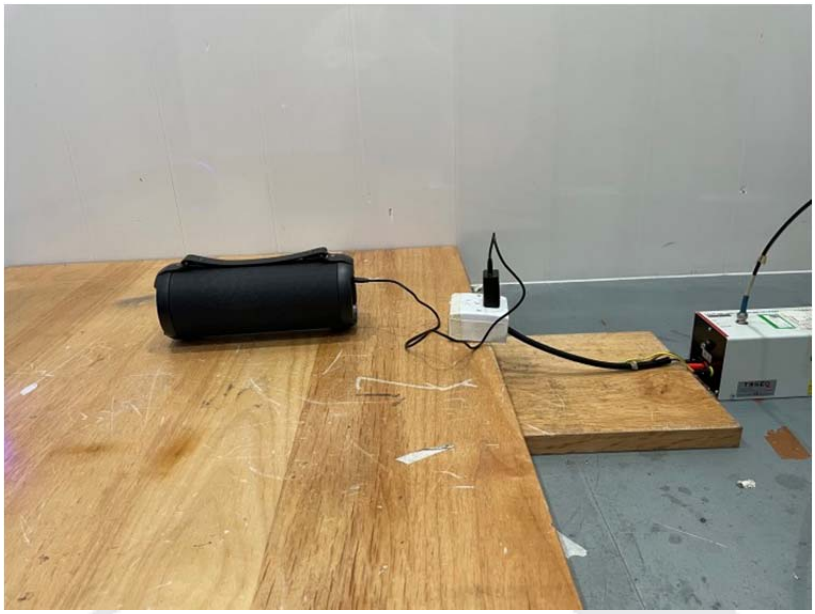
Electrical fast transient Test



Surge Test



Radio-frequency, Continuous conducted disturbance Test



Voltage dips & interruption Test

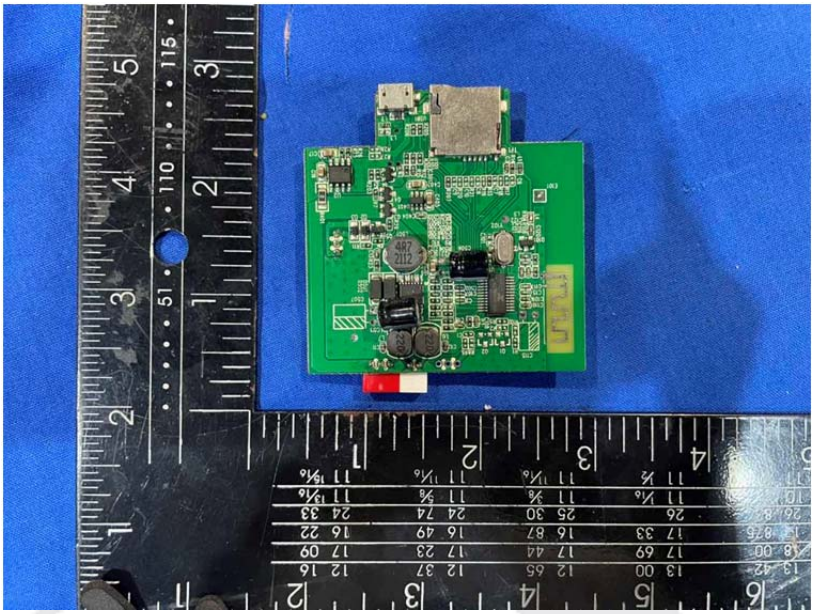
15 PHOTOS OF THE EUT

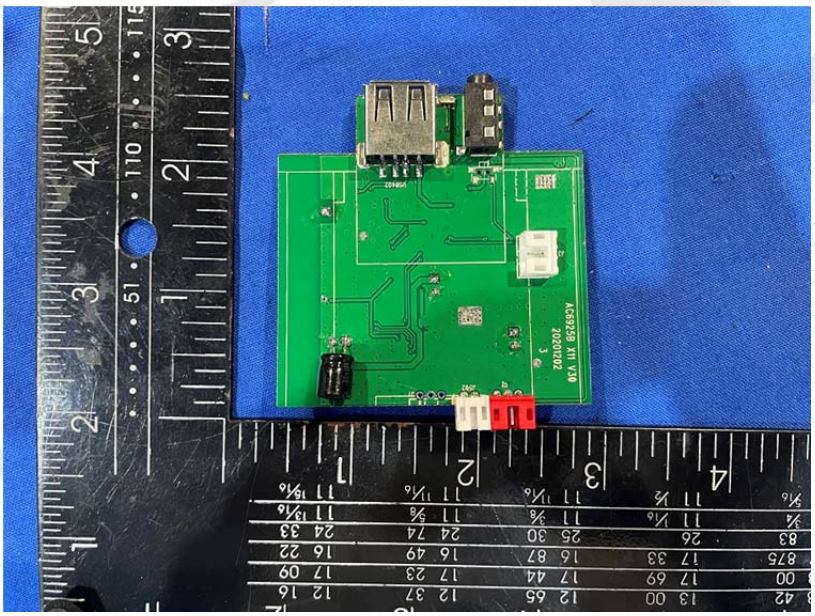
External photos

External photos

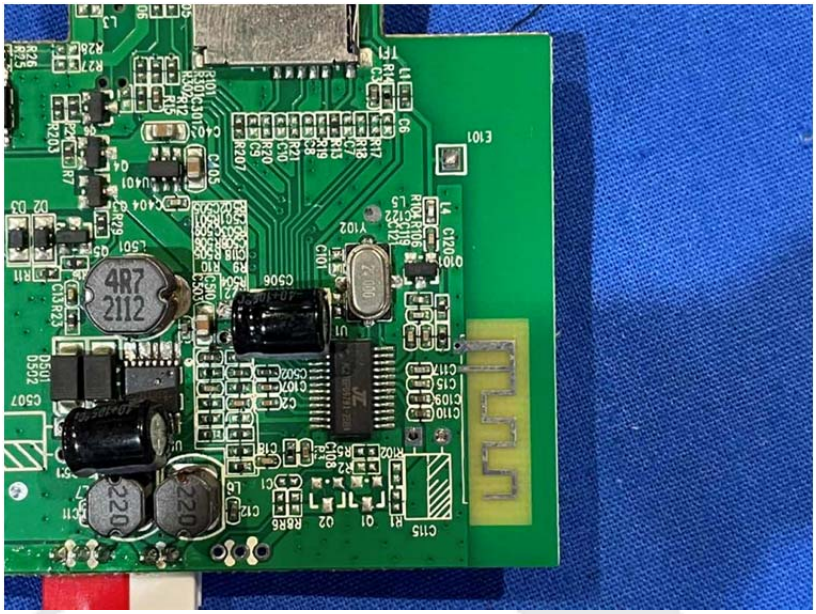
External photos

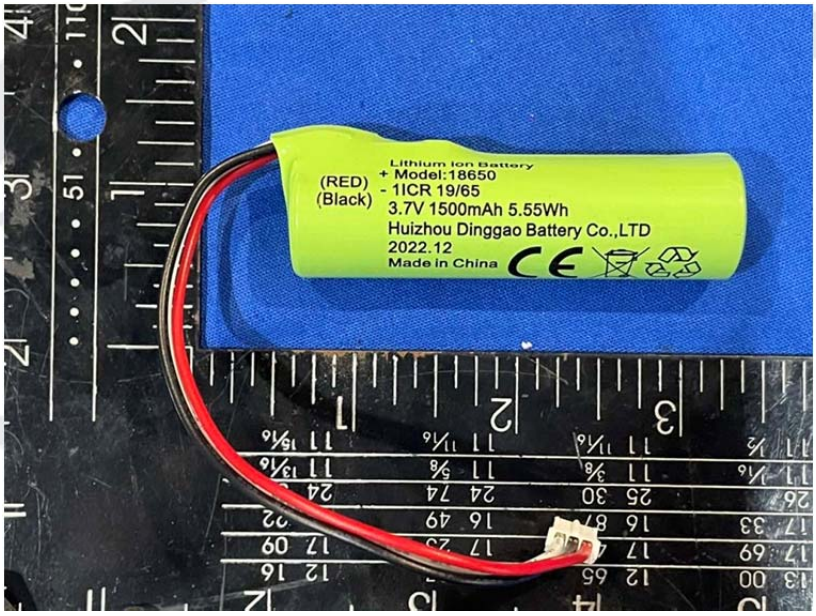
Internal photos



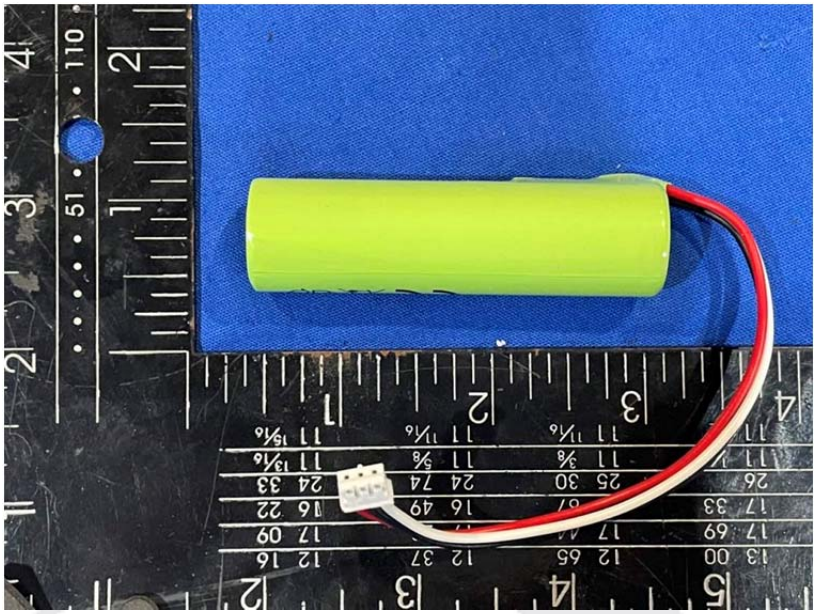


Internal photos





Internal photos



End of Report

Statement

1. The calibration and measurement of test equipments used in our laboratory are traceable to National primary standard of measurement and BIPM.
2. The report is invalid without the special test seal of the company.
3. The test report is invalid without the signature of main tester,examiner and approver.
4. The report is invalid if altered and added or deleted.
5. The test results in this report only apply to the tested samples.
6. This test report shall not be reproduced except in full, without the written approval of our laboratory.
7. "☆"item cannot be Accredited by CNAS.
8. Any objections must be raised to KeySense within 15days since the date when report is received.

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Postcode: 516006 Fax: 0752-3219929

Tel: 0752-3219929 E-mail: keysense@kst-cert.com